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Flywheels for reciprocating internal combustion engines — Installation dimensions for clutches

*Volant moteur pour moteur alternatif à combustion interne — Dimensions
d'installation des embrayages*



Reference number
ISO 11055:1996(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11055 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 15, *Interchangeability of components of commercial vehicles and buses*.

Annex A of this International Standard is for information only.

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Flywheels for reciprocating internal combustion engines — Installation dimensions for clutches

1 Scope

This International Standard specifies the nominal dimensions and tolerances which affect the interchangeability between flywheels and spring-loaded single- or two-plate clutches.

The flywheels are for use on reciprocating internal combustion engines in conjunction with flywheel housings and clutch housings which are dealt with in ISO 7648^[1] and ISO 7649^[2].

Dimensions and tolerances not specified are left to the discretion of the component manufacturer.

This International Standard applies to reciprocating internal combustion engines, with the exception of engines for aircraft and passenger cars; it may be used for other engine applications where no specific International Standard exists.

NOTE — It is recognized that the dimensions shown in this International Standard may not be suitable for some designs in use at present, but they should be used for all new designs as a means of achieving rationalization in the future.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*.

ISO 1101:1983, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings*.

3 Flywheel types and specifications

This International Standard defines two types of flywheel:

- flat type [see figure 1 a)];
- pot type [see figure 1 b)].

Both types are specified for clutch centring either by spigot or dowels. Dowel holes are specified on the same pitch circle diameter as tapped holes.

For dimensions and tolerances in figure 1, see tables 1 and 2. For definitions and symbols for geometrical tolerances, see ISO 1101.

4 Tapped holes and dowels

Any variation in tapped hole or dowel pattern and/or size shall be subject to agreement between engine manufacturers and clutch suppliers, including the eventuality of stepped dowels being required.

