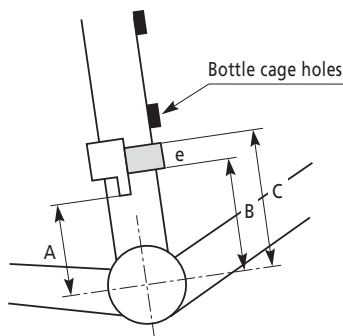


# Front derailleur

## Front derailleur clamp band position

The clamp band for the front derailleur is secured on the seat tube at the location marked "e."

Make sure that the seat tube at "e" where the band is secured is circular. Do not place the bottle cage holes, etc. in this vicinity "e" where they may interfere with the clamp band.



FD type	Model no.	Crankset	A	B	C
Top swing link (for 9-speed)	FD-M970	44T	—	55 mm	90 mm
	FD-M815 FD-M665	36T *		53 mm	91 mm
	FD-M770 FD-M772 NEW FD-M772A FD-M660 FD-T660 NEW FD-T660A NEW FD-M590	44T	—	53 mm	91 mm
		48T	—	61 mm	99 mm
	FD-M510	44T	—	55 mm	90 mm
		48T	—	63 mm	98 mm
Down swing link (for 9-speed)	FD-M971 FD-M771 FD-M661	44T	119 mm	120 mm	150 mm
	FD-M817 FD-M667	36T *			
	FD-M773 FD-T661 NEW FD-M591	44T	119 mm	123 mm	159 mm
		48T	127 mm	131 mm	167 mm
	FD-M511	44T	105 mm	111 mm	150 mm
		48T	113 mm	119 mm	158 mm
Top swing link	FD-M412	42T	—	51 mm	84 mm
		48T	—	63 mm	96 mm
	FD-M330	—	—	45 mm	70 mm
	FD-M360 FD-M310	42T	105 mm	43 mm	91 mm
Down swing link		48T	—	55 mm	103 mm
	FD-M413 FD-M311	42T	95 mm	125 mm	158 mm
	48T	106 mm	136 mm	169 mm	
Top swing link	FD-T301	48T	—	50 mm	80 mm
Top swing link	FD-C050	42T	—	45 mm	67 mm
	NEW FD-M190-3 NEW FD-M190A-6 NEW FD-TX50	42T	45 mm	46 mm	74 mm
	FD-C051 FD-C102	48T	53 mm	54 mm	90 mm
	NEW FD-M191 NEW FD-TX51	—	57 mm	58 mm	86 mm
	Down swing link	FD-TY10	42T	98 mm	111 mm

\*: Bash guard diameter is 165 mm.

## Clearance (Tire, Frame)

There are variety of frame design as well as tire width, so when deciding frame dimension please be put attention of following A – D figure to have enough clearane from tire and frame (suspension link).

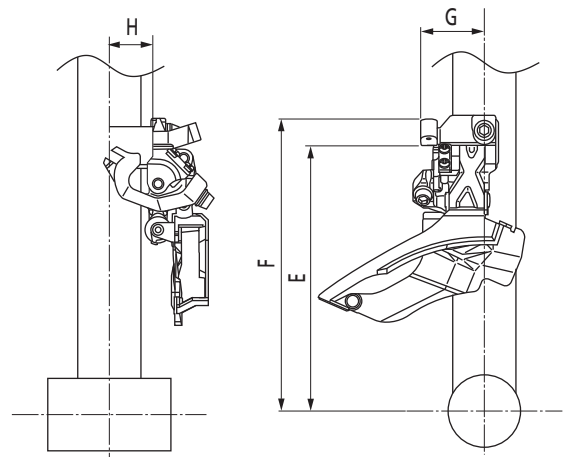
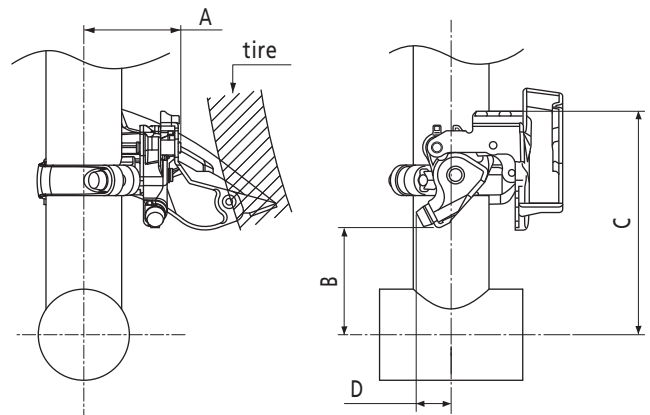
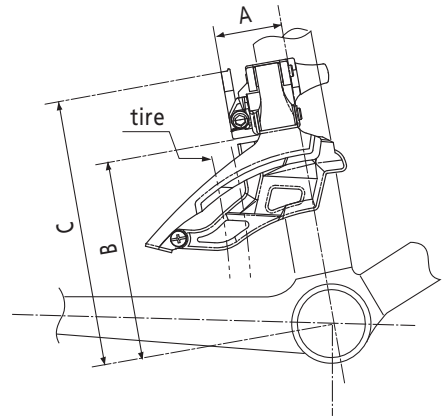
Model no.		A	B	C	D
FD-M970	44T	50	43	115	35
FD-M772	44T	50	43	115	31
<b>NEW</b> FD-M772A	44T	43.5	43	115	35
<b>NEW</b> FD-T660A-3/ <b>NEW</b> M590-3	48T	43.5	51	123	35
FD-T660-6/ <b>NEW</b> M590-6	44T	50	43	115	31
	48T	50	51	123	31
FD-M770/M660	44T	45	43	115	35
	48T	45	51	123	35
FD-M971/M771/M661	44T	34	107	165	-
FD-M773	44T	34	107	165	-
FD-T661/ <b>NEW</b> M591	48T	34	115	173	-
FD-M815/M665	36T*	45	43	115	35
FD-M817/M667		34	107	165	-
FD-M511	44T	33	93	158	-
	48T	33	101	166	-
FD-M412	42T	48.5	47	107	27
	48T	48.5	59	120	27
FD-M413	42T	38	108	163	-
	48T	38	119	174	-
FD-M310/M360	42T	48.5	47	107	27
	48T	48.5	59	120	27
FD-M311	42T	37	113	156	-
	48T	37	124	167	-
FD-M190/C050	42T	50	48	123	23
<b>NEW</b> FD-M190-3/ <b>NEW</b> M190A-6	42T	47	44	118	30
FD-C102/C051	48T	51	61	136	40
FD-M191/ <b>NEW</b> TX51	48T	47	56	130	30

\*: Bash guard diameter is 165 mm.

Dimension of E-type is same as band type of its model. (E-type: 44T compatible)

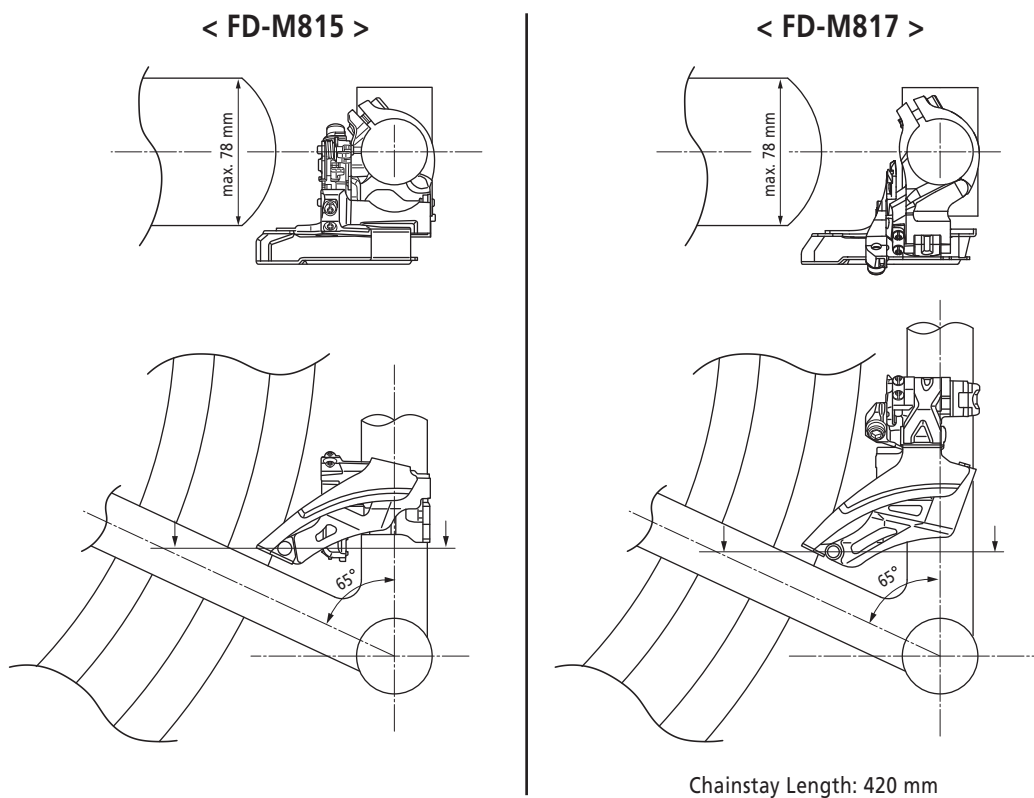
### Direct Mount MTB FD

Model no.		A	B	C	D	E	F	G	H
FD-M771-D	44T	34	107	165	-	144	164	40	23
FD-M661-D									



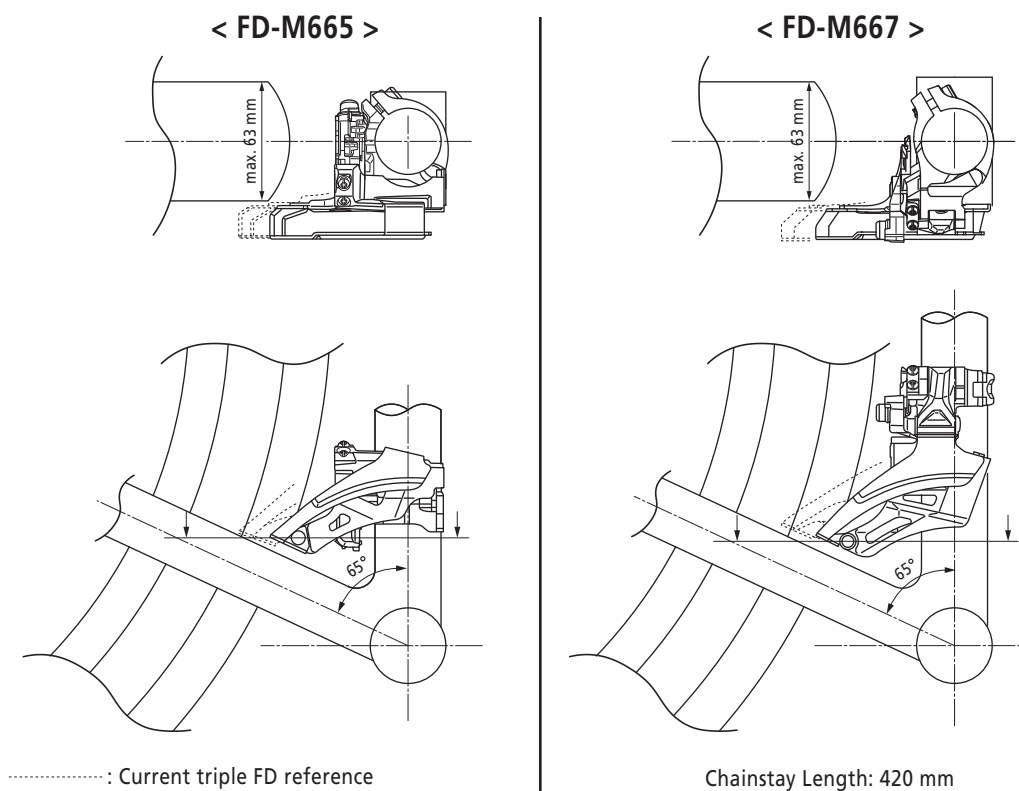
## Tire clearance (FD-M815/M817)

Rear tire width: Not larger than 78 mm.



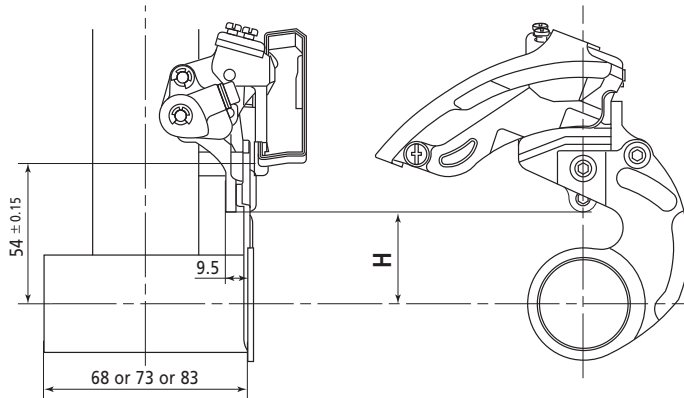
## Tire clearance (FD-M665/M667)

Rear tire width: Not larger than 63 mm.



## Bottom bracket mount front derailleur

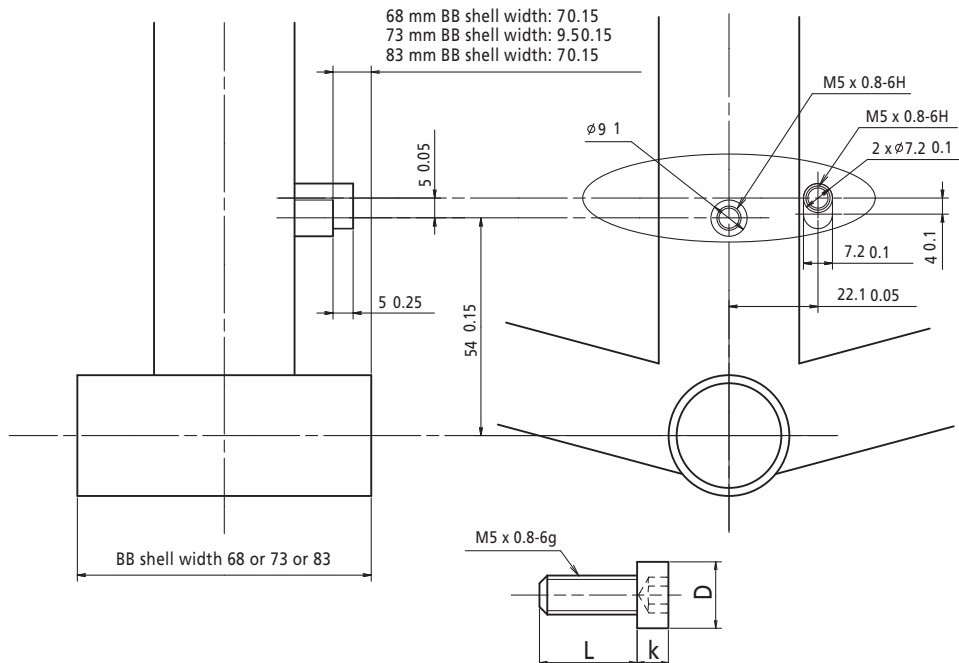
The dimensions are as shown below. Please make sure that there is no interference with the frame.



Model no.	Outer chainring teeth	Dimension H (mm)	BB Shell Width (mm)
FD-M970-E FD-M770-E FD-M660-E	44T	42	68, 73
FD-M665-E	36T	42	68, 73, 83

## Bottom bracket mount front derailleur (w/o BB-plate)

If you use w/o BB-plate E-type, the frame should be kept as following dimensions.



$$9 \leq D \leq 13.5$$

$$k \leq 4$$

$$L \leq 12.5$$

There are no damages to the bolt after tightening by the following torque.  
Tightening torque: 5~7 N m (44~60 in.lbs.)

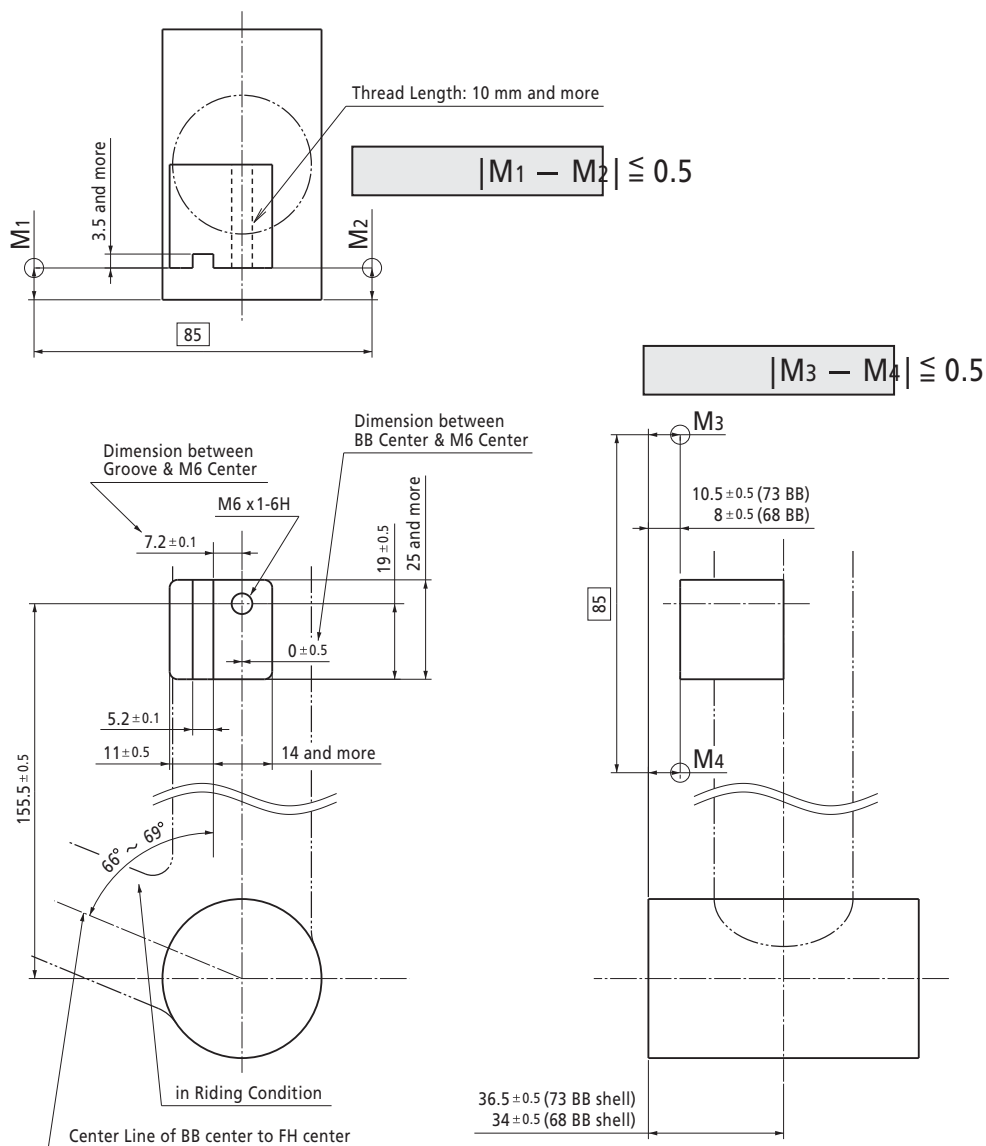
\* Shimano do not provide this fitting bolt, so please use the bolt like this size.

### Caution

Please contact to Shimano sales office before using this option.

## Dimension of brazed-on part for direct mount MTB FD (FD-M771D/M661D)

Please refer to Shimano recommended MTB direct mount part on seat tube below.

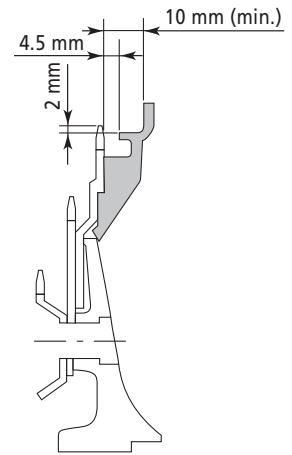


### ■ Caution

Please contact to Shimano sales office before using this option.

## Chain guard for top-swing front derailleur

When using a non-Shimano chain guard in combination with a Shimano top-swing front derailleur, make sure that the chain guard meets the specifications shown below in order to avoid interference with the derailleur operation.



## Front derailleur (All mountain compact drive)

### Recommended frame dimensions

	FD-M815 FD-M817	FD-M665 FD-M667	FD-M665-E
Seat Tube	S--- $\phi$ 28.6 mm M--- $\phi$ 31.8 mm L--- $\phi$ 34.9 mm		BB mount
Chain line	54.3 mm	46.8 mm	54.3 / 46.8 mm
BB shell width	83 mm	68 / 73 mm	63 / 73 / 83 mm
Chain stay angle	65 ~ 71		
Chain stay length	More than 420 mm		
Cable Routing	Top route, Bottom route		

## Front derailleur (MTB Triple)

### Compatibility table for front derailleurs and number of chainring teeth

Speed	Model No.	Chain stay angle	63° – 66°		66° – 69°	
		FC Top gear	44T	48T	44T	48T
9	FD-M970/M971/M970-E FD-M771/M771-D FD-M661/M661-D		-	-	X	-
	<b>NEW</b> FD-M772A/M773		X	X	-	-
	FD-M770/M660		-	-	X	X
	FD-M770-E/M660-E		-	-	X	-
	FD-T660-6/T661-6 <b>NEW</b> FD-M590-6/ <b>NEW</b> M591-6		-	-	X	X
	<b>NEW</b> FD-T660A-3/T661-3 <b>NEW</b> FD-M590-3/ <b>NEW</b> M591-3		X	X	-	-
	FD-M510-3/M511-3		X	X	-	-
	FD-M510-6/M511-6		-	-	X	X
Speed	Model No.	Chain stay angle	63° – 66°		66° – 69°	
		FC Top gear	42T	48T	42T	48T
8/7	FD-M412-3/M413-3		X	X	-	-
	FD-M412-6/M413-6		-	-	X	X
	FD-M330		X	-	X	-
	FD-M410-E		X	-	X	-
	FD-C101-E		X*	-	X	-
	FD-M310-3/M311-3/M360-3		X	X	-	-
	FD-M310-6/M311-6/M360-6		-	-	X	X
	FD-T301		-	X	-	X
	FD-C102		-	-	-	X

\*: Only for 28.6 mm and 31.8 mm seat tube

## Front derailleur (FD-M410-E)

### ■ Frame dimensions when using the FD-M410-E

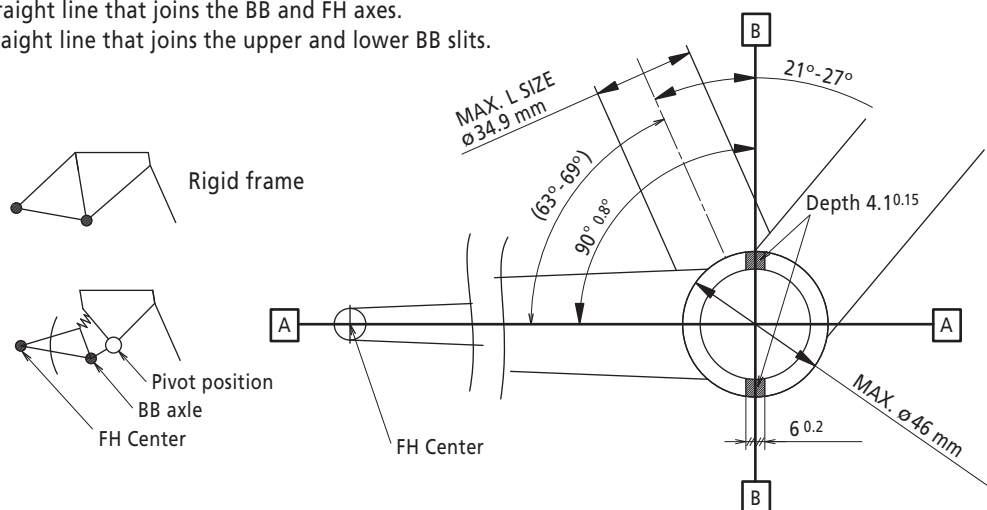
The FD-M410-E is a front derailleur which is designed according to new specifications. This front derailleur can be used with frames that have the dimensions listed below.

Due to new installation system adopted, slits are required on the right side edge of BB shell as following (Fig. 1). A new BB mount system can allow one specification of front derailleur to fit various frame design as well as it achieves precise shifting.

FIGURE 1.

Line A : The straight line that joins the BB and FH axes.

