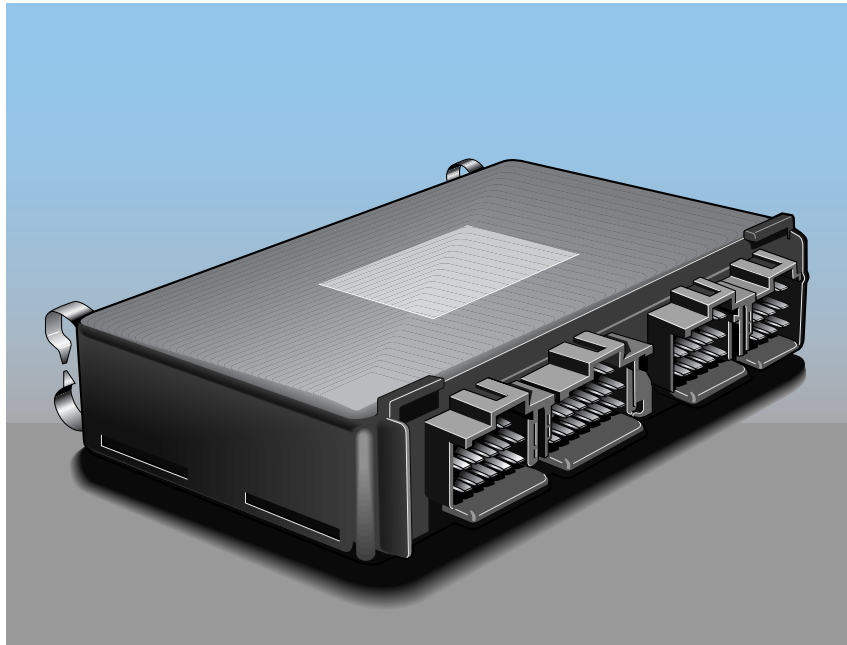


DAIMLERCHRYSLER

ADM-FR vehicle control adaption module



Control unit

Operating Instructions

Printed in Germany

We reserve the right to modify technical details of the control units and engines, which may then no longer conform with the information and illustrations in these Operating Instructions.

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Customer Service Powertrain Business Unit
E/MSS

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1. Safety

1.1. Symbols

The instructions which follow are shown against various symbols.



Risk of injury!

This symbol appears against all safety instructions which must be complied with in order to avoid a direct risk of danger to life and limb.



This symbol is used against all safety instructions which, if disregarded, could give rise to the danger of material damage or malfunctions.

1.2. General information



Risk of potentially fatal accident!

The ADM-FR vehicle control adaptation module is essential for defining the functions of the engine and vehicle. Functions such as engine start, engine stop, accelerator pedal evaluation, actuation of engine brake etc. are relevant to safety. Incorrectly performed modifications to the parameters or tampering with the wiring can cause far-reaching changes to the performance of the engine and/or vehicle. This can lead to personal injury and material damage.

The ADM-FR control unit has been developed and tested in accordance with the DaimlerChrysler Specifications for Operating Safety and EMC Compatibility. The manufacturer of the vehicle or equipment is solely responsible the examination and implementation of applicable legal stipulations.

1.3. Use for the intended purpose

The DaimlerChrysler engine and the ADM-FR control unit are only to be used for the purpose stated in the contract of purchase. Any other use or an extension of the stated use will be regarded as not conforming to the engine's intended purpose.

DaimlerChrysler AG cannot accept any liability for damage resulting from such use. Liability for damage resulting from the engine not having been used for its intended purpose shall rest solely with the manufacturer of the complete machine or vehicle in which the engine is installed.

These ADM-FR Operating Instructions and the engine Operating Instructions must be observed.

1.4. Personnel requirements

Work on the electrics and programmed parameters should only be carried out by specially skilled persons or those who have received training from DaimlerChrysler, or by specialists employed by a workshop authorised by DaimlerChrysler.

1.5. Conversions and modifications to the ADM-FR

Unauthorised modifications to the ADM-FR could affect the operation and safety of the vehicle/machine in which it is installed. No responsibility will be accepted for any resulting damage.

1.6. Installation

The guidelines and instructions in Chapter 5 must be observed.

1.7. Organisational measures

These Operating Instructions should be handed to personnel entrusted with the operation of the ADM-FR and should, whenever possible, be stored in an easily accessible place.

With the aid of these Operating Instructions, personnel must be familiarised with the operation of the ADM-FR, paying special attention to the safety-relevant instructions applicable to the engine. This applies in particular to personnel who only work on the engine and ADM-FR occasionally.

In addition to these Operating Instructions, comply with local legal stipulations and any other obligatory accident prevention and environmental protection regulations which may apply in the country of operation.

1.8. Safety precautions for engines with electronic control units



Risk of accident!

When the vehicle electrics are first operated, the drive train must be open (transmission in neutral).

The engine could start unexpectedly due to incorrect wiring or unsuitable parameter programming. If the drive train is closed (transmission not in neutral), the vehicle could unexpectedly start moving or set the working machine in operation, constituting a risk to life and limb.



The safety precautions stated below must be applied at all times in order to avoid damage to the engine, its components and wiring, and to avoid possible personal injury.

- Only start the engine with the batteries securely connected.
- Do not disconnect the batteries when the engine is running.
- Only start the engine with the engine speed sensor connected.
- Do not start the engine with the aid of a rapid battery charger.
If emergency starting is necessary, only start using separate batteries.
- The battery terminal clamps must be disconnected before a rapid charger is used. Comply with the operating instructions for the rapid charger.
- If electric welding work is to be performed, the batteries must be disconnected and both cables (+ and -) secured together.
- Work is only to be performed on the wiring and connectors are only to be plugged/unplugged with the electrical system switched off.
- The first time the engine is run, the possibility must be provided to switch off the voltage supply to the MR engine control and to the ADM-FR adaptation module in an emergency.
If it is incorrectly wired up, it may no longer be possible to switch the engine off.
- Interchanging the poles of the control unit's voltage supply (e.g. by interchanging the battery poles) can damage the control unit beyond repair.
- Fasten connectors on the fuel injection system with the specified tightening torque.
- Only use properly fitting test leads for measurements on plug connectors (DaimlerChrysler connector set).



If temperatures in excess of 80 °C (e.g. in a drying kiln) are to be expected, the control units must be removed as they could be damaged by such temperatures.



Telephones and two-way radios which are not connected to an external aerial can cause malfunctions in the vehicle electronics and thus jeopardise the engine's operating safety.

1.9. DaimlerChrysler original parts

DaimlerChrysler original parts are subject to the most stringent quality checks and guarantee maximum functional efficiency, safety and retention of value. Each part is specially designed, produced, selected and approved for DaimlerChrysler. For this reason, we are obliged to disclaim all liability for damage resulting from the use of parts and accessories which do not meet the above requirements.

In Germany and various other countries, certain parts (for instance parts relevant to safety) are only officially approved for installation or conversion work if they comply with valid legal stipulations. These regulations are assured to be satisfied by DaimlerChrysler original parts.

If other parts, which have not been tested and approved by DaimlerChrysler, are installed - even if in individual circumstances they have been granted an official operating permit - DaimlerChrysler is unable to assess them or grant any form of warranty, although the company endeavours to monitor market developments as far as possible. The installation of such parts may therefore restrict the validity of the warranty.

1.10. Safety and emergency running programme

The ADM-FR, FMR and MR electronic engine control units monitor the engine and carry out self-diagnosis.

As soon as a fault is detected it is evaluated and one of the following measures is initiated:

- Faults during operation are indicated by the warning lamps being activated.
- Switch-over to a suitable substitute function for continued, albeit restricted engine operation (e.g. constant emergency engine speed).



Have any faults rectified without delay by the responsible DaimlerChrysler Service Station.

Note:

The DaimlerChrysler diagnosis testers (hand-held tester (HHT) or Minidiag), which are connected to the 14-pin diagnosis socket (on the unit), can be used to read off the fault codes.

ADM-FR fault codes and their meanings are described in Chapter

Defective units which are still within the period of warranty cover (6 months from DaimlerChrysler dispatch date) must be returned to the DaimlerChrysler field service organisation.

2. Operation

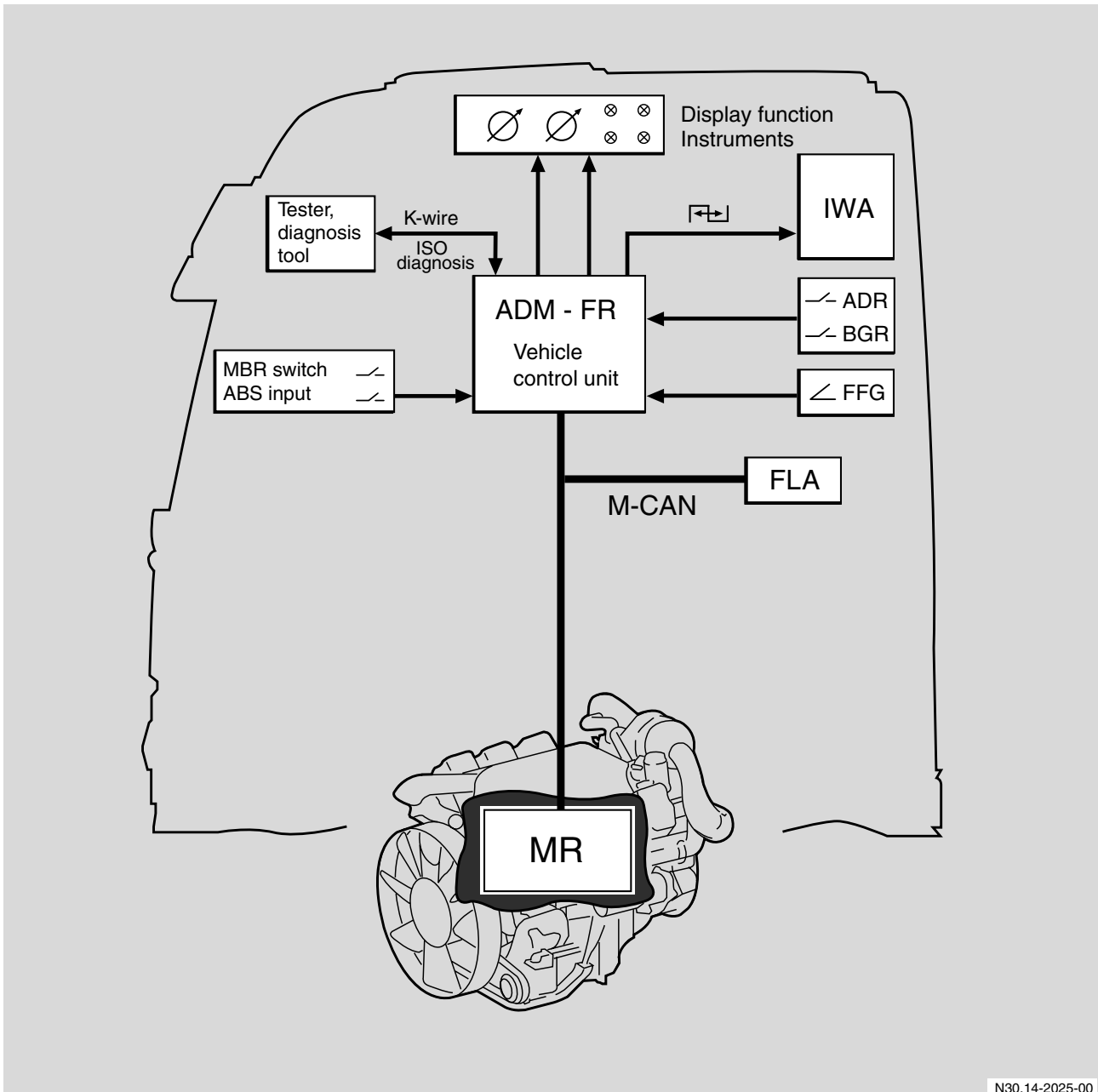
2.1. Introduction

DaimlerChrysler 500, 900 and 450 series engines are equipped with electronic engine management (MR). The MR monitors and determines all values which are required for the operation of the engine (e.g. commencement of injection, load level, ambient conditions, sensor evaluation etc.).

The connection to the vehicle is made via a CAN interface, which digitally transmits the specified values (e.g. torque, engine speed specification etc.) and the actual values (e.g. engine speed, oil pressure, etc.).

The ADM-FR vehicle control adaptation module contains the CAN interface required by the MR and allows the operator to implement his requirements on the engine. On the one hand, the ADM-FR allows the use of conventional gauges and at the same time provides a conventional interface for special functions. Predefined engine control settings, e.g. torque/rpm limitations or a specified, predefined set engine speed, can be selected using signal switches. Routines stored in the control unit can be optimally adapted to the respective application with parameter programming. A diagnosis interface is provided to connect up an external diagnosis tester.

2. Operation



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Adaptation module as vehicle control (ADM-FR)

ABS = Anti-lock brake system

ADR = Working speed governor

BGR = Limitations

FFG = Accelerator pedal sender
(driving mode) or specified rpm

FLA = Flame-start system

ISO = International Organization for Standardization

IWA = Actual value output (for automatic transmission, customer-specific electronics,...)

MBR = Engine brake

MR = Engine control

2.2. Tasks

The tasks of the ADM-FR can be split into three areas:

- Functions
- Inputs
- Outputs

2.2.1. Functions

- Driving mode: Torque specification to engine management (MR)
- Working speed governor: Specified rpm to engine management (MR)
- Engine start, engine stop
- Accelerator pedal evaluation, monitoring, fault evaluation
- Engine brake (input and output)
- Speed limitation
- Parameter memory
- Fault memory
- Diagnosis
- Diagnosis intersections: Implementation of K-wire diagnosis to CAN diagnosis for other control units

2.2.2. Inputs

The ADM-FR has inputs for

- Linkup with conventional ABS control unit,
- Transmission "Neutral" position,
- Activating limitations,
- Switching to working speed governor,
- Adjusting rpm,
- Special functions.

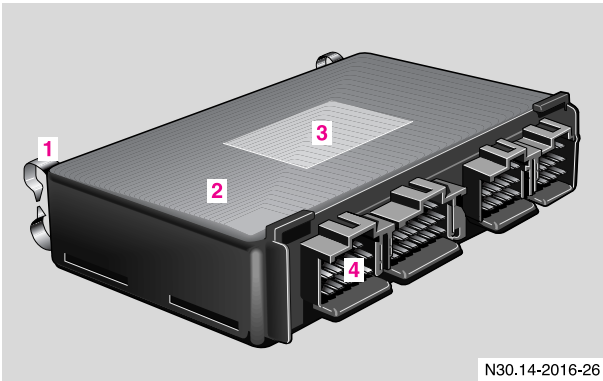
2.2.3. Outputs

The ADM-FR has outputs for

- Indicator and warning lamps
 - Oil pressure
 - Coolant temperature
 - Malfunction
 - Buzzer,
- Connections for measuring instruments
 - Oil pressure
 - Coolant temperature
 - Engine speed,
- Customer-specific electronics
 - Actual value output IWA 1,2 (e.g. for automatic transmission)
 - Relay outputs (kickdown)

3. Construction

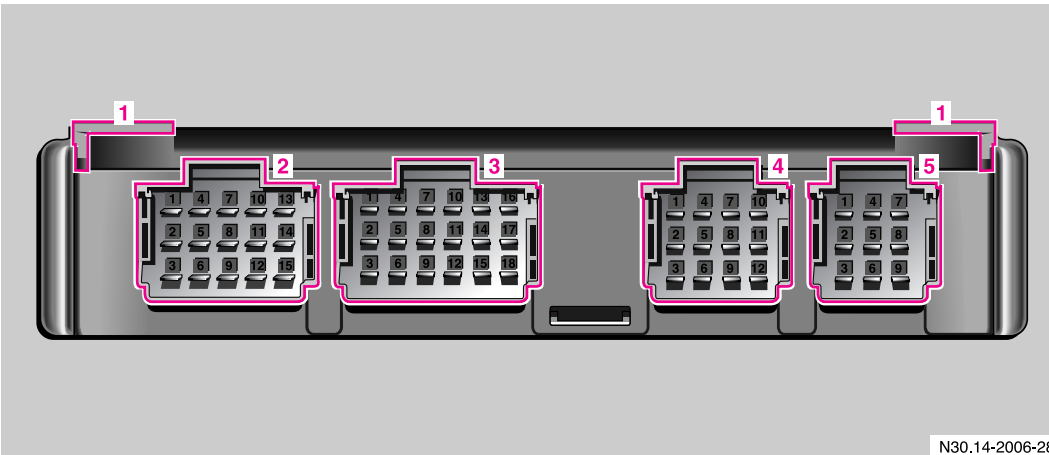
3. Construction



N30.14-2016-26

ADM-FR

- 1 Assembly spring
- 2 Housing
- 3 Data plate
- 4 Connectors





N30.14-2006-28

View from connector side

- 1 Support lug
- 2 Connector 1 (15-pin)
- 3 Connector 2 (18-pin)
- 4 Connector 3 (12-pin)
- 5 Connector 4 (9-pin)




The connector allocations and technical data are described on the following pages.