Dimensions in millimetres

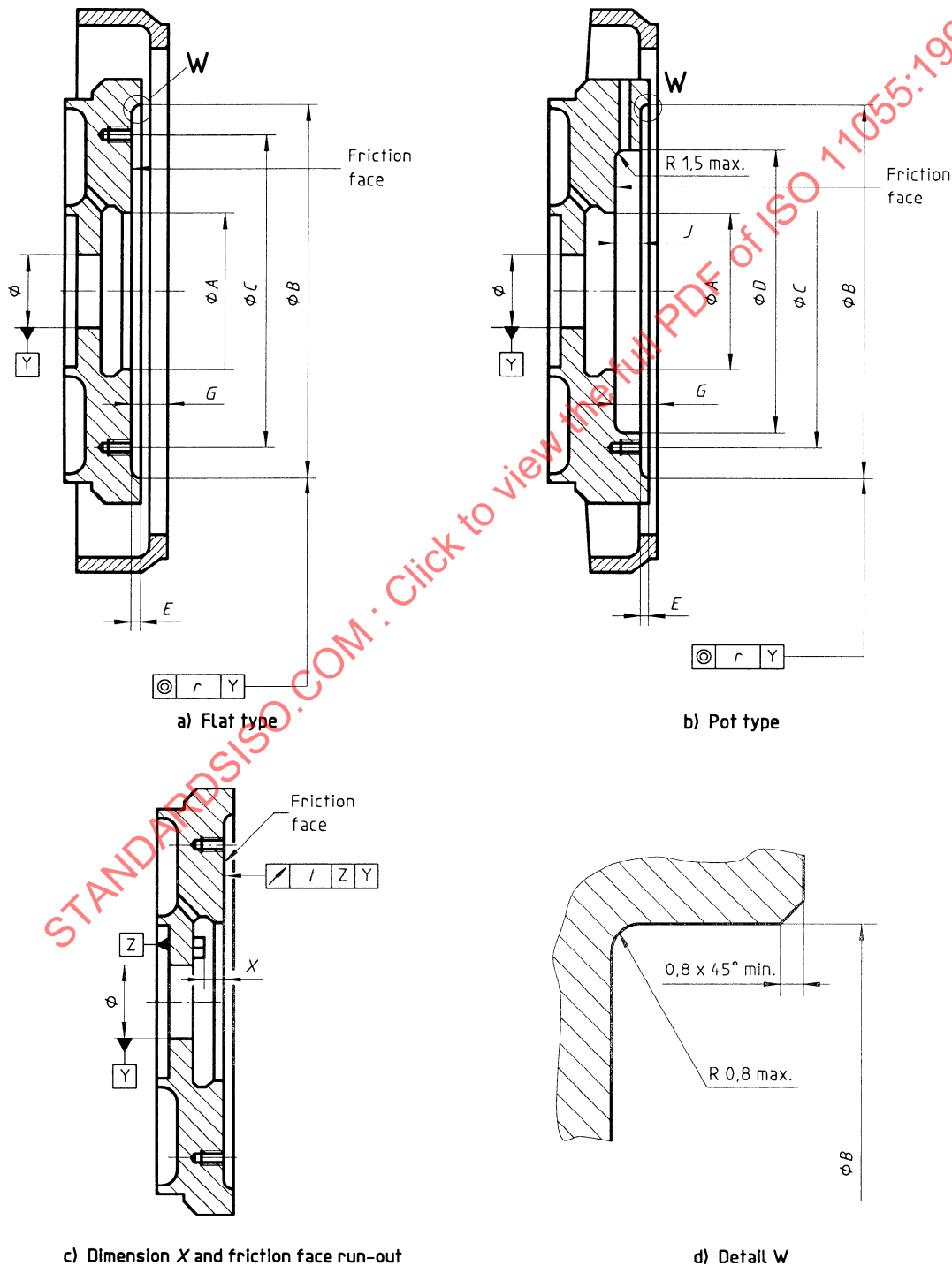


Figure 1 — Flywheels

Table 1 — Flywheels for single-plate clutches — Flat and pot types

Dimensions in millimetres

Sizes by type designation		A 1)	B 2)	C	D	E	Tapped holes		Dowels		G 3)	J 4)	X 3) 5)	t	r
Flat type	Pot type		+ 0,08 0				No.	L	For position, see figure	No.	M h 8 6)	For position, see figure	min.		
250		165	310	290			6		2				8		0,159
265		165	325	305			6		2	3			8		0,166
280	—	175	340	320	—	5	6	M8	2		8	—	8		0,174
310		185	365	345			12		4				10		0,189
330		195	390	370			12		4				12		0,2
350	350	200	395	375	360	6		M8		2, 3 or 4	8	66,5	14		0,205
380	380	200 7)	435 8)	410 8)	390	6		M10			10		16		0,22
395	395	215	435	410	405	6	12	M10	4 or 5		10		16		0,23
400	400	215 10)	450	418	—	8		M10			—		18		0,23
430	430	235 11)	475	450	440	8		M10		2, 3 or 4	10		18		0,245

1) Dimension A is for guidance only and will depend on future development.

2) Dimension B applies only when a spigot location is required. It does not apply when dowels are used for location purposes.

3) In certain cases, depending on the position of the release bearing, dimension G can be reduced, subject to agreement between engine manufacturer and clutch supplier; this question will be considered in the future. Also, depending upon the design of the clutch torsional damper, dimension X min. can be increased or reduced, subject to agreement between engine manufacturer and clutch supplier; this question will also be considered in the future.

4) Dimension J can be 48 mm for size designation 430.

5) The X min. dimension is given for guidance and is intended to ensure clearance between the clutch torsional damper in the fully worn condition of the driven plate and the heads of the flywheel/crankshaft fixing screws. As the PCD (Pitch Circle Diameter) of the latter is not specified and there are no envelope dimensions stated for clutches, this dimension permits installation and subsequent clutch plate wear without fouling.

6) See ISO 286-2.

7) 215 for engine torques above 750 N·m.

8) These dimensions are reduced when using flywheel housing size code 3 with cast iron clutch covers.

$$9) \quad t = \frac{0,013D'}{25,4}$$

where, D' is the diameter of measurements:

— for figure 1 a), D' is between A and B;

— for figure 1 b), D' is between D and B.

10) 235 for engine torques above 1 200 N·m.