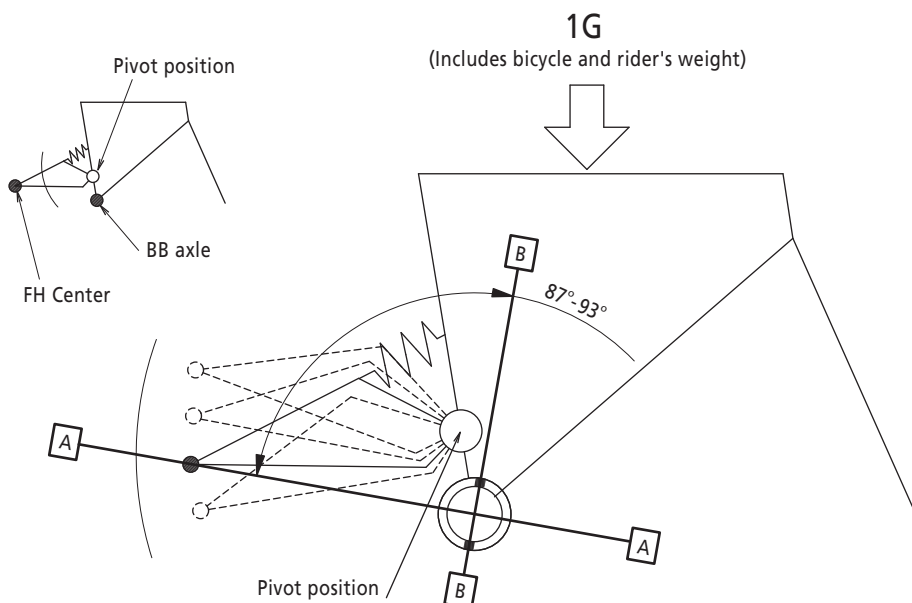
Line B : The straight line that joins the upper and lower BB slits.



1. With this type, the straight line that joins the BB and FH axes is not affected by the movement of the rear suspension (like a rigid bike and this diagram).

The angle between the seat tube and line B should be  $21^{\circ}$  to  $27^{\circ}$ .

FIGURE 2.



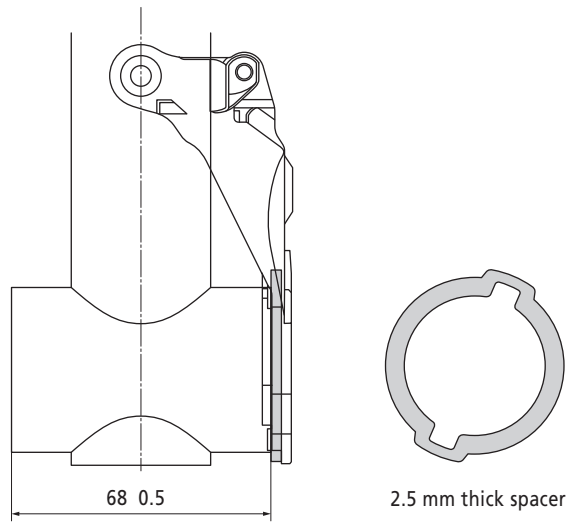
2. With this type, the straight line that joins the BB and FH axes is affected by the movement of the rear suspension (like this diagram).

Provide slits, as shown in the diagram, so that the angle between the line A and line B is between  $87^{\circ}$  and  $93^{\circ}$  even if the suspension moves when riding. Also, bearing in mind the situation when riding, adjust the FD within a range of  $87^{\circ}$  and  $93^{\circ}$ .

If road conditions cause the suspension to move greatly, the chain and FD might touch.

■ Combinations using the FD-M410-E

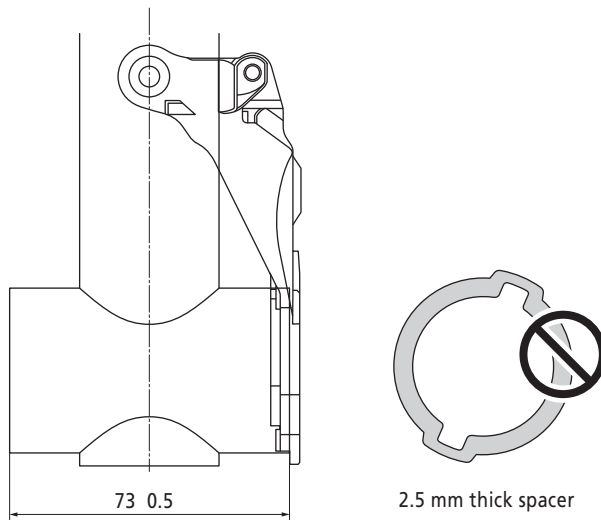
< If the bottom bracket shell width is 68 mm >



**For frames with a 68 mm shell width**

Use a 2.5 mm thick spacer between the bottom bracket shell and the bottom bracket plate.

< If the bottom bracket shell width is 73 mm >

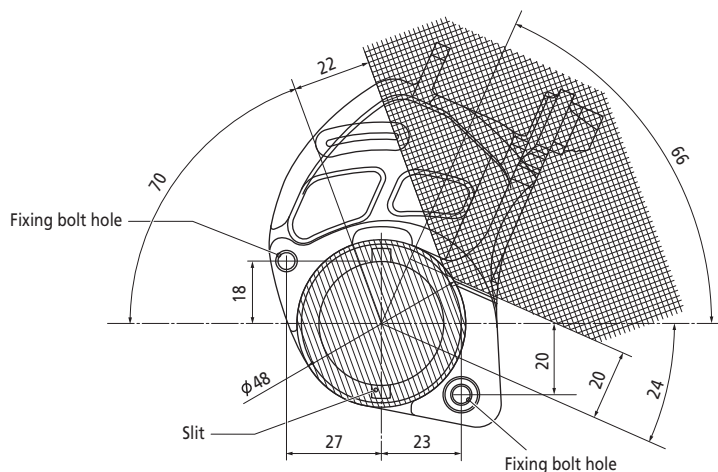


**For frames with a 73 mm shell width**

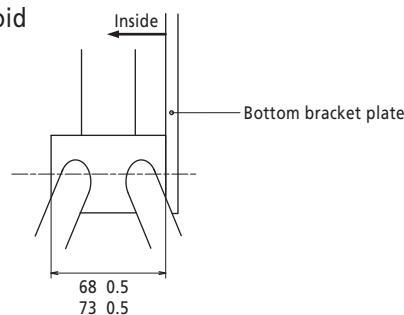
No spacer is required.



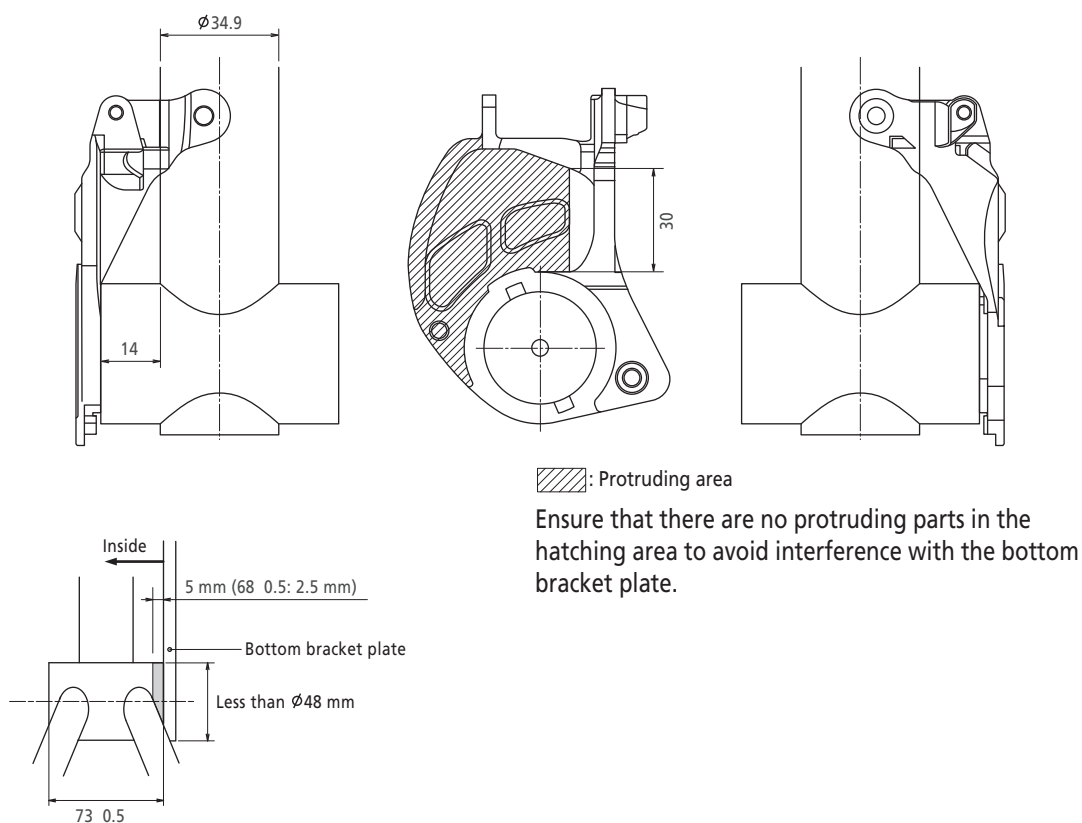
## ■ When using the FD-M410-E with a chain case



- Ensure that there are no protruding parts in the hatching area to avoid interference with the front derailleur or bottom bracket.
- The chain case needs to be fixed onto the frame or the bottom bracket plate using the fixing bolt holes.
- The chain case must not be placed in between the bottom bracket shell and the slit of the bottom bracket plate.
- The chain case must be inside the edge of the bottom bracket shell to avoid touching the bottom bracket plate of the front derailleur.



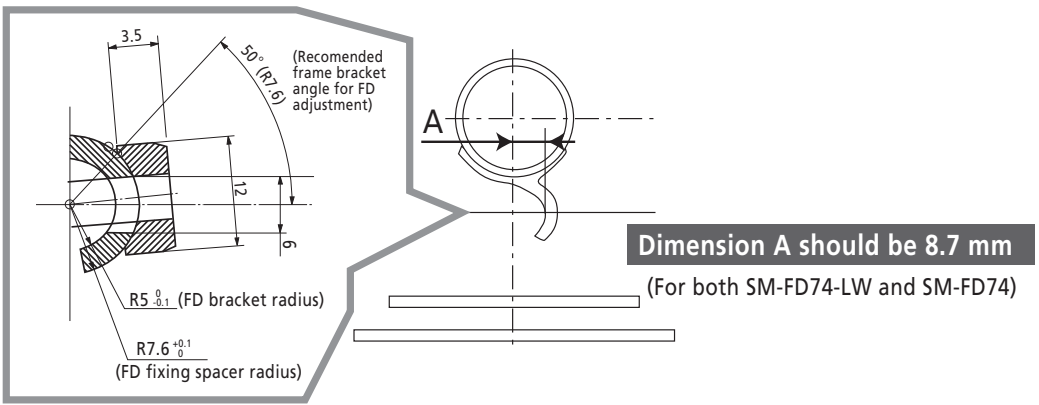
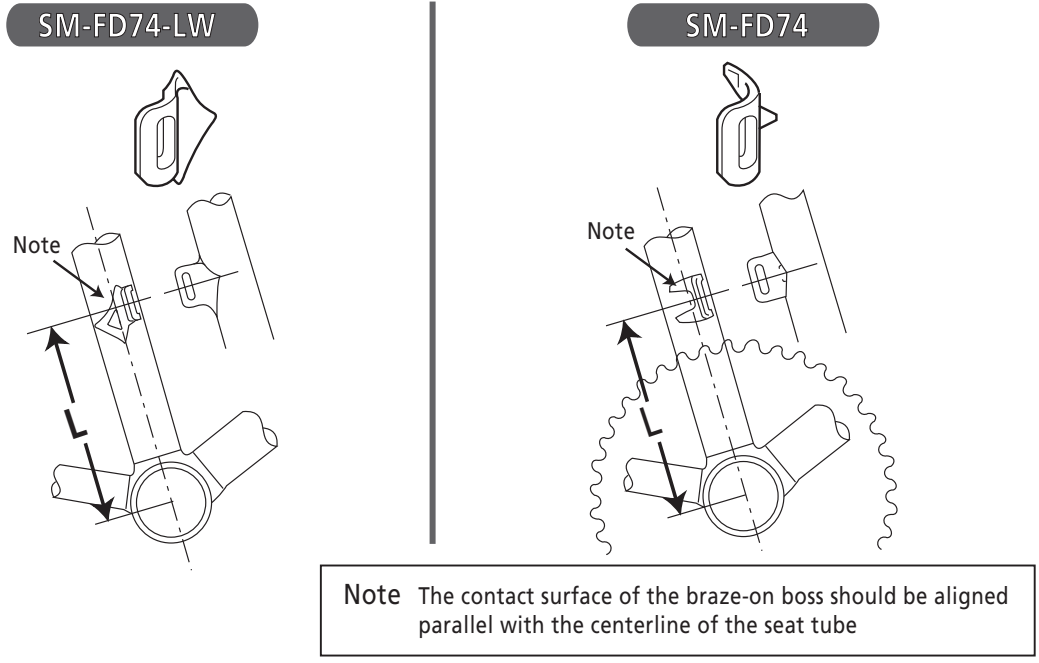
## ■ FD-M410-E interference dimensions



## Position of brazed-on boss for front derailleur (Road bike)

The position of a brazed-on front derailleur mounting boss has a significant effect on shifting performance. Please refer to the points shown below with regard to the correct positioning of the front derailleur mounting boss.

The recommended positions of the mounting bosses for Shimano brazed-on type front derailleurs are shown below. This position will change according to the size of largest chainring used on the bike.



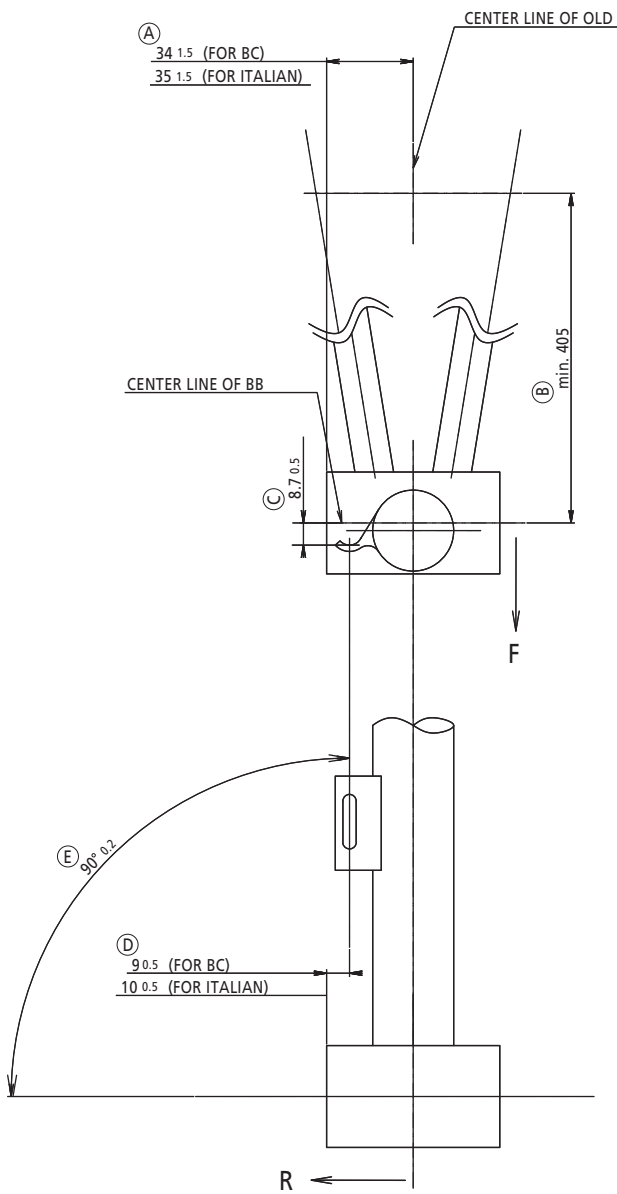
### < For front double FD >

Dimension L	Optimum teeth number	Usable teeth range
136 mm	48T	45T, 46T, 47T, 48T, 49T, 50T
138 mm	49T	46T, 47T, 48T, 49T, 50T, 51T
140 mm	50T	47T, 48T, 49T, 50T, 51T, 52T
142 mm	51T	48T, 49T, 50T, 51T, 52T, 53T
144 mm	52T	49T, 50T, 51T, 52T, 53T, 54T
146 mm	53T	50T, 51T, 52T, 53T, 54T, 55T
148 mm	54T	51T, 52T, 53T, 54T, 55T, 56T
150 mm	55T	52T, 53T, 54T, 55T, 56T
152 mm	56T	53T, 54T, 55T, 56T

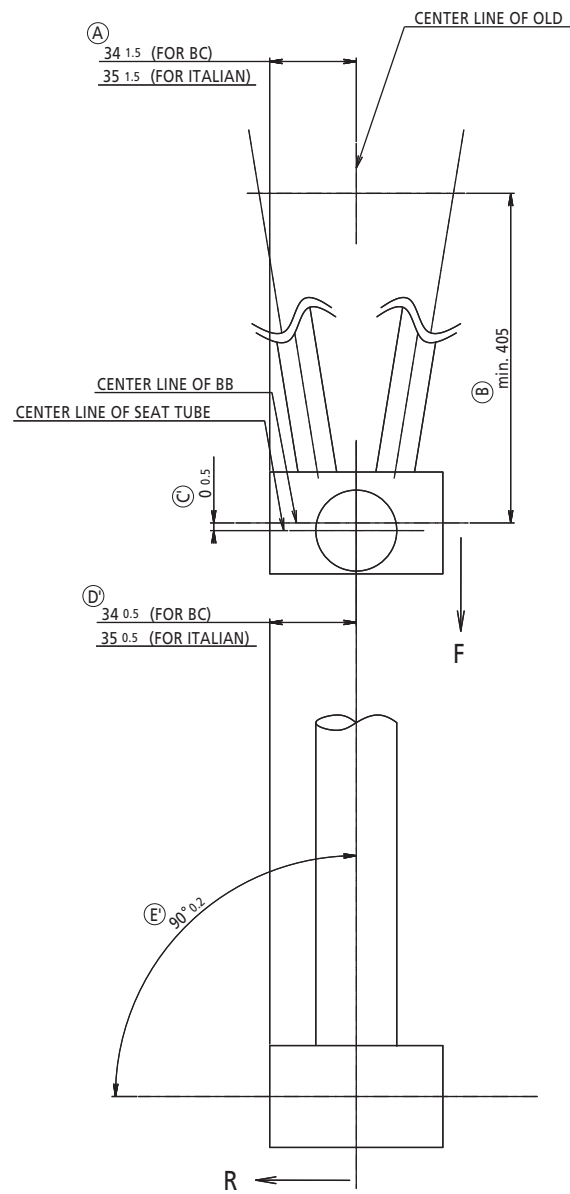
### < For front triple FD >

Dimension L	Optimum teeth number	Usable teeth range
148 mm		

# Required seat tube dimensions for front derailleur



Brazed on type



Band type

- Ⓐ: Dimension for right surface of BB shell and center of OLD
- Ⓑ: Dimension for BB center and FH center (chainstay length)
- Ⓒ: Dimension for brazed-on boss and BB center
- Ⓓ: Dimension for seat tube center and BB center
- Ⓔ: Dimension for brazed-on boss and right surface of BB shell
- Ⓕ: Dimension for seat tube center and right surface of BB shell
- Ⓖ: Angle between brazed-on boss and BB center
- Ⓗ: Angle between seat tube center and BB center

## ■ Front derailleur installation specifications

		Band type	Brazed on type	Brazed on + SM-AD11	Brazed on + SM-AD15
Double	S (ø28.6)	X	X	—	—
	M (ø31.8)	X	X	X	—
	L (ø34.9)	Note-2	X	—	X
Triple	S (ø28.6)	X	X	—	—
	M (ø31.8)	X	X	X	—
	L (ø34.9)	Note-2	Note-1	—	Note-1

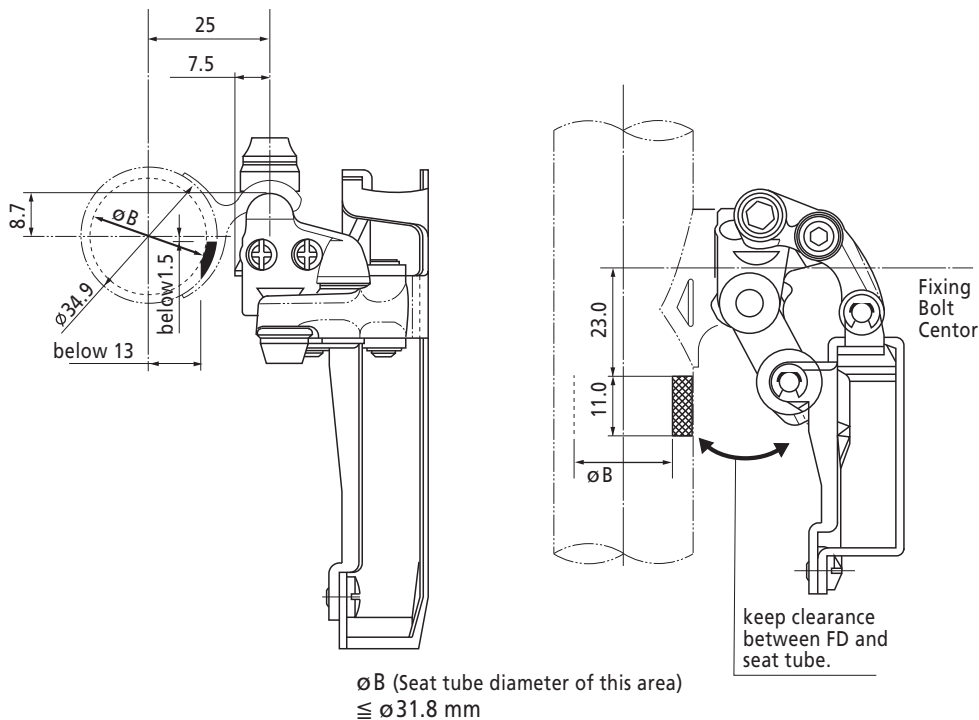
X: Yes

Note-1: When using a brazed on front derailleur except FD-7803/6603G/6603/5603/5603L/4503/3403/R773/R453 with a triple chainring on a road racing bicycle with a seat tube diameter of more than ø31.8 mm, refer to the bellow dimensions to prevent interference with front derailleur.

Note-2: L-size band type Front derailleur is available on FD-7900/7800/7803/6600/6603/5600/5600L/5603/5603L/4500/4503/3403/R770/R773/R453.

## ■ Note for clearance between front derailleur for triple and seat tube (except FD-7803/6603G/6603/5603/5603L/4503/3403/R773/R453)

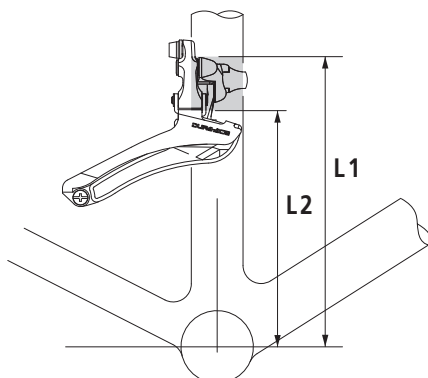
The front derailleur can be moved within the dimensions shown below. Do not interfere with these dimensions when designing the frame and brazed-on boss.



## Dimensions of front derailleur height (Road bike)

### ■ Dimensions of front derailleur height (Band type)

Avoid attaching anything that causes interference with the clamp band in the area between L1 and L2.



