

Changes to legislation: There are outstanding changes not yet made to Commission Regulation (EU) 2017/2400. Any changes that have already been made to the legislation appear in the content and are referenced with annotations. (See end of Document for details) [View outstanding changes](#)

ANNEX VI

VERIFYING TRANSMISSION, TORQUE CONVERTER, OTHER TORQUE TRANSFERRING COMPONENT AND ADDITIONAL DRIVELINE COMPONENT DATA

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Appendix 6

Family Concept

1. General

A transmission, torque converter, other torque transferring components or additional driveline components family is characterized by design and performance parameters. These shall be common to all members within the family. The manufacturer may decide which transmission, torque converter, other torque transferring components or additional driveline components belong to a family, as long as the membership criteria listed in this Appendix are respected. The related family shall be approved by the Approval Authority. The manufacturer shall provide to the Approval Authority the appropriate information relating to the members of the family.

1.1 Special cases

In some cases there may be interaction between parameters. This shall be taken into consideration to ensure that only transmissions, torque converter, other torque transferring components or additional driveline components with similar characteristics are included within the same family. These cases shall be identified by the manufacturer and notified to the Approval Authority. It shall then be taken into account as a criterion for creating a new transmission, torque converter, other torque transferring components or additional driveline components family.

In case of devices or features, which are not listed in paragraph 9. and which have a strong influence on the level of performance, this equipment shall be identified by the manufacturer on the basis of good engineering practice, and shall be notified to the Approval Authority. It shall then be taken into account as a criterion for creating a new transmission, torque converter, other torque transferring components or additional driveline components family.

1.2 The family concept defines criteria and parameters enabling the manufacturer to group transmission, torque converter, other torque transferring components or additional driveline components into families and types with similar or equal CO₂-relevant data.

2. The Approval Authority may conclude that the highest torque loss of the transmission, torque converter, other torque transferring components or additional driveline components family can best be characterized by additional testing. In this case, the manufacturer shall submit the appropriate information to determine the transmission, torque converter, other torque transferring components or additional driveline components within the family likely to have the highest torque loss level.

If members within a family incorporate other features which may be considered to affect the torque losses, these features shall also be identified and taken into account in the selection of the parent.

3. Parameters defining the transmission family

3.1 The following criteria shall be the same to all members within a transmission family.

- (a) Gear ratio, gearscheme and powerflow (for forward gears only, crawler gears excluded);
- (b) Center distance for countershaft transmissions;
- (c) Type of bearings at corresponding positions (if fitted);
- (d) Type of shift elements (tooth clutches, including synchronisers or friction clutches) at corresponding positions (where fitted).

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3.2 The following criteria shall be common to all members within a transmission family. The application of a specific range to the parameters listed below is permitted after approval of the Approval Authority

- (a) Single gear width ± 1 mm;
- (b) Total number of forward gears;
- (c) Number of tooth shift clutches;
- (d) Number of synchronizers;
- (e) Number of friction clutch plates (except for single dry clutch with 1 or 2 plates);
- (f) Outer diameter of friction clutch plates (except for single dry clutch with 1 or 2 plates);
- (g) Surface roughness of the teeth;
- (h) Number of dynamic shaft seals;
- (i) Oil flow for lubrication and cooling per input shaft revolution;
- (j) Oil viscosity (± 10 %);
- (k) System pressure for hydraulically controlled gearboxes;
- (l) Specified oil level in reference to central axis and in accordance with the drawing specification (based on average value between lower and upper tolerance) in static or running condition. The oil level is considered as equal if all rotating transmission parts (except for the oil pump and the drive thereof) are located above the specified oil level;
- (m) Specified oil level (± 1 mm).

4. Choice of the parent transmission

The parent transmission shall be selected using the following criteria listed below.

- (a) Highest single gear width for Option 1 or highest Single gear width ± 1 mm for Option 2 or Option 3;
- (b) Highest total number of gears;
- (c) Highest number of tooth shift clutches;
- (d) Highest number of synchronizers;
- (e) Highest number of friction clutch plates (except for single dry clutch with 1 or 2 plates);
- (f) Highest value of the outer diameter of friction clutch plates (except for single dry clutch with 1 or 2 plates);
- (g) Highest value for the surface roughness of the teeth;
- (h) Highest number of dynamic shaft seals;
- (i) Highest oil flow for lubrication and cooling per input shaft revolution;
- (j) Highest oil viscosity;
- (k) Highest system pressure for hydraulically controlled gearboxes;

