

**DaimlerChrysler AG  
MAN Nutzfahrzeuge AG**

**Scania AB  
Volvo Truck Corporation**

**Iveco SpA  
DAF Trucks N.V.**

# **FMS-Standard Interface description**

**Vers. 01.00**

<b>DaimlerChrysler AG</b> <b>MAN Nutzfahrzeuge AG</b>	<b>Scania AB</b> <b>Volvo Truck Corporation</b>	<b>Iveco SpA</b> <b>DAF Trucks N.V.</b>	Name of document <b>FMS-Standard</b>		Page <b>2 (18)</b>
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## General annotations

- Data might be not available during ignition off
- Physical Layer according to ISO 11898 (250kb/s)
- Application Layer according SAE J1939/ 71
- Data Link Layer according SAE J1939/ 21
- If there is a discrepancy between definitions in this document and the SAE, the SAE documents are the valid only.
- Mentioned reference no. in this document are referring to SAE document Vers. April 2000
- The priority/source address of each partner is different and has to be masked by connected FMS-ECU.
- In the FMS-ECU a switchable terminating resistance is recommended.
- If the information is delivered the function/data has to be delivered according FMS-standard definition.
- If the information is not available the function/data has to be sent as not available according to SAE
- The physical connectors are not standardized at the moment, so you are requested to ask for these information directly at the manufacturer
- “not used for FMS-standard” means that there might be data sent according SAE but are not used in FMS-standard interface. If no information is sent, then it has to be sent as “not available”. So don’t care.
- “reserved for FMS-standard” means that as long as there is no definition it is sent “FF (not available)”

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# 1 Parameters for FMS gateway (according SAE J1939)

always MSB (Most Significant BIT) First

## 1.1 Cruise Control/Vehicle Speed

<b>00FEF1</b>								<b>PGN Hex</b>
<b>65,265</b>								<b>PGN</b>
<b>100 ms</b>								<b>Rep. Rate</b>
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No
	8 7 6 5 4 3 2 1	8 7 6 5 4 3 2 1	8 7 6 5 4 3 2 1			8 7 6 5 4 3 2 1		<b>Bit No</b>
Not used for FMS-Standard	<b>Wheel based speed</b> 1/256 km/h Bit gain 0 km/h offset 5.2.1.12 SPN 84	<b>Wheel based speed</b> 1/256 km/h Bit gain 0 km/h offset 5.2.1.12 SPN 84	<b>Clutch switch</b> 00 = pedal released 01 = pedal pressed 5.2.6.12 SPN 598	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Name values values values SAE ref SPN
			<b>Brake switch</b> 00 = pedal released 01 = pedal depressed 5.2.6.11 SPN 597			<b>PTO state</b> 00000 = off/disabled 00101 = Set 11111 = not available 5.2.2.19 SPN 976		Name values values values SAE ref SPN
			Not used					
			<b>Cruise control active</b> 00 = switched off 01 = switched on 5.2.6.9 SPN 595					Name values values values SAE ref SPN

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## 1.2 Electronic Engine Controller #2: EEC2

<b>00F003</b>								<b>PGN Hex</b>							
<b>61,443</b>								<b>PGN</b>							
<b>50 ms</b>								<b>Rep. Rate</b>							
<b>Data Byte 1</b>	<b>Data Byte 2</b>							<b>Data Byte 3</b>	<b>Data Byte 4</b>	<b>Data Byte 5</b>	<b>Data Byte 6</b>	<b>Data Byte 7</b>	<b>Data Byte 8</b>	<b>Byte No</b>	
	8	7	6	5	4	3	2	1						<b>Bit No</b>	
Not used for FMS-Standard	Accelerator pedal position 0,4 % / Bit gain 0 % offset 5.2.1.8 SPN 91							Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Name values values SAE ref SPN

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### 1.3 Fuel Consumption

<b>00FEE9</b>								<b>PGN Hex</b>																												
<b>65,257</b>								<b>PGN</b>																												
<b>1000 ms</b>								<b>Rep. Rate</b>																												
<b>Data Byte 1</b>	<b>Data Byte 2</b>	<b>Data Byte 3</b>	<b>Data Byte 4</b>	<b>Data Byte 5</b>				<b>Data Byte 6</b>				<b>Data Byte 7</b>				<b>Data Byte 8</b>				<b>Byte No</b>																
				8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	<b>Bit No</b>
<b>Not used for FMS-Standard</b>	<b>Not used for FMS-Standard</b>	<b>Not used for FMS-Standard</b>	<b>Not used for FMS-Standard</b>	<b>Total fuel used 0,5 L / Bit gain 0 L offset</b>				<b>Total fuel used 0,5 L / Bit gain 0 L offset</b>				<b>Total fuel used 0,5 L / Bit gain 0 L offset</b>				<b>Total fuel used 0,5 L / Bit gain 0 L offset</b>				<b>Name values values values SAE ref SPN</b>																
				5.2.5.66 SPN 250				5.2.5.66 SPN 250				5.2.5.66 SPN 250				5.2.5.66 SPN 250																				

