

ANNEX I

Complete list of information for the purpose of EC type-approval of vehicles

3. POWER PLANT ⁽⁴⁾ (In the case of a vehicle that can run either on petrol, diesel, etc., or also in combination with another fuel, items shall be repeated ⁽⁺⁾)
 - 3.1. Manufacturer:
 - 3.1.1. Manufacturer's engine code as marked on the engine:
 - 3.2. Internal combustion engine
 - 3.2.1. Specific engine information
 - 3.2.1.1. Working principle: positive ignition/compression ignition, four stroke/two stroke ⁽¹⁾
 - 3.2.1.2. Number and arrangement of cylinders:
 - 3.2.1.2.1. Bore ^(f): ... mm
 - 3.2.1.2.2. Stroke ^(f): ... mm
 - 3.2.1.2.3. Firing order:
 - 3.2.1.3. Engine capacity ^(g): ... cm³
 - 3.2.1.4. Volumetric compression ratio ⁽²⁾:
 - 3.2.1.5. Drawings of combustion chamber, piston crown and, in the case of positive ignition engines, piston rings:
 - 3.2.1.6. Normal engine idling speed ⁽²⁾: ... min⁻¹
 - 3.2.1.6.1. High engine idling speed ⁽²⁾: ... min⁻¹
 - 3.2.1.7. Carbon monoxide content by volume in the exhaust gas with the engine idling ⁽²⁾: ... % as stated by the manufacturer (positive ignition engines only)
 - 3.2.1.8. Maximum net power ^(b): ... kW at ... min⁻¹ (manufacturer's declared value)
 - 3.2.1.9. Maximum permitted engine speed as prescribed by the manufacturer: ... min⁻¹
 - 3.2.1.10. Maximum net torque ^(c): ... Nm at ... min⁻¹ (manufacturer's declared value)
 - 3.2.2. Fuel: Diesel oil/Petrol/LPG/NG/Ethanol ⁽¹⁾ ...
 - 3.2.2.1. RON, leaded:
 - 3.2.2.2. RON, unleaded:
 - 3.2.2.3. Fuel tank inlet: restricted orifice/label ⁽¹⁾
 - 3.2.3. Fuel tank(s)
 - 3.2.3.1. Service fuel tank(s)
 - 3.2.3.1.1. Number, capacity, material:

3.2.3.1.2. Drawing and technical description of the tank(s) with all connections and all lines of the breathing and venting system, locks, valves, fastening devices:

3.2.3.1.3. Drawing clearly showing the position of the tank(s) in the vehicle:

3.2.3.2. Reserve fuel tank(s)

3.2.3.2.1. Number, capacity, material:

3.2.3.2.2. Drawing and technical description of the tank(s) with all connections and all lines of the breathing and venting system, locks, valves, fastening devices:

3.2.3.2.3. Drawing clearly showing the position of the tank(s) in the vehicle:

3.2.4. Fuel feed

3.2.4.1. By carburettor(s): yes/no ⁽¹⁾

3.2.4.1.1. Make(s):

3.2.4.1.2. Type(s):

3.2.4.1.3. Number fitted:

3.2.4.1.4. Adjustments ⁽²⁾

3.2.4.1.4.1.	Jets: ...	Or the curve of fuel delivery plotted against the air flow and settings required to keep to the curve
3.2.4.1.4.2.	Venturis: ...	
3.2.4.1.4.3.	Float-chamber level: ...	
3.2.4.1.4.4.	Mass of float: ...	
3.2.4.1.4.5.	Float needle: ...	