#### < For front double FD >

Gear Teeth #		50T	51T	52T	53T	54T	55T	56T
FD-7900 FD-7800	L1 (mm)	151.0	153.1	155.1	157.1	159.1	161.2	163.2
	L2 (mm)	127.9	130.0	132.0	134.0	136.0	138.1	140.1
NEW FD-6700	L1 (mm)	152.1	154.2	156.2	158.2	160.2	162.3	164.3
	L2 (mm)	126.5	128.6	130.6	132.6	134.6	136.7	138.7
FD-6600 FD-6600G	L1 (mm)	152.1	154.2	156.2	158.2	160.2	162.3	164.3
	L2 (mm)	126.5	128.6	130.6	132.6	134.6	136.7	138.7
FD-5600 FD-5600L	L1 (mm)	152.1	154.2	156.2	158.2	160.2	162.3	164.3
	L2 (mm)	126.5	128.6	130.6	132.6	134.6	136.7	138.7
FD-4500 FD-3400	L1 (mm)	152.1	154.2	156.2	158.2	160.2	162.3	164.3
	L2 (mm)	126.5	128.6	130.6	132.6	134.6	136.7	138.7
NEW FD-2300	L1 (mm)	159.3	161.4	163.4	165.4	167.4	169.5	171.5
	L2 (mm)	134.2	136.3	138.3	140.3	142.3	144.4	146.4
FD-R770	L1 (mm)	151.2	154.2	156.2	158.2	160.2	162.3	164.3
	L2 (mm)	126.5	128.6	130.6	132.6	134.6	136.7	138.7
FD-R440A	L1 (mm)	151.9	154.0	156.0	158.0	160.0	162.1	164.1
	L2 (mm)	126.9	129.0	131.0	133.0	135.0	137.1	139.1

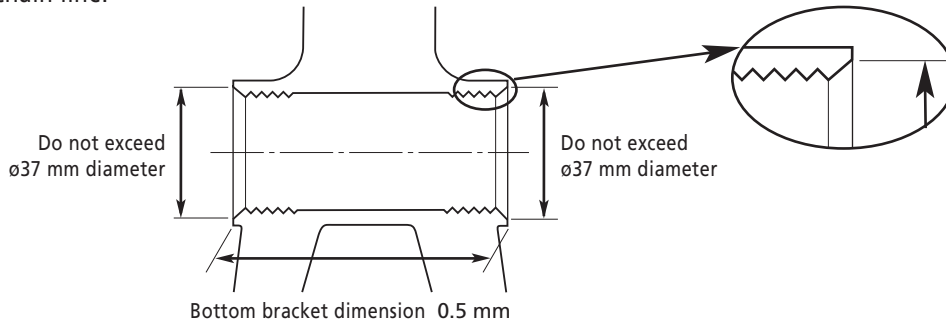
#### < For front triple FD >

Gear Teeth #		50T	52T	53T
FD-7803	L1 (mm)	—	159.4	—
	L2 (mm)	—	136.3	—
NEW FD-6703	L1 (mm)	—	160.5	—
	L2 (mm)	—	134.9	—
FD-6603 FD-6603G	L1 (mm)	—	160.5	—
	L2 (mm)	—	134.9	—
FD-5603 FD-5603L	L1 (mm)	160.4	—	—
	L2 (mm)	134.8	—	—
FD-4503 FD-3403	L1 (mm)	160.4	—	—
	L2 (mm)	134.8	—	—
NEW FD-2303	L1 (mm)	—	166.7	—
	L2 (mm)	—	141.7	—
FD-R773-0	L1 (mm)	160.4	—	—
	L2 (mm)	134.8	—	—
FD-R453	L1 (mm)	160.4	—	—
	L2 (mm)	134.8	—	—
FD-R443A	L1 (mm)	—	158.6	—
	L2 (mm)	—	133.6	—

# Bottom bracket

## Shimano sealed cartridge type bottom bracket

The inside diameter of the bottom bracket face chamfer should not be over 37 mm for Shimano sealed cartridge type bottom brackets. If this dimension is exceeded, there is a possibility that the bottom bracket cartridge may over-insert and skew the chain line.

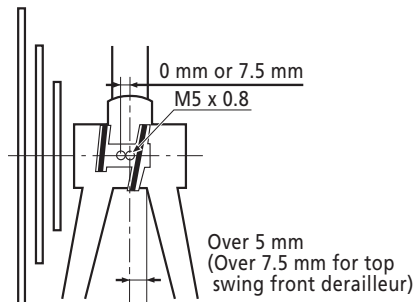
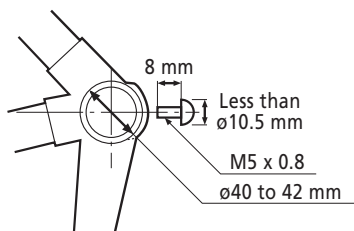


## Bottom bracket cable guide installation

And to keep this performance,

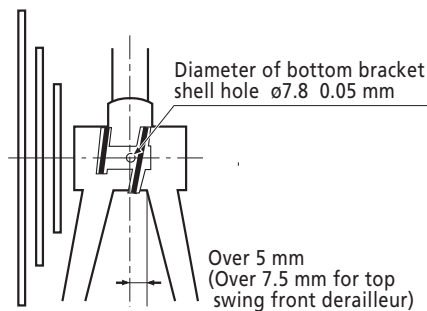
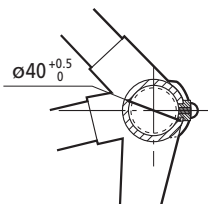
- Assemble BB guide on frame with no clearance.
- Don't make inner cable touch with frame.

### SM-SP17M, SP18M (screw on type)



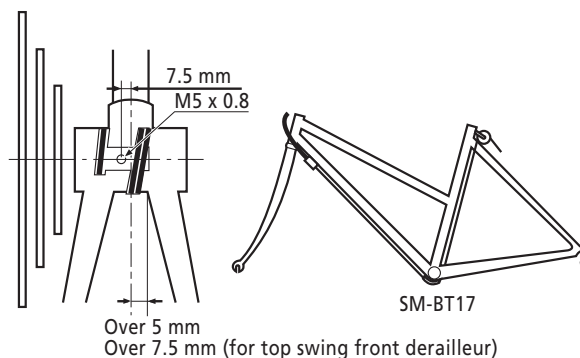
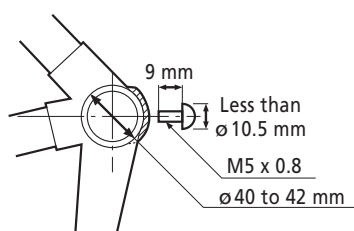
FD, RD

### SM-SP17, SP18T (snap on type) (Requires ø7.8 mm hole in BB shell.)



FD, RD

### SM-BT17, BT18 (screw on type for mixte frames)



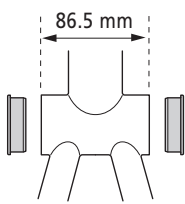
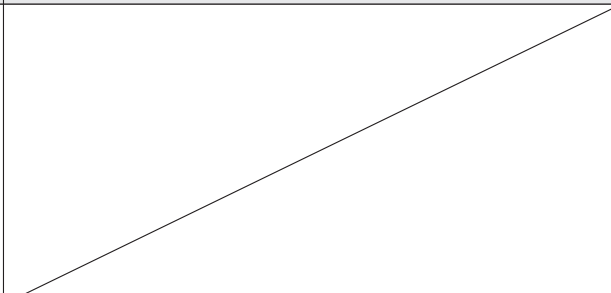
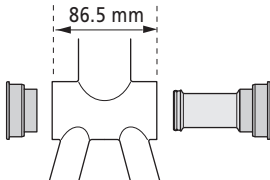
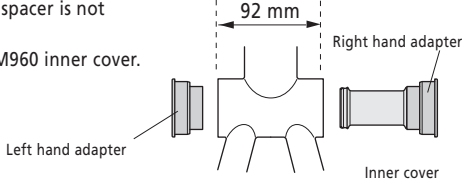
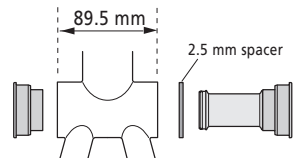
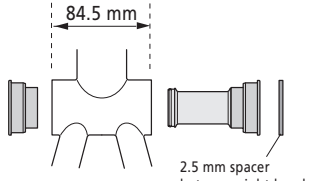
FD, RD, BR

## Press-Fit bottom bracket adapter

### Caution

- \* Due to variations in material properties and the structure of bicycle BB shells, Shimano cannot provide a specific BB shell diameter bore and tolerance. Instead of this, Shimano will provide technical information and the dimensions of Shimano products. For frame related information, please follow the recommendation of individual bike manufacturers. For further information, contact your local Shimano sales office.
- \* Please contact to Shimano sales office before using this option.
- \* Please check X4, Y4 dimension carefully on FC (page 36 – 37/41 – 42) to avoid interference between inner ring and BB shell.

### Assembly example

Adapter type		ROAD	MTB
Inner cover cannot be installed	If the frame has no openings inside the bottom bracket shell, it can be installed without the inner cover sleeve.	<ul style="list-style-type: none"> <li>• Inner cover is not available.</li> </ul>  <p>86.5 mm</p> <p>SM-FC7800P</p>	
		<ul style="list-style-type: none"> <li>• NO spacer is needed.</li> <li>• Use the FC-7800 inner cover.</li> </ul>  <p>86.5 mm</p> <p>SM-BB91-41B</p>	
Inner cover can be installed	If the frame has openings inside the bottom bracket shell, it should be installed with the inner cover sleeve to prevent possible contamination.	<ul style="list-style-type: none"> <li>• The 2.5 mm spacer is not needed.</li> <li>• Use the FC-M960 inner cover.</li> </ul>  <p>92 mm</p> <p>SM-FCM970 SM-BB91-41A</p>	<ul style="list-style-type: none"> <li>• Insert the 2.5 mm spacer into the right hand side (between the frame and the right hand adapter).</li> <li>• Use the FC-M960 inner cover.</li> </ul>  <p>89.5 mm</p> <p>2.5 mm spacer</p> <p>SM-FCM970 SM-BB91-41A</p>
		<ul style="list-style-type: none"> <li>• Use the FC-M805 inner cover.</li> </ul>  <p>84.5 mm</p> <p>2.5 mm spacer between right hand adapter and FC.</p> <p>SM-BB91-42A</p>	

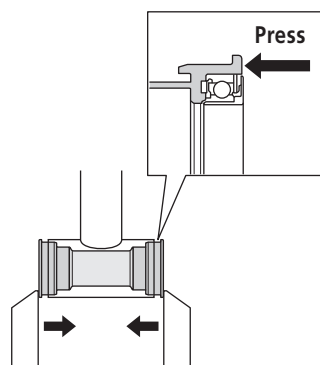
### Removing and inserting

#### <Removing>

Push out firmly from the inside. Do not reuse the adapters as they can be damaged from the removal.

#### <Installation>

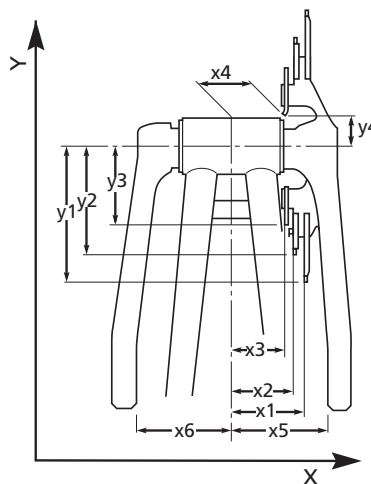
Press-fit the adapters by tightening them in a vise, while applying pressure evenly to both sides so that they do not become tilted. When doing this, push at the points indicated by arrows in the illustration. If you push anywhere further in from these points it may damage the ball races of the bearings.



# Front chainwheel

## Crankset dimensions (MTB/Comfort)

Below are the dimensions for the Shimano chainwheels. Design the frame while referring to these dimensions to ensure no interference.



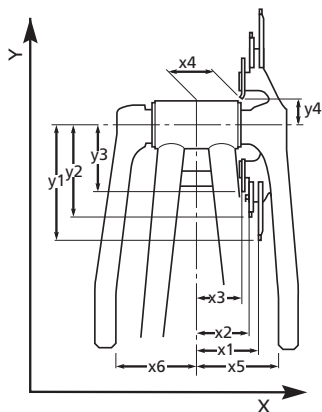
### < Y dimensions >

Speed	Model No.		y1	y2	y3	y4
9	FC-M970	44-32-24T	91.7	67.7	52.3	23.9
		44-32-22T	91.7	67.7	48.3	24.5
	FC-M815-2/M810-2	36-22T	83.9*	75.6	48.3	24.5
		FC-M665/M545	36-22T	83.9*	75.6	48.3
	FC-M815-1 FC-M810-1	34T	83.9*	72.4	-	-
		36T	83.9*	76.4	-	-
		38T	98.8*	80.4	-	-
		40T	98.8*	84.5	-	-
		42T	98.8*	88.5	-	-
	FC-M770	44-32-22T	91.7	67.7	48.3	24.5
		FC-M771-K	48-36-26T	99.8	75.1	56.2
	FC-M660/T661	44-32-22T	91.7	67.7	48.3	25.0
		48-36-26T	99.8	75.6	56.2	24.0
	NEW FC-M591 / NEW M590 FC-M543-K	44-32-22T	91.7	67.0	48.1	24.5 (24.0**)
		48-36-26T	99.8	75.0	56.2	24.0
	FC-M542	44-32-22T	91.7	67.0	48.1	24.5 (24.0**)
FC-M521		44-32-22T	91.7	67.0	48.1	20.0
FC-M443/M442	44-32-22T	92.3	67.7	47.6	20.0	
	FC-M443(48T)	48-36-26T	100.4	75.3	55.7	20.0
8/7	FC-M411(48T)	48-38-28T	100.3	80.1	60.3	20.0
		FC-M411	87.7	68.2	47.2	20.0
	FC-M410	42-32-22T				
8/7	FC-M361	42-32-22T	87.7	68.2	47.2	20.0
		48-38-28T	100.3	80.1	60.3	20.0
	FC-M361-8	42-32-22T	87.7	68.2	47.1	20.0
8/7	FC-M311	42-32-22T	87.7	68.2	47.2	20.0
		48-38-28T	100.2	79.3	59.3	25.5
8	FC-M311-8	42-32-22T	87.7	68.2	47.1	20.0
		FC-C810	46-34-24T	95.5	71.0	52.2
7/6	FC-M191/M151	42-34-24T	88.3	72.1	51.3	21.5
		48-38-28T	100.4	79.3	58.9	25.5
1	MX70	34T	-	-	72.2	43.6
		38T	-	-	80.3	43.6
		41T	-	-	86.3	43.6
		42T	-	-	88.3	43.6
		43T	-	-	90.4	43.6
		44T	-	-	92.4	43.6
46T	-	-	96.4	43.6		

\*: Bash guard dimension

\*\* : Running change is scheduled in June/2008





- \*1: Bash guard dimension
- \*2: Single gear position
- \*3: Center of middle – low gear

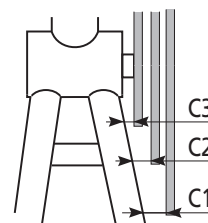
\* Chain case stay thickness should be 11.8 0.3 mm.

< X dimensions >

Speed	Model No.	Chainline	x1	x2	x3	x4	x5	x6
9	FC-M970	44-32-22/24T	50.0	56.0	48.3	40.4	40.2	69.0
	FC-M810-1	34/36/38/40/42T	50.4*2	53.6*1	47.8	-	-	70.8
	FC-M810-2	36-22T	46.8*3	53.6*1	48.3	40.4	39.5	70.8
	FC-M815-1	34/36/38/40/42T	57.9*2	61.1*1	55.3	-	-	78.3
	FC-M815-2	36-22T	54.3*3	61.1*1	55.8	47.9	47.0	78.3
	FC-M770	44-32-22T	50.0	56.0	48.3	40.4	39.5	72.2
	FC-M771-K	48-36-26T	50.0	55.2	47.9	39.9	38.9	78.7
	FC-M665	36-22T	46.8	53.6*1	48.3	40.4	39.5	70.5
	FC-M660	44-32-22T	50.0	56.0	48.3	40.4	39.5	72.2
		48-36-26T	50.0	55.9	48.4	40.4	40.4	78.7
	FC-T661	44-32-22T	50.0	56.0	48.3	40.4	39.5	72.2
		48-36-26T	50.0	55.9	48.4	40.4	40.4	78.7
	FC-M545	36-22T	46.8	53.6	48.3	40.4	39.5	70.9
	FC-M543-K	44-32-22T	50.0	55.2	47.9	39.9	39.9	78.4
		48-36-26T						
	FC-M542	44-32-22T	50.0	55.2	47.9	39.9	39.9	71.7
	NEW FC-M591	44-32-22T	50.0	55.2	47.9	39.9	39.9	78.4
		48-36-26T						
	NEW FC-M590	44-32-22T	50.0	55.2	47.9	39.9	39.9	71.7
		48-36-26T						
FC-M521	44-32-22T	50.0	55.2	47.9	39.9	39.9	80.6	
	48-36-26T							
FC-M443	44-32-22T	47.5+t	52.7+t	45.4+t	37.4+t	35.4+t	70.7+t	
		50+t	55.2+t	47.9+t	39.9+t	37.9+t	73.2+t	
FC-M443(48T)	48-36-26T	47.5+t	52.7+t	45.4+t	37.4+t	35.4+t	70.7+t	
		50+t	55.2+t	47.9+t	39.9+t	37.9+t	73.2+t	
FC-M442	44-32-22T	47.5	52.7	45.4	37.4	35.4	70.7	
		50.0	55.2	47.9	39.9	37.9	73.2	
8/7	FC-M411 (48T)	48-38-28T	50.0	55.5	47.7	39.9	37.9	80.4
	FC-M411	42-32-22T		55.8	48.0	40.2	38.2	74.1
	FC-M410	42-32-22T						
8/7	FC-M361	42-32-22T	50.0	55.5	47.7	39.9	37.9	79.2
		48-38-28T						79.5
8/7	FC-M311	42-32-22T	50.0	55.5	47.7	39.9	38.6	80.9
		48-38-28T						81.8
		42-32-22T						
8	FC-C810	46-34-24T	50.0	55.7	48.2	40.3	40.3	76.9
7/6	FC-M191	42-34-24T	47.5	52.7	45.5	37.3	35.9	74.3
			47.5+t	52.7+t	45.5+t	37.3+t	35.9+t	74.3+t
		48-38-28T	47.5	52.5	45.9	36.3	36.1	74.3
	FC-M151	42-34-24T	47.5+t	52.5+t	45.9+t	36.3+t	36.1+t	74.3+t
			47.5	52.7	45.5	37.3	35.9	74.3
		48-38-28T	47.5+t	52.7+t	45.5+t	37.3+t	35.9+t	74.3+t
1	FC-MX70	46/44/43/42/41/38/34T	44.0	-	-	41.4	40.1	70.1

NOTE:

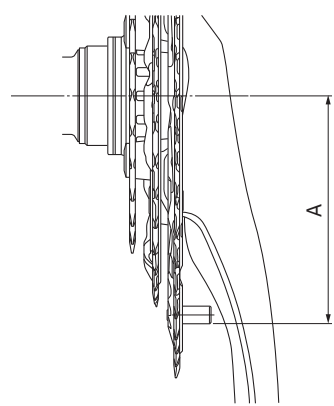
When you want a frame design which minimizes the risk of the frame being scratched by the chain, (e.g. when removing the chain from between the gear and the frame, after the chain has come off, or when freeing a jammed chain) make dimensions C1, C2 and C3 larger than the chain width (more than 10 mm).



# Stopper pin position for chain case compatible front chainwheel

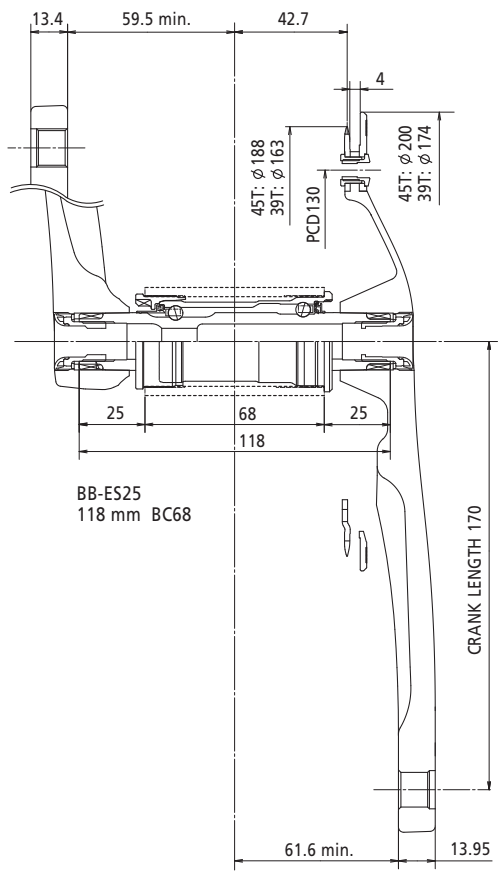
Dimension from crank center to outer side of the pin which concerns the interference with chain case.

Speed	Series	Model no.	Top gear	Pin position distance
				Nominal (A)
9	Deore XT	FC-M771	44T	83.00
			48T	91.00
	Deore LX	FC-T661	44T	82.00
			48T	80.00
	Non-Series	FC-M543-K	44T	83.00
			48T	91.00
	Deore	FC-M591	44T	82.00
			48T	91.00
			44T	82.00
Non-Series	FC-M521/M443-8/M443	44T	82.00	
		48T	91.00	
		48T	89.50	
8/7	Alivio	FC-M411	42T	78.00
			48T	88.00
	Acera	FC-M361-8/M361	42T	78.00
			48T	88.00
	Altus	FC-M311-8/M311	42T	78.30
			48T	81.80
8/7/6	Non-Series	FC-M191	42T	70.80
			48T	81.80
		FC-M151	42T	72.00
			48T	84.47

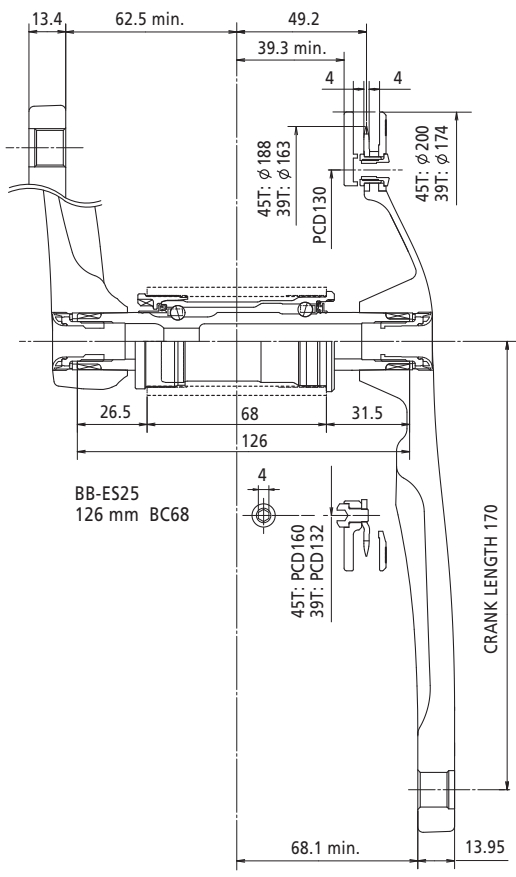


## Crankset (FC-S400)

(Single CG)

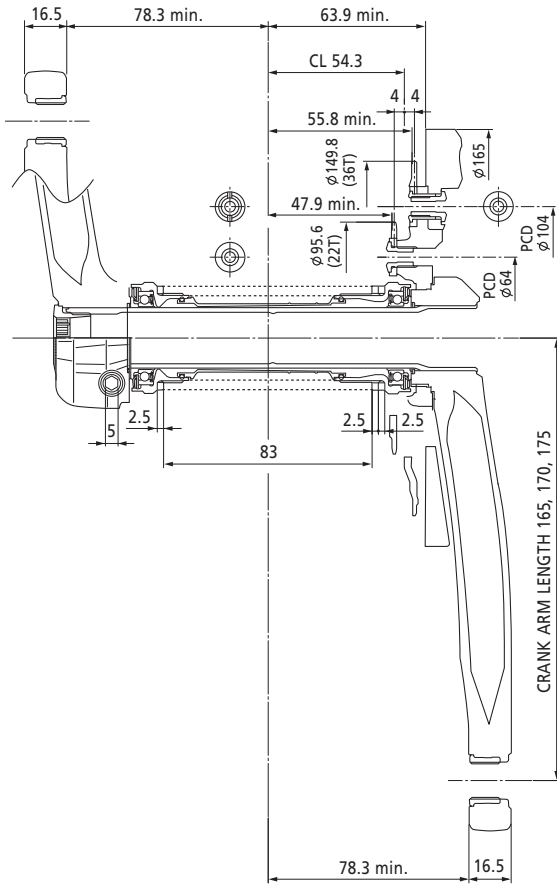


(Double CG)