3.1. Connector allocation

Connector 1				
Pin	Type	Function	Abbreviation	Description
1	-	Battery voltage	Terminal 30	Supply voltage
2	A	Oil pressure	P_OEL	Sensor-compatible signal for conventional oil pressure gauge.
3	A	Warning lamp (MR, ADM)	LA_ADM	The "LA_ADM" output reports impermissible engine operating states (e.g. oil pressure too low) and active faults which are recognised by the control unit due to the permanent monitoring of the inputs and outputs.  If the output is active while the engine is running, perform maintenance or fault diagnosis as soon as possible.
4	A	Retarder	RETA	The output, wired to ground, is active if the accelerator pedal is not in the idling position. This signal can be used to deactivate a retarder. The output is monitored for a short or open circuit.
5	-	Ground	Terminal 31	Ground wire
6	A	Output to engine brake 1	MBRA1	Output, wired to ground, for connecting a solenoid valve to actuate the engine brake. Note the engine brake configuration parameters. The output is monitored for a short or open circuit.
7	A	Coolant temperature	T_MOT	Sensor-compatible signal for conventional temperature gauge.
8	-	Accelerator pedal 2, (supply)	FFG2	Supply voltage for accelerator pedal electronics, branch 2.
9	A	Buzzer	BUZZER	The output is active if serious faults have developed, e.g. oil pressure too low.  If the output is active while the engine is running, stop the engine without delay. Perform maintenance or fault diagnosis as soon as possible.
10	A	Actual value output 2 Frequency: Speed PWM: FP, limiting load...	IWA2	Programmable actual value output (PWM signal) for customer-specific electronics or automatic transmission. Possible output signals: - Accelerator pedal signal - Marginal moment (limiting load signal) - Actual engine torque

A = Output
 E/A = Input/output (bi-directional)
 DE = Digital input
 AE = Analogue input
 IE = Impulse input

3. Construction

Connector 1 (continued)				
Pin	Type	Function	Abbreviation	Description
11	-	Accelerator pedal 1, (supply)	FFG1+	Supply voltage for accelerator pedal electronics, branch 1.
12	A	Coolant indicator lamp	LA_T_MOT	Output is active if the engine coolant temperature is too high.  If the output is active while the engine is running, stop the engine without delay. Perform maintenance or fault diagnosis as soon as possible.
13	A	Oil level indicator lamp	LA_OELST	Output is active if the oil level has dropped to an impermissibly low level. This function is only available on engines with oil level sensor.  If the output is active while the engine is running, stop the engine without delay. Perform maintenance or fault diagnosis as soon as possible.
14	A	Oil pressure indicator lamp	LA_P_OEL	Output is active if the engine oil pressure at current rpm is too low.  If the output is active while the engine is running, stop the engine without delay. Perform maintenance or fault diagnosis as soon as possible.
15	DE	Battery voltage activated	Terminal 15	Input for "Terminal 15 ON" signal from starter switch. This signal must also be connected to the MR engine management.

A = Output
 E/A = Input/output (bi-directional)
 DE = Digital input
 AE = Analogue input
 IE = Impulse input

Connector 2				
Pin	Type	Function	Abbreviation	Description
1	IE	Tachograph speed	C3	Speed input from tachograph for road speed signal C3 (B7).
2	DE	Engine brake input	MBRE	Input for engine brake actuation to outputs MBRA1 and MBRA2. Note engine brake configuration parameters.
3	IE	Generator terminal W	Terminal W	Terminal W input from generator.
4	DE	Air conditioner	KLIMA	Input for activating selectable air conditioner pin limitations (e.g. idle speed boost for air conditioner). These imitations are always effective when the input is active. It is possible to programme the input to reflect a changeover between driving and ADR mode.
5	IE	Terminal 50	Terminal 50	Input for engine start signal from starter switch. This signal must also be connected to the MR engine management.
6	DE	Working speed up	ADR+	Driving mode: Input for idle speed boost ADR mode: Input for increasing specified engine speed
7	DE	Working speed 0	ADR0	Input for activating selectable ADR0 pin limitations. These limitations are always effective when the input is active. It is possible to programme the input to reflect a changeover between driving and ADR mode.
8	DE	Special functions 1	DSF1	Input, wired to ground, with programmable function - "Antigas" (Accelerator pedal lock) - ABS signal from conventional ABS control unit
9	DE	Neutral position	NE	"Neutral" information from transmission. This input affects the engine start.
10	A	Engine speed (terminal W-compatible signal)	N_MOT	Engine speed information for terminal W-compatible rev counter. Allocation of engine speed output frequency can be programmed.
11	DE	Rear axle	HA	vacant
12	DE	Special function 0 (antigas, upper vehicle...)	DSF0	Input, wired to positive, with programmable function - "Antigas" (Accelerator pedal lock) - ABS signal from conventional ABS control unit

A = Output
 E/A = Input/output (bi-directional)
 DE = Digital input
 AE = Analogue input
 IE = Impulse input

3. Construction

Connector 2 (continued)				
13	IE	Accelerator pedal 1 (PWM)	FFG1	Signal information from accelerator pedal, branch 1 (driver requirement)
14	DE	Working speed 1	ADR1	Input for activating selectable ADR1 pin limitations. These limitations are always effective when the input is active. It is possible to programme the input to reflect a changeover between driving and ADR operation.
15	IE	Accelerator pedal 2 (PWM)	FFG2	Signal information from accelerator pedal, branch 2 (driver requirement)
16	DE	Working speed 2	ADR2	Input for activating selectable ADR2 pin limitations. These limitations are always effective when the input is active. It is possible to programme the input to reflect a changeover between driving and ADR operation.
17	IE	Manual throttle sender (PWM)	HFG	Signal information (specified engine speed) from PWM manual throttle sender.
18	DE	Working speed down	ADR-	Driving mode: Input for idle speed reduction ADR mode: Input for decreasing specified engine speed

Connector 3				
Pin	Type	Function	Abbreviation	Description
1	-	-	-	vacant
2	-	-	-	vacant
3	-	-	-	vacant
4	AE	Analogue input 1	AE1	vacant
5	DE	Engine flap (bus)	MKLE	Input for engine starter inhibitor
6	DE	Door open (bus)	TROE	Input for accelerator pedal lock
7	A	Output relay 4	REL4	Output of actual value comparator 4
8	A	Output relay 3	REL3	Output of actual value comparator 3

A = Output
 E/A = Input/output (bi-directional)
 DE = Digital input
 AE = Analogue input
 IE = Impulse input

Connector 3 (continued)				
9	A	Output relay 2	REL2	Output is active if the accelerator pedal is in the idling position.
10	A	Output relay 1	REL1	Output is active when the accelerator pedal is in the "kickdown" position (information for automatic transmission).
11	A	Actual value output 1 (FP, limiting load,...)	IWA1	Programmable actual value output for customer-specific electronics or automatic transmission. Possible output signals: - Accelerator pedal signal - Marginal moment (limiting load signal) - Actual engine torque
12	A	Output to engine brake 2	MBRA2	Output, wired to ground, for connecting a solenoid valve to actuate the engine brake. Note the engine brake configuration parameters. The output is monitored for a short or open circuit.

Connector 4				
Pin	Type	Function	Abbreviation	Description
1	E/A	High-speed CAN (high)	CAN-HH	vacant
2	-	-	-	reserved
3	E/A	High-speed CAN (low)	CAN-HL	vacant
4	-	CAN-HF ground	HF-GND	CAN connection (HF ground) to MR engine electronics
5	E/A	K wire	K-DIAG	Diagnosis wire
6	-	CAN-HF ground	HF-GND	CAN connection (HF ground) to MR engine electronics
7	E/A	Low-speed CAN (high)	CAN-LH	CAN connection (high wire) to MR engine electronics
8	-	-	-	reserved
9	E/A	Low-speed CAN (low)	CAN-LL	CAN connection (low wire) to MR engine electronics

A = Output
 E/A = Input/output (bi-directional)
 DE = Digital input
 AE = Analogue input
 IE = Impulse input

3. Construction

3.2. Technical data of connector allocation

Power supply				
Conn./pin	Function	Abbreviation	I _{MAX}	Other data
1/1	Battery voltage	Terminal 30	< 500 mA	Current draw
1/5	Ground	Terminal 31	-	-
1/8	Accelerator pedal 2, (supply)	FFG2+	20 mA	U _B 15, Ri=150 ohms short-circuit-protected
1/11	Accelerator pedal 1, (supply)	FFG1+	20 mA	U _B 15, Ri=150 ohms short-circuit-protected
1/15	Battery voltage activated	Terminal 15	< 10 mA	Current draw

The value 150 ohms of the internal resistance of the accelerator pedal supply 1 and 2 is to be regarded as a guideline, as it depends on a number of factors (e.g. current, temperature, component tolerances, etc.).

Dynamic inputs (IE)						
Conn./pin	Function	Abbreviation	f	U _{LOW}	U _{HIGH}	Other data
2/1	Tachograph speed	C3	5.2 kHz	< 3.3 V	> 5.7 V	Wired to ground, 47k to terminal 30 (U _B)
2/3	Generator terminal W	Terminal W	p-n/60	< 8 V	> 15 V	Wired to positive, 22k to ground
2/5	Terminal 50	Terminal 50	-	< 5 V	> 8 V	Wired to positive, 3.6k to ground
2/13	Accelerator pedal 1 (PWM)	FFG1	200 ... 300 Hz	< 6.5 V	> 14 V	Wired to ground, 22k to terminal 30 (U _B)
2/15	Accelerator pedal 2 (PWM)	FFG2	200 ... 300 Hz	< 6.5 V	> 14 V	Wired to ground, 22k to terminal 30 (U _B)
2/17	Manual throttle sender (PWM)	HFG	200 ... 300 Hz	< 6.5 V	> 14V	Wired to ground, 22k to terminal 30 (U _B)

Digital inputs (DE)						
Conn./pin	Function	Abbreviation	f	U _{LOW}	U _{HIGH}	Other data
2/2	Engine brake input	MBRE	< 100 Hz	< 4 V	> 7.5 V	Wired to positive, 2k4 to ground
2/4	Air conditioner	KLIMA	< 100 Hz	< 4 V	> 7.5 V	Wired to positive, 2k4 to ground
2/6	Working speed up	ADR+	< 100 Hz	< 8 V	> 16.5 V	Wired to ground, 2k3 to terminal 30 (U _B)
2/7	Working speed 0	ADR0	< 100 Hz	< 8 V	> 16.5 V	Wired to ground, 2k3 to terminal 30 (U _B)
2/8	Special function 1 (ABS)	DSF1	< 100 Hz	< 8 V	> 16.5 V	Wired to ground, 600R to terminal 30 (U _B)
2/9	Neutral position	NE	< 100 Hz	< 3.8 V	> 7.5 V	Wired to positive, 2k4 to ground
2/11	Rear axle	HA	< 100 Hz	< 4 V	> 7.5 V	Wired to positive, 2k4 to ground
2/12	Special function 0 (antigas, upper vehicle...)	DSF0	< 100 Hz	< 4 V	> 7.5 V	Wired to positive, 2k4 to ground
2/14	Working speed 1	ADR1	< 100 Hz	< 4 V	> 7.5 V	Wired to positive, 2k4 to ground
2/16	Working speed 2	ADR2	< 100 Hz	< 8 V	> 16.5 V	Wired to ground, 2k3 to terminal 30 (U _B)
2/18	Working speed down	ADR-	< 100 Hz	< 8 V	> 16.5 V	Wired to ground, 2k3 to terminal 30 (U _B)
3/5	Engine flap (bus)	MKLE	< 100 Hz	< 8 V	> 16.5 V	Wired to ground, 2k3 to terminal 30 (U _B)
3/6	Door open (bus)	TROE	< 100 Hz	< 4 V	> 7.5 V	Wired to positive, 2k4 to ground

3. Construction

Analogue inputs (AE)					
Conn./pin	Function	Abbreviation	U_{MIN}	U_{MAX}	Other data
3/4	Analogue input 1	AE 1	0	U_B	14k2 to ground

Instrument outputs (A)						
Conn./pin	Function	Abbreviation	I_{MAX}	f	U_{MAX}	Other data
1/2	Oil pressure	P_OEL	120 mA	-	U_B	Analogue, 0 V - terminal 30 (U_B), short-circuit-protected
1/7	Coolant temperature	T_MOT	120 mA	-	U_B	Analogue, 0 V - terminal 30 (U_B), short-circuit-protected
1/10	Actual value output 2 PWM: FP, limiting load...	IWA2	50 mA	300 Hz, +/- 1 %	U_B	PWM, wired to ground, pull-up 4k7 to terminal 30 (U_B), short-circuit-protected
2/10	Engine speed (terminal-W-compatible signal)	N_MOT	50 mA	0 - 8 kHz	U_B	PWM, pull-up 4k7 to terminal 30 (U_B), short-circuit-protected
3/11	Actual value output 1 (FP, limiting load,...)	IWA1	50 mA	300 Hz, +/- 1 %	U_B	PWM, wired to ground, pull-up 4k7 to terminal 30 (U_B), short-circuit-protected

Driver outputs (A)						
Conn./pin	Function	Abbreviation	I_{MAX}	$P_{MAX, LAMP}$	$R_{coil, at 20\text{ }^{\circ}C}$	Other data
1/3	Warning lamp (MR, ADM)	LA_ADM	200 mA	2.0 W at 12 V	-	Wired to ground
1/4	Retarder	RETA	500 mA	-	-	Wired to ground, inductive load, diagnosis possible
1/6	Output to engine brake 1	MBRA1	1.2 A	16.5 W	35 ohms	Wired to ground, inductive load, diagnosis possible
1/9	Buzzer	BUZZER	200 mA	2.0 W at 12 V	-	Wired to ground
1/12	Coolant indicator lamp	LA_T_MOT	200 mA	2.0 W at 12 V	-	Wired to ground
1/13	Oil level indicator lamp	LA_OELST	200 mA	2.0 W at 12 V	-	Wired to ground
1/14	Oil pressure indicator lamp	LA_P_OEL	200 mA	2.0 W at 12 V	-	Wired to ground
3/7	Output relay 4	REL4	200 mA	-	24 V: 130 ohms 12 V: 65 ohms	Wired to ground, inductive load
3/8	Output relay 3	REL3	200 mA	-	24 V: 130 ohms 12 V: 65 ohms	Wired to ground, inductive load
3/9	Output relay 2	REL2	200 mA	-	24 V: 130 ohms 12 V: 65 ohms	Wired to ground, inductive load
3/10	Output relay 1	REL1	200 mA	-	24 V: 130 ohms 12 V: 65 ohms	Wired to ground, inductive load
3/12	Engine brake (output)	MBRA2	1.2 A	16.5 W	35 ohms	Wired to ground, inductive load, diagnosis possible

3. Construction

Interfaces (E/A)						
Conn./pin	Function	Abbreviation	Level	U _{MIN}	U _{MAX}	Other data
4/1	High-speed CAN (high)	CAN-HH	5 V	-	-	ISO/DIS 11898
4/3	High-speed CAN (low)	CAN-HL	5 V	-	-	ISO/DIS 11898
4/4	CAN-HF ground	HF-GND	GND	-	-	100 nF to ground
4/5	K wire	K-DIAG	U _B	0	U _B	-
4/6	CAN-HF ground	HF-GND	GND	-	-	100 nF to ground
4/7	High-speed CAN (high)	CAN-LH	U _B	-	-	ISO/DIS 11992, single-wire- compatible
4/9	High-speed CAN (low)	CAN-LL	U _B	-	-	ISO/DIS 11992, single-wire- compatible

4. Parameters (ADM-FR version 4)

A comparison of the parameters of version 1 and of version 4 is given in the appendix.

The ADM-FR parameters are divided into 17 groups. Each parameter group corresponds to one area of influence.