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- (l) Highest specified oil level in reference to central axis and in accordance with the drawing specification (based on average value between lower and upper tolerance) in static or running condition. The oil level is considered as equal if all rotating transmission parts (except for the oil pump and the drive thereof) are located above the specified oil level;
- (m) Highest specified oil level (± 1 mm).
- 5. Parameters defining the torque converter family
 - 5.1 The following criteria shall be the same to all members within a torque converter (TC) family.
 - 5.1.1 For hydrodynamic torque converter without mechanical transmission (serial arrangement).
 - (a) Outer torus diameter;
 - (b) Inner torus diameter;
 - (c) Arrangement of pump (P), turbine (T) and stator (S) in flow direction;
 - (d) Torus width;
 - (e) Oil type according to test specification;
 - (f) Blade design;
 - 5.1.2 For hydrodynamic torque converter with mechanical transmission (parallel arrangement).
 - (a) Outer torus diameter;
 - (b) Inner torus diameter;
 - (c) Arrangement of pump (P), turbine (T) and stator (S) in flow direction;
 - (d) Torus width;
 - (e) Oil type according to test specification;
 - (f) Blade design
 - (g) Gear scheme and power flow in torque converter mode
 - (h) Type of bearings at corresponding positions (if fitted)
 - (i) Type of cooling/lubrication pump (referring to parts list)
 - (j) Type of shift elements (tooth clutches (including synchronisers) or friction clutches) at corresponding positions where fitted
 - 5.1.3 The following criteria shall be common to all members within a hydrodynamic torque converter with mechanical transmission (parallel arrangement) family. The application of a specific range to the parameters listed below is permitted after approval of the Approval Authority
 - (a) Oil level according to drawing in reference to central axis.
- 6. Choice of the parent torque converter

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6.1 For hydrodynamic torque converter without mechanical (serial arrangement) transmission.

As long as all criteria listed in 5.1.1 are identical every member of the torque converter without mechanical transmission family can be selected as parent.

6.2 For hydrodynamic torque converter with mechanical transmission.

The parent hydrodynamic torque converter with mechanical transmission (parallel arrangement) shall be selected using the following criteria listed below.

(a) Highest oil level according to drawing in reference to central axis.

7. Parameters defining the other torque transferring components (OTTC) family

7.1 The following criteria shall be the same to all members within a hydrodynamic torque transferring components / retarder family.

(a) Outer torus diameter;

(b) Torus width;

(c) Blade design;

(d) Operating fluid.

7.2 The following criteria shall be the same to all members within a magnetic torque transferring components/retarder family.

(a) Drum design (electro magnetic retarder or permanent magnetic retarder);

(b) Outer rotor diameter;

(c) Cooling blade design;

(d) Blade design.

7.3 The following criteria shall be the same to all members within a torque transferring components / hydrodynamic clutch family.

(a) Outer torus diameter;

(b) Torus width;

(c) Blade design.

7.4 The following criteria shall be common to all members within a hydrodynamic torque transferring components/retarder family. The application of a specific range to the parameters listed below is permitted after approval of the Approval Authority.

(a) Outer torus diameter - inner torus diameter (OD-ID);

(b) Number of blades;

(c) Operating fluid viscosity ($\pm 50\%$).

7.5 The following criteria shall be common to all members within a magnetic torque transferring components / retarder family. The application of a specific range to the parameters listed below is permitted after approval of the Approval Authority.

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- (a) Outer rotor diameter - inner rotor diameter (OD-ID);
 - (b) Number of rotors;
 - (c) Number of cooling blades / blades;
 - (d) Number of arms.
- 7.6 The following criteria shall be common to all members within a torque transferring components / hydrodynamic clutch family. The application of a specific range to the parameters listed below is permitted after approval of the Approval Authority.
- (a) Operating fluid viscosity ($\pm 10\%$);
 - (b) Outer torus diameter - inner torus diameter (OD-ID);
 - (c) Number of blades.
8. Choice of the parent torque transferring component
- 8.1 The parent hydrodynamic torque transferring component/retarder shall be selected using the following criteria listed below.
- (a) Highest value: outer torus diameter – inner torus diameter (OD-ID);
 - (b) Highest number of blades;
 - (c) Highest operating fluid viscosity.
- 8.2 The parent magnetic torque transferring component / retarder shall be selected using the following criteria listed below.
- (a) Highest outer rotor diameter – highest inner rotor diameter (OD-ID);
 - (b) Highest number of rotors;
 - (c) Highest number of cooling blades/blades;
 - (d) Highest number of arms.
- 8.3 The parent torque transferring component/hydrodynamic clutch shall be selected using the following criteria listed below.
- (a) Highest operating fluid viscosity ($\pm 10\%$);
 - (b) Highest outer torus diameter – highest inner torus diameter (OD-ID);
 - (c) Highest number of blades.
9. Parameters defining the additional driveline components family
- 9.1 The following criteria shall be the same to all members within an additional driveline components/angle drive family family.
- (a) Gear ratio and gearscheme;
 - (b) Angle between input/output shaft;
 - (c) Type of bearings at corresponding positions

