Former issues of this standard: April 2012

1. Scope and field of application

This EUWA Standard specifies the dimensional characteristics necessary for the attachment of the wheel on the hub. The flat attachment type with centring on central bore (hub centring) is the recommended type for future equipment. Stud centered & mixed centered wheels should be avoided wherever possible. The specifications indicated hereafter do not imply that the wheel is inter- changeable from one vehicle to another. The fatigue life performance of the wheel can depend on the vehicle's hub shape. The hub should provide an uninterrupted circular support area for the wheel attachment face to have no negative influence on the fatigue life behaviour* For non-circular or non-flat hubs, a negative effect to the wheel's endurance behaviour must be expected.

This standard applies to wheel attachments for commercial vehicles whose fixing includes 6, 8, 10 and 12 stud holes.

*see also DIN 74361-3

2. General requirements

2.1. Flat attachment with centring on center bore (hub centring) as in DIN74361-3

The dimensions and tolerances for the wheel center shall be as in Table 1 and Fig. 1a+b.

For the contact of the hub side it has to be ensured that the effective contact of the hub (D_4) is bigger or equal to the maximum contact of the washer (PCD+D_5) to ensure a proper support in force distribution. E.g. for a PCD 335mm with a D_5 = 47mm the min. hub diameter D_4 has to be 382mm.

Table 1

No. of studs	PCD [D_1]	Central bore [D_2] 1)	Disc contact diameter [D_3]	Hub contact diameter [D_4]				max. flat outer washer contact diameter [D_5]
	-	Ø +0.2mm	Ø min.	*EUWA recommended* $D_{4min.} = D_1 + D_5$ $D_{4max.} = D_3 - 1mm$		*acc. to DIN74361-3*		*acc. to DIN74361-3*
				Min.	Max.	Min.	Max.	
6	205	161	255	245	254	245	250	40 (M18)
	245 3)	191	295	285	294	-	-	40 (M18)
	245	202	295	285	294	285	290	40 (M18)
8	222.25 4)	164	280	267.25	279	-	-	45 (M20)
	275	221	325	320	324	315	320	45 (M20)
				322	324	315	320	47 (M22)
10	225	176	275	272	274	265	270	47 (M22)
	285.75 4)	220	345	332.75	344	-	-	47 (M22)
		221.45	340	332.75	339	-	-	47 (M22)
	335	281	390	382	389	380	385	47 (M22)
12 5)	168	130	215	204.2	214	205	210	36.2 (M18)

1) Values are for steel wheels, for aluminum wheels: central bore diameter +0,2mm
2) If requested, datum face “B” can also be on the other side of the attachment face
3) New: Special use, i.e. due to increased bolt diameter
4) Not of current use in Europe: to be used for specific market only
5) New: Direct mounting application