4.1. List of parameters

Parameter group	Parameter	Range	Unit	Default value
1 CAN configuration	01 Single wire capability Engine CAN switched off	YES/NO	-	NO
2 Base configuration driving mode	01 Engine brake (MBR)	0 ... 4	-	1
	02 Retarder (RET) fitted	YES/NO	-	NO
	03 Automatic transmission fitted	YES/NO	-	NO
	04 Activate touch inputs ADR+/-	YES/NO	-	YES
	05 Foot throttle actuator (FFG) fitted	YES/NO	-	YES
	06 Manual throttle actuator (HFG) fitted	YES/NO	-	NO
	07 HFG stops can be learned	YES/NO	-	NO
	08 Configuration for 12/24V use	12/24	V	24
3 Generally valid limits	01 Stationary speed limit	0 ... 4,000	rpm	2,496
	02 Idle speed control specified value	0 ... 4,000	rpm	592
	03 Max. value idle speed control	0 ... 4,000	rpm	896
	04 Maximum speed	0 ... 4,000	rpm	3,008
	05 Maximum vehicle speed	0 ... 150	km/h	85

4. Parameters

Parameter group	Parameter	Range	Unit	Default value
3 Generally valid limits	06 Max. torque	0 ... 5,000	Nm	4,999
	07 Governor selection	0 ... 5	-	1
	08 Slope of speed limit	1 ... 99	rpm/10 ms	10
	09 Slope of torque limit	1 ... 1,000	Nm/10 ms	50
4 Variable limits No. 0	01 Min. speed Pin ADR 0	0 ... 4,000	rpm	496
	02 Max. speed Pin ADR 0	0 ... 4,000	rpm	3,008
	03 Max. vehicle speed Pin ADR 0	0 ... 150	km/h	150
	04 Max. torque Pin ADR 0	0 ... 5,000	Nm	4,999
	05 Governor selection ADR 0	0 ... 5	-	1
5 Variable limits No. 1	01 Min. speed Pin ADR 1	0 ... 4,000	rpm	496
	02 Max. speed Pin ADR 1	0 ... 4,000	rpm	3,008
	03 Max. vehicle speed Pin ADR 1	0 ... 150	km/h	150
	04 Max. torque Pin ADR 1	0 ... 5,000	Nm	4,999
	05 Governor selection ADR 1	0 ... 5	-	1
6 Variable limits No. 2 (idle speed increase)	01 Min. speed Pin AC	0 ... 4,000	rpm	496
	02 Max. speed Pin AC	0 ... 4,000	rpm	3,008
	03 Max. vehicle speed Pin AC	0 ... 150	km/h	150

Parameter group	Parameter	Range	Unit	Default value
6 Variable limits No. 2 (idle speed increase)	04 Max. torque Pin AC	0 ... 5,000	Nm	4,999
	05 Governor selection AC	0 ... 5	-	1
7 Configuration working speed control	01 Allow for input ADR 0	YES/NO	-	YES
	02 Allow for input ADR 1	YES/NO	-	NO
	03 Allow for input ADR 2	YES/NO	-	NO
	04 Allow for input Neutral	YES/NO	-	NO
	05 Allow for input AC	YES/NO	-	NO
	06 Allow for idle throttle status	YES/NO	-	NO
	07 Allow for status $v < 5$ km/h	YES/NO	-	NO
	08 Inputs ADR +, ADR - active	YES/NO	-	YES
	09 Foot throttle actuator active	YES/NO	-	YES
	10 Manual throttle actuator active	YES/NO	-	NO
	11 Activate working speed control (ADR)	YES/NO	-	YES
	12 ADR touch set value Start value	0 ... 4,000	rpm	0
	13 ADR +/- bounce time	50 ... 5,000	ms	500
	14 ADR +/- step width	2 ... 10,000	rpm/10	200
	15 Change speed, ADR set value	2 ... 5,000	rpm/100 ms	11

4. Parameters

Parameter group	Parameter	Range	Unit	Default value
8 C3 signal analysis	01 Input C3 signal	0 ... 2	-	1
	02 Distance pulse count (tachograph)	4,400 ... 13,600	Pulses/km	4,400
	03 Rear axle ratio	1 ... 2,000	-	100
9 Act. value output (IWA)	01 Actual value output IWA 1	0 ... 4	-	1
	02 Actual value output IWA 2	0 ... 4	-	4
	03 Reference torque for IWA 1,2	0 ... 5,000	Nm	0
	04 Pulse count (tachometer)	200 ... 15,000	Pulses/100 rpm	2,173
10 Engine brake management	01 MBR, activation speed	0 ... 4,000	rpm	900
	02 MBR, time FP torque inhibited after MBR off	0 ... 5,000	ms	300
	03 MBR, acceleration ramp after MBR off	0 ... 500	Nm/10 ms	30
11 Accelerator pedal	01 Foot throttle actuator positioning rate up	0.1 ... 100	%/10 ms	4.0
	02 Foot throttle actuator positioning rate down	0.1 ... 100	%/10 ms	5.5
	03 Shift point idle speed	0.1 ... 100	%	6.0
	04 Shift point full load	0.1 ... 100	%	16.0
	05 Shift point KD on	0.1 ... 100	%	4.0
	06 Shift point KD off	0.1 ... 100	%	14.0
	07 Starting-off aid reduction FP additional torque	2 ... 1,000	Nm/s	10

Parameter group	Parameter	Range	Unit	Default value
11 Accelerator pedal	08 RQV, FFG position bottom	0 ... 100	%	0
	09 RQV, FFG position top	0 ... 100	%	100
	10 RQV, constant speed droop	20 ... 20,000	-	4,000
12 Transmission protection	01 Transmission protection 1st vehicle speed	0 ... 150	km/h	0
	02 Transmission protection 2nd vehicle speed	0 ... 150	km/h	0
	03 Transmission protection torque reduction	0 ... 5,000	Nm	4,999
	04 Hysteresis	0 ... 500	Nm	50
	05 Damping at zero load threshold	0 ... 5,000	Nm	25
	06 dM/dt within threshold, >0	0 ... 500	Nm/10 ms	48
	07 dM/dt within threshold, <0	0 ... 500	Nm/10 ms	8
	08 dM/dt not within threshold	0 ... 500	Nm/10 ms	450
13 Input configuration	01 Activate analogue input 1	YES/NO	-	NO
	02 Analogue input 1 lower limit value	0 ... 24,000	mV	0
	03 Analogue input 1 upper limit value	0 ... 24,000	mV	23,977
	04 Digital input DSF0 function configuration	0 ... 4	-	0
	05 Digital input DSF1 function configuration	0 ... 4	-	4

4. Parameters

Parameter group	Parameter	Range	Unit	Default value
14 INS curve oil pressure	01 Selection oil pressure curve	0 ... 1	-	0
15 INS curve coolant	01 Selection coolant curve	0 ... 1	-	0
16 Vehicle speed limit	Parameters in this group define the operation of the speed control system. Access to these parameters is not possible.			
17 Switching thresholds relays 3 and 4	01 Configuration IWK3	0 ... 4	-	0
	02 IWK3 Torque M	0 ... 5,000	Nm	5,000
	03 IWK3 Hysteresis M	0 ... 5,000	Nm	50
	04 IWK3 Vehicle speed	0 ... 150	km/h	150
	05 IWK3 Hysteresis V	0 ... 150	km/h	5
	06 IWK3 Speed N	0 ... 4,000	rpm	4,000
	07 IWK3 Hysteresis N	0 ... 4,000	rpm	50
	08 IWK3 Coolant temperature	-50 ... 200	°C	200
	09 IWK3 Hysteresis T	-50 ... 200	°C	5
	10 Configuration IWK4	0 ... 4	-	0
	11 IWK4 Torque M	0 ... 5,000	Nm	5,000
	12 IWK4 Hysteresis M	0 ... 5,000	Nm	50
	13 IWK4 Vehicle speed	0 ... 150	km/h	150

17 Switching thresholds relays 3 and 4	14 IWK4 Hysteresis V	0 ... 150	km/h	5
	15 IWK4 Speed N	0 ... 4,000	rpm	4,000
	16 IWK4 Hysteresis N	0 ... 4,000	rpm	50
	17 IWK4 Coolant temperature	-50 ... 200	°C	200
	18 IWK4 Hysteresis T	-50 ... 200	°C	5

4.2. Description of parameters

1 CAN configuration	
Parameter	Description
01 Single wire capability Engine CAN deactivated	<p>According to CAN definition, the CAN-Hi and CAN-Lo data wires transmit the same information with complementary physical levels. This type of transmission is considered extremely reliable with regard to influences (interference). The CAN connection between the ADM-FR and the MR engine management can be made with a single wire. This allows communications to be continued on the second, intact wire in the event of a short or broken circuit in one wire. Higher availability is thus achieved.</p> <p>Single wire capability must be deactivated if more than two participants are connected to the engine CAN.</p> <p>ADM-FR and MR engine management must have identical settings with regard to single wire capability.</p>

4. Parameters

2 Basic configuration driving mode

This group contains parameters which define driving operation.

The vehicle control adaptation module (ADM-FR) differentiates between the operating modes "Driving" and "Working speed governing (ADR)".

Driving mode is used for road-based vehicles.

The output/setting value for driving mode is engine torque.

The specified engine torque is determined by the ADM-FR and transmitted to the engine electronics via the CAN connection.

Driving mode is activated whenever the working speed governor is not active.

Parameter	Description																								
01 Engine brake (MBR)	<p>The following engine brake configurations are possible, depending on this parameter:</p> <table border="1"> <thead> <tr> <th>Value</th> <th>MBRA1 output</th> <th>MBRA2 output</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Output open</td> <td>Output open</td> <td>No engine brake</td> </tr> <tr> <td>1</td> <td>1 valve</td> <td>Output open</td> <td>Constantly open throttle valve, brake flap on one valve</td> </tr> <tr> <td>2</td> <td>1 valve (BK)</td> <td>Output open</td> <td>Brake flap to ADM-FR, hydr. constantly open throttle valve to MR</td> </tr> <tr> <td>3</td> <td>Output open</td> <td>1 valve (KDR)</td> <td>Constantly open throttle valve to ADM-FR, brake flap to MR</td> </tr> <tr> <td>4</td> <td>1 valve (BK)</td> <td>1 valve (KDR)</td> <td>Constantly open throttle valve and brake flap to each ADM-FR output</td> </tr> </tbody> </table>	Value	MBRA1 output	MBRA2 output	Remarks	0	Output open	Output open	No engine brake	1	1 valve	Output open	Constantly open throttle valve, brake flap on one valve	2	1 valve (BK)	Output open	Brake flap to ADM-FR, hydr. constantly open throttle valve to MR	3	Output open	1 valve (KDR)	Constantly open throttle valve to ADM-FR, brake flap to MR	4	1 valve (BK)	1 valve (KDR)	Constantly open throttle valve and brake flap to each ADM-FR output
Value	MBRA1 output	MBRA2 output	Remarks																						
0	Output open	Output open	No engine brake																						
1	1 valve	Output open	Constantly open throttle valve, brake flap on one valve																						
2	1 valve (BK)	Output open	Brake flap to ADM-FR, hydr. constantly open throttle valve to MR																						
3	Output open	1 valve (KDR)	Constantly open throttle valve to ADM-FR, brake flap to MR																						
4	1 valve (BK)	1 valve (KDR)	Constantly open throttle valve and brake flap to each ADM-FR output																						
02 Retarder (RET) fitted	<p>The "RETA" (retarder) output can be used to deactivate a retarder. Retarder operation is only permissible if, for example the engine is in deceleration (overrun) mode, no ABS adjustments have been made and the working speed governor is not active.</p>																								
03 Automatic transmission fitted	<p>If an automatic transmission is fitted, it is only possible to start the engine with input "terminal 50" if input "NE" (neutral) is active.</p>																								
04 Activate touch inputs ADR+/-	<p>The ADM-FR inputs "ADR+" (working speed governor up) and "ADR-" (working speed governor down) can be used to increase idling speed. Idling speed can be adjusted in steps by tipping the "ADR+" or "ADR-" inputs, or along a ramp with a prolonged actuation. The maximum idling speed is set with parameter "3/03 Max. idling speed control". Input debouncing time, increment and ramp rate are adjustable. Press "ADR+" and "ADR-" at the same time to reset the specified setting (idling speed setting). This function is only possible when the vehicle is stationary and driving mode is selected (no working speed governor).</p>																								

2 Driving mode basic configuration (continued)

Parameter	Description
05 Foot throttle actuator (FFG) fitted	On vehicles, the foot throttle actuator generally serves to transmit the driver's requirements to the engine. On systems without a foot throttle actuator, e.g. stationary appliances, the evaluation and monitoring of the FFG signals can be deactivated to prevent fault messages being given due to an open input. This is only possible if the parameter "7/09 foot throttle actuator active" is also set to "NO".
06 Manual throttle actuator (HFG) fitted	This parameter is not currently available. The function is planned for future extensions.
07 HFG stops can be learned	This parameter is not currently available. The function is planned for future extensions.
08 Configuration for 12/24 V use	Set this parameter to the rated voltage of the appliance electrical system.

3 Generally valid limits

This group contains general limitations which define the characteristics of the vehicle or equipment. It is only possible to modify the limits set in the engine electronics to the extent that maximum values are reduced and minimum values increased.

Parameter	Description
01 Stationary speed limit	The engine speed can be limited to the value set here when driving mode is activated and the vehicle is stationary (speed = 0). This prevents the engine from overrevving when the vehicle is stationary.
02 Idle specified value control	Definition of the minimum engine speed, provided the set value is greater than the idling speed stored in the engine electronics. The set value is always valid and can only be superseded by higher engine speeds using the programmable limitations. It may be necessary to raise the idling speed if the engine is permanently operated with increased basic load (ancillary equipment, converter transmission).
03 Max. value idle speed control	Definition of the upper end value of the idling speed adjustment in driving mode, possible via switches with digital inputs "ADR+" (working speed up) and "ADR-" (working speed down). This function is activated via parameter programming (see parameter 2/04).

4. Parameters

3 Generally valid limitations (continued)	
Parameter	Description
04 Maximum speed	<p>Definition of the maximum engine speed, provided the set value is lower than the limiting speed stored in the engine electronics.</p> <p>The set value is always valid and can only be superseded by lower engine speeds using the programmable limitations.</p> <p>It may be necessary to reduce the maximum engine speed, e.g. when a hydrostatic drive is fitted, to prevent the maximum speed of the hydraulic pump from being exceeded.</p>
05 Maximum vehicle speed	<p>The vehicle control adaptation module (ADM-FR) is certified as per directive 92/24/EEC as a speed limiter for keeping to legally specified maximum speeds. This parameter can only be changed with the relevant authorisation. Such authorisation can be issued to vehicle manufacturers upon application to DaimlerChrysler.</p> <p>The set value is always valid and can only be superseded by lower speeds using the programmable limitations.</p>
06 Max. torque	<p>Limitation of maximum torque value, provided the set value is below the maximum torque value stored in the engine electronics.</p> <p>The set value is always valid and can only be superseded by lower torques using the programmable limitations.</p>
07 Governor selection	<p>Depending on the application, different, finely tuned speed governors can be used on the engine electronics in the operating mode "Working speed governor". The type of governor is set with this parameter.</p> <p>Governor type 0 is a dynamic governor, e.g. for engine-clutch governing.</p> <p>Governor type 1 is specially tuned for use with power take-offs, pumps etc.</p> <p>Other governor types are not available at present.</p>
08 Slope of speed limit	<p>Ramps become effective when switching over from driving mode to working speed governor mode (or vice versa) or when torque limitations cut in.</p> <p>The time characteristic of the change of torque limitation (dynamic or soft) can be set with this parameter.</p>
09 Slope of torque limit	<p>Ramps become effective when switching over from driving mode to working speed governor mode (or vice versa) or when engine speed limitations cut in.</p> <p>The time characteristic of the change of engine speed (dynamic or soft) can be set with this parameter.</p>

4 Variable limits No. 0

These limitations become effective as a function of the switching state of the "ADR 0" digital input (working speed 0). These values are effective both in driving mode and in working speed governor mode and can influence minimum and maximum engine speed, maximum road speed, maximum torque and governor type.

The maximum values effective in parameter group 3 or in the engine electronics can only be superseded by lower values, the minimum values only be higher values - i.e. the maximum speed can only be reduced with "ADR 0" input activated.

Parameter	Description
01 Min. speed Pin ADR 0	Definition of idling speed boost. The set value is selected via input "ADR 0" (working speed 0).
02 Max. speed Pin ADR 0	Definition of engine speed limitation. The set value is selected via input "ADR 0" (working speed 0).
03 Max. vehicle speed Pin ADR 0	Definition of reduced maximum speed. The set value is selected via input "ADR 0" (working speed 0).
04 Max. torque Pin ADR 0	Definition of torque limitation. The set value is selected via input "ADR 0" (working speed 0).
05 Governor selection ADR 0	<p>Depending on the application, different, finely tuned speed governors can be used on the engine electronics in the operating mode "Working speed governor". This parameter is used to set the governor type, provided the input "ADR 0" (working speed 0) is to be allowed for with respect to the switchover to working speed governor mode (see parameter 7/01).</p> <p>Governor type 0 is a dynamic governor, e.g. for engine-clutch governing. Governor type 1 is specially tuned for use with power take-offs, pumps etc.</p> <p>Other governor types are not available at present.</p>

4. Parameters

5 Variable limits No. 1

These limitations become effective as a function of the switching state of the "ADR 1" digital input (working speed 1). Function and access to limitations are identical to "4 Variable limits No. 0". The only difference is that the values are activated via input "ADR 1".

Upper limits are always linked to the minimum value. Lower limits are linked to the maximum value. This also applies when several programmable limitations are active.