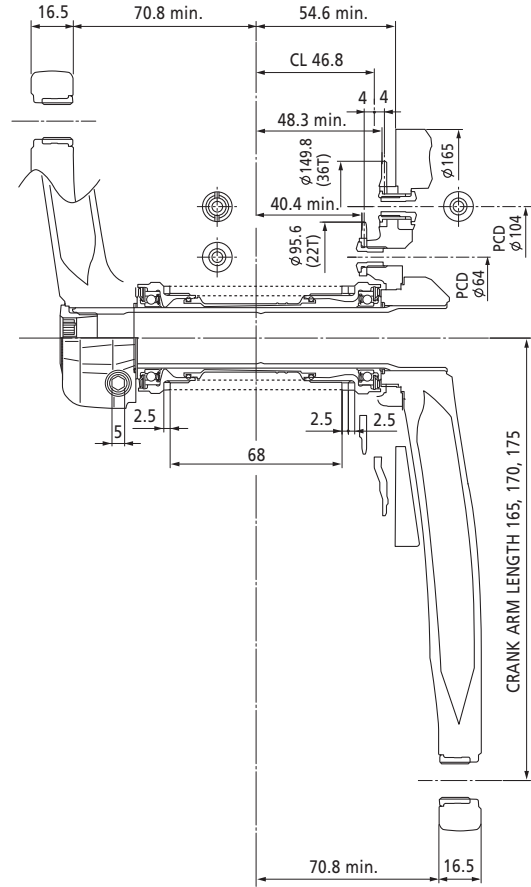


# Crankset (FC-M815/M810)

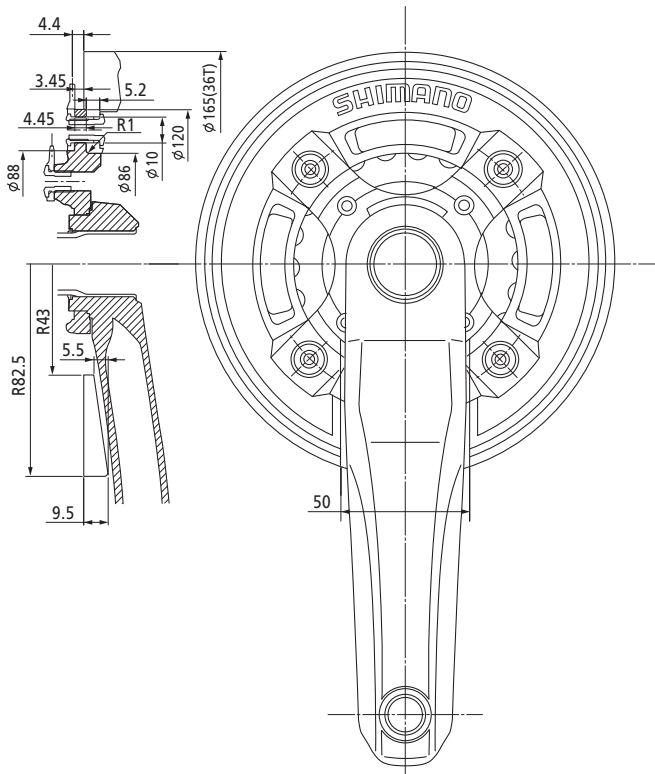
< FC-M815-2 >



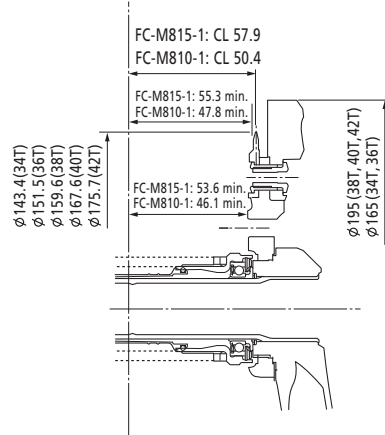
< FC-M810-2 >



< TAB/BASH GUARD >

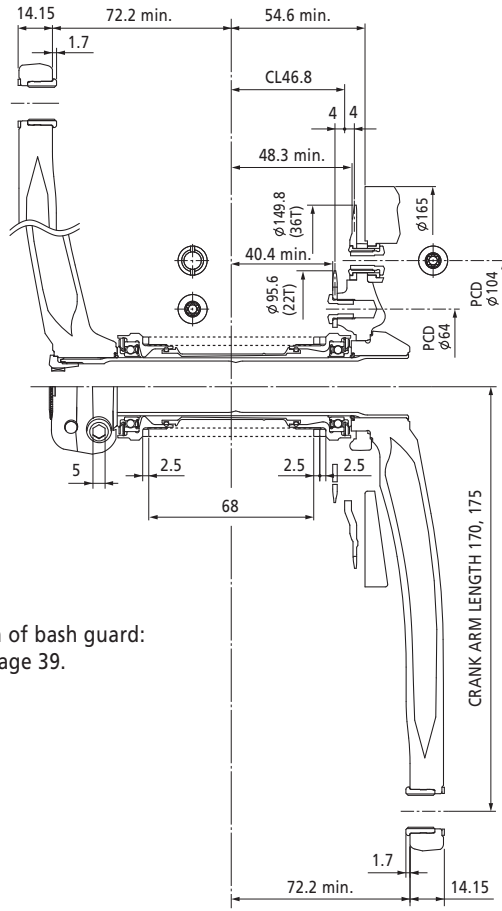


< FC-M815-1/M810-1 >



# Crankset (FC-M665)

Front chainwheel

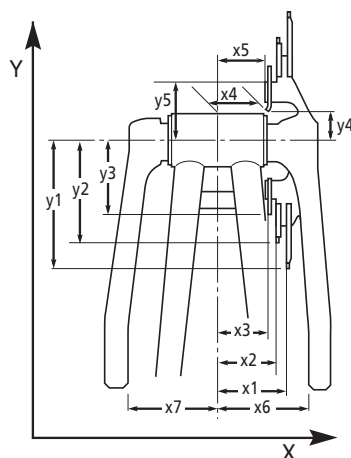


Detail dimension of bash guard:  
Please refer to page 39.

Frame Requirement

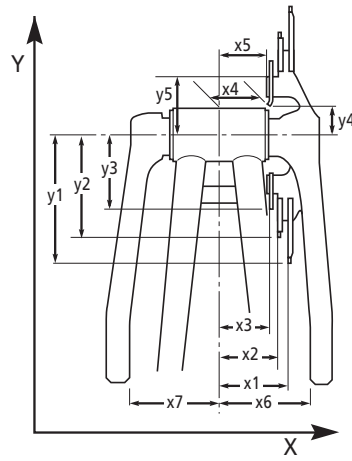
## Crankset dimensions (Road bike)

The dimensions of the new chainrings of Dura-ace are shown in the table below. Check these dimensions when designing the frame in order to avoid interference between the chainring and chainstay.



### < Y dimensions >

Speed	Model No.		Chainline	y1	y2	y3	y4	y5
10	FC-7900	53-42T	43.5	109.2	87.0	-	-	-
	FC-7950	50-34T	43.5	103.2	70.1	-	-	-
	FC-7800	53-42T	43.5	109.2	87.0	-	-	-
	FC-7803	52-39-30T	45.0	107.2	81.0	63.5	23.4	53.0
	<b>NEW</b> FC-6700	53-42T	43.5	109.9	82.2	-	-	-
	<b>NEW</b> FC-6750	50-34T	43.5	103.8	70.8	-	-	-
	<b>NEW</b> FC-6703	52-39-30T	45.0	107.9	81.6	64.1	26.9	52.6
	FC-6600/6601G	53-39T	43.5	109.2	81.5	-	-	-
	FC-6603/6604G	52-39-30T	45.0	107.2	81.0	63.5	26.9	43.0
	FC-6650S/6650G	50-34T	43.5	103.2	70.1	-	-	-
	FC-R700/R600	50-34T	43.5	103.2	70.1	-	-	-
	FC-5600/5600L	50-39T	43.5	103.2	81.5	-	-	-
		52-39T	43.5	107.2	81.5	-	-	-
		53-39T	43.5	109.2	81.5	-	-	-
	FC-5603/5603L	50-39-30T	45.0	103.2	80.9	63.5	26.9	43.0
	FC-5650/5650L	50-34T	43.5	103.2	70.1	-	-	-
FC-R550	53-39T	43.5	109.2	81.5	-	-	-	
	52-39T	43.5	107.2	81.5	-	-	-	
	50-39T	43.5	103.2	81.5	-	-	-	
FC-R553	50-39-30T	45.0	103.2	80.9	63.5	26.9	43.0	
9	FC-4500	52-39T	43.5	107.2	81.5	-	-	-
	FC-4503	50-39-30T	45.0	103.2	80.9	63.5	23.5	43.0
	FC-4550	50-34T	43.5	103.2	70.1	-	-	-
	FC-4550-S	50-34T	43.5	103.2	70.1	-	-	-
	FC-3450	50-34T	43.5	103.2	70.1	-	-	-
	FC-3403	50-39-30T	45.0	103.2	80.9	63.5	23.5	43.0
	FC-R450	52-39T	43.5	107.2	81.5	-	-	-
	FC-R453	50-39-30T	45.0	103.2	80.9	63.5	23.4	43.0
	<b>NEW</b> FC-2300	52-39T	44.9	108.2	82.5	-	-	-
	<b>NEW</b> FC-2303	52-42-30T	45.8	108.2	87.3	64.1	22.4	43.6
8	FC-A050	52-39T	44.9	107.3	81.5	-	-	-
		50-39T	44.9	103.2	81.5	-	-	-

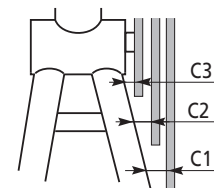


< X dimensions >

Speed	Model No.	Chainline	x1	x2	x3	x4	x5	x6	x7
10	FC-7900	43.5	46.3	38.5	-	-	-	57.2	57.3
	FC-7950	43.5	46.3	38.5	-	-	-	57.2	57.3
	FC-7800	43.5	45.4	38.2	-	-	-	57.8	57.8
	FC-7803	45.0	51.4	44.2	36.1	35.6	34.1	64.0	61.0
	<b>NEW</b> FC-6700	43.5	46.3	38.5	-	-	-	-	-
	<b>NEW</b> FC-6703	45.0	51.4	44.2	36.1	36.1	34.9	64.0	61.0
	FC-6600/6601G	43.5	45.4	38.2	-	-	-	58.0	58.0
	FC-6603/6604G	45.0	51.4	44.2	36.1	36.1	34.9	64.0	61.0
	FC-6650/6650G	43.5	45.6	38.2	-	-	-	58.0	58.0
	FC-R700	43.5	45.6	38.2	-	-	-	58.0	58.0
	FC-5600/5600L	43.5	45.4	38.2	-	-	-	58.0	58.0
	FC-5603/5603L	45.0	51.4	44.2	36.1	36.1	35.0	64.0	61.0
	FC-5650/5650L	43.5	45.6	38.2	-	-	-	58.0	58.0
	FC-R600	43.5	45.6	38.2	-	-	-	61.0	59.5
	FC-R550	43.5	45.7	38.5	-	-	-	59.5	59.5
FC-R553	45.0	51.4	44.2	36.1	36.9	34.9	65.5	62.5	
9	FC-4500	43.5	45.9	38.1	-	-	-	59.5	59.5
	FC-4503	45.0	52.0	44.2	36.2	36.2	34.2	65.5	62.5
	FC-4550	43.5	45.9	38.2	-	-	-	59.5	59.5
	FC-4550-S	43.5	45.9	38.2	-	-	-	59.5	59.5
	FC-3450	43.5	45.9	38.2	-	-	-	59.5	59.5
	FC-3403	45.0	52.0	44.2	36.2	36.2	34.2	65.5	62.5
	FC-R450	43.5	45.9	38.1	-	-	-	59.9	59.5
	FC-R453	45.0	52.0	44.2	36.2	36.2	34.2	65.5	61.0
8	<b>NEW</b> FC-2300	44.9	46.0	38.3	-	-	-	58.9	61.0
	<b>NEW</b> FC-2303	45.8	51.3	43.9	35.6	36.5	34.5	63.8	60.8
	FC-A050	44.9	46.0	38.8	-	-	-	66.3	68.9

Note:

If dimensions C1 and C2 (between the chainring and chainstay) are too narrow, the frame can be scratched if the chain comes off or gets jammed between the inner chainring and chainstay.



# Chainstay

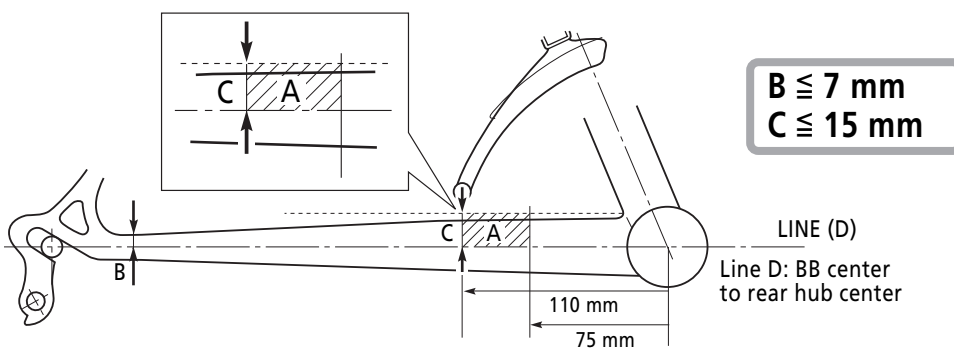
## Chainstay dimensions

### ■ Dimension "C"

In order to keep the front derailleur plate from touching the chainstay, design the frame at area A (cross hatched section in diagram below) so that the dimension C (distance from centerline D to top edge of the chainstay) is 15 mm or less.

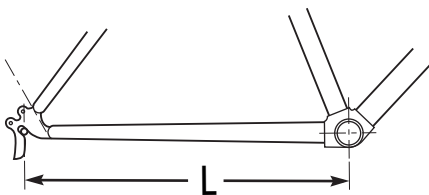
### ■ Dimension "B"

In order to keep the chainstay from interfering with the chain, design the frame so that dimension B (the area that the chain comes closest to the chainstay) is 7mm or less.



### ■ Chainstay length "L"

The Shimano MTB shifting system is designed on the chainstay dimensions given below. (When using frames that do not meet these dimensions, be sure to confirm that the system operates without problems.)

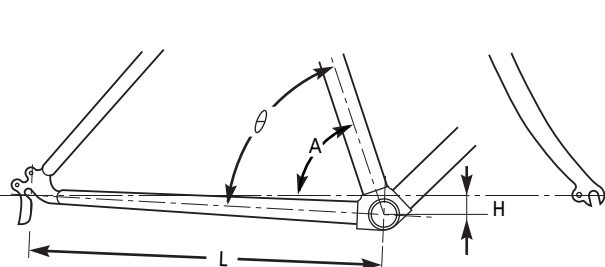


L: the length from BB center to rear hub center.

Bicycle type	Speed	Dimension "L"
MTB, Hybrid	6,7,8 and 9-speed (rear)	420 mm min.
Tourney	Triple (FCW)	430 mm min.
	Double (FCW)	400 mm min.
Trekking	6,7,8 and 9-speed (rear)	450 mm min.

### ■ Chainstay angle "θ"

In order for the front SIS shifting system to function properly, set the chainstay angle  $\theta$  within the range supported by the front derailleur.



$\theta$ : Chainstay angle  
 A: Seat tube angle  
 H: Hanger drop

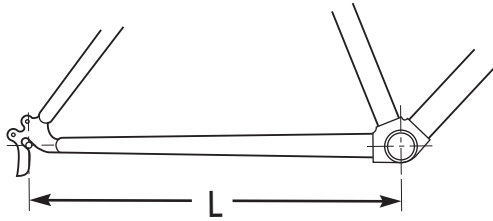
$$\theta = A - \sin^{-1} \frac{H}{L}$$

$$H = L \times \sin(A - \theta)$$

# Chainstay dimensions (Road bike)

## Chainstay length

All Shimano road components are designed for use with and tested on chainstays that are 405 mm or longer. If the components are used on chainstays that are shorter than 405 mm, the components may not operate properly.



$$L \geq 405 \text{ mm}$$

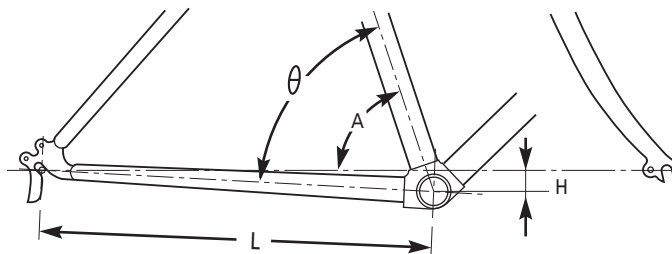
L = The distance from the center of the bottom bracket to the center of the rear hub.

**Note:** It is recommended that chainstay dimension when specifying FH-R505 or other 135 mm O.L.D. hubs must be greater than 430 mm.

## Chainstay angle "θ"

In order for the front SIS shifting to function properly, the chainstay angle is of most importance. Design the chainstay angle so that it falls within the allowable range depending on the front derailleur you are using.

Model No.	Type	Chainstay angle "θ"
FD-7900 FD-7800 FD-6600 FD-6600G FD-5600 FD-5600L FD-4500 FD-3400 NEW FD-2300 FD-R770 FD-R440A	Double	61° to 66°
FD-7803 FD-6603 FD-6603G FD-5603 FD-5603L FD-4503 FD-3403 NEW FD-2303 FD-R773 FD-R453 FD-R443A	Triple	63° to 66°



θ: Chainstay angle  
 A: Seat tube angle  
 H: Hanger drop

$$\theta = A - \sin^{-1} \frac{H}{L}$$

$$H = L \times \sin(A - \theta)$$

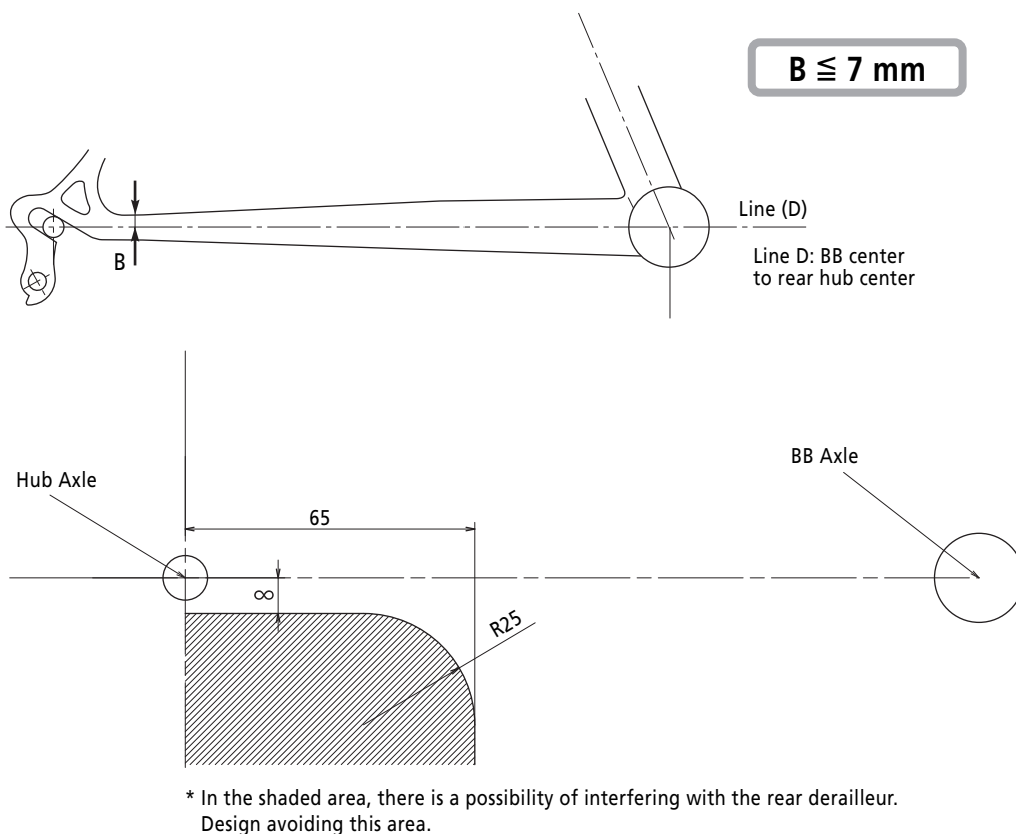


## Chainstay (Capreo)

Since the top gear of the cassette sprockets of Capreo component group is 9T, design the form of chain stay using examples from the below-listed figures. Furthermore, the PCD of the 9T sprocket is 36.9 mm.

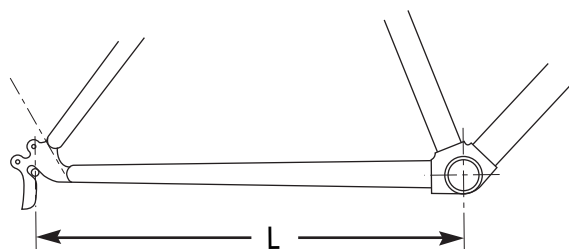
### ■ Dimension "B"

In order to keep the chainstay from interfering with the chain, design the frame so that dimension B (the area that the chain comes closest to the chainstay) is 7 mm or less.



### ■ Chainstay length "L"

The Shimano shifting system for Capreo is designed on the chain stay dimensions given below. (When using frames that do not meet these dimensions, be sure to confirm that the system operates without problems.)



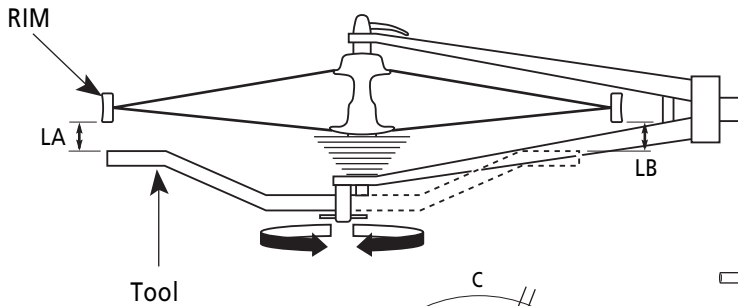
L: the length from BB center to rear hub center.

Bicycle type	Speed	Dimension "L"
Capreo	9-speed	390 mm min.

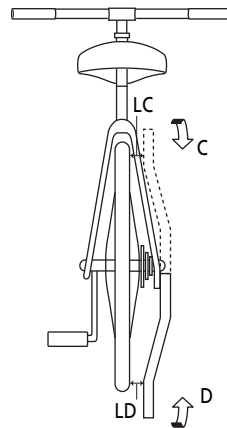
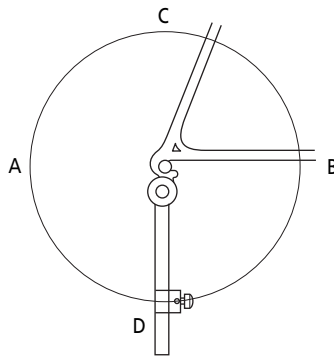
# Dropout

## Dropout dimensions

Rear dropout alignment is set in relation to the frame centerline. To check alignment of the dropout, use the tool. Attach the rear dropout so that the absolute value of  $|LA-LB|$  is less than 10 mm.



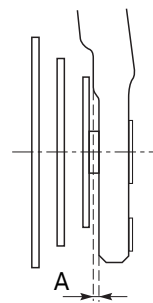
Adjust the dropout so that  
 $|LA-LB|$  and  $|LC-LD| \leq 10$  mm  
 $|LA-LB|$  and  $|LC-LD| = 0$  mm is optimum setting



## Clearance between the smallest sprocket and dropout

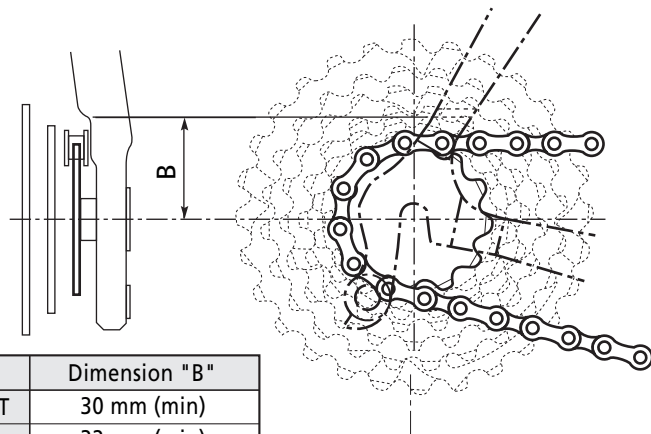
Set the distance between the smallest sprocket (top gear) and the rear dropout as explained below.

The top gear position of SHIMANO 10-speed and 9-speed cassette sprocket is the same as current 8-speed HG cassette sprockets.



Speed	Dimension "A"
8,9 and 10-speed	1.3 mm (max.)
7-speed	2.2 mm (max.)