Fig. 1a

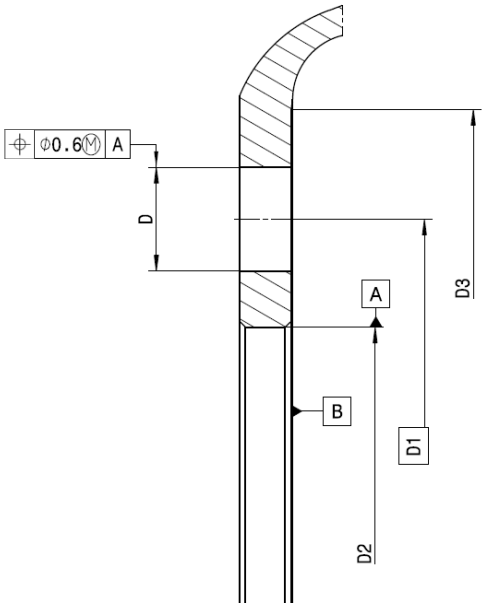
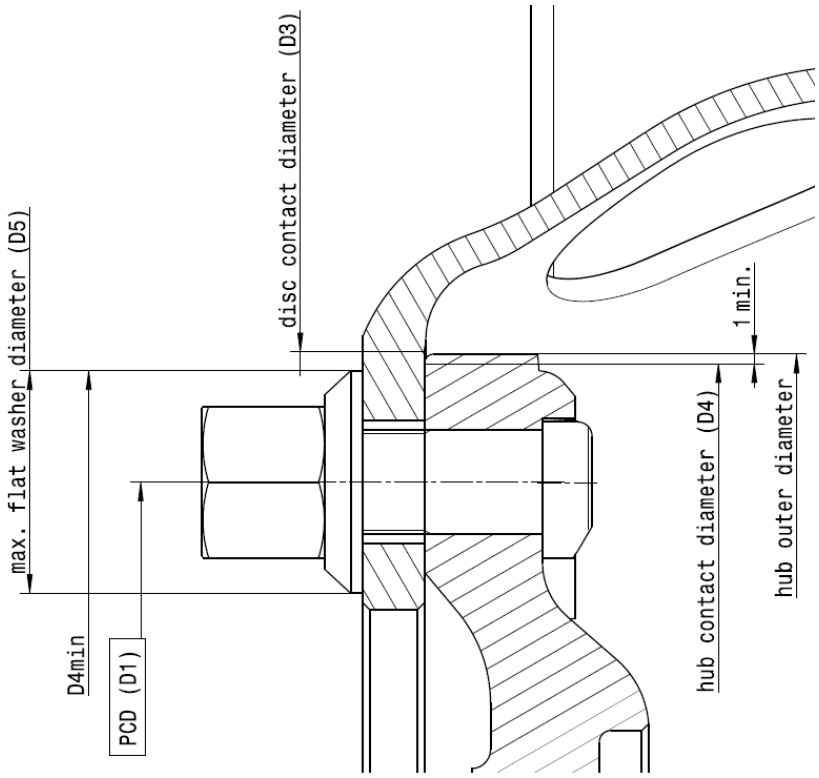

Φ0.6 M A
D
D3
A
B
D1
D2

Fig. 1b


disc contact diameter (D3)
max. flat washer diameter (D5)
1 min.
hub contact diameter (D4)
hub outer diameter
D4min
PCD (D1)

2.2. Attachments with spherical or conical centering on the stud hole (no centering on center bore) or with mixed centering (at stud hole and center bore) as in DIN74361-2

For a stud hole centred wheel, dimensions and tolerances for the wheel center shall be as in Table 2 and Fig. 2. For a mixed centred wheel, dimensions and tolerances for the wheel center shall be as in Table 2 and Fig. 3.

Table 2

No. of studs	PCD [D_1]	Central bore [D_2]	Disc contact diameter [D_3]	Hub contact diameter [D_4]				max. outer washer contact diameter [$D_{5special}$]
	-	Ø +1mm for stud centering Ø +0.2mm for mixed centering	Ø min.	*EUWA recommended*		*acc. to DIN74361-2*		*acc. to DIN74361-2*
				Min.	Max.	Min.	Max.	
6	205	161	255	245	254	245	250	28 (M18)
	222.25	164.31	280	255.25	279	-	-	33 (M20)
		164	280	255.25	279	-	-	33 (M20)
	245	202	295	285	294	285	290	28 (M18)
8	275	221	325	315	324	315	320	33 (M20)
				315	324	315	320	36 (M22)
	285	221	345	318	344	-	-	33 (M20)
10	222.25 1)	164.3	280	255.25	279	-	-	33 (M20)
	225	176	275	265	274	265	270	36 (M22)
	285.75 1)	221.45	345	321.75	344	-	-	36 (M22)
	335	281	390	380	389	380	385	36 (M22)

1) Not of current use in Europe: to be used for specific market only
2) If requested, datum “B” can also be on the outer side of the attachment face

Fig. 2 (Stud Centering)