Parameter	Description
01 Min. speed Pin ADR 1	Definition of idling speed boost. The set value is selected via input "ADR 1" (working speed 1).
02 Max. speed Pin ADR 1	Definition of engine speed limitation. The set value is selected via input "ADR 1" (working speed 1).
03 Max. vehicle speed Pin ADR 1	Definition of reduced maximum speed. The set value is selected via input "ADR 1" (working speed 1).
04 Max. torque Pin ADR 1	Definition of torque limitation. The set value is selected via input "ADR 1" (working speed 1).
05 Governor selection ADR 1	<p>Depending on the application, different, finely tuned speed governors can be used on the engine electronics in the operating mode "Working speed governor". This parameter is used to set the governor type, provided the input "ADR 1" (working speed 1) is to be allowed for with respect to the switchover to working speed governor mode (see parameter 7/02).</p> <p>Governor type 0 is a dynamic governor, e.g. for engine-clutch governing. Governor type 1 is specially tuned for use with power take-offs, pumps etc.</p> <p>Other governor types are not available at present.</p>

6 Variable limits No. 2 (idle speed increase)

These limitations become effective as a function of the switching state of the "KLIMA" digital input. Function and access to limitations are identical to "4 Variable limits No. 0". The only difference is that the values are activated via input "KLIMA".

Upper limits are always linked to the minimum value. Lower limits are linked to the maximum value. This also applies when several programmable limitations are active.

Parameter	Description
01 Min. speed Pin A/C	Definition of idling speed boost. The set value is selected via input "KLIMA" (air conditioner).
02 Max. speed Pin A/C	Definition of engine speed limitation. The set value is selected via input "KLIMA" (air conditioner).
03 Max. vehicle speed Pin A/C	Definition of reduced maximum speed. The set value is selected via input "KLIMA" (air conditioner).
04 Max. torque Pin A/C	Definition of torque limitation. The set value is selected via input "KLIMA" (air conditioner).
05 Governor selection A/C pin	<p>Depending on the application, different, finely tuned speed governors can be used on the engine electronics in the operating mode "Working speed governor". This parameter is used to set the governor type, provided the input "KLIMA" (air conditioner) is to be allowed for with respect to switchover to working speed governor mode (see parameter 7/05).</p> <p>Governor type 0 is a dynamic governor, e.g. for engine-clutch governing. Governor type 1 is specially tuned for use with power take-offs, pumps etc.</p> <p>Other governor types are not available at present.</p>

4. Parameters

7 Configuration working speed control

This group contains parameters which define the operation of the working speed governor.

The vehicle control adaptation module (ADM-FR) differentiates between the operating modes "Driving" and "Working speed governor (ADR)"

The working speed governor is used for power take-offs, working equipment (e.g. cranes, piste maintenance equipment, harvesters, etc.) and for stationary applications (e.g. compressors, power generators, pumps, etc.).

The output/setting value for ADR mode is engine speed.

The specified engine speed is determined by the ADM-FR and transmitted to the engine electronics via the CAN connection.

The working speed governor is activated when all selected conditions are true (AND link).

Which conditions have to be allowed for to switch to working speed governor mode is programmed using simple yes/no decisions.

Parameter	Description
01 Allow for input ADR 0	The input "ADR 0" (working speed 0) can be allowed for as a condition for activating the working speed governor. Working speed governor mode is then only possible when the input "ADR 0" is active. The setting of this value has no influence on the effect of parameter group "4 Variable limits No. 0".
02 Allow for input ADR 1	The input "ADR 1" (working speed 1) can be allowed for as a condition for activating the working speed governor. Working speed governor mode is then only possible when the input "ADR 1" is active. The setting of this value has no influence on the effect of parameter group "5 Variable limits No 1".
03 Allow for input ADR 2	The input "ADR 2" (working speed 2) can be allowed for as a condition for activating the working speed governor. The condition is considered to be true if the control unit detects a falling edge at the input.
04 Allow for input Neutral	The input "NE" (neutral) can be allowed for as a condition for activating the working speed governor.
05 Allow for input A/C	The input "KLIMA" (air conditioner) can be allowed for as a condition for activating the working speed governor. Working speed governor mode is then only possible when the input "KLIMA" is active. The setting of this value has no influence on the effect of parameter group "6 Variable limits No. 2".
06 Allow for idle throttle status	The state "idle" can be allowed for as a condition for activating the working speed governor. Working speed governor mode is then only possible when the accelerator pedal is not depressed.
07 Allow for status $v < 5$ km/h	The status vehicle stationary ($v < 5$ km/h) can be allowed for as a condition for activating the working speed governor.

7 Configuration working speed control (continued)	
Parameter	Description
08 Inputs ADR+, ADR- active	The inputs "ADR+" (working speed up) and "ADR-" (working speed down) can be activated to define or change the engine speed specification in working speed governor mode. The specified engine idling speed can be adjusted in steps by tipping the inputs "ADR+" or "ADR-", or ramped within the valid engine speed range by prolonged actuation. Input debouncing time, increment and ramp rate are adjustable. Press "ADR+" and "ADR-" at the same time to reset the specified setting (idling speed setting).
09 Foot throttle actuator active	The foot throttle actuator can be activated to define the specified engine speed in working speed governor mode. The accelerator pedal position is shown in linear form in the range defined by the minimum and maximum engine speeds.
10 Manual throttle actuator active	A manual throttle actuator with PWM output can be activated to define the specified engine speed in working speed governor mode.
11 Activate working speed control (ADR)	This parameter is used to enable or to disable the working speed governor.
12 ADR tip specification Start value	When switching over from driving mode to working speed governor mode, the specified engine speed is set to the value programmed here, provided the inputs "ADR+" (working speed up) and "ADR-" (working speed down) are used to define the specified engine speed (see parameter 7/08).
13 ADR+/- debounce time	The specified engine idling speed can be adjusted in steps by tipping the inputs "ADR+" (working speed up) or "ADR-" (working speed down), or ramped within the valid engine speed range by prolonged actuation. After the time set here has elapsed, the engine speed adjust ramp commences.
14 ADR+/- step width	The specified engine idling speed can be adjusted in steps by tipping the inputs "ADR+" (working speed up) or "ADR-" (working speed down), or ramped within the valid engine speed range by prolonged actuation. When it is tipped, the specified engine speed changes by the increment set here.
15 Change speed ADR set value	The specified engine idling speed can be adjusted in steps by tipping the inputs "ADR+" (working speed up) or "ADR-" (working speed down), or ramped within the valid engine speed range by prolonged actuation. The value set here defines how steep the ramp is, i.e. how quickly the speed is ramped.

4. Parameters

8 C3 signal analysis

This group contains the speed determination parameters.
To implement a speed limitation, the ADM-FR requires a speed signal.

Parameter	Description
01 Input C3 signal	<p>This parameter defines whether a speed signal is present, and if so what type. This value can only be changed with the relevant authorisation. Such authorisation can be issued to vehicle manufacturers upon application to DaimlerChrysler.</p> <p>Programmable values: 0 = off, no speed signal, e.g. for stationary operation. 1 = C3 (B7) - speed signal from tachograph output. 2 = pulse generator, HALL sensor on transmission. This function is being prepared.</p>
02 Distance pulse count (tachograph)	<p>This parameter is not currently available. The function is planned for future extensions. Parameter for scaling the speed measurement if the signal is detected by the HALL sensor on the transmission.</p>
03 Rear axle ratio	<p>This parameter is not currently available. The function is planned for future extensions.</p> <p>If a rear axle with variable transmission ratio is fitted, this parameter serves to adapt the speed calculation when the crawler gear is engaged (only possible with signal detection via HALL sensor on transmission). The ADM-FR receives the rear axle switching state information via the "Rear axle" input.</p>

9 Act. value output (IWA)

Parameter group for actual value output to PWM outputs "IWA 1" (actual value output 1), "IWA 2" (actual value output 2) and engine speed information to output "N_MOT" (engine speed).

Parameter	Description																					
01 Actual value output IWA 1	<p>The physical value output at "IWA 1" (actual value output 1) can be selected. Pulse duty factors < 5 % and > 95 % are evaluated as faults or as signal failures by the subsequent electronic circuit connected.</p> <p>Programmable values:</p> <table border="1"> <thead> <tr> <th data-bbox="584 629 655 656">Value</th> <th data-bbox="699 629 794 656">Meaning</th> <th data-bbox="979 629 1075 656">Remarks</th> </tr> </thead> <tbody> <tr> <td data-bbox="584 685 596 712">0</td> <td data-bbox="699 685 799 712">no output</td> <td data-bbox="979 685 1075 712"></td> </tr> <tr> <td data-bbox="584 741 596 768">1</td> <td data-bbox="699 741 922 768">FP torque 10 % ... 90 %</td> <td data-bbox="979 741 1374 819">Illustration of accelerator pedal position Idle - full throttle to 10 % ... 90 % pulse duty factor</td> </tr> <tr> <td data-bbox="584 848 596 875">2</td> <td data-bbox="699 848 884 875">Differential torque</td> <td data-bbox="979 848 1369 1005">Signal for engine load evaluation e.g. for limit load regulation 90 %: Maximum engine torque reached (drive) 50 %: Engine not under load 10 %: Maximum friction torque reached</td> </tr> <tr> <td data-bbox="584 1034 596 1061">3</td> <td data-bbox="699 1034 922 1061">FP torque 90 % ... 10 %</td> <td data-bbox="979 1034 1374 1113">Illustration of accelerator pedal position Idle - full throttle to 90 % ... 10 % pulse duty factor</td> </tr> <tr> <td data-bbox="584 1142 596 1169">4</td> <td data-bbox="699 1142 831 1169">Actual torque</td> <td data-bbox="979 1142 1326 1220">Illustration of actual engine torque 0 ... MMAX to 10 % ... 90 % pulse duty factor</td> </tr> <tr> <td data-bbox="584 1249 596 1276">5</td> <td data-bbox="699 1249 810 1276">Load signal</td> <td data-bbox="979 1249 1422 1350">Load signal to coupling of automatic transmission with PWM interface. Output value is minimum of actual torque and accelerator pedal position.</td> </tr> </tbody> </table>	Value	Meaning	Remarks	0	no output		1	FP torque 10 % ... 90 %	Illustration of accelerator pedal position Idle - full throttle to 10 % ... 90 % pulse duty factor	2	Differential torque	Signal for engine load evaluation e.g. for limit load regulation 90 %: Maximum engine torque reached (drive) 50 %: Engine not under load 10 %: Maximum friction torque reached	3	FP torque 90 % ... 10 %	Illustration of accelerator pedal position Idle - full throttle to 90 % ... 10 % pulse duty factor	4	Actual torque	Illustration of actual engine torque 0 ... MMAX to 10 % ... 90 % pulse duty factor	5	Load signal	Load signal to coupling of automatic transmission with PWM interface. Output value is minimum of actual torque and accelerator pedal position.
Value	Meaning	Remarks																				
0	no output																					
1	FP torque 10 % ... 90 %	Illustration of accelerator pedal position Idle - full throttle to 10 % ... 90 % pulse duty factor																				
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4	Actual torque	Illustration of actual engine torque 0 ... MMAX to 10 % ... 90 % pulse duty factor																				
5	Load signal	Load signal to coupling of automatic transmission with PWM interface. Output value is minimum of actual torque and accelerator pedal position.																				

4. Parameters

9 Actual value output (IWA) (continued)																						
Parameter	Description																					
02 Actual value output IWA 2	<p>The physical value output at "IWA 2" (actual value output 2) can be selected. Pulse duty factors < 5 % and > 95 % are evaluated as faults or as signal failures by the subsequent electronic circuit connected.</p> <p>Programmable values:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Value</th> <th style="text-align: center;">Meaning</th> <th style="text-align: center;">Remarks</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>no output</td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td>FP torque 10 % ... 90 %</td> <td>Illustration of accelerator pedal position Idle - full throttle to 10 % ... 90 % pulse duty factor</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Differential torque</td> <td>Signal for engine load evaluation e.g. for limit load regulation 90 %: Maximum engine torque reached (drive) 50 %: Engine not under load 10 %: Maximum friction torque reached</td> </tr> <tr> <td style="text-align: center;">3</td> <td>FP torque 90 % ... 10 %</td> <td>Illustration of accelerator pedal position Idle - full throttle to 90 % ... 10 % pulse duty factor</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Actual torque</td> <td>Illustration of actual engine torque 0 ... MMAX to 10 % ... 90 % pulse duty factor</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Load signal</td> <td>Load signal to coupling of automatic transmission with PWM interface. Output value is minimum of actual torque and accelerator pedal position.</td> </tr> </tbody> </table>	Value	Meaning	Remarks	0	no output		1	FP torque 10 % ... 90 %	Illustration of accelerator pedal position Idle - full throttle to 10 % ... 90 % pulse duty factor	2	Differential torque	Signal for engine load evaluation e.g. for limit load regulation 90 %: Maximum engine torque reached (drive) 50 %: Engine not under load 10 %: Maximum friction torque reached	3	FP torque 90 % ... 10 %	Illustration of accelerator pedal position Idle - full throttle to 90 % ... 10 % pulse duty factor	4	Actual torque	Illustration of actual engine torque 0 ... MMAX to 10 % ... 90 % pulse duty factor	5	Load signal	Load signal to coupling of automatic transmission with PWM interface. Output value is minimum of actual torque and accelerator pedal position.
Value	Meaning	Remarks																				
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4	Actual torque	Illustration of actual engine torque 0 ... MMAX to 10 % ... 90 % pulse duty factor																				
5	Load signal	Load signal to coupling of automatic transmission with PWM interface. Output value is minimum of actual torque and accelerator pedal position.																				
03 Reference torque for IWA 1,2	This parameter is not currently available. The function is planned for future extensions.																					
04 Pulse count (tachometer)	<p>A square-wave signal which is directly proportional to the engine speed is available at the "N_MOT" (engine speed) output. Pulse duty factor approx. 50 %.</p> <p>The scaling, i.e. allocation of frequency to engine speed can be adjusted.</p> $f_{\text{MOT}}[\text{Hz}] = k \cdot \frac{n_{\text{MOT}}[\text{min}^{-1}]}{6000}$ <p> f_{MOT} : Frequency at "N_MOT" output k : rev counter pulse count, number of pulses pro 100 rpm n_{MOT} : current engine speed, actual value </p>																					

10 Engine brake management

This group contains parameters which define the characteristics and operation of the engine brake.



Risk of accident!

The engine brake is a safety-relevant function for commercial vehicles. Incorrect or unsuitable parameter programming can make it impossible to actuate the engine brake. The lack of, or reduction in, engine braking power could lead to the vehicle brake being overloaded. The vehicle can then no longer be braked.

Changes to the parameters in this group must only be performed by specially trained personnel or after consultation with the engine manufacturer.

It is not normally necessary to change these parameters.

Parameter	Description
01 MBR, activation speed	Engine brake intervention is only possible when the engine speed is above the speed set here. This prevents the engine from being stopped by engine brake intervention at excessively low speed.
02 MBR,time FP torque inhibited after MBR off	When the engine brake is deactivated, the accelerator pedal is blocked for the time set here (delayed injection). This time is intended for the transition of the engine brake to its rest position.
03 MBR, acceleration after MBR off	When the time set under parameter "02 MBR, time FP torque inhibited after MBR off" has elapsed, the current accelerator pedal position is effective via the ramp set here.

11 Accelerator pedal

This group contains parameters which define the evaluation of the accelerator pedal.



Risk of accident!

The accelerator pedal is a safety-relevant function for commercial vehicles.

Incorrect or unsuitable parameter programming can seriously affect the reactions of the accelerator pedal. This can cause the driver's requirements (e.g. throttle back) not to be implemented properly or only after a delay.

Changes to the parameters in this group must only be performed by specially trained personnel or after consultation with the engine manufacturer.

It is not normally necessary to change these parameters.

Parameter	Description
01 Foot throttle actuator, positioning rate up	Acceleration to the current accelerator pedal position runs along the ramp set here. This ramp is used to damp leaps in the accelerator pedal position in the direction of acceleration.
02 Foot throttle actuator, positioning rate down	Deceleration to the current accelerator pedal position runs along the ramp set here. This ramp is used to damp leaps in the accelerator pedal position in the direction of deceleration.
03 Shift point idle speed	Definition of accelerator pedal position upper limit for condition "Idle".
04 Shift point full load	Definition of accelerator pedal position upper limit for condition "Full load".
05 Shift point KD on	Definition of accelerator pedal position above that for which the condition "Kickdown" has been set.
06 Shift point KD off	Definition of accelerator pedal position below that for which the condition "Kickdown" has been set.
07 Starting-off aid reduction FP additional torque	Here, the time for the reduction of additional accelerator pedal torque for the starting aid is defined.