11) 258 for engine torques above 2 200 N·m.

Table 2 — Flywheels for two-plate clutches — Flat type

Dimensions in millimetres

Size	A ¹⁾	B ²⁾ + 0,08 0	C	E	Tapped holes			G ³⁾	X ^{3) 4)} min.
					No.	L	For position, see figure		
310	185	370	350	5	12	M8	4 or 5	66,5	10
350	200	395 ⁵⁾	375 ⁵⁾	6	12	M8 or M10 ⁶⁾	4 or 5	66,5	14
380	200 or 215	440	410	6	12	M10 or M12 ⁶⁾	4 or 5	66,5	16
400	235	470	450	8	12	M10	4 or 5	66,5	18

1) Dimension A is for guidance only and will depend on future development.

2) Dimension B applies only when a spigot location is required. It does not apply when dowels are used for location purposes.

3) In certain cases, depending on the position of the bearing, dimension G can be reduced, subject to agreement between engine manufacturer and clutch supplier; this question will be considered in the future. Also, depending upon the design of the clutch torsional damper, dimension X min. can be increased or reduced, subject to agreement between engine manufacturer and clutch supplier; this question will also be considered in the future.

4) The X min. dimension is given for guidance and is intended to ensure clearance between the clutch torsional damper in the fully worn condition of the driven plate and the heads to the flywheel/crankshaft fixing screws. As the PCD (Pitch Circle Diameter) of the latter is not specified and there are no envelope dimensions stated for clutches, this dimension permits installation and subsequent clutch plate wear without fouling.

5) These dimensions are reduced when using flywheel housing size code 3 with cast iron clutch covers.

6) The thread size depends on the engine torque.

4.1 Tapped holes

The number and sizes for tapped holes shall be as given in tables 1 and 2. The tapped holes shall be equally spaced as shown in figures 2 to 6.

Positional tolerances for tapped holes are shown in figure 6 a) and b).

4.2 Dowels

Where dowels are required, the number and size to be used is given in table 1 and their positions are shown in figures 3 and 4. The flywheel manufacturer may select either two or three equally spaced dowels as dictated by the requirements of the clutch for sizes 310 mm, and above.

Flywheels may also be provided with 12 tapped holes and 4 dowel holes (positions I, II, III, IV) as shown in figure 4, or 12 tapped holes and either two or three dowel holes as follows:

- 2 dowel pattern on positions I and III,
- 3 dowel pattern on positions I, II and IV.

The positional tolerance for dowel location is shown in figure 6 a).