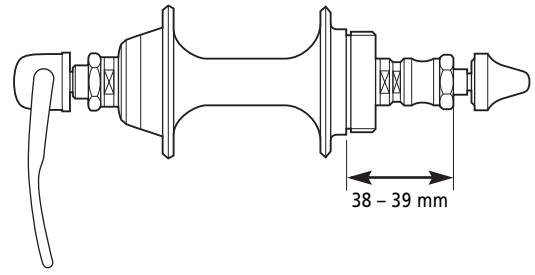
These dimensions must be maintained to prevent contact between the seatstay, and the chainstay and the chain when the chain is on the smallest sprocket. (The dimensions will differ depending on the number of teeth on the smallest sprocket.)



Teeth	Dimension "B"
11, 12T	30 mm (min)
13T	32 mm (min)
14T	34 mm (min)
15T	36 mm (min)
16T	38 mm (min)

### ■ Rear hub dimensions

Be sure to observe the dimensions shown in the illustration when assembling 7-speed multiple freewheels.



### ■ Dropout width / QR skewer length

Rear freehub QR skewer length adaptation with dropout specification.

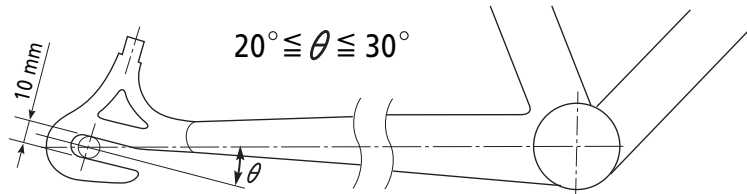
		Dropout thickness	QR skewer length	
			Alloy QR lever	Steel QR lever
MTB	135 mm	12 - 16 mm	168 mm	166 mm
	135 mm	16 - 20 mm	173 mm	170 mm
	130 mm	12 - 16 mm	-	161 mm
Road	130 mm	12 - 16 mm	163 mm	161 mm

Dropout thickness = width of L-hand dropout + R-hand dropout.

i.e. use 173 mm QR skewer when dropout thickness is 16 - 20 mm.

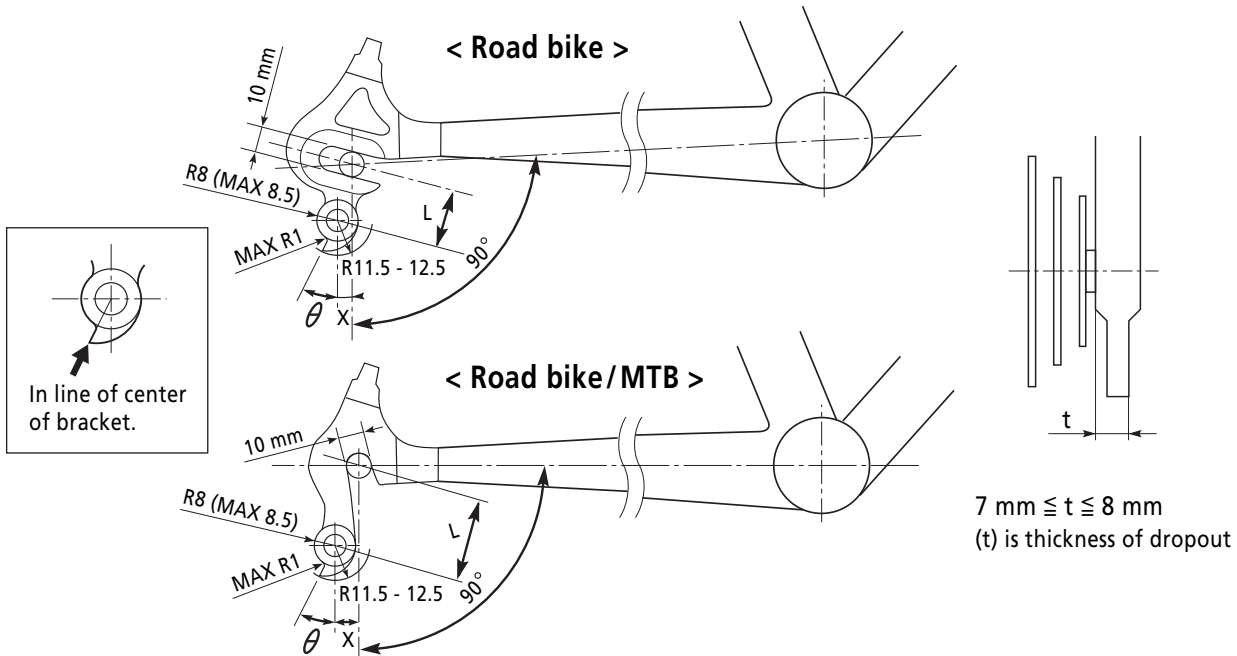
### ■ Dropout configuration

In order to maintain optimum SIS shifting performance, set angle  $\theta$  to between 20 and 30. Dropout thickness should be between 4 mm and 5 mm.



#### Integral derailleur mount

In order to maintain optimum SIS shifting performance, set angles as shown below.



$7 \text{ mm} \leq t \leq 8 \text{ mm}$   
(t) is thickness of dropout

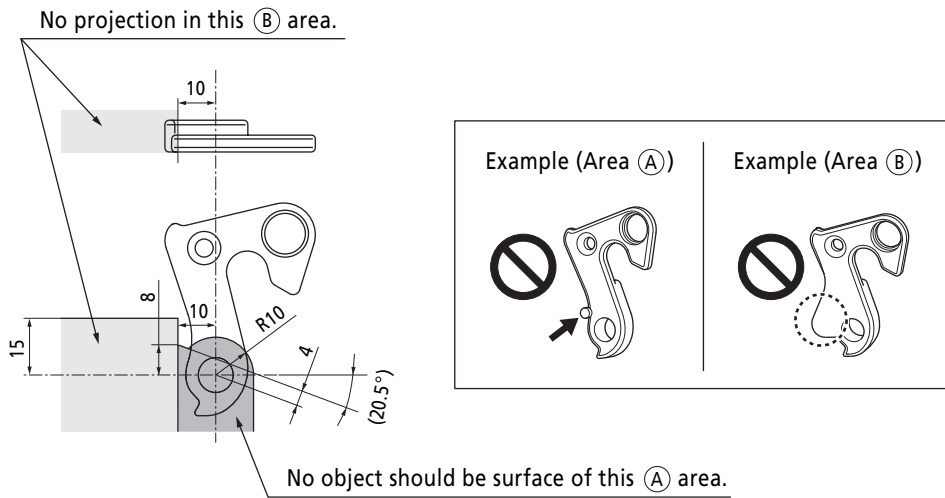
Dropout type	L	X	Angle $\theta$
Road bike recommendation	24 mm	4 mm to 10 mm	30° to 35°
	26 mm	6 mm to 10 mm	30° to 35°
MTB recommendation	28 mm	6 mm to 10 mm	25° to 30°
	30 mm	7.5 mm to 10 mm	25° to 30°

Note: If a dropout that does not conform to the dimensions above is used, optimum SIS shifting performance may not be obtained.

Remark  
For NEXAVE C810, the thickness of the opposite end must be kept to the dimension as left chart, especially for the FH-C810.  
 $7 \text{ mm} \leq t \leq 8 \text{ mm}$   
If a dropout that does not conform to the dimensions as above, Link Glide shifting performance may not be obtained.

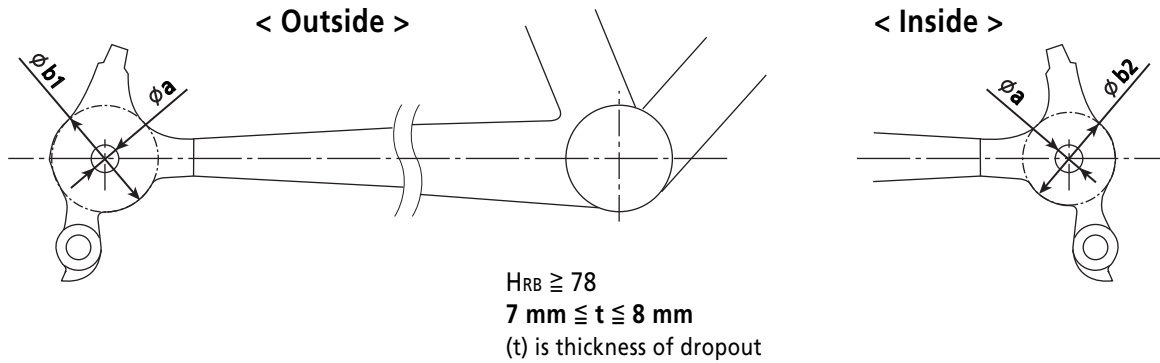
# Dropout for SHIMANO SHADOW REAR DERAILLEUR (RD-M972/M772)

These dimension must be maintained to prevent contact between the dropout surface and RD.



## Dropout (SAINT)

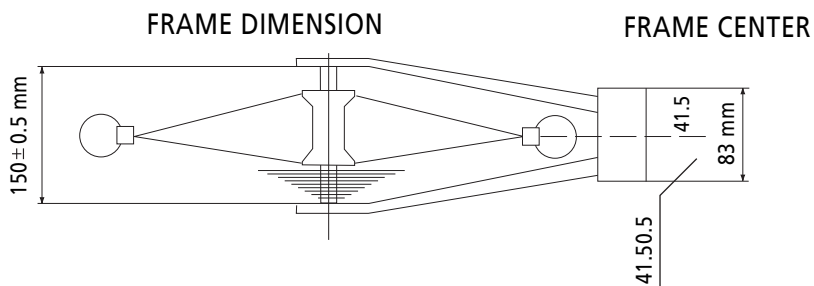
### ■ Dimensions



- $\phi a$  is a required diameter for thru axle unit (SM-AX80).
- $\phi b1, \phi b2$  need to be flat surface.
- $\phi b1, \phi b2$  flatness should be less than 0.2 mm.
- SM-AX80 is designed for the thickness (t).

Model no.	OLD	$\phi a$	$\phi b1$	$\phi b2$
FH-M810	135 mm	$\phi 10^{+0.2}_0$	$\phi 24$	$\phi 21$
		$\phi 12^{+0.2}_0$		
FH-M815	150 mm	$\phi 12^{+0.2}_0$		

## ■ Frame dimension (150 mm O.L.D./SAINT)

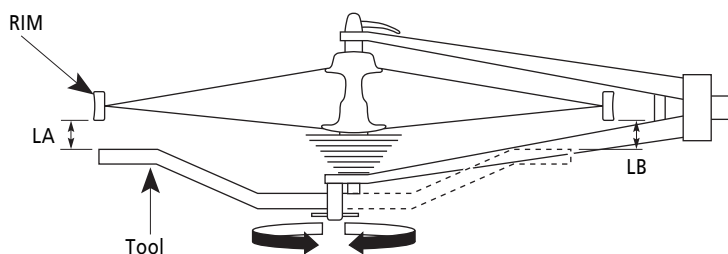


## Dropout (Capreo)

### ■ Dimensions

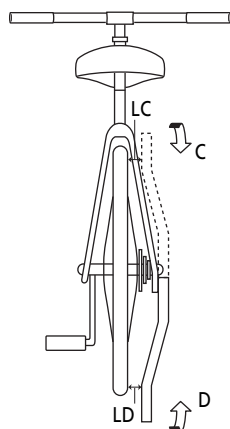
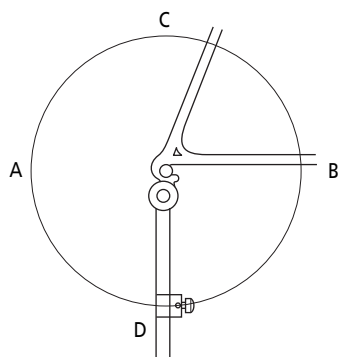
Rear dropout parallelism is set in relation to the frame centerline.

To measure the parallelism of the dropout, use the tool. Attach the rear dropout so that the absolute value of  $|LA-LB|$  and  $|LC-LD|$  are less than 5 mm.



Adjust the dropout so that  $|LA-LB|$  and  $|LC-LD| \leq 5$  mm

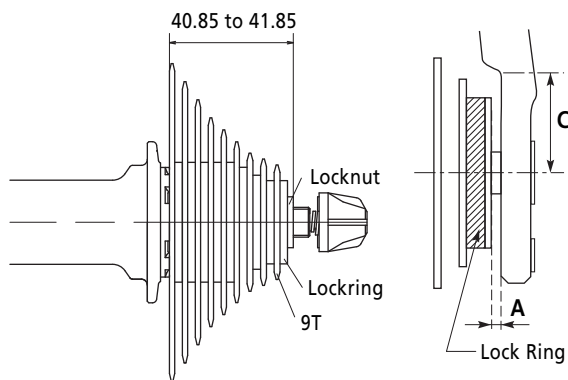
$|LA-LB|$  and  $|LC-LD| = 0$  mm are optimum setting



## ■ Clearance between the smallest sprocket and dropout

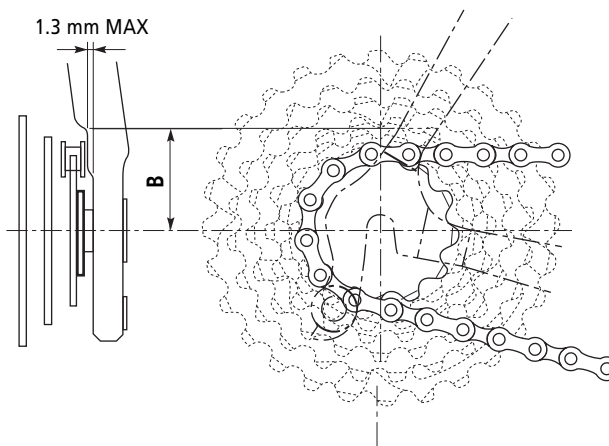
Set the distance between Lock Ring and the rear dropout as explained below.

Dimension "A"	Dimension "C"
1.1 mm min.	15 mm min.



These dimensions must be maintained to prevent contact between the seatstay and the chainstay and the chain which is on the smallest sprocket.

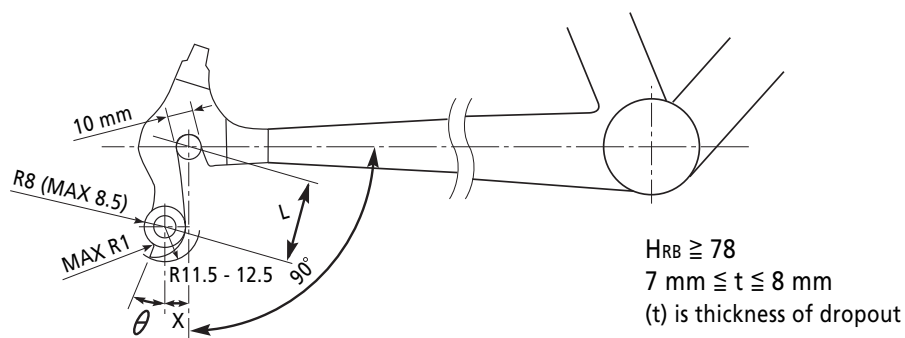
Number of teeth	Dimension "B"
9T	28 mm min.



Wheel Size: max 20 inch

## ■ Form of rear dropout (Capreo)

In order to bring out the SIS (= Shimano Indexed System) performance maximally, set the size L, the size X and the angle according to measures shown in the following chart. (As for the dropout, use those above the hardness of HRB78 at least.)



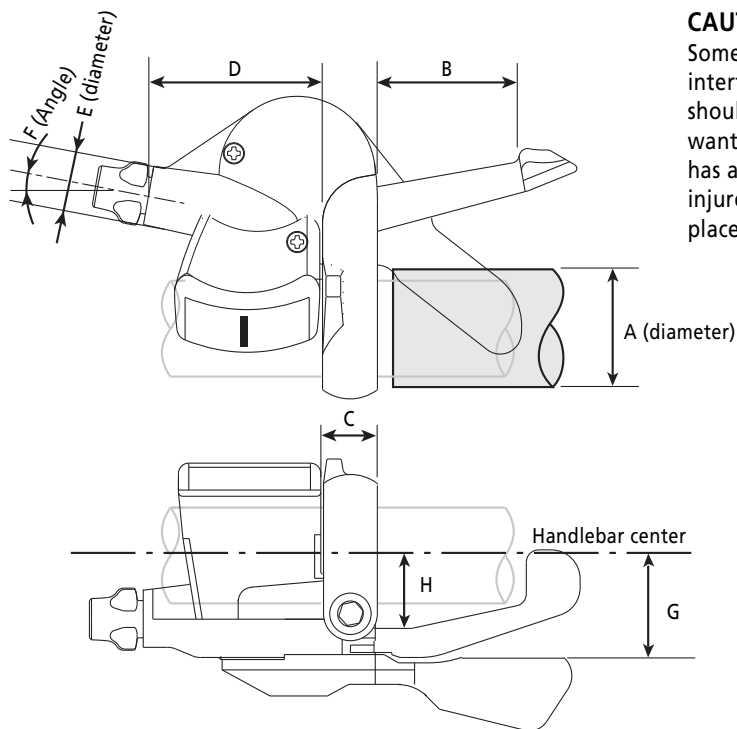
Dropout type	L	X	Angle $\theta$
Capreo recommendation	28 mm	6 to 10 mm	25° to 30°
	30 mm	7.5 to 10 mm	25° to 30°

Note: If a dropout that does not conform to dimensions above is used, optimum SIS shifting performance may not be obtained.

# Levers

## Shift lever dimensions

Please refer to the following dimensions to choose the handlebar and brake lever for Rapidfire-SL, Rapidfire-plus and Tap-fire.



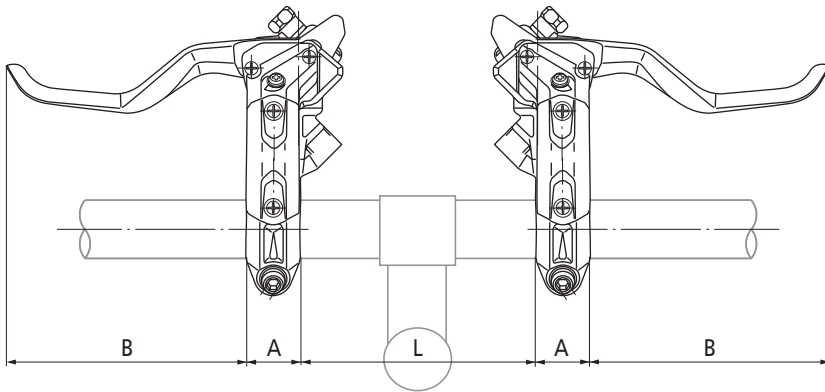
### CAUTION:

Some brake lever designs may interfere with the shift lever and should not be used. You may also want to check that the brake lever has adequate clearance not to injure an index finger that is placed on the release trigger.

Series	Model no.	A	B	C	D Front/Rear	E	F	G	H
XTR	SL-M970A	ø32 (mm)	28 (mm)	10 (mm)	40.7/37.7 (mm)	ø16 (mm)	10°	29.2 (mm)	23 (mm)
SAINT	SL-M810	ø36 (mm)	16 (mm)	13.5 (mm)	49.4/35.8 (mm)	ø15 (mm)	16°	28.7 (mm)	23.4 (mm)
Deore-XT	SL-M770		28 (mm)		39.4/35.8 (mm)			29.2 (mm)	
SLX	SL-M660				41.8/41.5 (mm)		24.5 (mm)	21 (mm)	
Deore-LX	SL-T660		28 (mm)	13 (mm)	40.6/40.2 (mm)		10°	26.7 (mm)	21.5 (mm)
Deore	SL-M590		20°	25 (mm)	28.5 (mm)				
Alivio	SL-M410	ø32 (mm)	33 (mm)	14.7 (mm)	46.4/45.3 (mm)	10°	26.7 (mm)	23 (mm)	
Acera	SL-M360		31 (mm)	14.6 (mm)	39.3/39.7 (mm)	15°	21.7 (mm)	13.5 (mm)	
No series	SL-R770 SL-R660(R661) SL-R440(R441) SL-M748		35 (mm)	13 (mm)	32.8/32.2 (mm)				

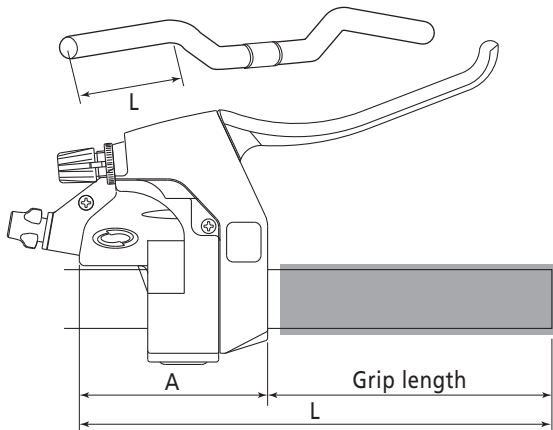
# Handlebar installation dimensions

Model No.	A (mm)	B (mm)	L (mm)
ST-M975	16	88	100 or more
ST-M775	16	85	100 or more
BL-M975A	21	76.1	100 or more
BL-M810 BL-M775A BL-M665	20	90	100 or more
<b>NEW</b> BL-T665	18	104	100 or more
<b>NEW</b> BL-M595	20	78.5	100 or more
BL-T605 BL-S500	18	110	195 or more
BL-M575	18	89	100 or more
BL-M486	18	83	135 or more



## Required length of straight section of handlebar (for ST)

When installing Shimano STI lever sets on bent handle bars, as shown below, the straight section (L) at the end of the bar must have a certain minimum length. Use the dimension chart below to select the correct bar type for the intended lever set.

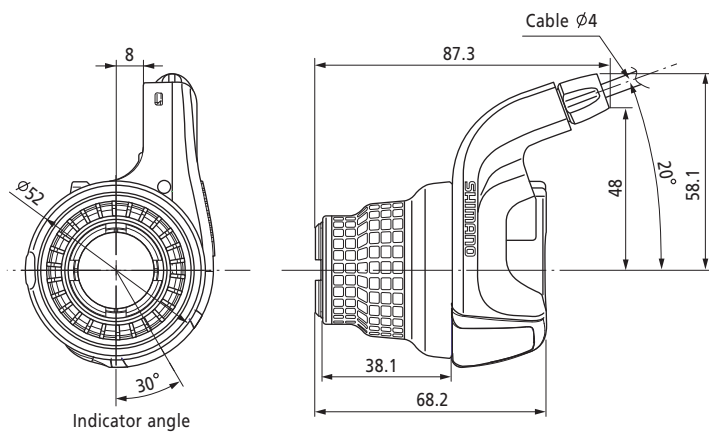
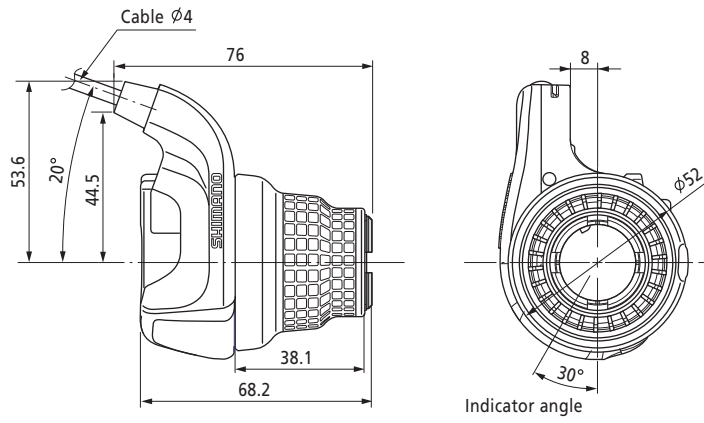


L = Length of minimum required amount of straight portion of handlebar.

L = A + Grip length	
Model No.	Dimension A
ST-C503-A	70 mm
ST-T660/ <b>NEW</b> M590	50 mm



# Shift lever (SL-RS35)

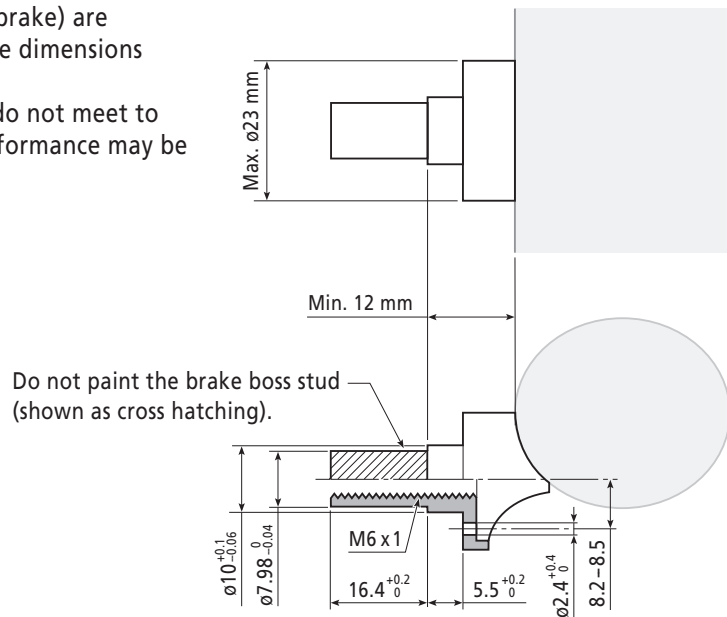


# V-BRAKE and Cantilever brake

## Boss dimensions for Shimano brakes

The Shimano brakes (V-Brake and cantilever brake) are designed for use with brake bosses having the dimensions shown below.