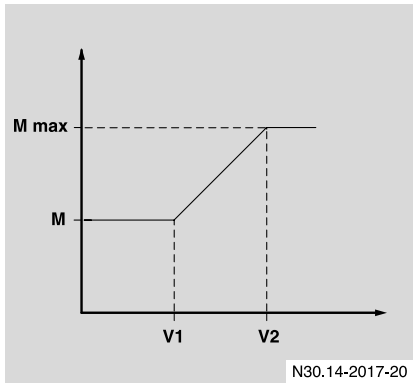
11 Accelerator pedal (continued)

Parameter	Description
08 RQV, FFG position bottom	This parameter has an effect on the accelerator pedal characteristic. It is not normally necessary to change this value.
09 RQV, FFG position top	This parameter has an effect on the accelerator pedal characteristic. It is not normally necessary to change this value.
10 RQV, constant P droop	This parameter has an effect on the accelerator pedal characteristic. It is not normally necessary to change this value.

12 Transmission protection

This group contains parameters from the following areas.

- Definition of speed-dependent torque limitation.
This prevents the transmission from being overloaded due to excessively high torque.
- Influence of torque crossover.
This minimises the effects of sudden load changes in the transmission.

Parameter	Description
01 Transmission protection 1st vehicle speed	Definition of limiting speed (v_1) If this speed is exceeded, the engine torque will be limited to the value of the parameter "03 Transmission protection torque reduction".
02 Transmission protection 2nd vehicle speed	Definition of limiting speed (v_2) Above this speed, the limitations of group "12 transmission protection" are no longer active. From "1st vehicle speed" (parameter 01) to "2nd vehicle speed" (parameter 02), the limitation increases linearly to the maximum engine torque (provided no other limitations are active).  N30.14-2017-20

4. Parameters

12 Transmission protection (continued)	
Parameter	Description
03 Transmission protection torque reduction	Definition of limiting torque. The engine torque is limited to the value set here at speeds below "2nd vehicle speed" (parameter 01).
04 Hysteresis	This parameter is intended to optimise the characteristics during sudden load changes. It is not normally necessary to change this value.
05 Damping at zero-load threshold	This parameter is intended to optimise the characteristics during sudden load changes. It is not normally necessary to change this value.
06 dM/dt within threshold, > 0	This parameter is intended to optimise the characteristics during sudden load changes. It is not normally necessary to change this value.
07 dM/dt within threshold, < 0	This parameter is intended to optimise the characteristics during sudden load changes. It is not normally necessary to change this value.
08 dM/dt not within threshold	This parameter is intended to optimise the characteristics during sudden load changes. It is not normally necessary to change this value.

13 Input configuration																									
The parameters in this group define the function of analogue and digital ADM-FR inputs.																									
Parameter	Description																								
01 Activate analogue input 1	This parameter is not currently available. The function is planned for future extensions.																								
02 Analogue input 1 lower limit value	This parameter is not currently available. The function is planned for future extensions.																								
03 Analogue input 1 upper limit value	This parameter is not currently available. The function is planned for future extensions.																								
04 Digital input DSF0 function configuration	<p>Depending on the setting of this parameter, certain functions are activated with the digital input "DSF0" (special function 0) wired to positive.</p> <p>Programmable values:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Value</th> <th style="text-align: center;">Meaning</th> <th style="text-align: center;">Remarks</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>Input "DSF0" not active</td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td>Accelerator pedal lock</td> <td>When input "DSF0" is active, the accelerator pedal is not effective.</td> </tr> <tr> <td style="text-align: center;">2</td> <td>vacant</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td>vacant</td> <td></td> </tr> <tr> <td style="text-align: center;">4</td> <td>ABS intervention</td> <td>Input "DSF0" is available for coupling a conventional ABS control unit. When input "DSF0" is active, the engine brake outputs are deactivated.</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Retarder intervention</td> <td>Input "DSF0" is available to couple a conventional retarder. When input "DSF0" is active, the information "Retarder intervention" is reported to the MR engine control. This setting only has a useful purpose on units on which the fan is controlled via the MR engine control.</td> </tr> <tr> <td style="text-align: center;">6</td> <td>Accelerator pedal lock and Retarder intervention</td> <td>Combination of settings 1 and 5.</td> </tr> </tbody> </table>	Value	Meaning	Remarks	0	Input "DSF0" not active		1	Accelerator pedal lock	When input "DSF0" is active, the accelerator pedal is not effective.	2	vacant		3	vacant		4	ABS intervention	Input "DSF0" is available for coupling a conventional ABS control unit. When input "DSF0" is active, the engine brake outputs are deactivated.	5	Retarder intervention	Input "DSF0" is available to couple a conventional retarder. When input "DSF0" is active, the information "Retarder intervention" is reported to the MR engine control. This setting only has a useful purpose on units on which the fan is controlled via the MR engine control.	6	Accelerator pedal lock and Retarder intervention	Combination of settings 1 and 5.
Value	Meaning	Remarks																							
0	Input "DSF0" not active																								
1	Accelerator pedal lock	When input "DSF0" is active, the accelerator pedal is not effective.																							
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3	vacant																								
4	ABS intervention	Input "DSF0" is available for coupling a conventional ABS control unit. When input "DSF0" is active, the engine brake outputs are deactivated.																							
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6	Accelerator pedal lock and Retarder intervention	Combination of settings 1 and 5.																							

13 Input configuration (continued)			
Parameter	Description		
05 Digital input DSF1 function configuration	Depending on the setting of this parameter, certain functions are activated with the digital input "DSF1" (special function 1) wired to ground.		
	Programmable values:		
	Value	Meaning	Remarks
	0	Input "DSF1" not active	
	1	Accelerator pedal lock	When input "DSF1" is active, the accelerator pedal is not effective.
	2	vacant	
	3	vacant	
	4	ABS intervention	Input "DSF1" is available for coupling a conventional ABS control unit. When input "DSF1" is active, the engine brake outputs are deactivated.
5	Retarder intervention	Input "DSF1" is available to couple a conventional retarder. When input "DSF1" is active, the information "Retarder intervention" is reported to the MR engine control. This setting only has a useful purpose on units on which the fan is controlled via the MR engine control.	
6	Accelerator pedal lock and Retarder intervention	Combination of settings 1 and 5.	

14 INS curve oil pressure	
Parameter	Description
01 Selection oil pressure curve	Configuration of output "P_OEL" (oil pressure) as per the oil pressure measuring equipment connected.
	Parameter = 0:
	Oil pressure (bar) Reference resistance (ohms)
	0 10
	1 48
	2 82
	3 116
	4 151
	5 184
	Parameter = 1:
	Oil pressure (bar) Reference resistance (ohms)
	0 10
	2 52
	4 88
	6 124
	8 155
	10 184

4. Parameters

15 INS curve coolant													
Parameter	Description												
01 Selection coolant curve	<p>Configuration of output "T_MOT" (coolant temperature) as per the coolant temperature measuring equipment connected.</p> <p>Parameter = 0:</p> <table><thead><tr><th>Temperature (°C)</th><th>Reference resistance (ohms)</th></tr></thead><tbody><tr><td>40</td><td>287.4</td></tr><tr><td>60</td><td>134</td></tr><tr><td>80</td><td>69.1</td></tr><tr><td>100</td><td>38.5</td></tr><tr><td>120</td><td>22.7</td></tr></tbody></table> <p>Parameter = 1:</p> <p>vacant</p>	Temperature (°C)	Reference resistance (ohms)	40	287.4	60	134	80	69.1	100	38.5	120	22.7
Temperature (°C)	Reference resistance (ohms)												
40	287.4												
60	134												
80	69.1												
100	38.5												
120	22.7												

16 Vehicle speed limit
<p>Parameters in this group define the operation of the speed control system. Access to these parameters is not possible.</p>

17 Switching thresholds relays 3 and 4

The parameters in this group define two actual value comparators (IWK). These comparators can be used to check whether the actual engine torque, speed, engine speed or the coolant temperature are higher than the programmed values. If the actual value is too high, the respective output is activated.

Parameter	Description		
01 Configuration IWK3	Parameters for "REL3" digital output configuration (relay 3 output).		
	Programmable values:		
	Value	Meaning	Remarks
	0	Idle	"REL3" output active, provided the accelerator pedal is in the idle position.
	1	$M_{\text{actual}} > M_{\text{KOMP3}}$	Comparison actual engine torque with values "02 IWK3, torque M" and "03 IWK3, hysteresis M". "REL3" output active, provided actual engine torque is greater than "02 IWK3, torque M". "REL3" output not active, provided actual engine torque is less than the difference between "02 IWK3, torque M" and "03 IWK3, hysteresis M".
	2	$V_{\text{actual}} > V_{\text{KOMP3}}$	Comparison actual speed with values "04 IWK3, speed" and "05 IWK3, hysteresis V". "REL3" output active, provided actual speed is greater than "04 IWK3, speed". "REL3" not active, provided actual speed is less than the difference between "04 IWK3, speed" and "05 IWK3, hysteresis V".
3	$N_{\text{actual}} > N_{\text{KOMP3}}$	Comparison actual engine speed with values "06 IWK3, engine speed N" and "07 IWK3, hysteresis N". "REL3" output active, provided actual engine speed is greater than "06 IWK3, engine speed N". "REL3" not active, provided actual engine speed is less than the difference between "06 IWK3, engine speed N" and "07 IWK3, hysteresis N".	
4	$T_{\text{actual}} > T_{\text{KOMP3}}$	Comparison actual coolant temperature with values "08 IWK3, coolant temperature" and "09 IWK3, coolant temperature". "REL3" output active, provided actual coolant temperature is greater than "06 IWK3, engine speed N". "REL3" not active, provided actual coolant temperature is less than the difference between "08 IWK3, coolant temperature" and "09 IWK3, hysteresis T".	

4. Parameters

17 Switching thresholds relays 3 and 4 (continued)	
Parameter	Description
02 IWK3 Torque M	Definition of reference value for actual engine torque.
03 IWK3 Hysteresis M	Definition of hysteresis for comparison of actual engine torque with "02 IWK3, torque M"
04 IWK3 Vehicle speed	Definition of reference value for actual speed.
05 IWK3 Hysteresis V	Definition of hysteresis for comparison of actual engine torque with "04 IWK3, speed"
06 IWK3 Speed N	Definition of reference value for actual engine speed.
07 IWK3 Hysteresis N	Definition of hysteresis for comparison of actual engine speed with "06 IWK3, engine speed N"
08 IWK3 Coolant temperature	Definition of reference value for actual coolant temperature.
09 IWK3 Hysteresis T	Definition of reference value for actual coolant temperature.

17 Switching thresholds relays 3 and 4 (continued)

Parameter	Description		
10 Configuration IWK4	Parameters for "REL3" digital output configuration (relay 4 output).		
	Programmable values:		
	Value	Meaning	Remarks
	0	vacant	
	1	$M_{\text{actual}} > M_{\text{KOMP4}}$	Comparison actual engine torque with values "11 IWK4, torque M" and "12 IWK4, hysteresis M". "REL4" output active, provided actual engine torque is greater than "11 IWK4, torque M". "REL4" output not active, provided actual engine torque is less than the difference between "11 IWK4, torque M" and "12 IWK4, hysteresis M".
	2	$V_{\text{actual}} > V_{\text{KOMP4}}$	Comparison actual speed with values "13 IWK4, speed" and "14 IWK4, hysteresis V". "REL4" output active, provided actual speed is greater than "13 IWK4, speed". "REL4" output not active, provided actual speed is less than the difference between "13 IWK4, speed" and "14 IWK4, hysteresis V".
3	$N_{\text{actual}} > N_{\text{KOMP4}}$	Comparison actual engine speed with values "15 IWK4, engine speed N" and "16 IWK4, hysteresis N". "REL4" output active, provided actual engine speed is greater than "15 IWK4, engine speed N". "REL4" output not active, provided actual engine speed is less than the difference between "15 IWK4, engine speed N" and "16 IWK4, hysteresis N".	
4	$T_{\text{actual}} > T_{\text{KOMP4}}$	Comparison actual coolant temperature with values "17 IWK4, coolant temperature" and "18 IWK4, coolant temperature". "REL4" output active, provided actual coolant temperature is greater than "17 IWK4, coolant temperature". "REL4" output not active, provided actual coolant temperature is less than the difference between "17 IWK4, coolant temperature" and "18 IWK4, hysteresis T".	

4. Parameters

17 Switching thresholds relays 3 and 4 (continued)	
Parameter	Description
11 IWK4 Torque M	Definition of reference value for actual engine torque.
12 IWK4 Hysteresis M	Definition of hysteresis for comparison of actual engine torque with "11 IWK4, torque M"
13 IWK4 Vehicle speed	Definition of reference value for actual speed.
14 IWK4 Hysteresis V	Definition of hysteresis for comparison of actual engine torque with "13 IWK4, speed"
15 IWK4 Speed N	Definition of reference value for actual engine speed.
16 IWK4 Hysteresis N	Definition of hysteresis for comparison of actual engine speed with "15 IWK4, engine speed N"
17 IWK4 Coolant temperature	Definition of reference value for actual coolant temperature.
18 IWK4 Hysteresis T	Definition of reference value for actual coolant temperature.

5. Fitting and connecting

5.1. Operating data

Protection rating of ADM-FR with plugged-on connector sockets: IP 30.

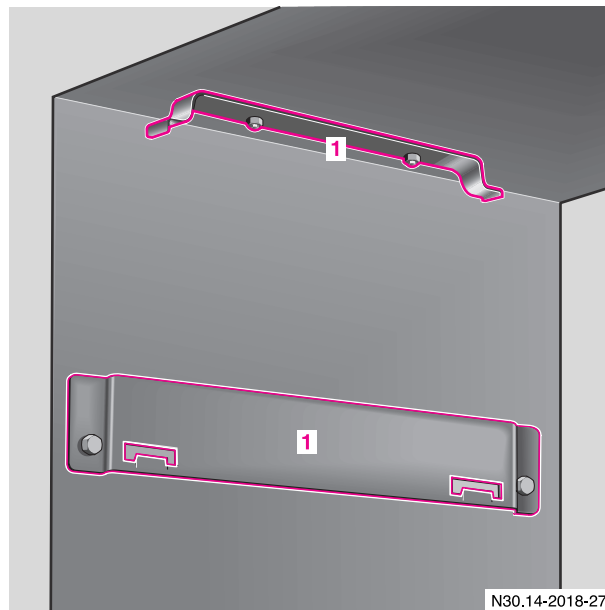
Ambient temperature for use and storage of ADM-FR:

- Operating temperature range: -40 °C to +70 °C
- Storage temperature range: -50 °C to +80 °C

5.2. Installation

Install the ADM-FR on a flat surface in a dry place with the connectors facing downwards.

Fit the central diagnosis socket in an easily accessible place.



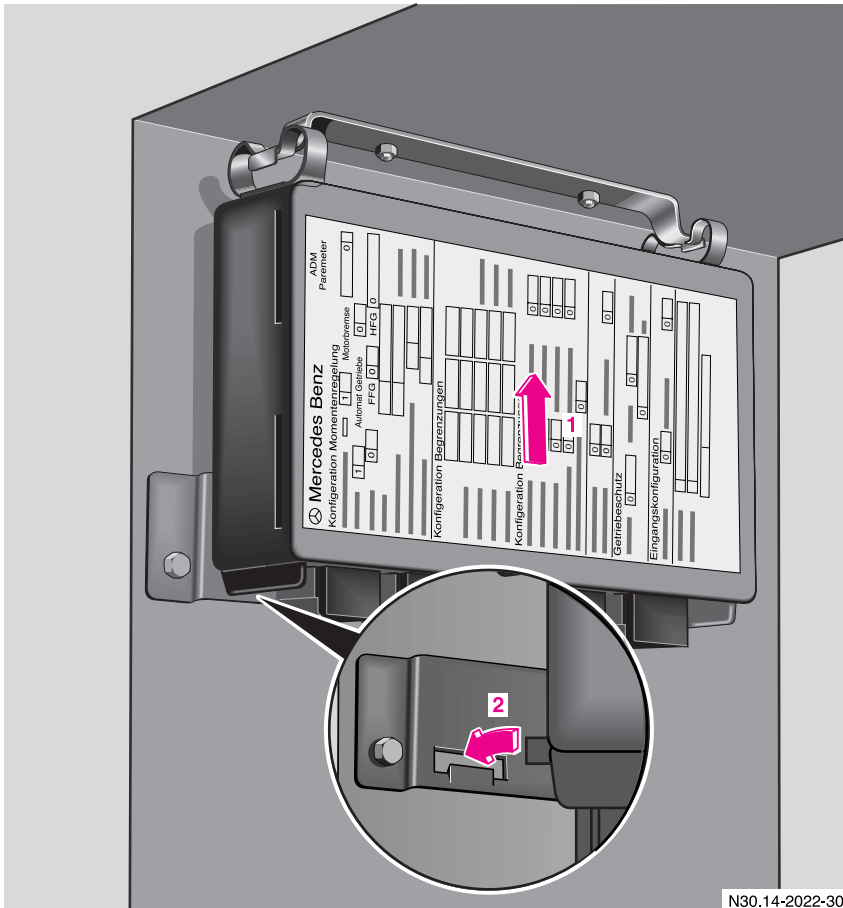
1 Brackets

(for MB part number and bolt dimensions of the brackets, see Appendix)



Only use DaimlerChrysler brackets. This will guarantee that the ADM-FR is securely mounted.