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- 9.2 The following criteria shall be common to all members within an additional driveline components/angle family. The application of a specific range to the parameters listed below is permitted after approval of the Approval Authority.
- (a) Single gear width;
 - (b) Number of dynamic shaft seals;
 - (c) Oil viscosity ($\pm 10\%$);
 - (d) Surface roughness of the teeth;
 - (e) Specified oil level in reference to central axis and in accordance with the drawing specification (based on average value between lower and upper tolerance) in static or running condition. The oil level is considered as equal if all rotating transmission parts (except for the oil pump and the drive thereof) are located above the specified oil level.
10. Choice of the parent additional driveline component
- 10.1 The parent additional driveline component / angle drive shall be selected using the following criteria listed below.
- (a) Highest single gear width;
 - (a) Highest number of dynamic shaft seals;
 - (c) Highest oil viscosity ($\pm 10\%$);
 - (d) Highest surface roughness of the teeth;
 - (e) Highest specified oil level in reference to central axis and in accordance with the drawing specification (based on average value between lower and upper tolerance) in static or running condition. The oil level is considered as equal if all rotating transmission parts (except for the oil pump and the drive thereof) are located above the specified oil level.

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Changes and effects yet to be applied to the whole legislation item and associated provisions

- Signature words omitted by [S.I. 2022/1273 reg. 82\(18\)](#)
- Annex 5 Appendix 6 point 1.3 substituted by [S.I. 2022/1273 reg. 83\(4\)\(b\)\(i\)](#)
- Annex 5 Appendix 6 point 1.4.1 image substituted by [S.I. 2022/1273 reg. 83\(4\)\(b\)\(iii\)\(aa\)](#)
- Annex 5 Appendix 6 point 1.5.1 image substituted by [S.I. 2022/1273 reg. 83\(4\)\(b\)\(iv\)\(aa\)](#)
- Annex 5 Appendix 4 point 7.4 word substituted by [S.I. 2022/1273 reg. 83\(4\)\(a\)](#)
- Annex 5 Appendix 6 point 2.1 word substituted by [S.I. 2022/1273 reg. 83\(4\)\(b\)\(v\)](#)
- Annex 5 Appendix 6 point 1.4.1 words omitted by [S.I. 2022/1273 reg. 83\(4\)\(b\)\(iii\)\(bb\)](#)
- Annex 5 Appendix 6 point 1.5.1 words omitted by [S.I. 2022/1273 reg. 83\(4\)\(b\)\(iv\)\(bb\)](#)
- Annex 5 Appendix 6 point 1.4 words substituted by [S.I. 2022/1273 reg. 83\(4\)\(b\)\(ii\)](#)
- Annex 5 Appendix 6 point 2.1 table words substituted by [S.I. 2022/1273 reg. 83\(4\)\(b\)\(vi\)](#)
- Annex 10 Appendix 4 point 1.1 word substituted by [S.I. 2022/1273 reg. 83\(8\)\(d\)\(i\)](#)
- Annex 10 Appendix 1 words substituted by [S.I. 2022/1273 reg. 83\(8\)\(c\)](#)
- Annex 10 Appendix 4 point 1.1 table words substituted by [S.I. 2022/1273 reg. 83\(8\)\(d\)\(ii\)](#)
- Annex 7 Appendix 5 point 1.3 substituted by [S.I. 2022/1273 reg. 83\(6\)\(c\)\(i\)](#)
- Annex 7 Appendix 5 point 1.4.1 image substituted by [S.I. 2022/1273 reg. 83\(6\)\(c\)\(iii\)\(aa\)](#)
- Annex 7 Appendix 1s. 1 point 000.5 word substituted by [S.I. 2022/1273 reg. 83\(6\)\(b\)\(ii\)](#)
- Annex 7 Appendix 1 words inserted by [S.I. 2022/1273 reg. 83\(6\)\(b\)\(i\)\(aa\)](#)
- Annex 7 Appendix 1 words omitted by [S.I. 2022/1273 reg. 83\(6\)\(b\)\(i\)\(bb\)](#)
- Annex 7 Appendix 5 point 1.4.1 words omitted by [S.I. 2022/1273 reg. 83\(6\)\(c\)\(iii\)\(bb\)](#)
- Annex 7 Appendix 5 point 1.4 words substituted by [S.I. 2022/1273 reg. 83\(6\)\(c\)\(ii\)](#)
- Annex 7 Appendix 5 point 2.1 words substituted by [S.I. 2022/1273 reg. 83\(6\)\(c\)\(iv\)](#)
- Annex 7 Appendix 5 point 2.1 table words substituted by [S.I. 2022/1273 reg. 83\(6\)\(c\)\(v\)](#)
- Annex 8 Appendix 8 point 1.3 substituted by [S.I. 2022/1273 reg. 83\(7\)\(d\)\(i\)](#)
- Annex 8 Appendix 8 point 1.4.1 image substituted by [S.I. 2022/1273 reg. 83\(7\)\(d\)\(iii\)\(aa\)](#)
- Annex 8 Appendix 4 table 11 word omitted by [S.I. 2022/1273 reg. 83\(7\)\(c\)\(i\)](#)
- Annex 8 Appendix 4 table 13 word omitted by [S.I. 2022/1273 reg. 83\(7\)\(c\)\(i\)](#)
- Annex 8 Appendix 4 table 15 word omitted by [S.I. 2022/1273 reg. 83\(7\)\(c\)\(ii\)\(aa\)](#)
- Annex 8 Appendix 4 table 15 word omitted by [S.I. 2022/1273 reg. 83\(7\)\(c\)\(ii\)\(bb\)](#)
- Annex 8 Appendix 1s. 1 point 000.6 word substituted by [S.I. 2022/1273 reg. 83\(7\)\(b\)\(ii\)](#)
- Annex 8 Appendix 8 point 2.1 word substituted by [S.I. 2022/1273 reg. 83\(7\)\(d\)\(iv\)](#)
- Annex 8 Appendix 1 words inserted by [S.I. 2022/1273 reg. 83\(7\)\(b\)\(i\)\(aa\)](#)
- Annex 8 Appendix 1 words omitted by [S.I. 2022/1273 reg. 83\(7\)\(b\)\(i\)\(bb\)](#)
- Annex 8 Appendix 8 point 1.4.1 words omitted by [S.I. 2022/1273 reg. 83\(7\)\(d\)\(iii\)\(bb\)](#)
- Annex 8 Appendix 8 point 1.4 words substituted by [S.I. 2022/1273 reg. 83\(7\)\(d\)\(ii\)](#)
- Annex 8 Appendix 8 point 2.1 table words substituted by [S.I. 2022/1273 reg. 83\(7\)\(d\)\(v\)](#)