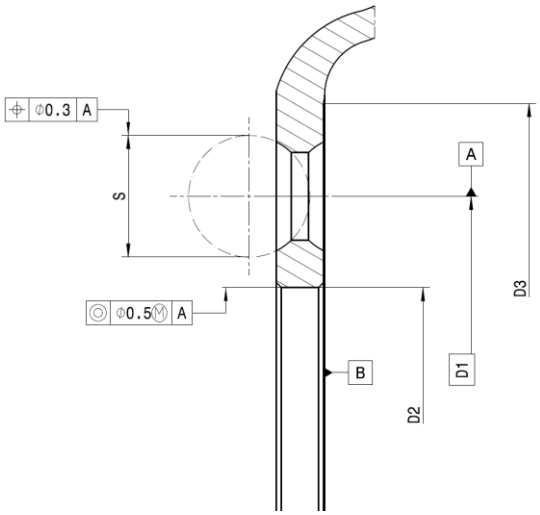
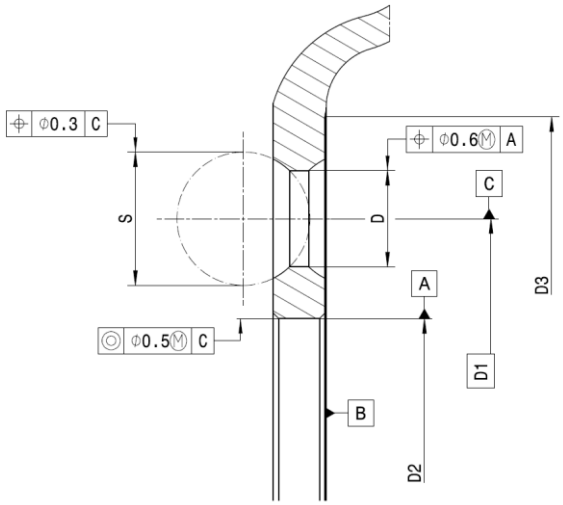


Fig. 3 (Mixed Centering)



2.3. Use of flat nuts with spherical or conical centering on the stud hole (no centering on center bore) and mixed centering (at stud hole and center bore) wheels

2.3.1. The use of flat nuts on stud-centered wheels is not allowed. The primary reason is that this configuration does not provide adequate centering support. Specifically, the clearance between the studs and stud holes, as well as the gap between the hub and the wheel center bore, leads to a loss of proper alignment. Consequently, the effective contact area between the flat nuts and the disc surface is reduced, which may result in torque loss, stud failures, and potential cracking of the wheel. This situation is illustrated in Figure 4.

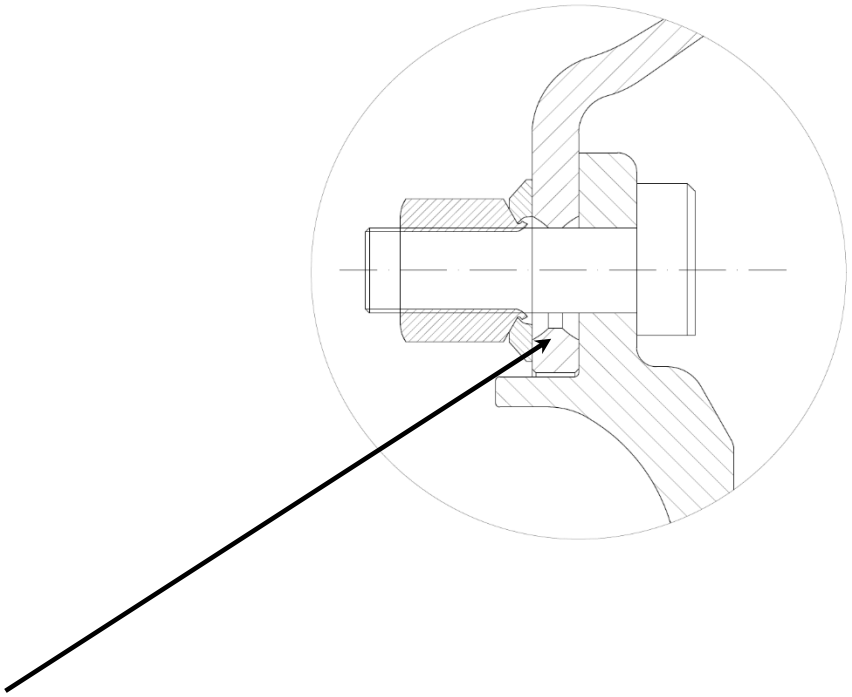


Fig. 4 Example sketch of misalignment with flat nuts on stud-centered wheels (not centered stud inside the bolt hole)

2.3.2. Flat nuts may only be used on mixed-centered wheels when two centering sleeves per hub are installed, positioned opposite each other, as defined in DIN 74361. This is illustrated in Figure 5 and Figure 6.