5. Fitting and connecting



To install:

- 1 Press the ADM-FR against the upper bracket with the mounting springs.
- 2 Guide the support lugs into the recesses in the lower bracket.

To remove:

Press the ADM-FR against the upper bracket with the mounting springs until the support lugs can be taken from the recesses in the lower bracket.

5.3. Connecting up



Risk of accident!

"Terminal 15" and "Terminal 50" of the control units are high-resistance signal inputs which draw current in the order of mA. Impermissible residual voltage at these inputs could affect LOW level detection.

Consequence:

- The engine starts unexpectedly (terminal 50)
- The engine can no longer be switched off (terminal 15)

If the engine starts unexpectedly, the vehicle could start moving unintentionally if the drive train is closed (transmission not in neutral) or the working equipment could start be set into operation, constituting a risk to life and limb.



A battery isolator switch is only to be fitted to one battery terminal (positive). Wiring a ground connection is not permissible and could result in damage to the MR and ADM-FR control units.

Observe the following guidelines when connecting up the ADM-FR:

- Only use DaimlerChrysler star quad cables to wire up CAN connections. These cables are specially designed for vehicle CAN application (EMC).
- The CAN connection between the MR and ADM-FR must not exceed a length of 15 metres.
- Switching off the power supply (terminal 30) is only permissible at the end of the control unit's run-on phase. The run-on phase begins when terminal 15 is switched off and lasts for about 5 seconds. During the run-on phase, new fault codes and parameters may be stored in the EEPROM memory.
- To avoid fault entries, the input "terminal 15" should be switched simultaneously for all control units.
- To avoid fault entries, the input "terminal 50" (engine start) should be switched simultaneously for the ADM-FR and MR control units.
- If a battery charge warning lamp is wired, it is important that a blocking diode is installed, as it would not otherwise be possible to switch the engine off via terminal 15.
- The ground connection of all electrical consumers should be distributed in a star formation from a central ground point. If the ground connection is not arranged in a star formation, or if the current flows through frame members with poor conductivity, malfunctions may develop due to ground offset or EMC effects.

6. Parameter programming

Equipment used for diagnosis and parameter programming of the ADM-FR is described below.

6.1. Minidiag

The following diagnostic functions can be performed with the Minidiag diagnosis tester:

- Read out control unit version
- Read out/clear the fault memory
- Read out actual value data (e.g. inputs, outputs, operating states)
- Teach in the accelerator pedal.

How to perform these function is described in the Minidiag operating instructions.

Parameter programming of control units is not possible with the Minidiag.

6.2. Hand-held tester (HHT)

The following diagnostic and parameter programming functions can be performed with the HHT:

- Read out control unit version
- Read out/clear the fault memory
- Read out actual value data
- Teach in the accelerator pedal.
- Parameter programming
- Actuate outputs

The system "Star Diagnosis" with the application programme "HHTWin" offers the same diagnostic and parameter programming functions.

6. Parameter programming

6.2.1. Diagnosis and parameter programming with HHT

The programme module "NFZ" (commercial vehicles) is required for diagnosis and parameter programming of the ADM-FR with the HHT.

Preparation:

- Connect the HHT to the diagnosis socket.
- Set the starter switch to the ON position.
- Switch the HHT on.

After the initial HHT display, there will be a number of introductory texts which are ended with the "enter" button.

Following this, the first menu appears, in which the vehicle/application is selected (see left).

	Com. veh.
1	Truck
2	Bus
3	Transporter
4	IMO

- In this menu, select the application "IMO".

	Com. veh.
1	IMO

- On the next screen, confirm the selection "IMO".

Following further notes on the release date of the HHT programme module, the next menu will appear:

	Perform short test
00	Short test
01	ADM
02	MR
99	Short test result

- In this menu, select "ADM".

ADM	Functions
1	Control unit version
2	Fault memory
3	Actual values
4	Actuations
5	Learning
6	Parameterizing

The required diagnosis and parameter programming functions can be selected in the ADM menu.

The continued procedure is described on-screen and in the HHT operating instructions.

Description of menu items:

- 1 Control unit version
Display of
 - DaimlerChrysler control unit part number,
 - Control unit version
 - Production date.
- 2 Fault memory
 - Display of stored faults, current and non-current,
 - Clear the fault memory.
- 3 Actual value data
Current operating data for the engine or for the vehicle/equipment.
Display of
 - Inputs,
 - Outputs,
 - Operating states.
- 4 Actuation signals
Setting (simulation) of values at outputs.
The actuation of outputs serves in troubleshooting.
- 5 Teach-in
Teach-in the accelerator pedal
- 6 Parameter programming
Check and modify parameters

7. Application

The following pages describe the areas of application of the ADM-FR and the associated inputs/input data, outputs/output data and parameters.

7.1. Driving mode

The drive control adaptation module (ADM-FR) differentiates between the operating modes "Driving" and "Working speed governing (ADR)". Driving mode is used for road-based vehicles.

The output/setting value in driving mode is the engine torque, this can be compared to an injection pump with RQ characteristics.

The ADM-FR computes a torque specification from the accelerator pedal position and transmits this to the MR engine management.

In driving mode, the following applications are possible. These are described on the pages stated.

Application	
Engine start/stop	page 65
Accelerator pedal	page 63
Instruments/displays*	page 67
Generator	page 72
Engine brake/ABS	page 66
Transmission	page 71
Actual value output	page 72
Tachograph (speed)	page 73
Programmable limitations	page 74

Applications printed in bold type are essential in driving mode.

* For driving mode, the applications "Warning lamp" and "Buzzer" are essential with instruments/displays.

7.2. Working speed governor (ADR)

The vehicle control adaptation module (ADM-FR) differentiates between the operating modes "Driving" and "Working speed governor (ADR)".

The working speed governor is used for power take-offs, working equipment (e.g. cranes, piste maintenance equipment, harvesters, etc.) and for stationary applications (e.g. compressors, power generators, pumps, etc.).

The output/setting value for ADR mode is engine speed.

The specified engine speed is identified by the ADM-FR from the input values given below and transmitted to the MR engine management via a CAN connection. The setting range of the specified engine speed is between the currently active minimum and maximum engine speeds. As in driving mode, these limits are defined by the parameters in group "3 Generally valid limitations" or "Programmable limitations no. 0, no. 1, no. 2".

The input value for the specified engine speed can be selected by parameter programming. The following input values are possible:

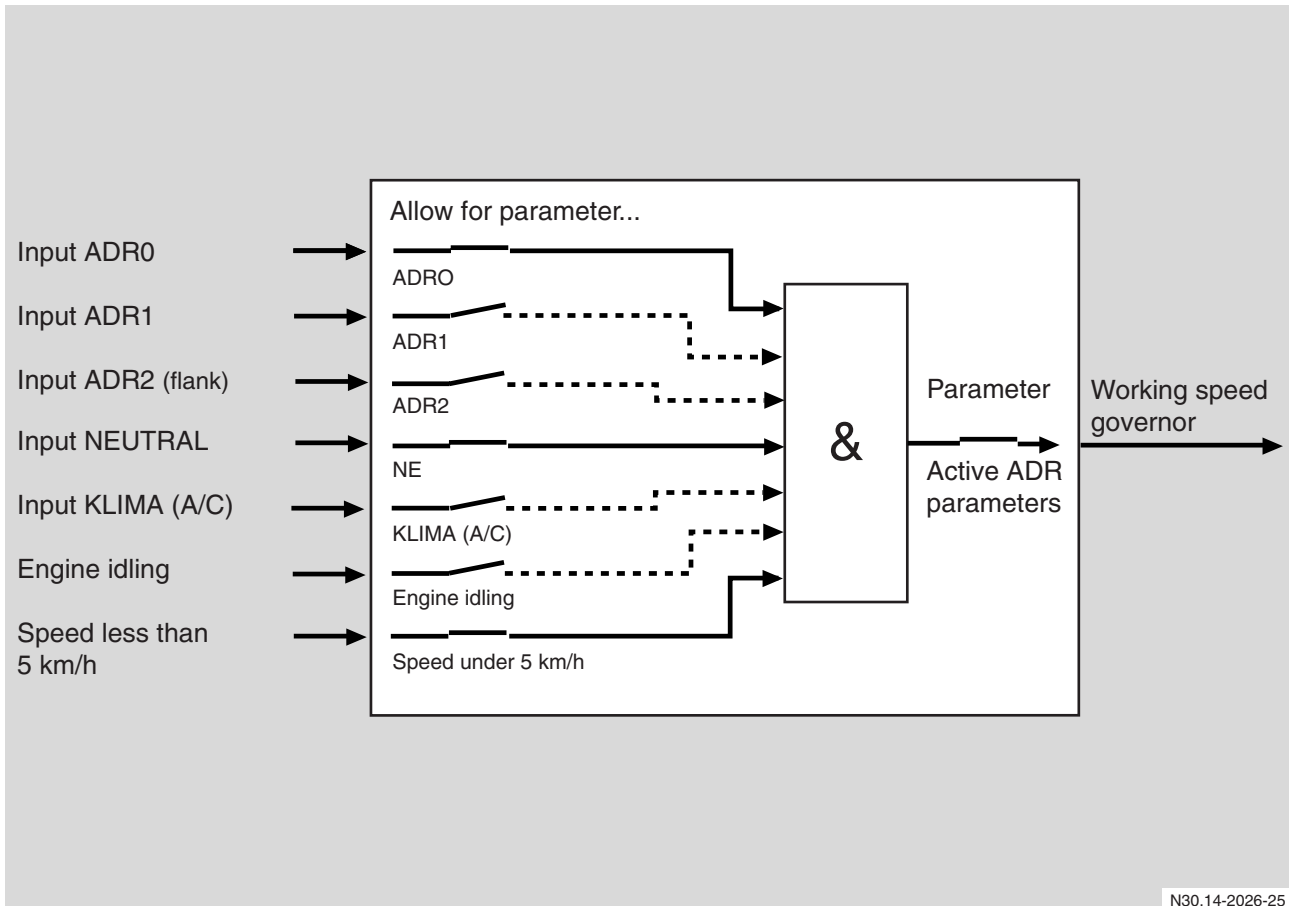
- Accelerator pedal
- Manual throttle sender
- Engine potentiometer function via input "ADR+" (working speed governor up) and "ADR-" (working speed governor down)
- Fixed engine speed via inputs "ADR0" (working speed governor 0), "ADR1" (working speed governor 1) or "KLIMA" (air conditioner).

It is possible to combine accelerator pedal with manual throttle sender and/or tip inputs.

The specified engine speed is defined by the maximum of all selected input values.

The system will switch from driving mode to working speed governor mode when all the selected conditions are true (AND link). Which conditions have to be considered to switch to working speed governor mode is programmed using simple yes/no decisions.

7. Application



N30.14-2026-25

Parameter = yes = switch closed.

In the above symbolic illustration of parameter programming, the working speed governor is activated when the following conditions are satisfied at the same time:

- Input "ADRO" (working speed governor 0) active
- Input "NE" (neutral) active
- Vehicle speed less than 5 km/h.

Inputs	Parameter	Output values
ADR0	7/01 Allow for ADR input 0	Condition for activating the working speed governor
ADR1	7/02 Allow for ADR input 1	
ADR2	7/03 Allow for ADR input 2	
NE	7/04 Allow for neutral input	
KLIMA	7/05 Allow for a/c input	
ADR+ ADR-	7/08 ADR +, ADR - inputs active	Definition of specified engine speed via inputs "ADR+" and "ADR-"
	7/12 ADR tip specification starting value	
	7/13 ADR +/- debounce time	
	7/14 ADR +/- increment	
	7/15 Adjustment speed of ADR specification	
FFG1 FFG2	7/09 Accelerator pedal sender active	Accelerator pedal for engine speed specification
HFG	7/10 Manual throttle sender active	Manual throttle sender for engine speed specification
-	7/11 Activate working speed governor (ADR)	Central enablement of working speed governor

In working speed governor mode, the following applications are possible. These are described on the pages stated.

Application	
Engine start/stop	page 65
Instruments/displays	page 67
Generator	page 72
Accelerator pedal	page 63
Actual value output	page 72
Programmable limitations	page 74

Applications printed in bold type are essential in working speed governor mode.

7.3. Accelerator pedal



Risk of accident!

The accelerator pedal is a safety-relevant function for commercial vehicles. Incorrect wiring or parameter programming can seriously affect the reactions of the accelerator pedal. This can cause the driver's requirements (e.g. throttle back) not to be implemented properly or only after a delay.

Changes to the accelerator pedal parameters must only be performed by specially trained personnel or after consultation with the engine manufacturer. It is not normally necessary to change the accelerator pedal parameters.



Only use accelerator pedals approved by DaimlerChrysler. The use of any other accelerator pedal could lead to malfunctions or damage to the ADM-FR.

The accelerator pedal must be connected to the ADM-FR accelerator pedal connection. The driver's requirements (accelerator pedal position) are identified by two electronic modules working independently of each other and transmitted via two PWM signals with mutually opposite pulse duty cycles. The evaluation electronics check the plausibility of the accelerator pedal signals and generate fault codes in the event of deviations.

Constant signal values are not allocated to the accelerator pedal stops (idle, full throttle). For this reason, it is necessary to teach-in the accelerator pedal to the ADM-FR control unit. This only has to be done once and is performed using diagnosis tools. This procedure stores the accelerator pedal extreme values in the non-volatile memory of the control unit.

If the accelerator pedal or control unit is replaced, the teach-in process must be repeated.

The teach-in process is described by the displays on the diagnosis units. For further information, see the operating instructions of the diagnosis units.

The accelerator pedal can be used in both driving mode and working speed governor mode. Depending on the accelerator pedal position, either a torque value can be specified in driving mode or an engine speed value in working speed governor mode.

The following inputs are available for the function "Accelerator pedal lock":

- "TROE" (door open (bus))

The accelerator pedal is blocked when the input "TROE" is active.

or

- "DSF0" (special function 0)

The accelerator pedal is blocked when input "DSF0" is active and programmed accordingly.

or

- "DSF1" (special function 1)

The accelerator pedal is blocked when input "DSF1" is active and programmed accordingly.

Inputs

- FFG1
- FFG2
- TROE
- DSF0
- DSF1

Parameters

- 2/05 Accelerator pedal sender (FFG) fitted
- 7/09 Accelerator pedal sender active
- 13/04 Digital input DSF0
Function configuration
- 13/05 Digital input DSF1
Function configuration

The parameters in group "11 accelerator pedal" also affect the characteristics of the accelerator pedal. It is not however necessary to change these parameters.

Outputs

- FFG1+
- FFG2+

7.4. Engine start/stop



Risk of accident!

The functions "starter inhibitor" and "engine start with automatic transmission" are not effective in engine emergency running programme without ADM-FR control unit or if the CAN connection is defective. In such cases, the engine start is controlled only by the MR engine management and can no longer be influenced by the ADM-FR. The engine could be started unexpectedly by the MR. If the drive train is closed (transmission not in neutral), the vehicle could unexpectedly start moving or set the working machine in operation, constituting a risk to life and limb.

7.4.1. Engine start

Note:

On DaimlerChrysler engines with starter type JE, the MR engine management controls the engine start. The starter motor is actuated directly from an output on the MR control unit.

It is possible to start the engine by activating the input "terminal 50" on the ADM-FR and on the MR engine management. The "terminal 50" inputs of the ADM-FR and MR must be wired in parallel.

For the purpose of service, the engine start/stop can be controlled via buttons directly on the engine. However, the buttons fitted on the engine are only intended for service purposes.

If an automatic transmission is fitted (parameter "2/03 automatic transmission fitted" = YES), it is only possible to start the engine when the input "NE" (neutral) is also active.

The input "MKLE" (engine flap (bus)) is provided for the function "starter inhibitor". If the input "MKLE" is active, it is no longer possible to start the engine via terminal 50.

Inputs

- Terminal 50
- MKLE

Parameter

- 2/03 Automatic transmission fitted

Output value

- Engine start instruction to MR via CAN connection

7.4.2. Engine stop

The engine is stopped by deactivating the control inputs "terminal 15" of the ADM-FR and MR.

Please observe the notes in Chapter 5 regarding the run-on phase, input resistance, blocking diode etc.

Input

- Terminal 15 (OFF)

Output value

- Engine stop instruction to MR

7.5. Engine brake/ABS



Risk of accident!

The engine brake is a safety-relevant function for commercial vehicles. Incorrect wiring or parameter programming can make it impossible to actuate the engine brake. The lack of, or reduction in, engine braking power could lead to the vehicle brake being overloaded. The vehicle can then no longer be braked.

Changes to the engine brake parameters must only be performed by specially trained personnel or after consultation with the engine manufacturer. It is not normally necessary to change the engine brake parameters.