- Annex 2 Appendix 2s. 2 point 2 omitted by S.I. 2022/1273 reg. 83(2)(b)(ii)
- Annex 2 Appendix 2 words inserted by S.I. 2022/1273 reg. 83(2)(b)(i)
- Annex 6 Appendix 7 point 1.3 substituted by S.I. 2022/1273 reg. 83(5)(e)(i)
- Annex 6 Appendix 7 point 1.5 image substituted by S.I. 2022/1273 reg. 83(5)(e)(iii)(aa)
- Annex 6 Appendix 7 point 2.1 word substituted by S.I. 2022/1273 reg. 83(5)(e)(iv)
- Annex 6 Appendix 1 words omitted by S.I. 2022/1273 reg. 83(5)(c)
- Annex 6 Appendix 7 point 1.5 words omitted by S.I. 2022/1273 reg. 83(5)(e)(iii)(bb)
- Annex 6 Appendix 2 point 8 words substituted by S.I. 2022/1273 reg. 83(5)(d)
- Annex 6 Appendix 3 point 8 words substituted by S.I. 2022/1273 reg. 83(5)(d)
- Annex 6 Appendix 4 point 8 words substituted by S.I. 2022/1273 reg. 83(5)(d)
- Annex 6 Appendix 5 point 8 words substituted by S.I. 2022/1273 reg. 83(5)(d)
- Annex 6 Appendix 7 point 1.4 words substituted by S.I. 2022/1273 reg. 83(5)(e)(ii)
- Annex 6 Appendix 7 point 2.1 table words substituted by S.I. 2022/1273 reg. 83(5)(e)(v)
- Art. 3(5) omitted by S.I. 2022/1273 reg. 82(4)(a)
- Art. 3(16) words substituted by S.I. 2022/1273 reg. 82(4)(b)
- Art. 3(20) words substituted by S.I. 2022/1273 reg. 82(4)(c)
- Art. 10(1a) inserted by S.I. 2022/1273 reg. 82(8)(b)
- Annex 10a para. 3(f) words inserted by S.I. 2022/1273 reg. 83(9)(a)
- Annex 10a para. 3(f) table words substituted by S.I. 2022/1273 reg. 83(9)(b)(c)
- Art. 12(8) inserted by S.I. 2022/1273 reg. 82(10)