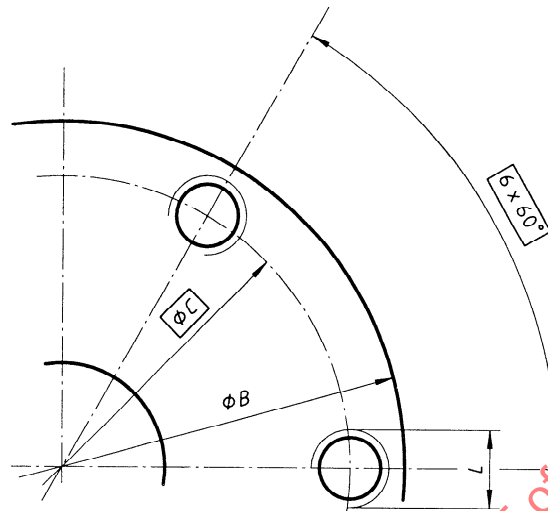


Figure 2 — 6 hole pattern

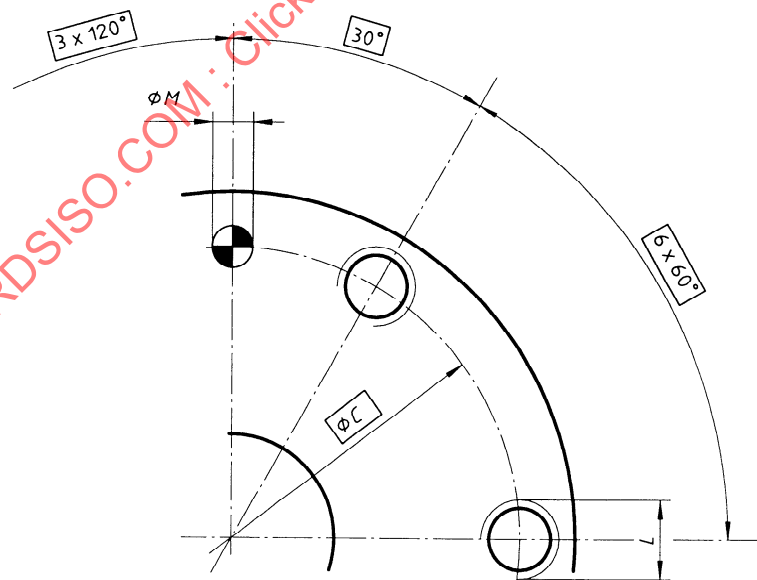


Figure 3 — 6 hole, 3 dowel pattern



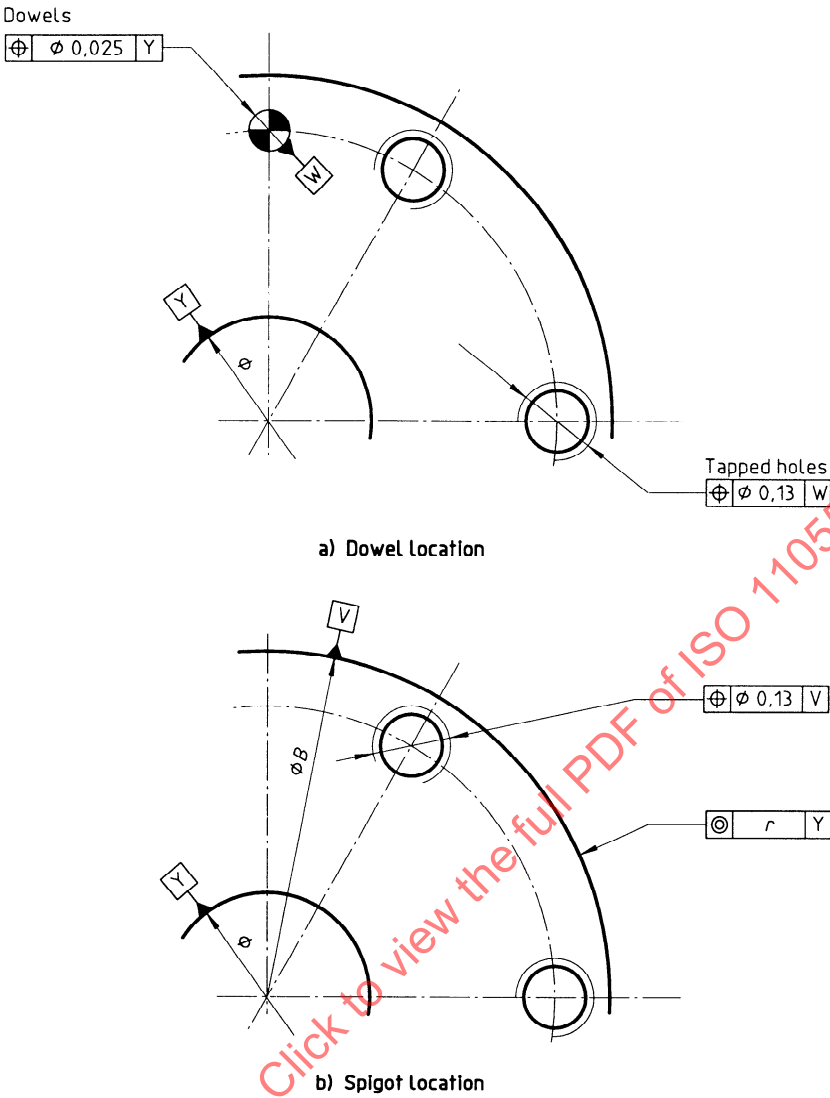


Figure 6 — Positional tolerances of holes