The engine brake is activated via the input "MBRE" (engine brake input). Here, the following conditions must be satisfied:

- Driving mode (not working speed governor mode)
- No ABS intervention
- Engine speed higher than parameter "10/01 MBR, activation speed"
- Accelerator pedal not depressed

Parameter "2/01 engine brake configuration (MBR)" is to be set according to the engine's equipment.

The engine brake is always actuated in a single stage. It is not possible to actuate the engine brake in operating mode "working speed governor". This should be borne in mind when programming the parameters.

Inputs

- MBRE
- DSF0
- DSF1

Parameters

- 2/01 Engine brake (MBR)
- 10/01 MBR, activation speed
- 10/02 MBR, FP torque time blocked after MBR off
- 10/03 MBR, ramp up after MBR off
- 13/04 Digital input DSF0 Function configuration
- 13/05 Digital input DSF1 Function configuration

Outputs

- MBRA1
- MBRA2

7.6. Instruments/displays

7.6.1. Rev counter

A signal for actuating a rev counter is provided at the output "N_MOT" (engine speed).

Input value

- Engine speed information from MR via CAN connection

Parameter

- 9/04 Pulse number
(rev counter)

Output

- N_MOT

7.6.2. Coolant temperature gauge

A signal which is compatible with temperature sensors is provided at the output "T_MOT" (coolant temperature) for connecting up a conventional analogue indicator instrument.

Input value

- Coolant temperature information from MR via CAN connection

Parameter

- 15/01 Select coolant
characteristic

Output

- T_MOT

7.6.3. Oil pressure gauge

A signal which is compatible with oil pressure sensors is provided at the output "P_OEL" (oil pressure) for connecting up a conventional analogue indicator instrument.

Input value

- Oil pressure information from MR via CAN connection

Parameter

- 14/01 Select oil pressure
characteristic

Output

- P_OEL

7.6.4. Warning lamp

The output "LA_ADM" (warning lamp) reports impermissible engine operating states (e.g. oil pressure too low) and active faults which are recognised by the control unit due to the permanent monitoring of the inputs and outputs.



The output "LA_ADM" must be connected to a suitable warning lamp. If the warning lamp lights up while the engine is in operation, both the engine and the electronics must be examined.

The output "LA_ADM" is actuated if the following faults are detected:

- Engine speed less than 300 rpm
- Coolant temperature too high or temperature signal not available
- Oil pressure too low or oil pressure signal not available
- Oil level too low



Stop the engine immediately if the coolant temperature is too high, the oil pressure too low or the oil level too low.

The operating safety of the engine is endangered (risk of engine damage).

- No CAN connection to engine electronics or CAN data implausible
- Active faults in MR engine management fault memory, fault priority medium or high
- Active faults in ADM-FR fault memory, fault priority medium or high

Input values

- Engine speed information from MR via CAN connection
- CAN information "Coolant temperature too high" from MR
- CAN information "Oil pressure too low" from MR
- CAN information "Oil level too low" from MR
- CAN information "Active fault in MR engine management" with fault priority medium or high
- Active fault in ADM-FR, fault priority medium or high
- CAN information "Buzzer instruction"

Output

- LA_ADM

7.6.5. Buzzer



The output "BUZZER" reports serious faults which require the engine to be switched off immediately. Failure to switch the engine off could result in major damage to the engine, possibly even its destruction.

The output "BUZZER" must be connected. A warning buzzer or warning lamp can be connected.

Input values

CAN instruction "Buzzer" from MR in the event of:

- Overspeeding
- Oil level impermissibly low
- Oil pressure impermissibly low
- Coolant temperature impermissibly high

The limits for the values listed above are stored in the engine data records.

Output

- BUZZER

7.6.6. Coolant temperature indicator lamp

The output "LA_T_MOT" (coolant indicator lamp) reports impermissibly high coolant temperatures. Here, the output "LA_ADM" (warning lamp) is actuated.

The temperature limit is stored in the engine data records.

Input values

- CAN information "Coolant temperature too high" from MR

Outputs

- LA_T_MOT
- LA_ADM

7.6.7. Oil level indicator lamp

The output "LA_OELST" (oil level indicator lamp) reports impermissibly low oil levels. Here, the output "LA_ADM" (warning lamp) is actuated. The function "Oil level warning" is only available on engines with oil level sensor. The oil level limit is stored in the engine data records.

Input value

- CAN information "Oil level too low" from MR

Outputs

- LA_OELST
- LA_ADM

7.6.8. Oil pressure indicator lamp

The output "LA_P_OEL" (oil pressure indicator lamp) reports impermissibly low oil pressures. Here, the output "LA_ADM" (warning lamp) is actuated. The oil pressure limit is stored in the engine data records.

Input value

- CAN information "Oil pressure too low" from MR

Outputs

- LA_P_OEL
- LA_ADM

7.7. Transmission

The following inputs/outputs/functions are provided in the ADM-FR for the incorporation of the transmission:

- Input "NE" (neutral).
The neutral position is a condition for starting the engine with an automatic transmission
- Output "REL1" (relay 1 output).
Information "Kickdown" for automatic transmission.
- Outputs "IWA1" (actual value output 1) and "IWA2" (actual value output 2).
Load signal for automatic transmission.
- Function "Transmission protection".
Programmable, speed-dependent torque limitation to prevent overloading.

Input	Parameter	Output/output values
NE	2/03 Automatic transmission fitted	-
-	-	REL1 (kickdown)
-	9/01 Actual value output IWA1	IWA1
	9/02 Actual value output IWA2	IWA2
C3	12/01 Transmission protection speed 1	Engine torque limitation
	12/02 Transmission protection speed 2	
	12/03 Transmission protection torque reduction	

7.8. Actual value output

The following information is provided in the form of PWM signals at the outputs "IWA1" (actual value output 1) and "IWA2" (actual value output 2) to incorporate customer-specific electronic systems:

- Accelerator pedal position
- Differential torque for limit load control
- Actual engine torque
- Automatic transmission load signal.

Input value	Parameter	Outputs
Physical values as per setting of parameters 9/01 and 9/02	9/01 Actual value output IWA 1	IWA1
	9/02 Actual value output IWA 2	IWA2

7.9. Generator

Terminal W of the generator must be connected to the input "terminal W" (generator terminal W) of the ADM-FR.

The engine speed computed from the terminal W signal is continuously compared via the CAN with the engine speed information in the MR. In the event of a discrepancy between the two values, a fault message will be generated.

If the CAN connection between the MR and ADM-FR should fail, the engine speed computed from the terminal W signal is used as a substitute value for the actuation of the rev counter and engine brake.

The generator pre-excitation/charge check should be performed with a locking diode (without influence of ADM-FR).

Input

- Terminal W

7.10. Tachograph (speed)

For the realisation of the functions

- Legal maximum speed
- Programmable maximum speed
- Transmission protection

The speed signal C3/B7 of a tachograph should be connected to input "C3" (tachograph speed) of the ADM-FR.

Input "C3" is monitored for a short or open circuit.

For applications without speed signal, the ADM-FR speed measurement function must be deactivated by appropriate parameter programming.

Parameter programming of the maximum speed (legal maximum speed) and the deactivation of the speed measurement is only possible with special authorisation. Such authorisation can be issued to vehicle manufacturers upon application to DaimlerChrysler.

Input	Parameter	Output value
C3	3/05 Maximum speed	Maximum speed via required torque to MR via CAN connection
	8/01 C3 signal input	
	12/01 Transmission protection speed 1	
	12/02 Transmission protection speed 2	
	12/03 Transmission protection torque reduction	
ADR0	4/03 Max. road speed ADR pin 0	
ADR1	5/03 Max. road speed ADR pin 1	
KLIMA	6/03 Max. road speed A/C pin	

7.11. Programmable limitations

The inputs "ADRO" (working speed 0), "ADR1" (working speed 1) or "KLIMA" (air conditioner) can be used to realise programmable limitations.

The following limitations can be realised when the input is active:

- Idling speed boost e.g. when the air conditioner is switched on
- Maximum engine speed limitation e.g. for pumps or other power take-offs.
- Vehicle speed limitation e.g. for roadsweepers or refuse collection trucks in working mode
- Maximum torque limitation e.g. as overload protection for power take-offs, transmission etc.
- Select type of governor in working speed governor mode.

Programmed limitations are active in both driving mode and working speed governor mode.

The maximum values effective in parameter group 3 or in the engine electronics can only be superseded by lower values, the minimum values only be higher values.

Input	Parameter	Output value
ADRO	4/01 Min. engine speed ADR pin 0	Minimum engine speed specification to MR
	4/02 Max. engine speed ADR pin 0	Maximum engine speed specification to MR
	4/03 Max. road speed ADR pin 0	Maximum speed via required torque to MR
	4/04 Max. torque ADR pin 0	Specified torque limitation to MR
	4/05 Engine speed governor selection - ADRO	Specified governor type to MR (in working speed governor mode)

7. Application

Input	Parameter	Output value
ADR1	5/01 Min. engine speed ADR pin 1	Specified governor type to MR (in working speed governor mode)
	5/02 Max. engine speed ADR pin 1	
	5/03 Max. road speed ADR pin 1	
	5/04 Max. torque ADR pin 1	
	5/05 Engine speed governor selection - ADR1	
KLIMA	6/01 Min. idle speed A/C pin	Specified governor type to MR (in working speed governor mode)
	6/02 Max. engine speed A/C pin	
	6/03 Max. road speed A/C pin	
	6/04 Max. torque A/C pin	
	6/05 Engine speed governor selection - A/C	

7.12. Diagnosis



The ADM-FR and MR engine management diagnosis wire "K-Diag" must be connected to the 14-pin central diagnosis connector in accordance with the electrical wiring diagrams.

Parameters, actual values and fault codes can be read out from the ADM-FR and MR using DaimlerChrysler diagnosis tools (e.g. HHT, Minidiag) at the diagnosis connector.

Input/output

- K-DIAG

8. Measured values

The measured values (actual values) are current operating values for the engine or for the vehicle/equipment. They can be read off with a diagnosis unit (e.g. hand-held tester, Minidiag).

8.1. Analogue measured values

Measured value	Range	Unit	Conn./pin
01 Foot throttle actuator feedback 1	0 ... 100	%	2/13
02 Foot throttle actuator feedback 2	0 ... 100	%	2/15
03 Manual throttle actuator	0 ... 100	%	2/17
04 Accelerator pedal torque	0 ... 5,000	Nm	-
05 Vehicle speed	0 ... 150	km/h	2/1
06 Vehicle speed specified value	0 ... 125	km/h	-
07 Engine speed through terminal W	0 ... 8,000	rpm	2/3
08 Engine speed MR(PLD)	0 ... 8,000	rpm	-
09 Engine specified speed	0 ... 8,000	rpm	-
10 Governor type	0 ... 5	none	-
11 Minimum engine speed	0 ... 4,000	rpm	-
12 Maximum engine speed	0 ... 4,000	rpm	-
13 Engine specified torque	-5,000 ... +500	Nm	-
14 Engine actual torque	-5,000 ... +500	Nm	-

Measured value	Range	Unit	Conn./pin
15 Voltage supply ADM	0 ... 40	V	1/1
16 Analogue input 1 (air filter sensor)	0 ... 24	V	3/4
reserved	-	-	-
reserved	-	-	-
19 Coolant temperature	0 ... 120	°C	1/7
20 Oil pressure	0 ... 5,000	bar	1/2
21 IWA 1	0 ... 100	%	3/11
22 IWA 2	0 ... 100	%	1/10

8.2. Binary measured values

Measured value	Range	Conn./pin
01 Terminal 15 input	YES/NO	1/15
02 Engine start signal tml. 50	YES/NO	2/5
03 ADR parameterized	YES/NO	-
04 ADR 0 Signal present	YES/NO	2/7
05 ADR 1 Signal present	YES/NO	2/14
06 ADR 2 Signal present	YES/NO	2/16
07 ADR speed +	YES/NO	2/6
08 ADR speed -	YES/NO	2/18

8. Measured values

Measured value	Range	Conn./pin
09 Engine brake input	YES/NO	2/2
10 Engine brake output	YES/NO	1/6
11 Neutral position switch	YES/NO	2/9
12 DSF1 input	YES/NO	2/8
13 Rear axle input	YES/NO	2/11
14 DSF0 input	YES/NO	2/12
15 AC input	YES/NO	2/4
16 Retarder output	YES/NO	1/4
17 Relay output 1 (KD output)	YES/NO	3/10
18 Relay output 2 (air filter sensor dirty)	YES/NO	3/9
19 Relay output 3	YES/NO	3/8
20 Relay output 4	YES/NO	3/7
21 Fault lamp MR(PLD)	YES/NO	1/3
22 Coolant temperature warning	YES/NO	1/12
23 Oil pressure warning	YES/NO	1/14
24 Oil level warning	YES/NO	1/13
25 Warning buzzer actuated	YES/NO	1/9
26 Engine start MR(PLD)	YES/NO	-

Measured value	Range	Conn./pin
27 Start lockout	YES/NO	-
28 Idle throttle	YES/NO	-
29 Kickdown	YES/NO	-
30 MR(PLD) request constant throttle	YES/NO	-
31 MR(PLD) request brake flap	YES/NO	-
32 ADR active	YES/NO	-
33 Foot throttle actuator learned	YES/NO	-
34 Manual throttle actuator learned	YES/NO	-
35 Engine brake output 2	YES/NO	3/12
36 Engine flap (bus)	YES/NO	3/5
37 Door open (bus)	YES/NO	3/6

9. Fault codes

The fault codes can be read off with a diagnosis unit (e.g. hand-held tester, Minidiag). The display differentiates between current and non-current faults. Current fault codes cannot be cleared.

The fault codes listed apply to both the ADM-FR and to the ADM-AR.

The fault codes stored in the control unit describe the priority, path and type of the fault which has developed.

Example of fault code: **10605**

1 = Fault priority
06 = Fault path
05 = Fault type

In the 5-digit fault code, the first digit (0,1 or 2) indicates the fault priority. Proceed as follows, depending on the fault priority:

Fault priority 0

If necessary, these faults can be rectified during the next maintenance service.

Fault priority 1

The fault must be rectified as soon as possible.



Risk of accident!

It can be expected that the running characteristics of the engine will be affected. The driving and braking characteristics of the vehicle may have changed if driving mode is active. If working speed governor mode is active, the operating characteristics of the equipment may have changed.

Fault priority 2

The fault must be rectified immediately.



Risk of accident!

The running characteristics of the engine will be affected (emergency running programme).

The driving and braking characteristics of the vehicle will have changed if driving mode is active. If working speed governor mode is active, the operating characteristics of the equipment will have changed.

Have priority 2 malfunctions rectified immediately in a DaimlerChrysler Service Station or specialist workshop.