If Shimano brakes are used with bosses that do not meet to the dimensions given below, the braking performance may be adversely affected.

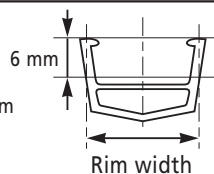


## Distance between brake bosses

Dimension D between brake bosses may change depending on rim width.

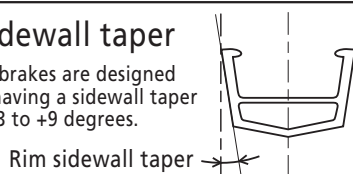
### Rim width

The width at a point 6 mm from the top of the rim.

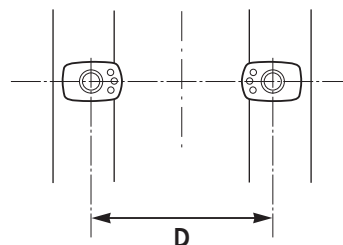


### Rim sidewall taper

Shimano brakes are designed for rims having a sidewall taper of from -3 to +9 degrees.



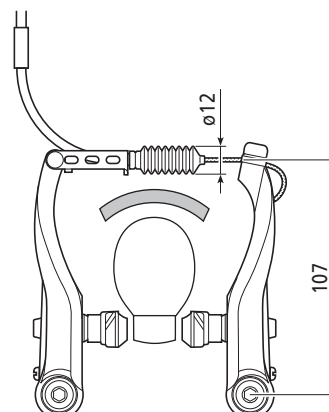
### Cantilever brake boss distance D



Dimension D is the distance between the cantilever brake bosses center to center.

## Length of the V-Brake link

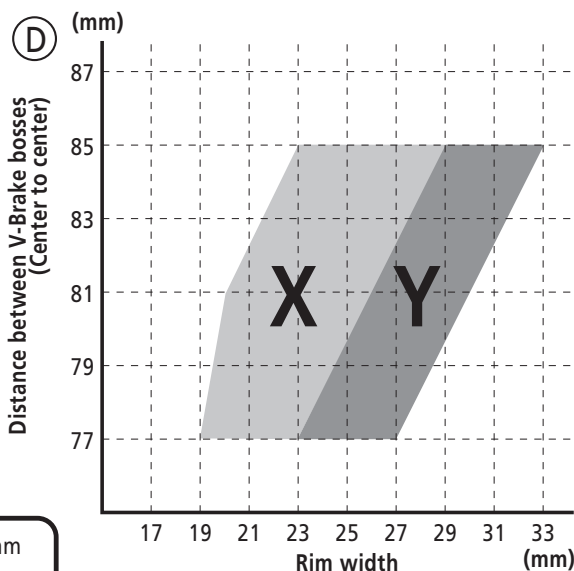
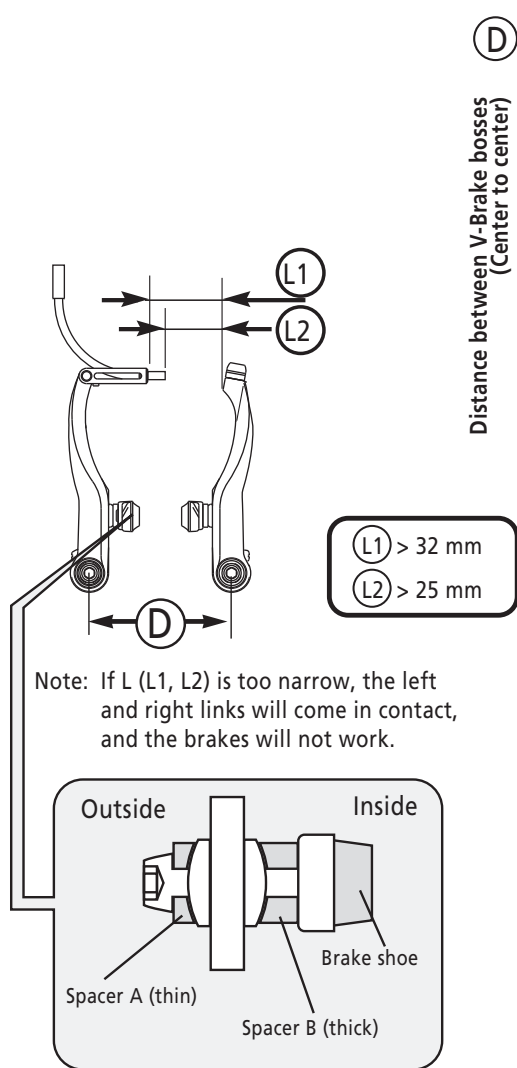
The length of the brake link for the new BR-T660/M590/M432/M422 V-Brake has been increased from 103 mm to 107 mm in order to reduce interference with the mudguard, lamp and carrier stay. The result of this is that the part is 4 mm higher than previous parts, so take care to ensure that it does not interfere with other parts.



## Distance between V-Brake bosses (for BR-M970/M770/T660/

### **NEW** M590/M432/M422)

- As with normal cantilever brakes, the Shimano V-Brake is designed for installation on frames with a 80 mm distance between bosses (center to center). Please refer to the graph for suitable rim width and boss distance combinations. If the brakes are used in conditions outside what is recommended, the brake performance may be adversely affected.
- For models other than those mentioned above, check the separate technical information booklet.

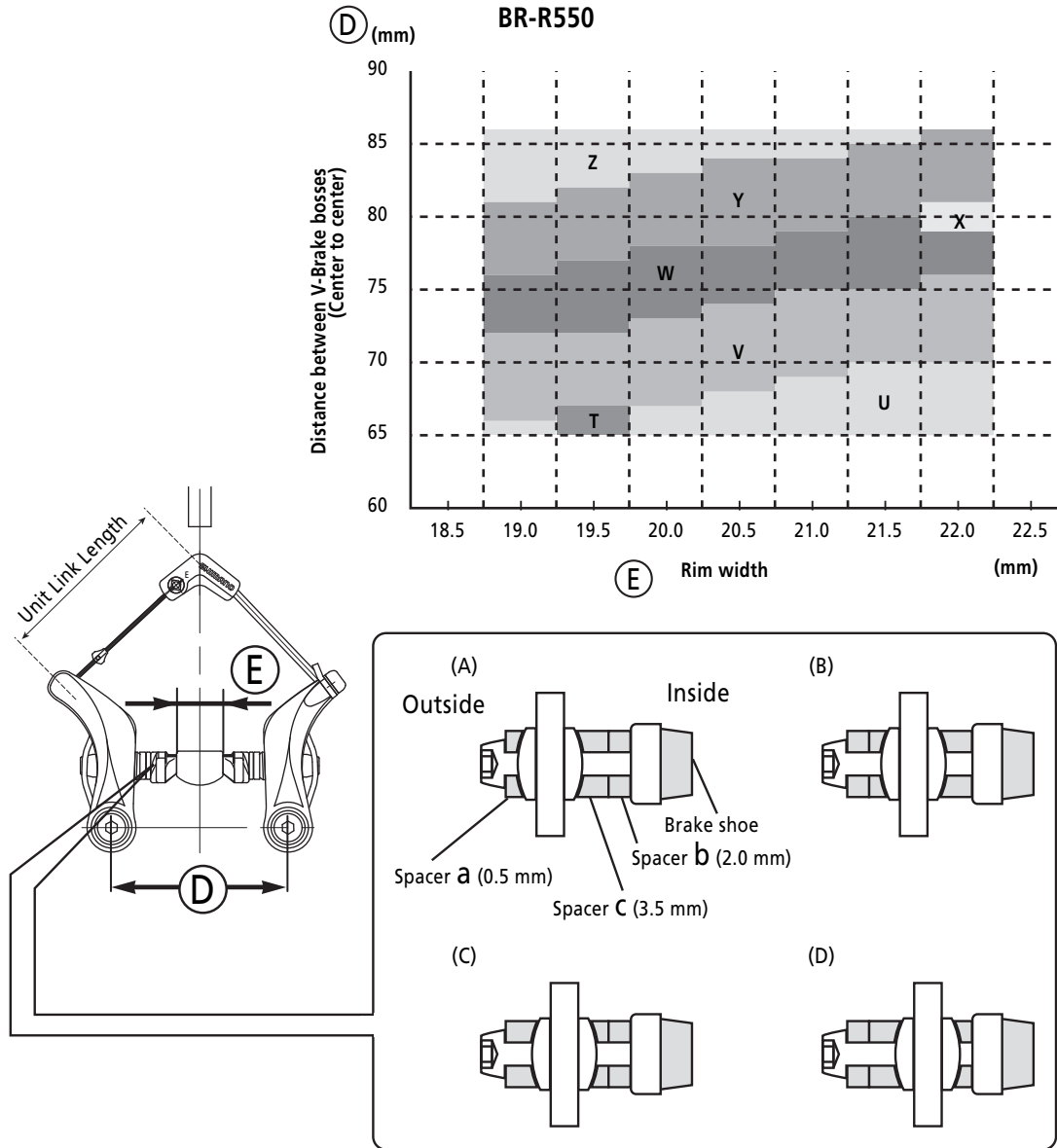


- Notes:
- Some rim width and boss combinations may require the reversal of A and B spacers in order to obtain the required L1 and L2 dimensions.
  - If the L dimensions of the frame are too large, interference may be created between the riders legs and the brakes.
  - To specify optimum set up and obtain the required minimum dimension L, refer to the graph above and the table below relating to boss distance, rim width, and spacer positioning.

Spacer A position	Spacer B position	Graph area
Outside	Inside	X area
Inside	Outside	Y area

## Distance between Cantilever brake bosses (for BR-R550)

Please refer to the graph for suitable rim width and boss distance combinations. If the brakes are used in conditions outside what is recommended, the brake performance may be adversely affected.

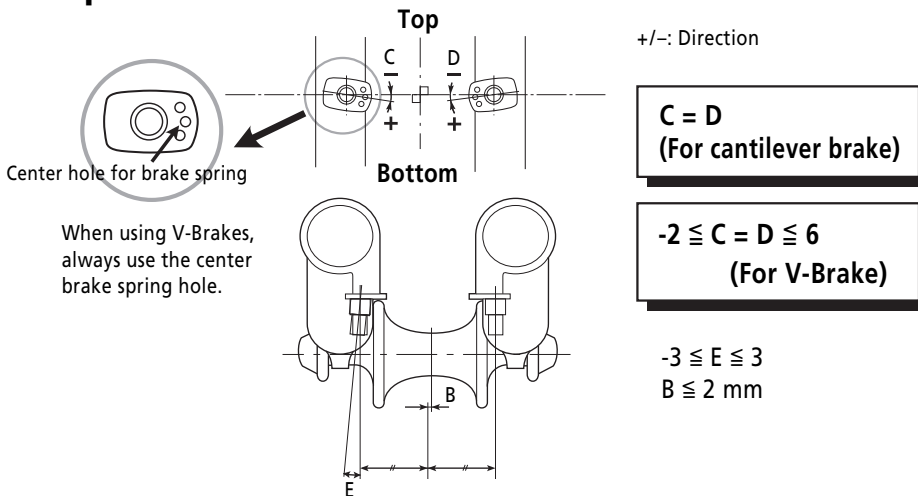


	Unit Link Type ( Length )	Spacer thickness		
		combination	Inside	Outside
T	E (79.5 mm)	D	0.5 (a)	5.5 (b+c)
U	F (84.5 mm)	D	0.5 (a)	5.5 (b+c)
V	F (84.5 mm)	C	2.5 (a+b)	3.5 (c)
W	E (79.5 mm)	C	2.5 (a+b)	3.5 (c)
X	E (79.5 mm)	B	3.5 (c)	2.5 (a+b)
Y	F (84.5mm)	A	5.5 (b+c)	0.5 (a)
Z	E (79.5 mm)	A	5.5 (b+c)	0.5 (a)

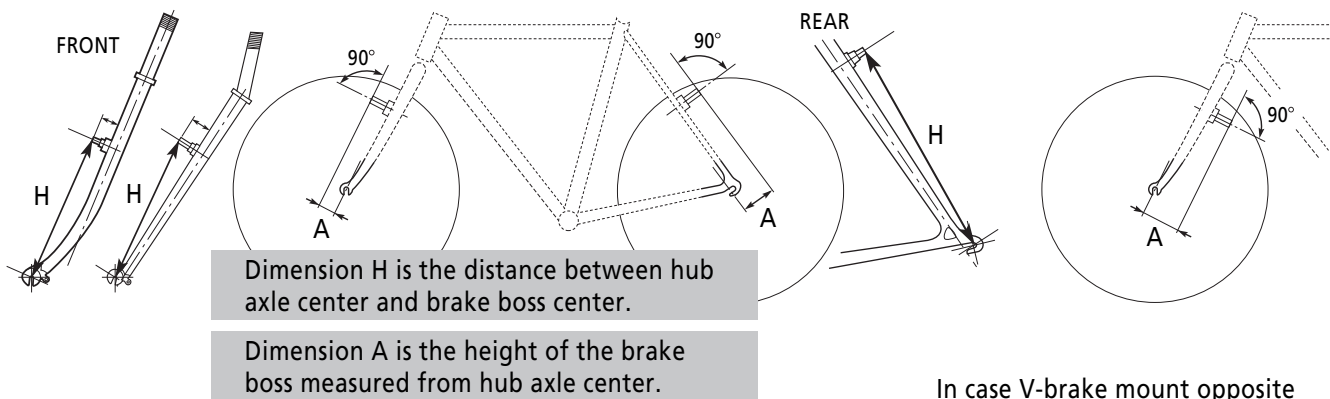
# Cantilever brake boss positioning

Cantilever brake bosses for use with Shimano brakes should be positioned within the ranges shown in the diagrams below. Notice that there is a slight difference in installation between normal cantilever brakes and V-Brakes.

## ■ Brake boss positions



## ■ Frame mounting height for brake bosses



In case V-brake mount opposite side of the fork

ISO 5775 #559 (Old marking 26-inch)

**H = 253.5 ± 1 mm**      **-8 mm ≤ A ≤ 70 mm**

**-70 mm ≤ A ≤ 8 mm**

ISO 5775 #622 (Old marking 700C, 28-inch)

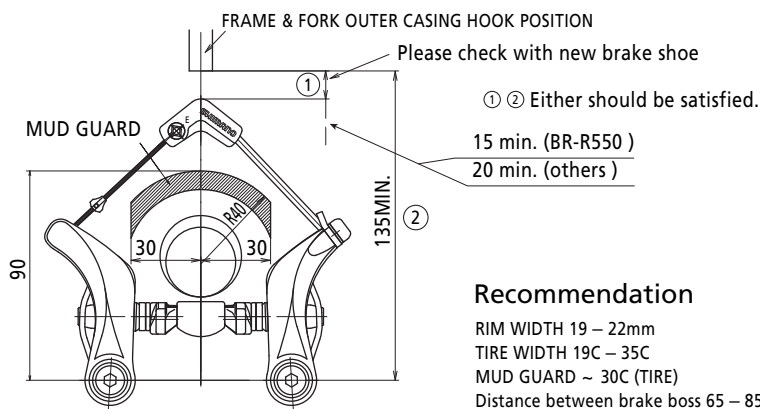
**H = 283 ± 1 mm**      **-8 mm ≤ A ≤ 70 mm**

**-70 mm ≤ A ≤ 8 mm**

ISO 5775 #630 (Old marking 27-inch)

**H = 286 ± 1 mm**      **-8 mm ≤ A ≤ 70 mm**

**-70 mm ≤ A ≤ 8 mm**



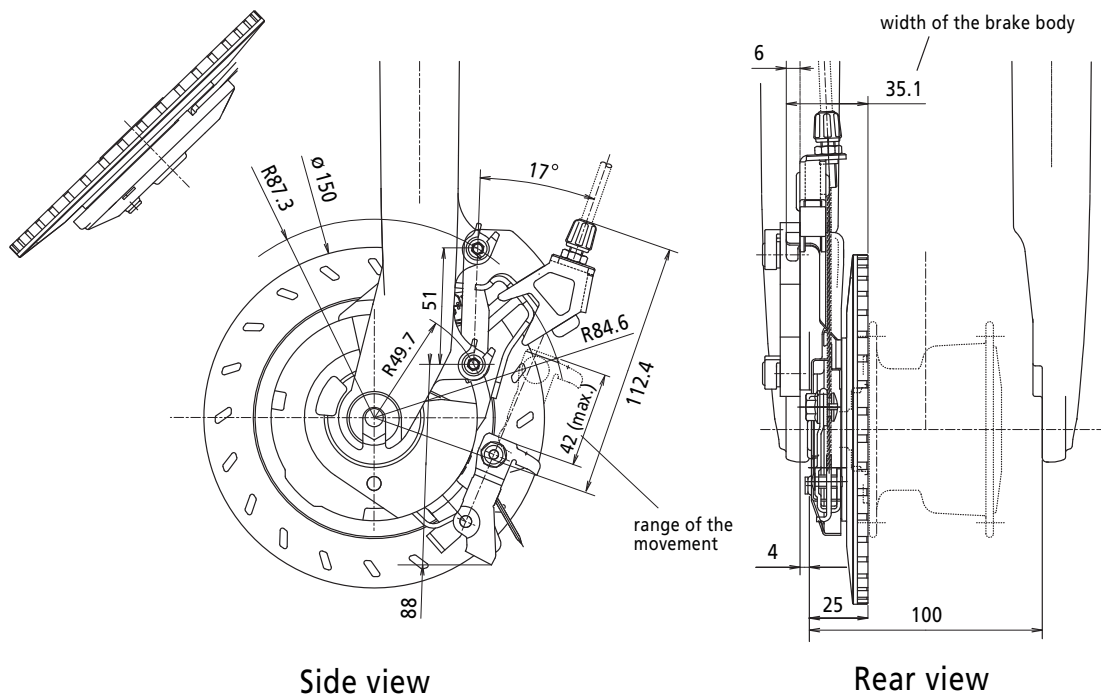
\* Be careful about the cable routing to prevent inner lead interfering with the frame when steering the handle bar.

\* Be careful about the direction of the brake shoe in case cartridge shoe is used.

# Roller brake

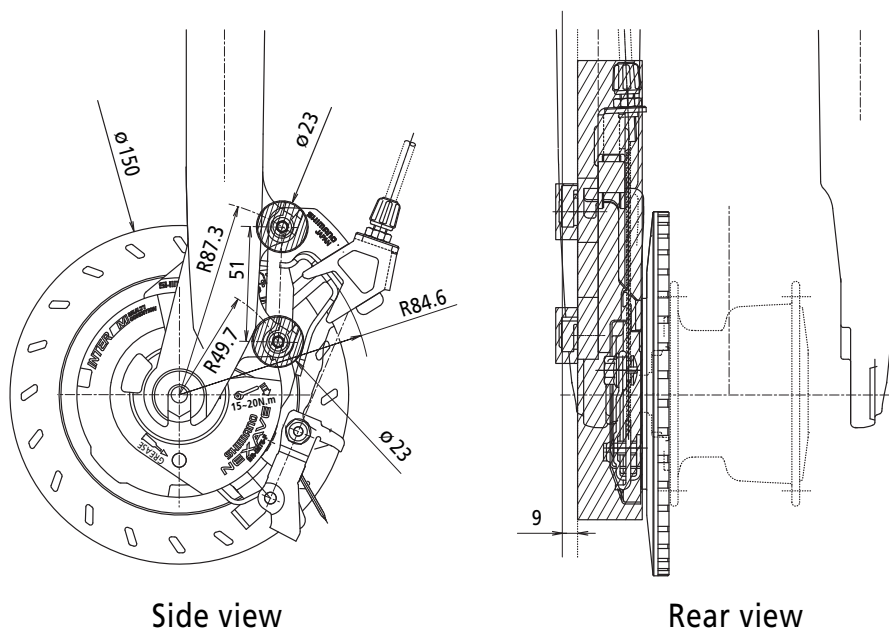
## Dimensions (BR-IM75-F)

The dimensions of the BR-IM75-F are as shown below. Outer cable direction is different from current model.



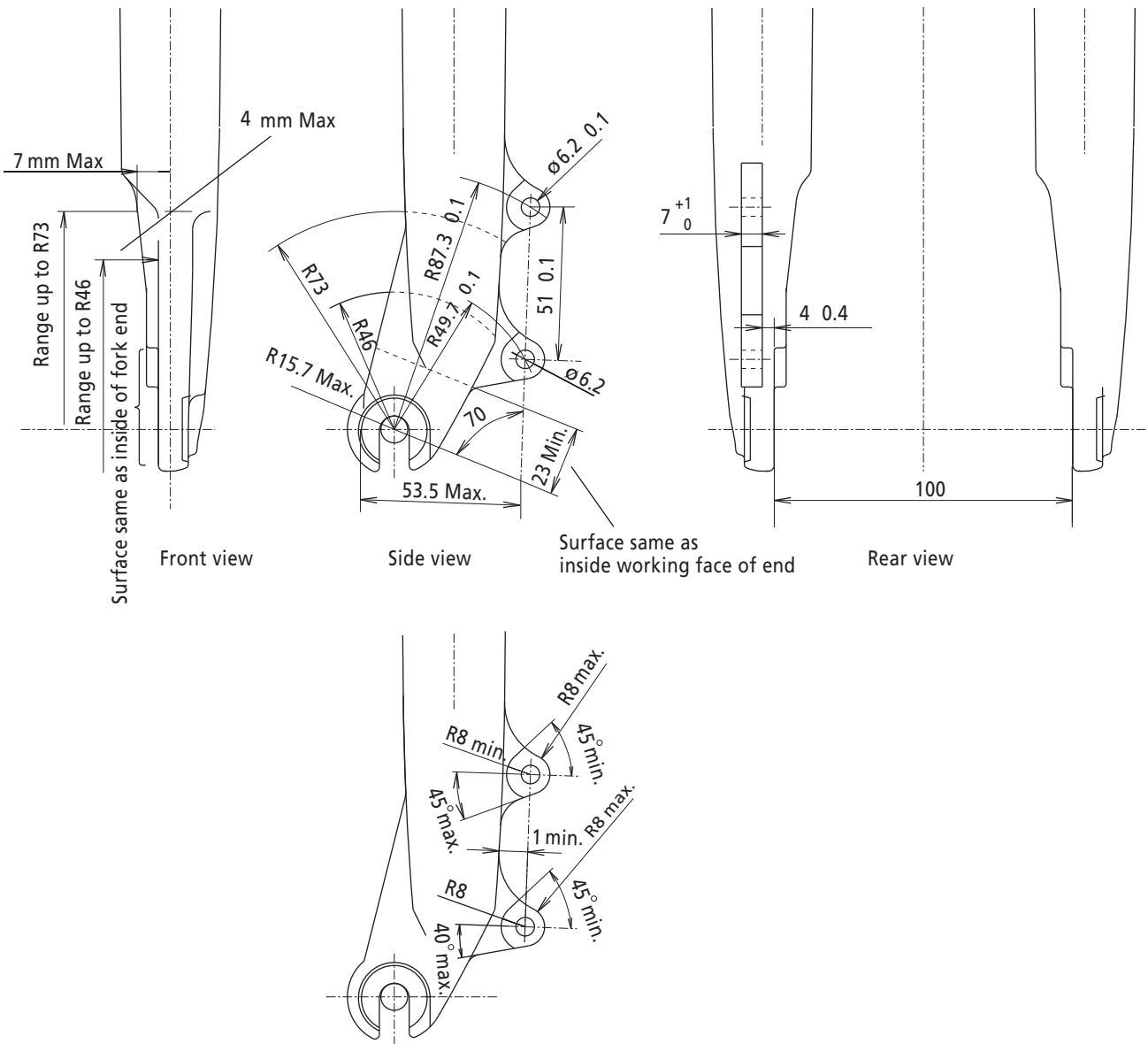
## Interference with mudguard

To avoid interference with mudguard, ensure that there is no projecting parts in X-hatching area.