3.2.4.1.5. Cold start system: manual/automatic ⁽¹⁾

3.2.4.1.5. Operating principle(s):

3.2.4.1.5.2. Operating limits/settings ⁽¹⁾ ⁽²⁾

3.2.4.2. By fuel injection (compression ignition only): yes/no ⁽¹⁾

3.2.4.2.1. System description:

3.2.4.2.2. Working principle: direct injection/pre-chamber/swirl chamber ⁽¹⁾

3.2.4.2.3. Injection pump

3.2.4.2.3. Make(s):

3.2.4.2.3. Type(s):

3.2.4.2.3.3. Maximum fuel delivery ⁽¹⁾ ⁽²⁾: ... mm³/stroke or cycle at a pump speed of: ... min⁻¹
¹ or, alternatively, a characteristic diagram:

3.2.4.2.3.4. Injection timing ⁽²⁾:

3.2.4.2.3.5. Injection advance curve (²):

3.2.4.2.3.6. Calibration procedure: test bench/engine (¹)

3.2.4.2.4. Governor

3.2.4.2.4. Type:

3.2.4.2.4. Cut-off point

3.2.4.2.4.2.1. Cut-off point under load: ... min⁻¹

3.2.4.2.4.2.2. Cut-off point without load: ... min⁻¹

3.2.4.2.5. Injection piping

3.2.4.2.5. Length: ... mm

3.2.4.2.5. Internal diameter: ... mm

3.2.4.2.6. Injector(s)

3.2.4.2.6. Make(s):

3.2.4.2.6. Type(s):

3.2.4.2.6. Opening pressure (²): ... kPa or characteristic diagram (²):

3.2.4.2.7. Cold start system

3.2.4.2.7. Make(s):

3.2.4.2.7. Type(s):

3.2.4.2.7. Description:

3.2.4.2.8. Auxiliary starting aid

3.2.4.2.8. Make(s):

3.2.4.2.8. Type(s):

3.2.4.2.8. System description:

3.2.4.2.9. Electronic control unit

3.2.4.2.9. Make(s):

3.2.4.2.9. Description of the system:

3.2.4.3. By fuel injection (positive ignition only): yes/no (¹)

3.2.4.3.1. Working principle: intake manifold (single-/multi-point (¹))/direct injection/other (specify) (¹)

3.2.4.3.2. Make(s):

3.2.4.3.3. Type(s):

3.2.4.3.4. System description

3.2.4.3.4.1.	Type or number of the control unit: ...	In the case of systems other than continuous injection give equivalent details.
3.2.4.3.4.2.	Type of fuel regulator: ...	
3.2.4.3.4.3.	Type of air-flow sensor: ...	
3.2.4.3.4.4.	Type of fuel distributor: ...	
3.2.4.3.4.5.	Type of pressure regulator: ...	
3.2.4.3.4.6.	Type of micro switch: ...	
3.2.4.3.4.7.	Type of idling adjustment screw: ...	
3.2.4.3.4.8.	Type of throttle housing: ...	
3.2.4.3.4.9.	Type of water temperature sensor: ...	