Fault code	Meaning	Remedial action
00502	Open circuit, short circuit to U _B + or short to ground terminal W, V-belt slipping	<ul style="list-style-type: none"> - Check terminal W signal wiring - Check V-belt tension - Check function of generator (battery charge indicator lamp out?) - Check whether terminal W signal is affected by other items of equipment
00602	Idle position restricted	The accelerator pedal must be taught-in again as the ADM-FR has not recognised idle position
00603	Pedal unit outside taught-in range	The accelerator pedal must be taught-in again as the full load position deviates greatly from the taught-in value
01001	Terminal 30 excess voltage identification	<ul style="list-style-type: none"> - Check voltage of electrical system - Check that parameter "2/08 configuration for 12/24 V application" tallies with electrical system voltage
01002	Terminal 30 undervoltage identification	<ul style="list-style-type: none"> - Check voltage of electrical system - Check that parameter "2/08 configuration for 12/24 V application" tallies with electrical system voltage
01103	MR data implausible	Check MR engine management for function/malfunction
10101/2	Analogue input 1 "AE1" - applicable threshold not reached/exceeded	Check wiring of analogue input "AE1"
10401	Open circuit, short circuit to U _B + or short to ground, tachograph C3	<ul style="list-style-type: none"> - Check wiring of speed signal C3 from tachograph. - If no tachograph signal is preset, check parameter group "8 C3 signal evaluation" (e.g. for stationary engines)
10402	Tachograph C3 frequency error	Check speed signal C3 for faults as the ADM-FR has detected a speed in excess of 200 km/h
10501	Generator terminal W allocation error (pulse/rev signal)	<ul style="list-style-type: none"> - Check terminal W signal wiring - Check V-belt tension - Check function of generator (does charge indicator lamp go out?) - Check whether terminal W signal is affected by other items of equipment

9. Fault codes

Fault code	Meaning	Remedial action
10601	Accelerator pedal unit defective	Renew accelerator pedal as signals are implausible
10604	Accelerator pedal unit not taught-in	Teach-in accelerator pedal
10605	Accelerator pedal signal GAS 1 not present (open circuit, short circuit to U _B ⁺ or to ground)	Check accelerator pedal and wiring
10606	Accelerator pedal signal GAS 2 not present (open circuit, short circuit to U _B ⁺ or to ground)	Check accelerator pedal and wiring
10701	Manual throttle sender signal outside defined range	Check manual throttle sender and wiring
10702	Manual throttle sender signal not present (open/short circuit)	Check manual throttle sender and wiring
10801	Engine brake output 1 "MBRA1" implausible	<ul style="list-style-type: none"> - Check engine brake and solenoid valve wiring - If no engine brake is fitted, check parameter "2/01 engine brake (MBR)"
10901	Retarder output "RETA" implausible (open circuit, short to U _B ⁺ or output overloaded)	<ul style="list-style-type: none"> - Check retarder cutoff wiring - If no retarder is fitted, check parameter "2/02 retarder (RET) fitted"
11101	Engine CAN - no connection to MR	<ul style="list-style-type: none"> - Check engine CAN wiring - Check MR wiring terminal 15, terminal 30, terminal 31 - Check that MR parameter "single-wire compatible" and ADM-FR parameter "1/01 single-wire compatible engine CAN off" have identical settings
11102	Engine CAN, no single-wire compatibility	Check that MR parameter "single-wire compatible" ADM-FR parameter "1/01 single-wire compatible engine CAN off" have identical settings
11104	Engine CAN defective, single wire mode active	Check engine CAN wiring

Fault code	Meaning	Remedial action
11201	Engine brake output 2 "MBRA2" implausible	<ul style="list-style-type: none">- Check engine brake and solenoid valve wiring- If no engine brake is fitted, check parameter "2/01 engine brake (MBR)"
11301	EEPROM error, can be corrected	<ul style="list-style-type: none">- Check all ADM-FR parameters for correct settings- If the fault reoccurs after fault acknowledgement and repeatedly switching the ADM-FR on and off, replace the ADM-FR
11401	IES CAN. No connection to FMR	<ul style="list-style-type: none">- Check IES CAN and neutral point wiring- Check FMR wiring terminal 15, terminal 30, terminal 31
21302	EEPROM error, cannot be corrected	<ul style="list-style-type: none">- Check all ADM-FR parameters for correct settings- If the fault reoccurs after fault acknowledgement and repeatedly switching the ADM-FR on and off, replace the ADM-FR

10. Appendix

10.1. Parameter list comparison ADM-FR version 1/version 4

The following table presents a comparison of the corresponding parameters of ADM-FR versions 1 and 4. The parameters are described in Chapter 4.

Parameter group, version 1	Parameter, version 1	Parameter group/ parameter, version 4
1 CAN configuration	01 Single wire capability Engine CAN switched off	1/01
2 Base configuration driving mode	01 Engine brake (MBR)	2/01
	02 Retarder (RET) fitted	2/02
	03 Automatic transmission fitted	2/03
	04 Activate touch inputs ADR+/-	2/04
	05 Foot throttle actuator (FFG) fitted	2/05
	06 Manual throttle actuator (HFG) fitted	2/06
	07 HFG stops can be learned	2/07
	08 Configuration for 12/24V use	2/08
3 Limits	01 Stationary speed limit	3/01
	02 Idle speed control specified value	3/02
	03 Max. value idle speed control	3/03

Parameter group, version 1	Parameter, version 1	Parameter group/ parameter, version 4
3 Limits	04 Maximum speed	3/04
	05 Maximum vehicle speed	3/05
	06 Max. torque	3/06
	07 Governor selection	3/07
	08 Min. speed Pin ADR 0	4/01
	09 Max. speed Pin ADR 0	4/02
	10 Max. vehicle speed Pin ADR 0	4/03
	11 Max. torque Pin ADR 0	4/04
	12 Governor selection ADR 0	4/05
	13 Min. speed Pin ADR 1	5/01
	14 Max. speed Pin ADR 1	5/02
	15 Max. vehicle speed Pin ADR 1	5/03
	16 Max. torque Pin ADR 1	5/04
	17 Governor selection ADR 1	5/05
	18 Min. speed Pin AC	6/01
	19 Max. speed Pin AC	6/02
	20 Max. vehicle speed Pin AC	6/03

Parameter group, version 1	Parameter, version 1	Parameter group/ parameter, version 4
3 Limits	21 Max. torque Pin AC	6/04
	22 Governor selection AC	6/05
	23 Slope of speed limit	3/08
	24 Slope of torque limit	3/09
4 Configuration working speed control	01 Allow for input ADR 0	7/01
	02 Allow for input ADR 1	7/02
	03 Allow for input ADR 2	7/03
	04 Allow for input Neutral	7/04
	05 Allow for input AC	7/05
	06 Allow for idle throttle status	7/06
	07 Allow for status $v < 5$ km/h	7/07
	08 Inputs ADR +, ADR - active	7/08
	09 Foot throttle actuator active	7/09
	10 Manual throttle actuator active	7/10

Parameter group, version 1	Parameter, version 1	Parameter group/ parameter, version 4
4 Configuration working speed control	11 Activate working speed control (ADR)	7/11
	12 ADR touch set value Start value	7/12
	13 ADR +/- bounce time	7/13
	14 ADR +/- step width	7/14
	15 Change speed, ADR set value	7/15
5 C3 signal analysis	01 Input C3 signal	8/01
	02 Distance pulse count (tachograph)	8/02
	03 Rear axle ratio	8/03
6 Act. value output (IWA)	01 Actual value output IWA 1	9/01
	02 Actual value output IWA 2	9/02
	03 Reference torque for IWA 1,2	9/03
	04 Pulse count (tachometer)	9/04
7 Engine brake management	01 MBR, activation speed	10/01
	02 MBR, time FP torque inhibited after MBR off	10/02
	03 MBR, acceleration ramp after MBR off	10/03

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Parameter group, version 1	Parameter, version 1	Parameter group/ parameter, version 4
8 Accelerator pedal	01 Foot throttle actuator positioning rate up	11/01
	02 Foot throttle actuator positioning rate down	11/02
	03 Shift point idle speed	11/03
	04 Shift point full load	11/04
	05 Shift point KD on	11/05
	06 Shift point KD off	11/06
	07 Starting-off aid reduction FP additional torque	11/07
9 RQV parameters	01 RQV, FFG position bottom	11/08
	02 RQV, FFG position top	11/09
	03 RQV, constant speed droop	11/10

Parameter group, version 1	Parameter, version 1	Parameter group/ parameter, version 4
10 Transmission protection	01 Transmission protection 1st vehicle speed	12/01
	02 Transmission protection 2nd vehicle speed	12/02
	03 Transmission protection torque reduction	12/03
	04 Hysteresis	12/04
	05 Damping at zero load threshold	12/05
	06 dM/dt within threshold, >0	12/06
	07 dM/dt within threshold, <0	12/07
	08 dM/dt not within threshold	12/08
11 Input configuration	01 Activate analogue input 1	13/01
	02 Analogue input 1 lower limit value	13/02
	03 Analogue input 1 upper limit value	13/03
	04 Digital input DSF0 function configuration	13/04
	05 Digital input DSF1 function configuration	13/05

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Parameter group, version 1	Parameter, version 1	Parameter group/ parameter, version 4
12 INS curve oil pressure	01 Selection oil pressure curve	14/01
13 INS curve coolant	01 Selection coolant curve	15/01
14 Vehicle speed limit	Parameters in this group define the operation of the speed control system. Access to these parameters is not possible.	

10.2. Connector components

10.2.1. Types of connector components required

CAN star quad cable: 000 546 14 01 kZ, see 000 546 16 01
Supplier: can be ordered from DaimlerChrysler organisation.

Item (no.)	MB part no.	Instruction drawing	AMP supplier part no.
Steckhülsegehäuse 55 pol	004 545 04 26 kZ	004 545 03 26	828 952 - 1
Steckhülsegehäuse 15 pol	000 153 06 22 kZ	009 545 13 26	966 168 - 4
Abdeckkappe für 15 pol	000 153 00 82	-	96 590
Blindstopfen Anzahl für 15 pol	000 545 62 80 kZ	000 545 27 39	828 922 - 1
Blindstopfen Anzahl für 55 pol	000 545 62 80 kZ	000 545 27 39	88 922 - 1
Einzelichtung (1)	000 545 29 39 kZ	000 545 27 39	828 905 - 1
Einzelichtung (2)	000 545 28 39 kZ	000 545 27 39	828 904 - 1
Kontaktfeder (1)	009 545 58 26 kZ	003 545 92 26	929 939 - 6 (Ag)
Kontaktfeder (2)	011 545 77 26 kZ	003 545 92 26	929 940 - 6 (Ag)
Kontaktfeder (3)	009 545 59 26 kZ	003 545 92 26	929 937 - 6 (Ag)
Kontaktfeder (4)	011 545 76 26 kZ	003 545 92 26	929 938 - 6 (Ag)
Steckhülsegehäuse 6 pol	005 545 96 26 kZ	005 545 91 26	964 561 - 5
Steckhülsegehäuse 9 pol	005 545 95 26 kZ	005 545 91 26	964 561 - 4
Steckhülsegehäuse 12 pol	005 545 94 26 kZ	005 545 91 26	964 561 - 3
Steckhülsegehäuse 15 pol	005 545 93 26 kZ	005 545 91 26	964 561 - 2
Steckhülsegehäuse 18 pol	005 545 92 26 kZ	005 545 91 26	964 561 - 1
Kontaktfeder (5)	011 545 79 26 kZ	003 545 92 26	927 771 - 6 (Ag)
Kontaktfeder (6)	011 545 81 26 kZ	003 545 92 26	927 779 - 6 (Ag)
Kontaktfeder (7)	011 545 78 26 kZ	003 545 92 26	927 768 - 6 (Ag)
Kontaktfeder (8)	011 545 80 26 kZ	003 545 92 26	927 777 - 6 (Ag)
Steckergehäuse 15 pol	026 545 95 28 kZ	026 545 93 28	964 562 - 2
Steckergehäuse 9 pol	026 545 97 28 kZ	026 545 93 28	964 562 - 4
Flachstecker (1)	035 545 22 28 kZ	019 545 20 28	1-962 841-2 (Ag)
Flachstecker (2)	035 545 24 28 kZ	019 545 20 28	1-963 745-2 (Ag)
AO Diagnose-Dose	-	650 005 09 54	-
AO Codierung Diagnose-Dose	-	673 005 32 54	-
Diagnose-Dose 14 pol	005 545 46 26	-	965 098 - 1
Befestigungsring	000 546 04 22	-	965 099 - 1
Staubkappe	001 545 00 83	-	965 100 - 1
Abstandscheibe	000 545 01 52	-	91 - 52 177-30
Kontaktbuchse	003 545 08 26	-	1-163 083-2 (Ag)

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10.2.2. Connector components required to make connection

Item (no.)	MR		ADM FR/AR*		FR LKN/SKN		PSM*		Steering column lever		Flame-start system CAN		Accelerator pedal sensor		Neutral point*		Diagnosis socket	
	0.5 - 1.0	1.0 - 2.5	0.5 - 1.0		0.5 - 1.0		0.5 - 1.0		0.5 - 1.0	1.0 - 2.5	0.5 - 1.0	1.0 - 2.5	0.5 - 1.0		0.5 - 1.0		0.75 - 1.5	
E = single/B = strip	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	
Steckhülsegehäuse 55 pol	(1)																	
Steckhülsegehäuse 15 pol	1																	
Abdeckkappe für 15 pol	1																	
Blindstopfen Anzahl für 15 pol	5																	
Blindstopfen Anzahl für 55 pol	(19)																	
Einzeldichtung (1)			a															
Einzeldichtung (2)	a																	
Kontaktfeder (1)	a																	
Kontaktfeder (2)	a																	
Kontaktfeder (3)			a															
Kontaktfeder (4)		a																
Steckhülsegehäuse 6 pol								1										
Steckhülsegehäuse 9 pol			1					1										
Steckhülsegehäuse 12 pol			1					1										
Steckhülsegehäuse 15 pol			1		1			1										
Steckhülsegehäuse 18 pol			1		3			1			1					1		
Kontaktfeder (5)			a		a			a			a					a		
Kontaktfeder (6)			a		a			a			a					a		
Kontaktfeder (7)												a						
Kontaktfeder (8)												a						
Steckergehäuse 15 pol									1									
Steckergehäuse 9 pol														1				
Flachstecker (1)									a						6			
Flachstecker (2)									a					6				
AO Diagnose-Dose																		+
AO Codierung Diagnose-Dose																		+
Diagnose-Dose 14 pol																		1
Befestigungsring																		1
Staubkappe																		1
Abstandscheibe																		1
Kontaktbuchse																		a

* = If other DaimlerChrysler electronic systems are used via a high-speed CAN, the CAN wire must be routed via a neutral point 029 545 92 28. If the CAN wire is lengthened, the neutral point 033 545 74 28 must be used.

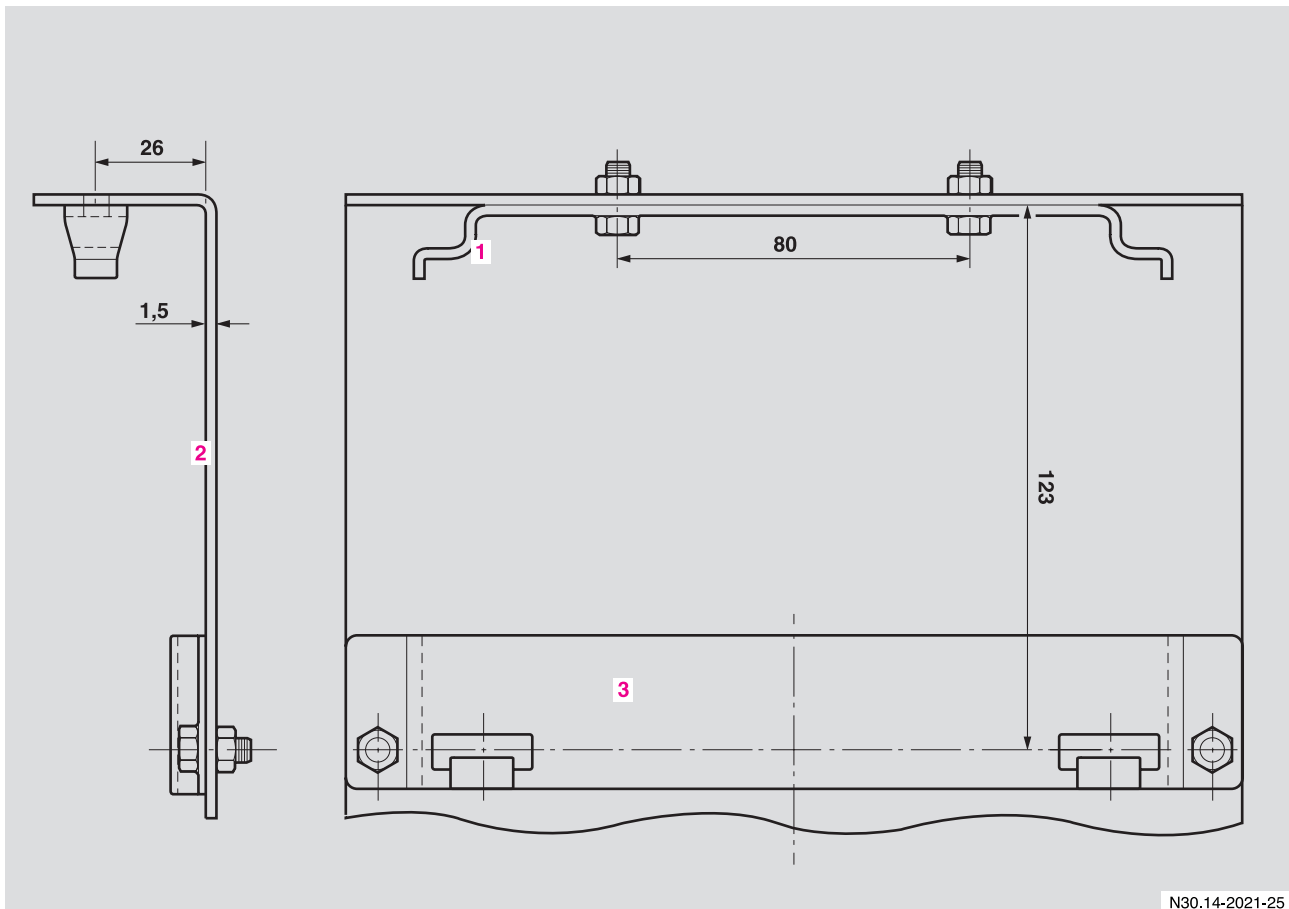
** = Wire cross-section in mm². All contact sockets for cable version "FLR".

a = Quantity as required.

AO = Allocation

+ = Drawing of allocation available.

10.3. Brackets



All holes $\varnothing = 5.5\text{mm}$

1 Bracket, MB part no. A 670 542 06 40

2 Installation surface

3 Bracket, MB part no. A 670 542 05 40

The brackets are to be bolted to a flat surface with the dimensions given.

Provisional edition
As at 14.06.99