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## 1.4 Dash Display

<b>00FEFC</b>								<b>PGN Hex</b>							
<b>65,276</b>								<b>PGN</b>							
<b>1000 ms</b>								<b>Rep. Rate</b>							
<b>Data Byte 1</b>	<b>Data Byte 2</b>							<b>Data Byte 3</b>	<b>Data Byte 4</b>	<b>Data Byte 5</b>	<b>Data Byte 6</b>	<b>Data Byte 7</b>	<b>Data Byte 8</b>	<b>Byte No</b>	
	8	7	6	5	4	3	2	1						<b>Bit No</b>	
Not used for FMS-Standard	<b>Fuel Level</b> 0,4 % / Bit gain 0 % offset  5.2.5.71 SPN 96							Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Name values values values SAE ref SPN

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## 1.5 Electronic Engine Controller #1: EEC1

<b>00F004</b>								<b>PGN Hex</b>											
<b>61,444</b>								<b>PGN</b>											
<b>20 ms</b>								<b>Rep. Rate</b>											
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4				Data Byte 5				Data Byte 6	Data Byte 7	Data Byte 8	Byte No					
			8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	
Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	<b>Engine speed</b> <b>0.125 rpm / Bit gain</b> <b>0 rpm offset</b>  <b>5.2.1.9</b> <b>SPN 190</b>				<b>Engine speed</b> <b>0.125 rpm / Bit gain</b> <b>0 rpm offset</b>  <b>5.2.1.9</b> <b>SPN 190</b>				Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Name values values values SAE ref SPN					





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## 1.7 Engine Hours, Revolutions

<b>00FEE5</b>								<b>PGN Hex</b>																														
<b>65,253</b>								<b>PGN</b>																														
<b>1000 ms</b>								<b>Rep. Rate</b>																														
<b>Data Byte 1</b>		<b>Data Byte 2</b>		<b>Data Byte 3</b>		<b>Data Byte 4</b>		<b>Data Byte 5</b>	<b>Data Byte 6</b>	<b>Data Byte 7</b>	<b>Data Byte 8</b>	<b>Byte No</b>																										
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1							<b>Bit No</b>
<b>Total engine hours</b>		<b>Total engine hours</b>		<b>Total engine hours</b>		<b>Total engine hours</b>		<b>Not used for FMS-Standard</b>	<b>Not used for FMS-Standard</b>	<b>Not used for FMS-Standard</b>	<b>Not used for FMS-Standard</b>	<b>Name</b>																										
<b>0.05 h / Bit gain 0 h offset</b>		<b>0.05 h / Bit gain 0 h offset</b>		<b>0.05 h / Bit gain 0 h offset</b>		<b>0.05 h / Bit gain 0 h offset</b>						<b>values values values SAE ref SPN</b>																										
<b>5.2.5.61 SPN 247</b>		<b>5.2.5.61 SPN 247</b>		<b>5.2.5.61 SPN 247</b>		<b>5.2.5.61 SPN 247</b>																																

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## 1.8 Vehicle Identification

<b>00FEEC</b>								<b>PGN Hex</b>
<b>65,260</b>								<b>PGN</b>
<b>10.000 ms</b>								<b>Rep. Rate</b>
<b>Variable 1-n</b>	<b>Variable 1-n</b>	<b>Variable 1-n</b>	<b>Variable 1-n</b>	<b>Variable 1-n</b>	<b>Variable 1-n</b>	<b>Variable 1-n</b>	<b>Variable 1-n</b>	<b>Byte No</b>
								<b>Bit No</b>
<b>Vehicle identification number</b> ASCII up to 200 characters * = Delimiter 5.2.5.87 SPN 237	<b>Vehicle identification number</b> ASCII up to 200 characters * = Delimiter 5.2.5.87 SPN 237	<b>Vehicle identification number</b> ASCII up to 200 characters * = Delimiter 5.2.5.87 SPN 237	<b>Vehicle identification number</b> ASCII up to 200 characters * = Delimiter 5.2.5.87 SPN 237	<b>Vehicle identification number</b> ASCII up to 200 characters * = Delimiter 5.2.5.87 SPN 237	<b>Vehicle identification number</b> ASCII up to 200 characters * = Delimiter 5.2.5.87 SPN 237	<b>Vehicle identification number</b> ASCII up to 200 characters * = Delimiter 5.2.5.87 SPN 237	<b>Vehicle identification number</b> ASCII up to 200 characters * = Delimiter 5.2.5.87 SPN 237	<b>Name</b> values values SAE ref SPN