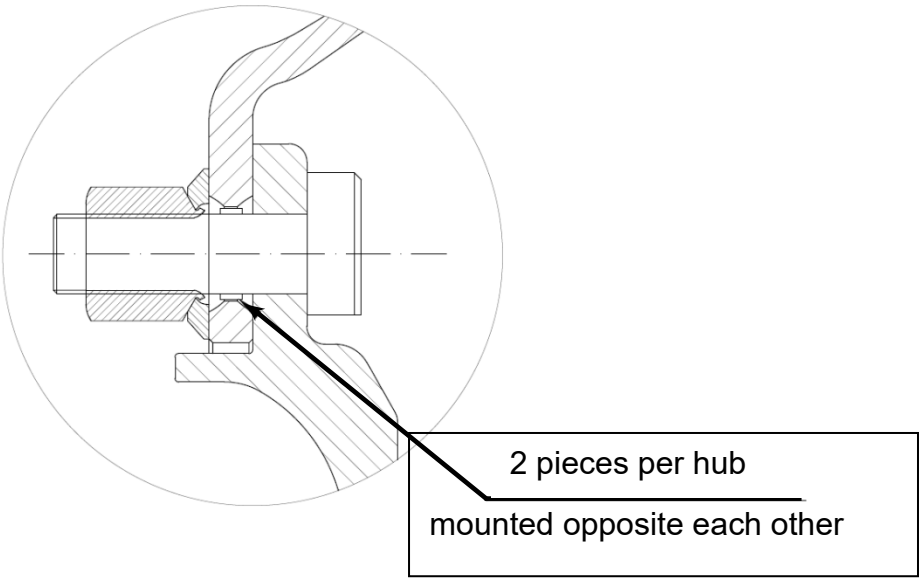


Fig. 5 Mixed centering with two sleeves on single wheel attachment

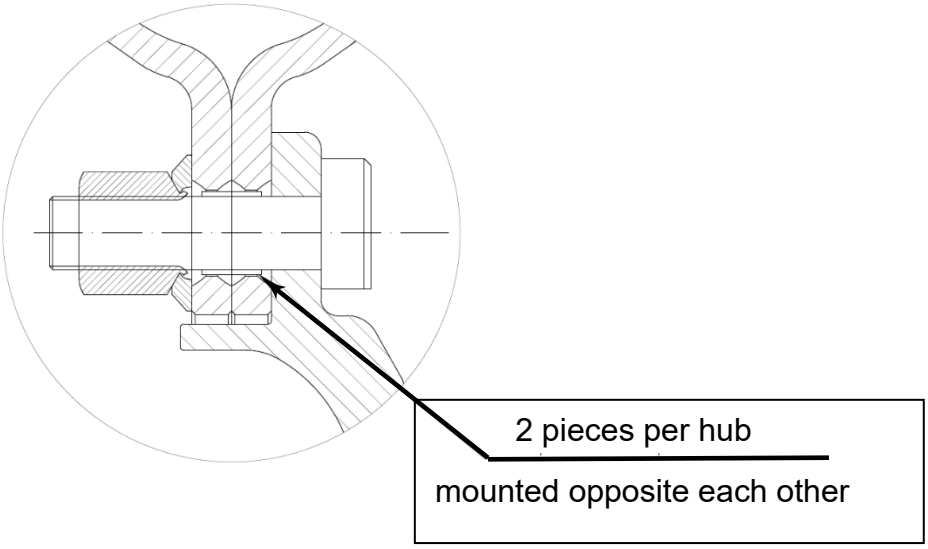


Fig. 6 Mixed centering with two sleeves on dual wheel attachment