3.2.4.3.4.10. Type of air temperature sensor: ...

3.2.4.3.4.11. Type of air temperature switch: ...

3.2.4.3.5. Injectors: opening pressure ⁽²⁾: ... kPa or characteristic diagram:

3.2.4.3.6. Injection timing:

3.2.4.3.7. Cold start system

3.2.4.3.7. Operating principle(s):

3.2.4.3.7. Operating limits/settings ⁽¹⁾ ⁽²⁾:

3.2.4.4. Feed pump

3.2.4.4.1. Pressure ⁽²⁾: ... kPa or characteristic diagram ⁽²⁾:

3.2.5. Electrical system

3.2.5.1. Rated voltage: ... V, positive/negative ground ⁽¹⁾

3.2.5.2. Generator

3.2.5.2.1. Type:

3.2.5.2.2. Nominal output: ... VA

3.2.6. Ignition

3.2.6.1. Make(s):

3.2.6.2. Type(s):

3.2.6.3. Working principle:

3.2.6.4. Ignition advance curve ⁽²⁾:

- 3.2.6.5. Static ignition timing (²): ... degrees before TDC
- 3.2.6.6. Contact-point gap (²): ... mm
- 3.2.6.7. Dwell-angle (²): ... degrees
- 3.2.7. Cooling system: liquid/air (¹)
 - 3.2.7.1. Nominal setting of the engine temperature control mechanism
 - 3.2.7.2. Liquid
 - 3.2.7.2.1. Nature of liquid:
 - 3.2.7.2.2. Circulating pump(s): yes/no (¹)
 - 3.2.7.2.3. Characteristics: or
 - 3.2.7.2.3. Make(s):
 - 3.2.7.2.3. Type(s):
 - 3.2.7.2.4. Drive ratio(s):
 - 3.2.7.2.5. Description of the fan and its drive mechanism:
 - 3.2.7.3. Air
 - 3.2.7.3.1. Blower: yes/no (¹)
 - 3.2.7.3.2. Characteristics: or
 - 3.2.7.3.2. Make(s):
 - 3.2.7.3.2. Type(s):
 - 3.2.7.3.3. Drive ratio(s):
- 3.2.8. Intake system
 - 3.2.8.1. Pressure charger: yes/no (¹)
 - 3.2.8.1.1. Make(s):
 - 3.2.8.1.2. Type(s):
 - 3.2.8.1.3. Description of the system (e. g. maximum charge pressure: ... kPa; wastegate if applicable):
 - 3.2.8.2. Intercooler: yes/no (¹)
 - 3.2.8.3. Intake depression at rated engine speed and at 100 % load
 - minimum allowable: ... kPa
 - maximum allowable: ... kPa
 - 3.2.8.4. Description and drawings of inlet pipes and their accessories (plenum chamber, heating device, additional air intakes, etc.):

- 3.2.8.4.1. Intake manifold description (include drawings and/or photos):
- 3.2.8.4.2. Air filter, drawings: or
- 3.2.8.4.2. Make(s):
- 3.2.8.4.2. Type(s):
- 3.2.8.4.3. Intake silencer, drawings: or
- 3.2.8.4.3. Make(s):
- 3.2.8.4.3. Type(s):
- 3.2.9. Exhaust system
 - 3.2.9.1. Description and/or drawing of the exhaust manifold:
 - 3.2.9.2. Description and/or drawing of the exhaust system:
 - 3.2.9.3. Maximum allowable exhaust back pressure at rated engine speed and at 100 % load: ... kPa
 - 3.2.9.4. Exhaust silencer(s): For front, centre, rear silencer: construction, type, marking; where relevant for exterior noise: reducing measures in the engine compartment and on the engine:
 - 3.2.9.5. Location of the exhaust outlet:
 - 3.2.9.6. Exhaust silencer containing fibrous materials:
- 3.2.10. Minimum cross-sectional areas of inlet and outlet ports:
- 3.2.11. Valve timing or equivalent data
 - 3.2.11.1. Maximum lift of valves, angles of opening and closing, or timing details of alternative distribution systems, in relation to dead centres:
 - 3.2.11.2. Reference and/or setting ranges ⁽¹⁾:
- 3.2.12. Measures taken against air pollution
 - 3.2.12.1. Device for recycling crankcase gases (description and drawings):
 - 3.2.12.2. Additional anti-pollution devices (if any, and if not covered by another heading)
 - 3.2.12.2.1. Catalytic converter: yes/no ⁽¹⁾
 - 3.2.12.2.2. Number of catalytic converters and elements:
 - 3.2.12.2.3. Dimensions, shape and volume of the catalytic converter(s):
 - 3.2.12.2.4. Type of catalytic action:
 - 3.2.12.2.5. Total charge of precious metals:
 - 3.2.12.2.6. Relative concentration:
 - 3.2.12.2.7. Substrate (structure and material):
 - 3.2.12.2.8. Cell density:

- 3.2.12.2.1 ~~8~~ Type of casing for the catalytic converter(s):
- 3.2.12.2.1 ~~9~~ Location of the catalytic converter(s) (place and reference distance in the exhaust line):
- 3.2.12.2.1 ~~10~~ Heat shield: yes/no ⁽¹⁾
- 3.2.12.2.2 ~~1~~ Oxygen sensor: yes/no ⁽¹⁾
- 3.2.12.2.2 ~~2~~ Type:
- 3.2.12.2.2 ~~2~~ Location:
- 3.2.12.2.2 ~~3~~ Control range:
- 3.2.12.2.3 ~~1~~ Air injection: yes/no ⁽¹⁾
- 3.2.12.2.3 ~~2~~ Type (pulse air, air pump, etc.):
- 3.2.12.2.4 ~~1~~ Exhaust gas recirculation: yes/no ⁽¹⁾
- 3.2.12.2.4 ~~2~~ Characteristics (flow rate, etc.):
- 3.2.12.2.5 ~~1~~ Evaporative emissions control system: yes/no ⁽¹⁾
- 3.2.12.2.5 ~~2~~ Detailed description of the devices and their state of tune:
- 3.2.12.2.5 ~~3~~ Drawing of the evaporative control system:
- 3.2.12.2.5 ~~4~~ Drawing of the carbon canister:
- 3.2.12.2.5 ~~5~~ Mass of dry charcoal: ... grams
- 3.2.12.2.5 ~~6~~ Schematic drawing of the fuel tank with indication of capacity and material:
- 3.2.12.2.5 ~~7~~ Drawing of the heat shield between tank and exhaust system:
- 3.2.12.2.6 ~~1~~ Particulate trap: yes/no ⁽¹⁾
- 3.2.12.2.6 ~~2~~ Dimensions, shape and capacity of the particulate trap:
- 3.2.12.2.6 ~~3~~ Type and design of the particulate trap:
- 3.2.12.2.6 ~~4~~ Location (reference distance in the exhaust line):
- 3.2.12.2.6 ~~5~~ Method or system of regeneration, description and/or drawing:
- 3.2.12.2.7 ~~1~~ On-board-diagnostic (OBD) system: yes/no ⁽¹⁾
- 3.2.12.2.7 ~~2~~ Written description and/or drawing of the MI:
- 3.2.12.2.7 ~~3~~ List and purpose of all components monitored by the OBD system:
- 3.2.12.2.7 ~~4~~ Written description (general working principles) for
- 3.2.12.2.7 ~~3.1~~ Positive-ignition engines ⁽¹⁾
- 3.2.12.2.7 ~~3.1.1~~ Catalyst monitoring ⁽¹⁾:
- 3.2.12.2.7 ~~3.1.2~~ Misfire detection ⁽¹⁾:

- 3.2.12.2.73.2.1.3 Oxygen sensor monitoring (¹):
- 3.2.12.2.73.2.1.4 Other components monitored by the OBD system (¹):
- 3.2.12.2.73.2.2 Compression-ignition engines (¹):
- 3.2.12.2.73.2.1.1 Catalyst monitoring (¹):
- 3.2.12.2.73.2.2.1 Particulate trap monitoring (¹):
- 3.2.12.2.73.2.3 Electronic fuelling system monitoring (¹):
- 3.2.12.2.73.2.4 Other components monitored by the OBD system (¹):
- 3.2.12.2.74 Criteria for MI activation (fixed number of driving cycles or statistical method):
- 3.2.12.2.75 List of all OBD output codes and formats used (with explanation of each):
- 3.2.12.2.80 Other systems (description and operation):
- 3.2.13. Location of the absorption coefficient symbol (compression ignition engines only):
- 3.2.14. Details of any devices designed to influence fuel economy (if not covered by other items):
- 3.2.15. LPG fuelling system: yes/no (¹)
 - 3.2.15.1. EC type-approval number according to Directive 70/221/EEC (when the Directive will be amended to cover tanks for gaseous fuels.):
 - 3.2.15.2. Electronic engine management control unit for LPG fuelling
 - 3.2.15.2.1 Make(s):
 - 3.2.15.2.2 Type(s):
 - 3.2.15.2.3 Emission-related adjustment possibilities:
 - 3.2.15.3. Further documentation
 - 3.2.15.3.1 Description of the safeguarding of the catalyst at switch-over from petrol to LPG or back:
 - 3.2.15.3.2 System lay-out (electrical connections, vacuum connections compensation hoses, etc.):
 - 3.2.15.3.3 Drawing of the symbol:
- 3.2.16. NG fuelling system: yes/no (¹)
 - 3.2.16.1. EC type-approval number according to Directive 70/221/EEC (when the Directive will be amended to cover tanks for gaseous fuels.):
 - 3.2.16.2. Electronic engine management control unit for NG fuelling
 - 3.2.16.2.1 Make(s):
 - 3.2.16.2.2 Type(s):