### Annotations:

- 1) If the Vehicle ID is up to 8 Bytes (including) then it is broadcasted with PGN 00FEEC containing the vehicle ID and filled with "FF" at the unused bytes.
- 2) If the Vehicle ID contains more than 8 Bytes then a TP.CM (PGN 00EC00) with a minimum of two TP.DT (PGN 00EB00) will be used.





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## 1.11 Service

<b>00FEC0</b>								<b>PGN Hex</b>										
<b>65,216</b>								<b>PGN</b>										
<b>1000 ms</b>								<b>Rep. Rate</b>										
Data Byte 1	Data Byte 2		Data Byte 3		Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No								
	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1		<b>Bit No</b>
Not used for FMS-Standard	Service distance 5 km / Bit gain -160 635 km offset  5.2.5.103 SPN 914		Service distance 5 km / Bit gain -160 635 km offset  5.2.5.103 SPN 914		Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Name  values values SAE ref SPN

## 1.12 TCO1

<b>00FE6C</b>																<b>PGN Hex</b>																								
<b>65,132</b>																<b>PGN</b>																								
<b>50 ms</b>																<b>Rep. Rate</b>																								
<b>Data Byte 1</b>				<b>Data Byte 2</b>				<b>Data Byte 3</b>				<b>Data Byte 4</b>				<b>Data Byte 5</b>	<b>Data Byte 6</b>	<b>Data Byte 7</b>				<b>Data Byte 8</b>				<b>Byte No</b>														
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	<b>Bit No.</b>
<b>Drive recognize</b> 00 = Vehicle motion not detected 01 = vehicle motion detected 5.2.6.78 SPN 1611				<b>Overspeed</b> 00 = No overspeed 01 = Overspeed 5.2.6.81 SPN 1614				Not used for FMS-Standard could be sent as "not available" or "don't care"				<b>Direction indicator</b> 00 = Forward 01 = Reverse 5.2.6.85 SPN 1619				Not used for FMS-Standard				Not used for FMS-Standard				<b>Tachogr. vehicle speed</b> 1/256 km/h Bit gain 0 km/h offset 5.2.5.283 SPN 1624				<b>Tachogr. Vehicle speed</b> 1/256 km/h Bit gain 0 km/h offset 5.2.5.283 SPN 1624				Name values values values values values values SAE ref SPN								
<b>Driv. 2 working state</b> 000 = Rest 001 = Driver available 010 = Work 011 = Drive 110 = Error 111 = not available 5.2.6.77 SPN 1613				<b>Driver 1 card</b> 00 = Card not present 01= Card present 5.2.6.80 SPN 1615				<b>Driver 2 card</b> 00 = Card not present 01= Card present 5.2.6.80 SPN 1616				<b>Tachgraph performance</b> 00 = Normal performance 01 = Performance analysis 5.2.6.84 SPN 1620												Name values values values values values values SAE ref SPN																
<b>Driv. 1 working state</b> 000 = Rest 001 = Driver available 010 = Work 011 = Drive 110 = Error 111 = not available 5.2.6.77 SPN 1612				<b>Driv. 1 time rel states</b> 0000 = normal 0001 = 15 min bef. 4 ½ h 0010 = 4 ½ h reached 0011 = 15 min bef. 9 h 0100 = 9 h reached 0101 = 15 min bef. 16 h 0110 = 16h reached 1110 = Error 1111 = not available 5.2.6.79 SPN 1617				<b>Driv 2 time rel. states</b> 0000 = normal 0001 = 15 min bef. 4 ½ h 0010 = 4 ½ h reached 0011 = 15 min before 9 h 0100 = 9 h reached 0101 = 15 min bef. 16 h 0110 = 16h reached 1110 = Error 1111 = not available 5.2.6.79 SPN 1618				<b>Handling information</b> 00 = no handling information 01 = handling information 5.2.6.83 SPN 1621												Name values values values values values values SAE ref SPN																
																				<b>System event</b> 00 = no tachogr. Event 01 = tachogr. Event 5.2.6.82 SPN 1622	Name values values values SAE ref SPN																			