# Recommended front fork for BR-IM75-F

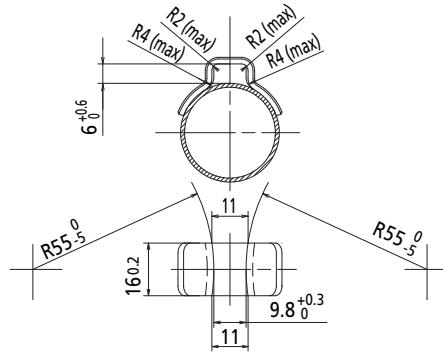
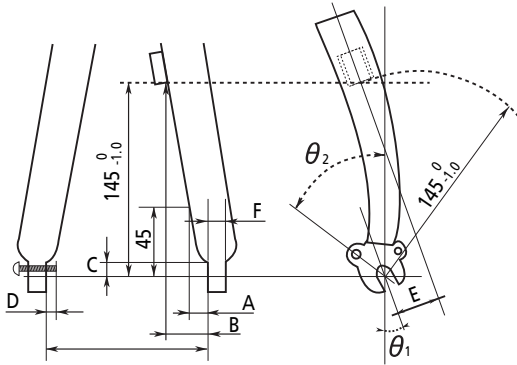
As shown below, the BR-IM75-F can be used with front forks equipped with Disc brake mount (International standard type) designed for city and trekking bikes. Please verify first that the fork dimensions will not cause interference with the HRB. Special mount, used up to now for HRB installation, is not required.



# Fork dimensions

This brake basically attaches to the front fork in the same way as the conventional left side direct-connect hub brake. However, caution is required, so please refer to the diagrams below with regard to frame design.

## for Nut type

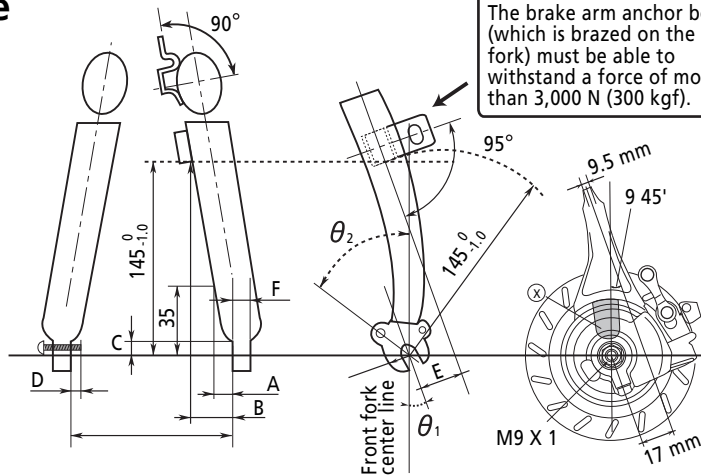


Recommended dimensions for the direct-connect hook

The brazed-on brake arm anchor boss for BR-IM50-F BR-IM70-F



## for QR type



The brake arm anchor boss (which is brazed on the fork) must be able to withstand a force of more than 3,000 N (300 kgf).

- \*A ≅ 6.7
- \*11 ≅ B ≅ 14.5
- \*C ≅ 16 ----- C is the straight section of fork dropout.
- \*D = ∅ ----- Mudguard and/or rack fasteners should not protrude beyond the inside face of the fork end.
- \*E = 17 ----- The  $\theta_1$  angle should be within the range given on the left. The basic dimensions of the brake are shown in the diagram at upper right. While the  $\theta_1$  angle is recommended to be within the above range, there may be cases where the E dimension and this  $\theta_1$  angle may have to be different from that shown above. In this case, establish the E and  $\theta_1$  specifications according to your requirements but as close as possible to the dimensions given above.
- \*63' ≅  $\theta_1$  ≅ 13
- \* $\theta_2 < 45$  -----  $\theta_2$  is the mudguard screw position.
- \*F > 4 ----- "F" is the fork end thickness.

When the fork end thickness "F" is 4 mm to 6.5 mm, please use the quick release with 129 mm length. When "F" is 5 mm to 8.5 mm, please use 133 mm.

### Cautionary Points:

1. The cross hatching area (shown as X) denotes the part of the brake body that is recessed in order to prevent interference with the fork. Use the fork center line (shown in the diagram above) as the reference point from which to establish the position of this recessed area.
2. Use a fork that has axle retention tabs on the outside of fork ends.
3. When using the hub roller brake with suspension forks, read next page.



## ■ Precautions when using front roller brake system with a suspension fork

Roller brake systems are hub brakes, and therefore apply a different type of braking stress to front forks than rim brakes. Be aware of the precautions listed below if you are using a roller brake system with suspension front forks.

### Operating characteristics:

1. Braking forces are absorbed by the left side of the forks only.  
The position where the stress are applied is at  $L = 150$  mm. (L is location of the mounting boss shown on the figure (145 mm) plus an additional 5 mm.)  
The maximum braking load is 3700N.
2. Long down hill braking will transfer brake generated heat directly to the fork leg. The hub lock nut can heat up form 70 to 90°C above ambient temperature.

### Cautionary Points:

- a. The hub braking action will cause suspension forks to twist.
- b. Brake stresses are concentrated at the brake arm mounting point.
- c. Brake heat will be transferred to the oil of oil-type suspension forks.

### Note

- Select a fork that is compatible with DIN standard hub brakes (EN Norm).
- Be sure to mount the brake arm that receives the braking force securely so that it does not separate from the braze-on or band-type anchor boss.
- Be sure to confirm the specification of the bicycle, confirm the purpose for which it will be used, perform the required quality assurance tests, and perform the necessary preliminary work before installation.

## ■ Fork strength

The hub roller brake was designed to be used with a fork that conforms to EN Norm. Always verify that the fork you plan to use conforms to this standard.

## ■ Spoke Lacing

Use a wheel with 3x or 4x spoke lacing. Wheels with radial lacing cannot be used because the spokes and the wheel can be damaged when applying the brakes and brake noise can be generated.

## Rims

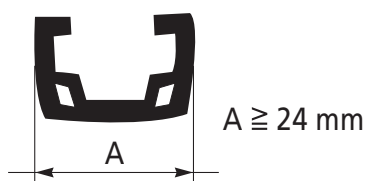
### ■ Rims used with the hub roller brake

This brake applies braking force at the hub section, so compared to rim brakes, rim strength is required. Use the recommended rim types in the table below.

\*Stainless Rim & Steel Rim --- No requirement

\*Aluminum 26 inch Rim --- No requirement

\*Aluminum 27 inch & 700C (28 x 1-5/8 x 1-1/4) --- As below A

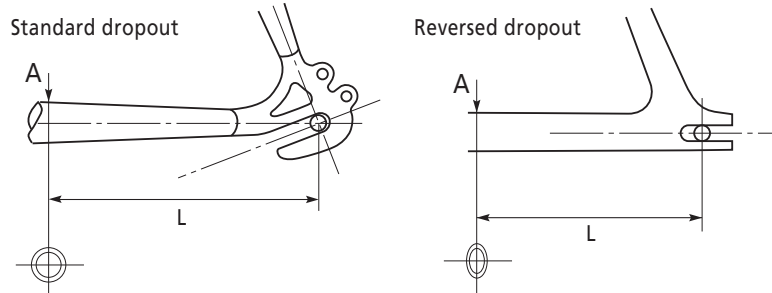
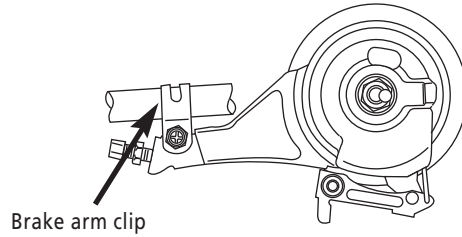


## Chainstay dimensions

### Chainstay dimensions for securing rear brake arm clip

The positions of the rear brake arm clip for the Inter-M Brake and the chain stay sizes which are compatible with the brake arm clip are shown below.

Model No.	L
NEW BR-IM80-R BR-IM70-R BR-IM50-R BR-IM41-R	98 mm
BR-IM35-RF BR-IM31-R	111 mm



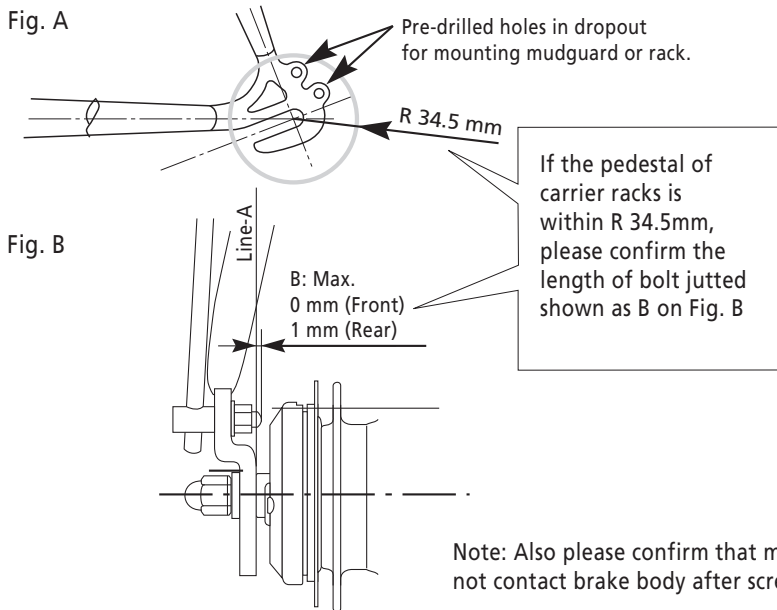
The following are the available sizes for the brake arm clip at position A (at the position 98 mm for BR-IM70-R, BR-IM50-R, BR-IM41-R, BR-C050-IM-R/111 mm for BR-IM31-R from the center of the rear hub).

Ø 15 mm, Ø 5/8 inch, Ø 11/16 inch, Ø 3/4 inch

## Mudguards & Carrier racks

### Cautionary points for installing mudguards & carrier racks

Verify the dimensions shown in the diagrams below when installing mudguards or carrier racks.



Note: Also please confirm that mount bolt will not contact brake body after screwing it.

## Brake lever

In order to get the best performance from the Shimano roller brake, be sure to use Shimano brakes cables and brake levers as a set.

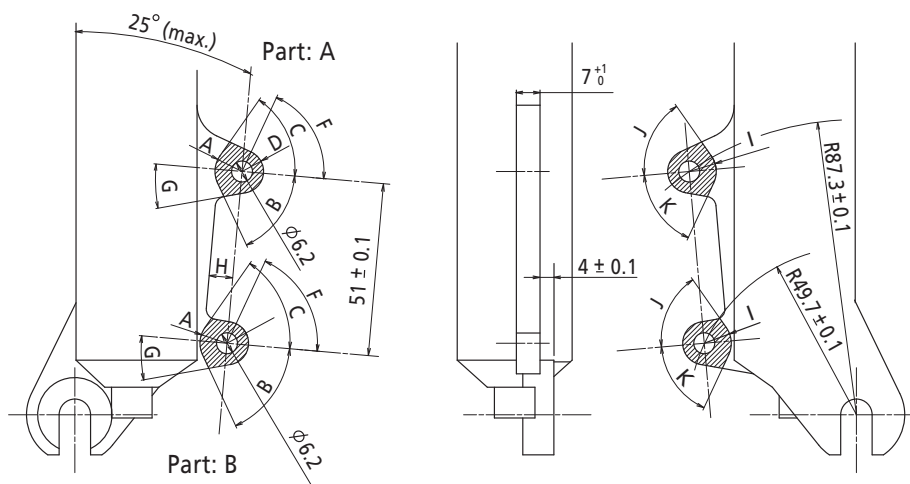
The distance of movement for the inner cable must be 14.5 mm or more when the brake lever is depressed. If it is less than 14.5 mm, braking performance will suffer, and the brakes may fail to work.

# Disc brake

## Disc brake mount dimensions

Shimano disc brakes are designed to fit the frame and front fork as shown below.  
 (The dimensions shown below are same as the International Standard disc brake mount.)  
 The following mount dimensions (A ~ H) are recommended for each model.  
 The gray areas should be flat.

### Front fork dimensions



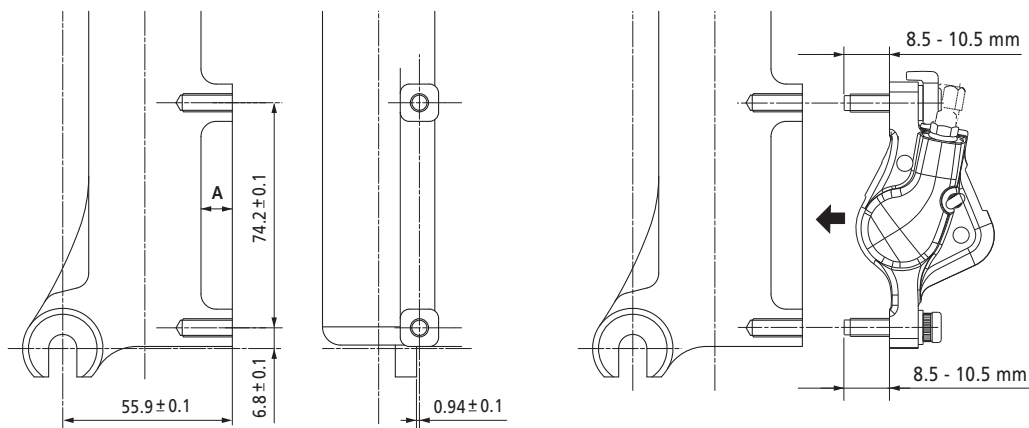
### Part: A

	Model	Dimension									
		A (min)	B (min)	C (min)	D (max)	F (min)	G (max)	H (min)	I (min)	J (min)	K (min)
Wiring type	BR-M975	6.0 mm	60°	60°	7.5 mm	—	—	-2.5 mm	6.0 mm	60°	60°
Cap type	BR-M810	8.0 mm	—	45°	8.0 mm	45°	—	2.0 mm		6.0 mm	75°
	BR-M775/M776							0.0 mm	95°		
	BR-M665/M535 BR-T605/S501							-1.0 mm			
	NEW BR-T665							0.0 mm			
	BR-M575/M486							1.0 mm			
	BR-M416/M495/R505							1.5 mm	45°		

### Part: B

	Model	Dimension									
		A (min)	B (min)	C (min)	D (max)	F (min)	G (max)	H (min)	I (min)	J (min)	K (min)
Wiring type	BR-M975	6.0 mm	60°	60°	7.5 mm	—	—	-2.5 mm	6.0 mm	60°	60°
Cap type	BR-M810	8.0 mm	45°	45°	8.0 mm	45°	45°	2.0 mm		6.0 mm	95°
	BR-M775/M776							0.0 mm			
	BR-M665/M535 BR-T605/S501							-1.0 mm			
	NEW BR-T665							0.0 mm			
	BR-M575/M486							1.0 mm			
	BR-M416/M495/R505							1.5 mm	10°		

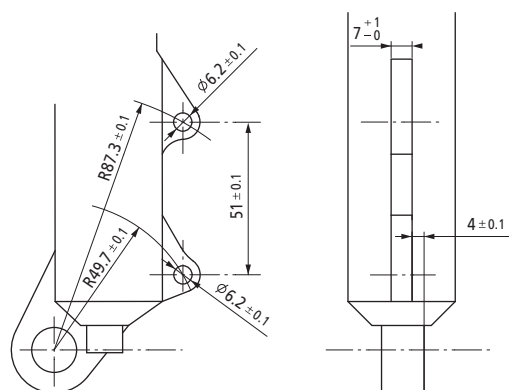
for Post mount fork



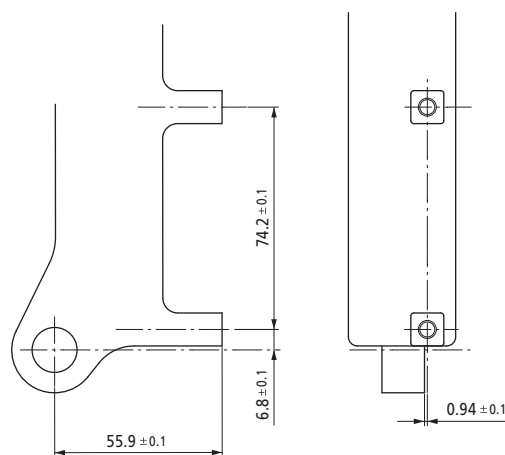
Model	Dimension
	A (min)
BR-M975-P	9.5 mm
BR-M810	11.5 mm
BR-M775/M776	9.0 mm
BR-M665/T605/S501	8.5 mm
BR-T665	10.0 mm
BR-M595	10.5 mm
BR-M575/M486	11.5 mm
BR-M495	11.0 mm
BR-M416	11.0 mm
BR-R505	12.0 mm

## Front fork (15 mm E-Thru)

< For International standard mount >

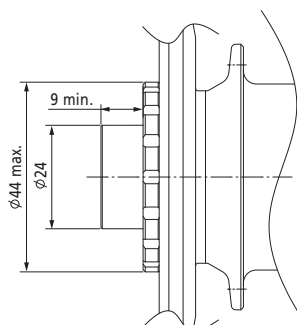


< For Post mount >

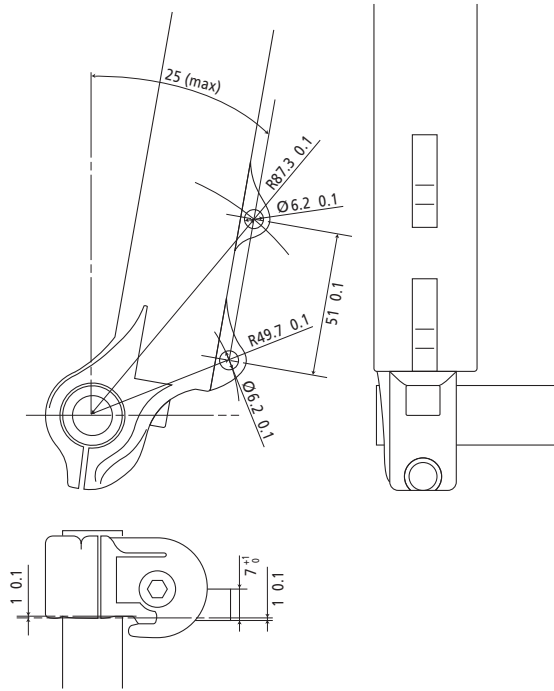


## Front fork (20 mm Thru axle)

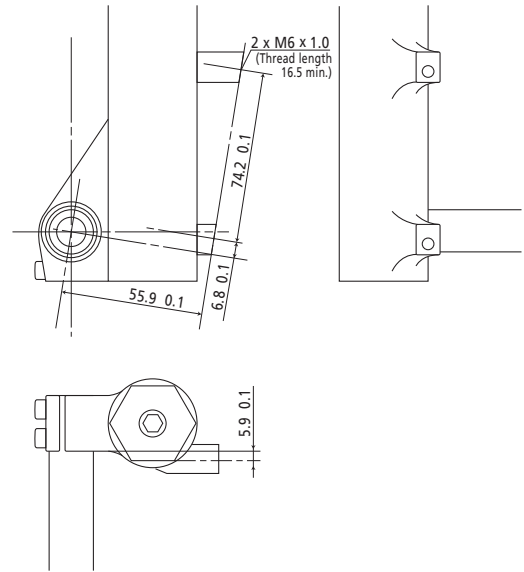
Dimension of center lock ring and fork



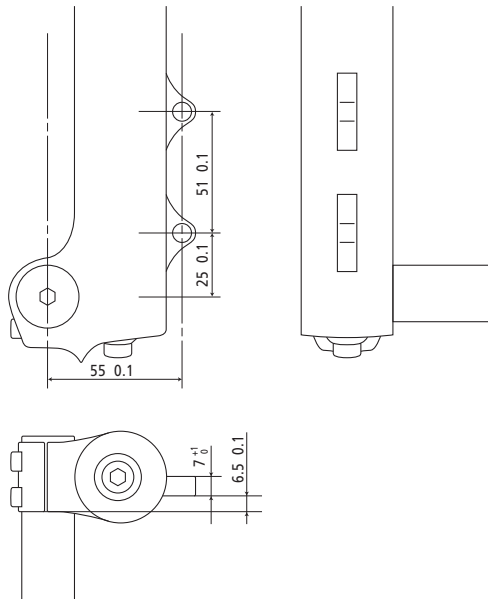
## International standard-type



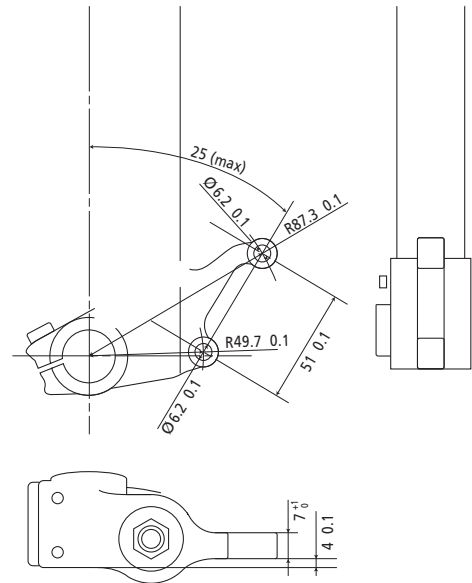
## Post-type



## Boxxer-type



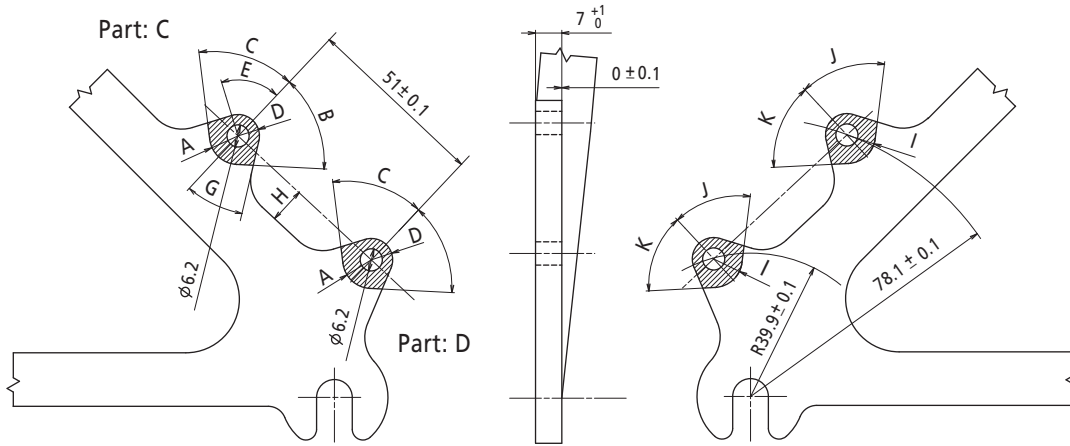
## Marzocchi-type



## Disc brake mount dimensions

- Shimano disc brakes are designed to fit the frame and front fork as shown below. (The dimensions shown below are same as the International Standard disc brake mount.) The following mount dimensions (A ~ H) are recommended for each model.

### Rear frame dimensions



Keep the rear end and disc brake installation surfaces on the same place.