3.2.16.2. Emission-related adjustment possibilities:

3.2.16.3. Further documentation

3.2.16.3.1. Description of the safeguarding of the catalyst at switch-over from petrol to NG or back:

3.2.16.3.2. System lay-out (electrical connections, vacuum connections compensation hoses, etc.):

3.2.16.3.3. Drawing of the symbol:

3.3. Electric motor

3.3.1. Type (winding, excitation):

3.3.1.1. Maximum hourly output: ... kW

3.3.1.2. Operating voltage: ... V

3.3.2. Battery

3.3.2.1. Number of cells:

3.3.2.2. Mass: ... kg

3.3.2.3. Capacity: ... Ah (Amp-hours)

3.3.2.4. Position:

3.4. Other engines or motors or combinations thereof (particulars regarding the parts of such engines or motors):

3.5. CO₂ emissions/fuel consumption ⁽⁴⁾ (manufacturer's declared value)

3.5.1. CO₂ mass emissions

3.5.1.1. CO₂ mass emissions (urban conditions): ... g/km

3.5.1.2. CO₂ mass emissions (extra-urban conditions): ... g/km

3.5.1.3. CO₂ mass emissions (combined): ... g/km

3.5.2. Fuel consumption

3.5.2.1. Fuel consumption (urban conditions): ... l/100 km/m³/100 km ⁽¹⁾

3.5.2.2. Fuel consumption (extra-urban conditions): ... l/100 km/m³/100 km ⁽¹⁾

3.5.2.3. Fuel consumption (combined): ... l/100 km/m³/100 km ⁽¹⁾

3.6. Temperatures permitted by the manufacturer

3.6.1. Cooling system

3.6.1.1. Liquid cooling

Maximum temperature at outlet: ... K

3.6.1.2. Air cooling

3.6.1.2.1. Reference point:

3.6.1.2.2. Maximum temperature at reference point: ... K

3.6.2. Maximum outlet temperature of the inlet intercooler: ... K

3.6.3. Maximum exhaust temperature at the point in the exhaust pipe(s) adjacent to the outer flange(s) of the exhaust manifold: ... K

3.6.4. Fuel temperature

minimum: ... K

maximum: ... K

3.6.5. Lubricant temperature

minimum: ... K

maximum: ... K

3.7. Engine-driven equipment

Maximum permissible power absorbed by the engine-driven equipment as specified in and under the operating conditions of Directive 80/1269/EEC, Annex I, item 5.1.1, at each engine speed as defined in item 4.1 in Annex III to Directive 88/77/EEC