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### 1.13 Engine Temperature

<b>00FEEE</b>								PGN Hex	
<b>65,262</b>								PGN	
<b>1000 ms</b>								Rep. Rate	
Data Byte 1		Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No
8	7	6	5	4	3	2	1		Bit No
<b>Engine coolant temperature</b> 1 °C / Bit gain - 40 °C offset  5.2.5.5 SPN 110		Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Name  values values SAE ref SPN



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## 2 Examples

### 2.1 Broadcast Announce Message (BAM) for Vehicle ID longer than 8 Byte Transport Protocol – Connection Management (TP.CM)

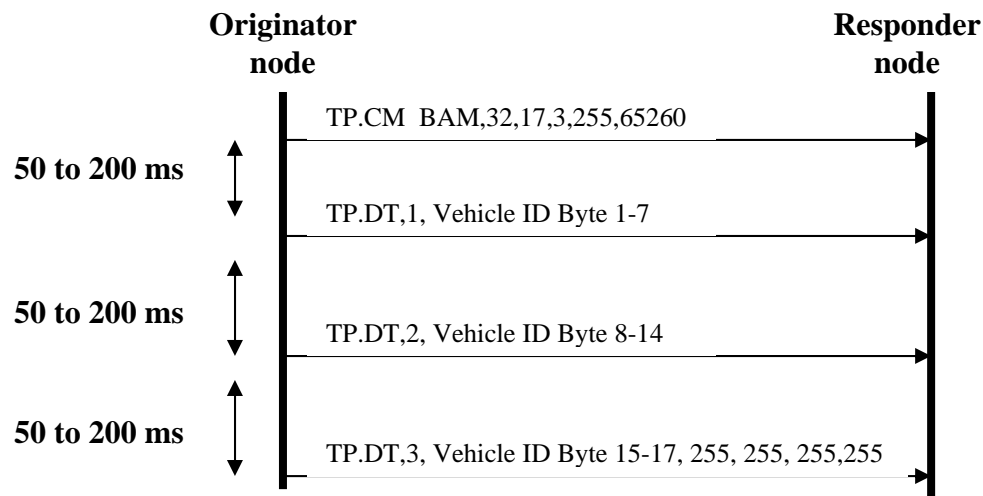
<b>00ECFF</b>								PGN Hex
<b>60,416</b>								PGN
Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte No
								Bit No
Control byte should be filled with (20 <sub>16</sub> )	Total message size, number of bytes	Total message size, number of bytes	Total number of packets	Reserved should be filled with FF <sub>16</sub>	Parameter Group Number of packeted message	Parameter Group Number of packeted message	Parameter Group Number of packeted message	Name values values values SAE ref SPN

### Transport Protocol – Data Transfer (TP.DT)

<b>00EBFF</b>								PGN Hex
<b>60,160</b>								PGN
Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte No
								Bit No
Sequence Number	Packetized Data	Packetized Data	Packetized Data	Packetized Data	Packetized Data	Packetized Data	Packetized Data	Name values values values SAE ref SPN

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In the situation shown in Figure 1, a node indicates to the network that it is about to transfer a multipacket message utilizing the service of the transport protocol. In this example, the PGN 00FEEC<sub>16</sub> (Vehicle Identification) is being broadcasted to the network. The length of the Vehicle ID in this example is 17. The unused bytes in the last TP.DT are filled with FF<sub>16</sub>. The originating node first transmits a TP.CM Broadcast Announce Message (BAM) followed by the data packets. No acknowledgment is performed by any of the responders.



**Figure 1**

Time (ms)	ID	DLC	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
0	1C EC FF SA <sub>16</sub>	8	20 <sub>16</sub>	11 <sub>16</sub>	00 <sub>16</sub>	03 <sub>16</sub>	FF <sub>16</sub>	EC <sub>16</sub>	FE <sub>16</sub>	00 <sub>16</sub>
50	1C EB FF SA <sub>16</sub>	8	01 <sub>16</sub>	Vehicle ID byte 1 – 7						
100	1C EB FF SA <sub>16</sub>	8	02 <sub>16</sub>	Vehicle ID byte 8 – 14						
150	1C EB FF SA <sub>16</sub>	8	03 <sub>16</sub>	Vehicle ID byte 15	Vehicle ID byte 16	Vehicle ID byte 17	FF <sub>16</sub>	FF <sub>16</sub>	FF <sub>16</sub>	FF <sub>16</sub>