3.7.1. Idling: ... kW

3.7.2. Intermediate: ... kW

3.7.3. Rated: ... kW

3.8. Lubrication system

3.8.1. Description of the system

3.8.1.1. Position of lubricant reservoir:

3.8.1.2. Feed system (by pump/injection into intake/mixing with fuel, etc.) ⁽¹⁾

3.8.2. Lubricating pump

3.8.2.1. Make(s):

3.8.2.2. Type(s):

3.8.3. Mixture with fuel

3.8.3.1. Percentage:

3.8.4. Oil cooler: yes/no ⁽¹⁾

3.8.4.1. Drawing(s):

or

3.8.4.1.1. Make(s):

3.8.4.1.2. Type(s):

- 3.9. GAS FUELLED ENGINES (In the case of systems laid-out in a different manner, supply equivalent information).
- 3.9.1. Fuel: LPG/NG-H/NG-L/NG-HL ⁽¹⁾
- 3.9.2. Pressure regulator(s) or vaporiser/pressure regulator(s) ⁽¹⁾
 - 3.9.2.1. Make(s):
 - 3.9.2.2. Type(s):
 - 3.9.2.3. Number of pressure reduction stages:
 - 3.9.2.4. Pressure in final stage
 - minimum: ... kPa
 - maximum: ... kPa
 - 3.9.2.5. Number of main adjustment points:
 - 3.9.2.6. Number of idle adjustment points:
 - 3.9.2.7. EC type-approval number according to .../.../EC:
- 3.9.3. Fuelling system: mixing unit/gas injection/liquid injection/direct injection ⁽¹⁾
 - 3.9.3.1. Mixture strength regulation:
 - 3.9.3.2. System description and/or diagram and drawings:
 - 3.9.3.3. EC type-approval number according to .../.../EC:
- 3.9.4. Mixing unit
 - 3.9.4.1. Number:
 - 3.9.4.2. Make(s):
 - 3.9.4.3. Type(s):
 - 3.9.4.4. Location:
 - 3.9.4.5. Adjustment possibilities:
 - 3.9.4.6. EC type-approval number according to .../.../EC:
- 3.9.5. Inlet manifold injection
 - 3.9.5.1. Injection: single point/multipoint ⁽¹⁾
 - 3.9.5.2. Injection: continuous/simultaneously timed/sequentially timed ⁽¹⁾
 - 3.9.5.3. Injection equipment
 - 3.9.5.3.1. Make(s):
 - 3.9.5.3.2. Type(s):
 - 3.9.5.3.3. Adjustment possibilities:

3.9.5.3.4. EC type-approval number according to .../.../EC:

3.9.5.4. Supply pump (if applicable)

3.9.5.4.1. Make(s):

3.9.5.4.2. Type(s):

3.9.5.4.3. EC type-approval number according to .../.../EC:

3.9.5.5. Injector(s)

3.9.5.5.1. Make(s):

3.9.5.5.2. Type(s):

3.9.5.5.3. EC type-approval number according to .../.../EC:

3.9.6. Direct injection

3.9.6.1. Injection pump/pressure regulator ⁽¹⁾

3.9.6.1.1. Make(s):

3.9.6.1.2. Type(s):

3.9.6.1.3. Injection timing:

3.9.6.1.4. EC type-approval number according to .../.../EC:

3.9.6.2. Injector(s)

3.9.6.2.1. Make(s):

3.9.6.2.2. Type(s):

3.9.6.2.3. Opening pressure or characteristic diagram ⁽²⁾:

3.9.6.2.4. EC type-approval number according to .../.../EC:

3.9.7. Electronic control unit (ECU)

3.9.7.1. Make(s):

3.9.7.2. Type(s):

3.9.7.3. Adjustment possibilities:

3.9.8. NG fuel-specific equipment

3.9.8.1. Variant 1 (only in the case of approvals of engines for several specific fuel compositions)

3.9.8.1.1. Fuel composition:

methane (CH₄): basis: ... %mole min. ... %mole max. ... %mole

ethane (C₂H₆): basis: ... %mole min. ... %mole max. ... %mole

propane (C₃H₈): basis: ... %mole min. ... %mole max. ... %mole

butane (C₄H₁₀): basis: ... %mole min. ... %mole max. ... %mole

C₅/C₅⁺: basis: ... %mole min. ... %mole max. ... %mole

oxygen (O₂): basis: ... %mole min. ... %mole max. ... %mole

inert (N₂, He, etc.): basis: ... %mole min. ... %mole max. ... %mole

3.9.8.1.2.Injector(s)

3.9.8.1.2.Make(s):

3.9.8.1.2.Type(s):

3.9.8.1.3.Others (if applicable): ...

3.9.8.1.4.Fuel temperature

minimum: ... K

maximum: ... K

at pressure regulator final stage for gas fuelled engines.

3.9.8.1.5.Fuel pressure

minimum: ... kPa

maximum: ... kPa

at pressure regulator final stage, NG fuelled gas engines only.

3.9.8.2. Variant 2 (only in the case of approvals for several specific fuel compositions)