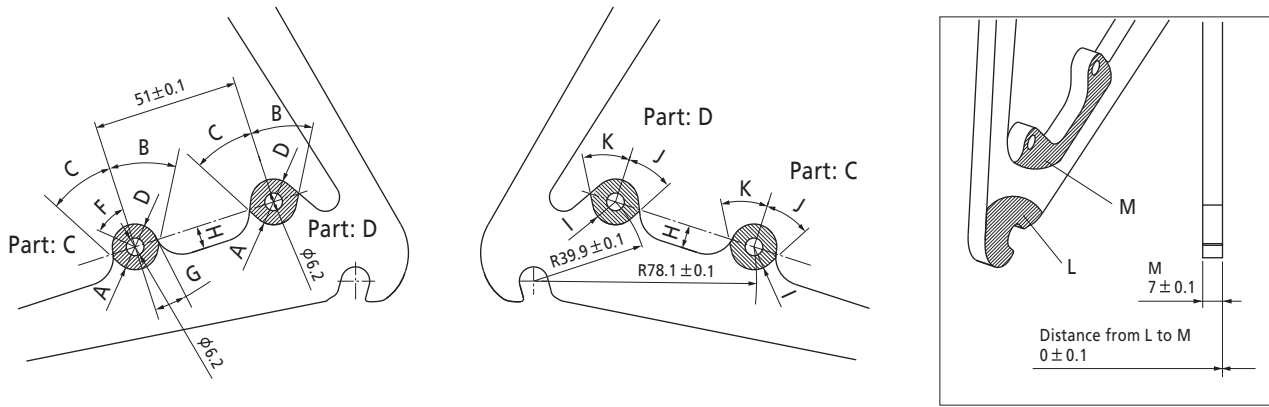
### Part: C

	Model	Dimension									
		A (min)	B (min)	C (min)	D (max)	F (min)	G (max)	H (min)	I (min)	J (min)	K (min)
Wiring type	BR-M975	6.0 mm	60°	50°	8.0mm	-	-	-6.0 mm	6.0 mm	60°	60°
Cap type	BR-M810	8.0 mm	-	45°	8.0 mm	45°	-	-3.0 mm		75°	90°
	BR-M775/M776							-5.5 mm			
	BR-M665/NEW M595 BR-T605/S501							-6.5 mm			
	NEW BR-T665							-5.0 mm			
	BR-M575/M486							-4.0 mm			
	BR-M416 BR-M495							-3.5 mm			
	BR-R505							-5.5 mm			

### Part: D

	Model	Dimension								
		A (min)	B (min)	C (min)	D (max)	H (min)	I (min)	J (min)	K (min)	
Wiring type	BR-M975	6.0 mm	60°	60°	-	-6.0 mm	6.0 mm	60°	60°	
Cap type	BR-M810	8.0 mm	-	45°	8.0 mm	-		90°	45°	
	BR-M775/M776						-3.0 mm			
	BR-M665/NEW M595 BR-T605/S501						-5.5 mm			
	NEW BR-T665						-6.5 mm			
	BR-M575/M486						-5.0 mm			
	BR-M416 BR-M495						-4.0 mm			
	BR-R505						-3.5 mm			
		-5.5 mm								

## Rear frame dimensions (For chainstay disc mount frame)



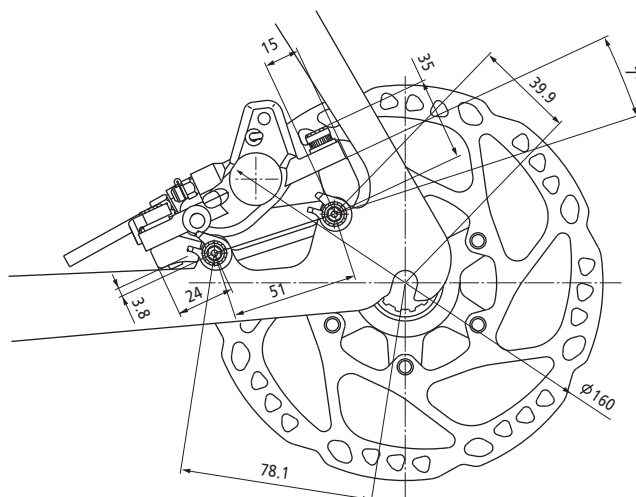
### Part: C

	Model	Dimension									
		A (min)	B (min)	C (min)	D (max)	F (min)	G (max)	H (min)	I (min)	J (min)	K (min)
Wiring type	BR-M975	6.0 mm	60°	60°	7.5 mm	-	-	-6.0 mm	6.0 mm	60°	60°
Cap type	BR-M810	8.0 mm	-	45°	8.0 mm	45°	-	-3.0 mm		75°	90°
	BR-M775/M776							-5.5 mm			
	BR-M665/NEW M595 BR-T605/S501							-6.5 mm			
	NEW BR-T665							-5.0 mm			
	BR-M575/M486							-4.0 mm			
	BR-M416 BR-M495							-3.5 mm			
	BR-R505							-5.5 mm			

### Part: D

	Model	Dimension									
		A (min)	B (min)	C (min)	D (max)	H (min)	I (min)	J (min)	K (min)		
Wiring type	BR-M975	6.0 mm	60°	60°	7.5 mm	-6.0 mm	6.0 mm	60°	60°		
Cap type	BR-M810	8.0 mm	-	45°	8.0 mm	-3.0 mm		90°	45°		
	BR-M775/M776					-5.5 mm					
	BR-M665/NEW M595 BR-T605/S501					-6.5 mm					
	NEW BR-T665					-5.0 mm					
	BR-M575/M486					-4.0 mm					
	BR-M416 BR-M495					-3.5 mm					
	BR-R505					-5.5 mm					

- SHIMANO disc brake dimensions in combination with chainstay disc brake mount frame.



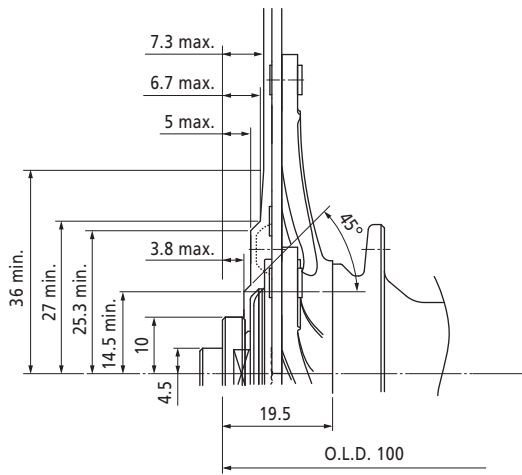
# Dimensions of disc brake rotor of front wheel

The dimensions of Shimano disc brake rotor are shown below.  
 There are three types (A, B, C) depend on each combinations hub spec and rotor spec.  
 Please verify that fork dimensions will not cause interference with rotor and hub.

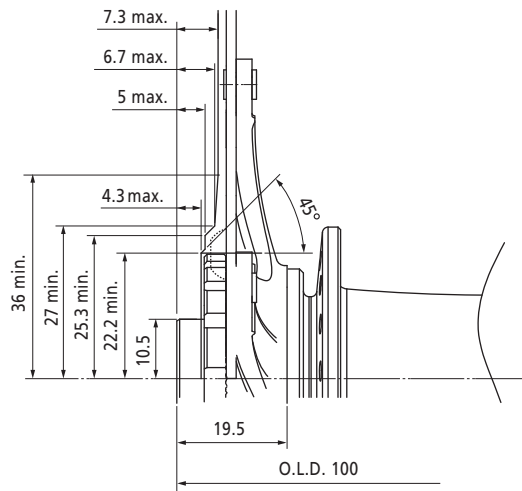
Dimension type		A		B	C
		QR	8 mm E-thru	15 mm E-thru	20 mm thru
Hub/Fork spec.	Axle Diameter	QR (9 mm)	8 mm	15 mm	20 mm
	Thru axle	-	X	X	X
	O.L.D.	100 mm	100 mm	100 mm	110 mm
Rotor spec. (fixation)	RT w/6 bolt	X	X	X	X
	RT w/Center lock ring	X	X	-	-
	RT w/15/20 mm Center lock ring	-	-	X	X

**Note:**  
 The position of RT for 20 mm HB fork is 5.25 mm further to fork from the center of HB than that of QR/E-thru fork.

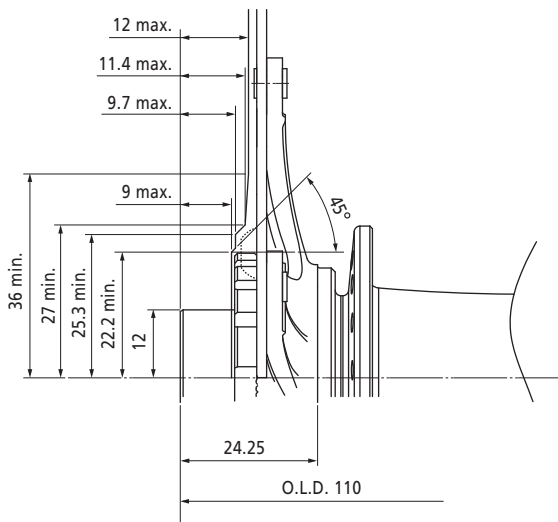
< A type >



< B type >



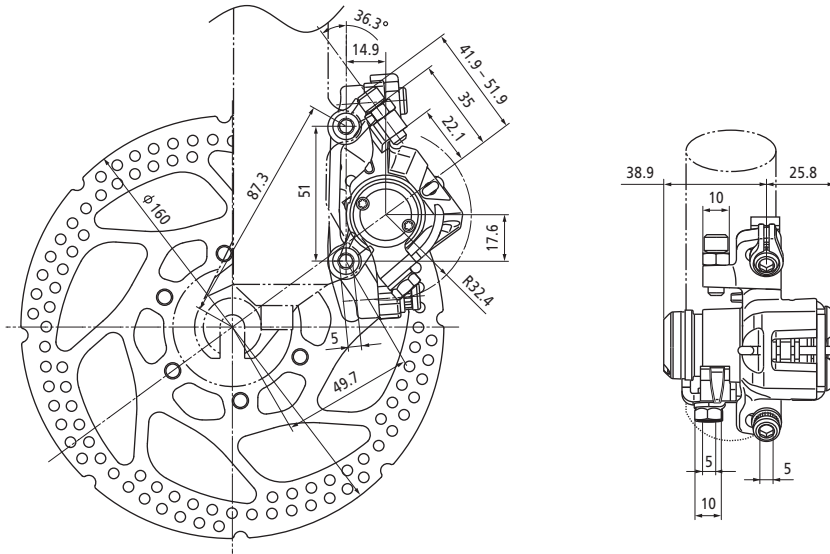
< C type >





# BR-M416 Dimensions

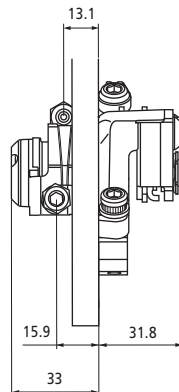
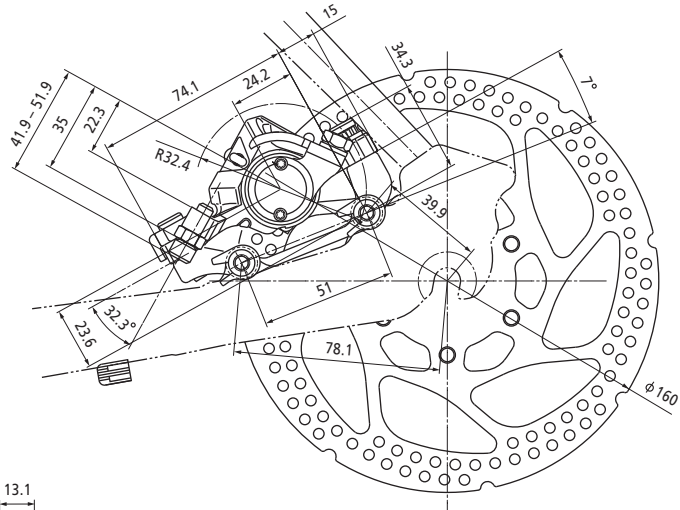
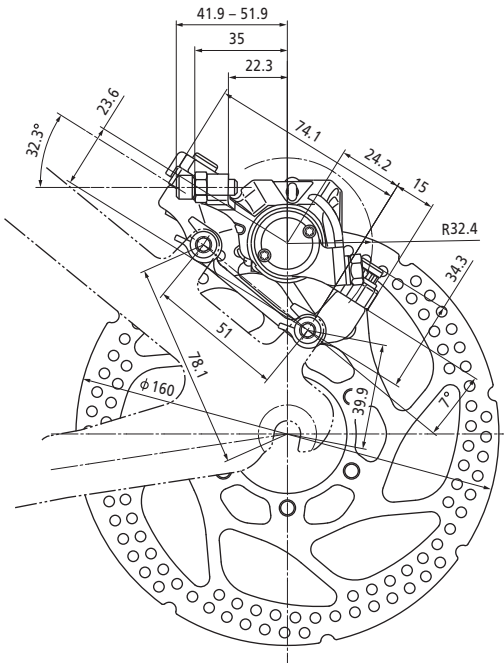
## Front



## Rear

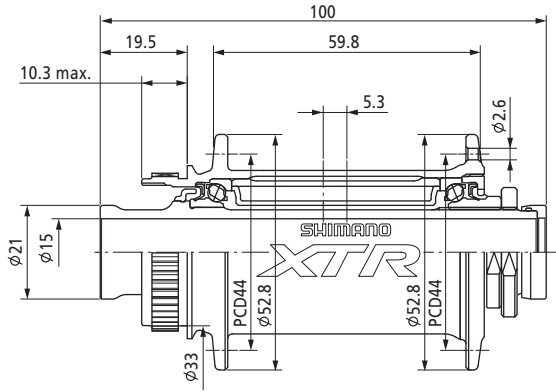
Seat stay mount type

Chainstay mount type

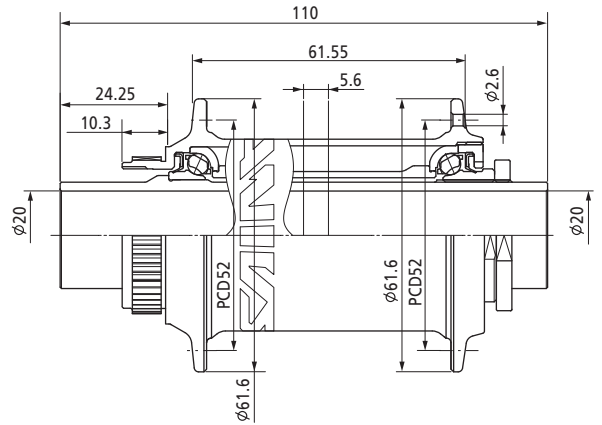


# Hub dimensions for Shimano disc brake

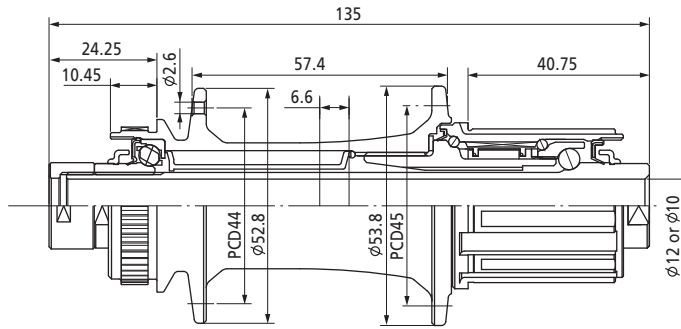
## HB-M978



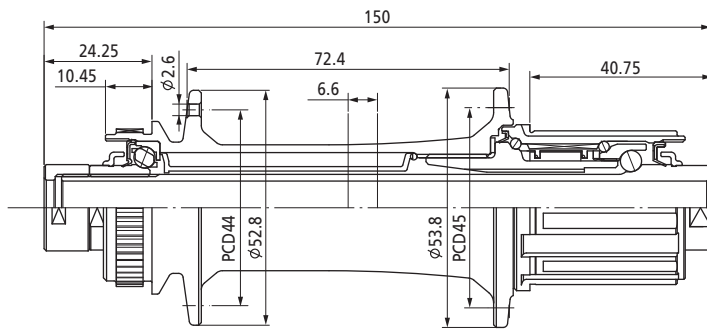
## HB-M810



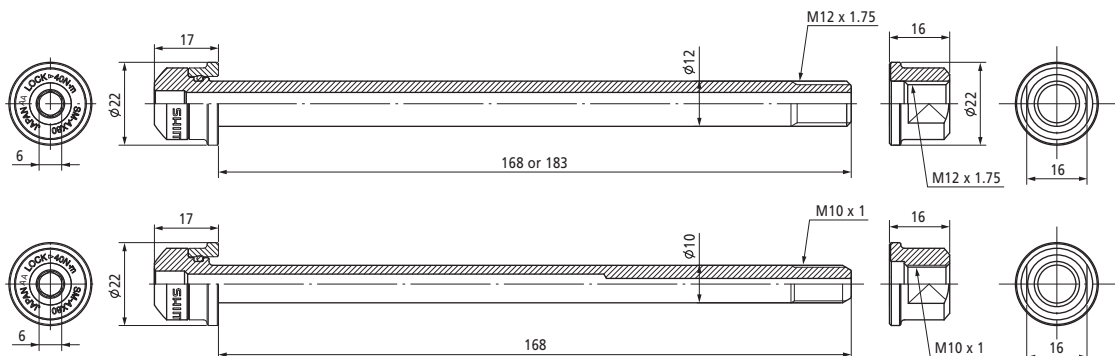
## FH-M810



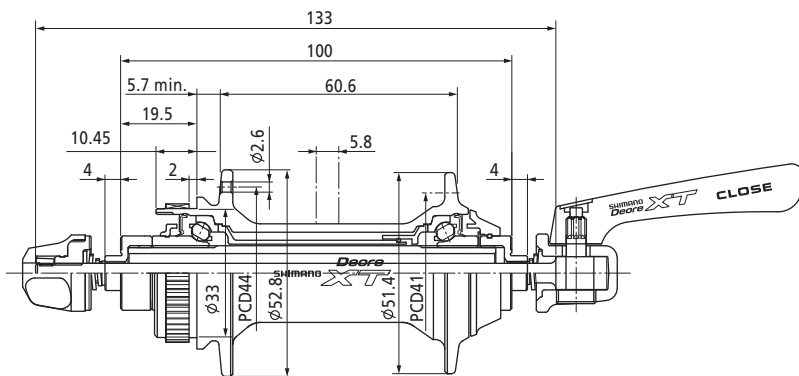
## FH-M815



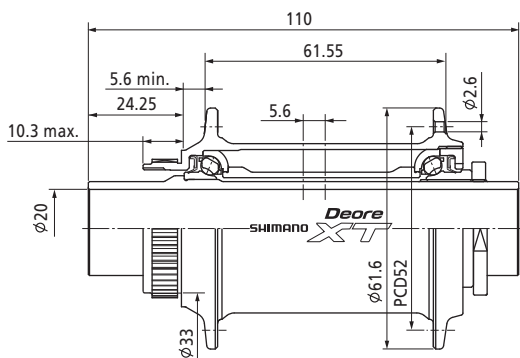
## SM-AX80



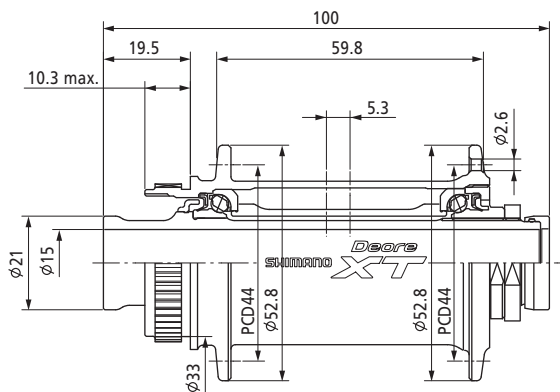
■ HB-M775



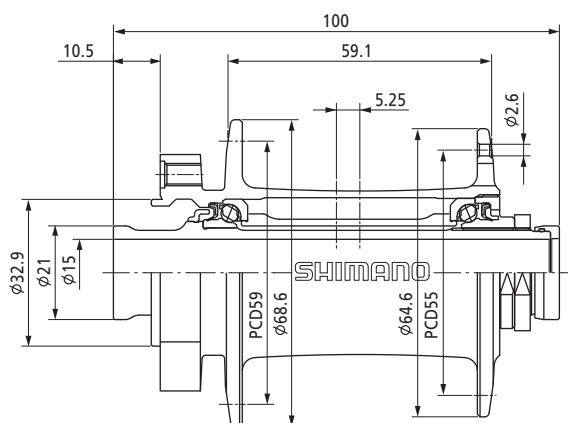
■ HB-M776



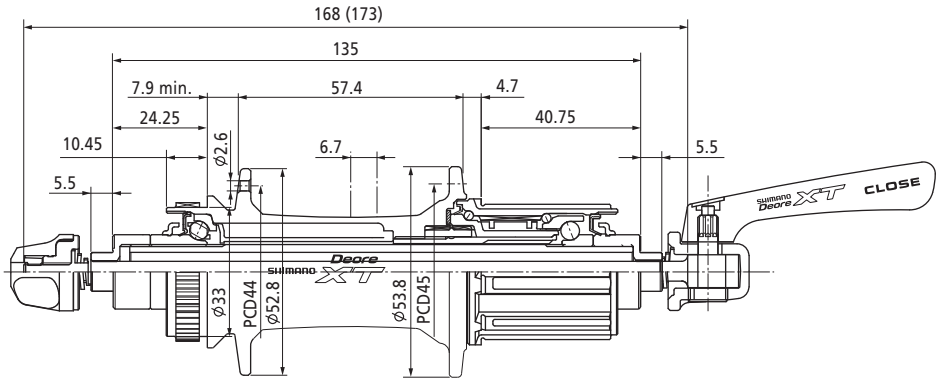
■ HB-M778



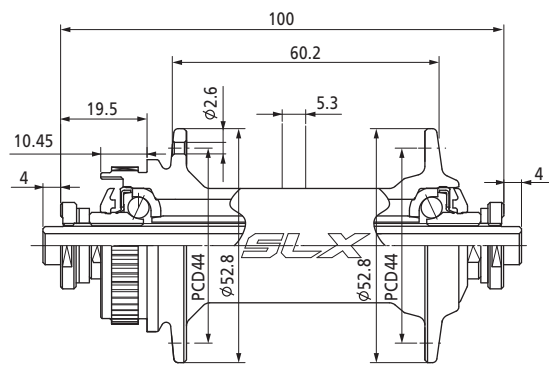
■ HB-M758



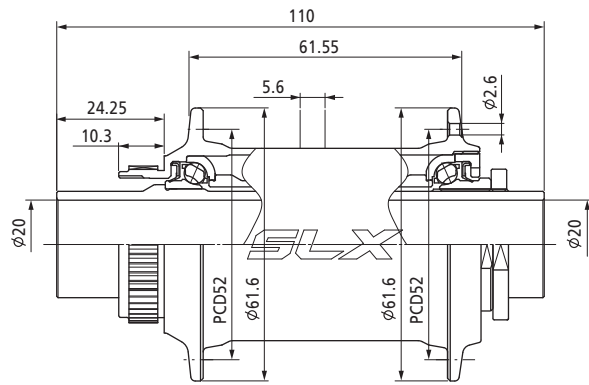
■ FH-M775



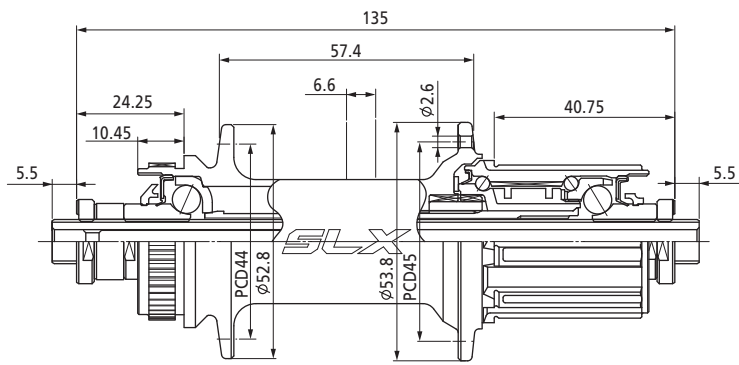
■ HB-M665



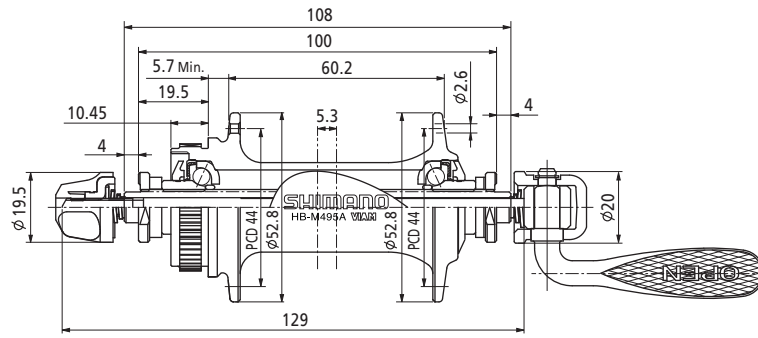
■ HB-M667



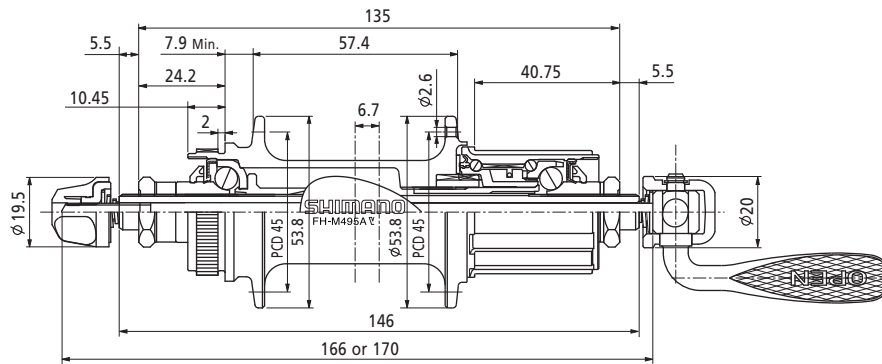
■ FH-M665



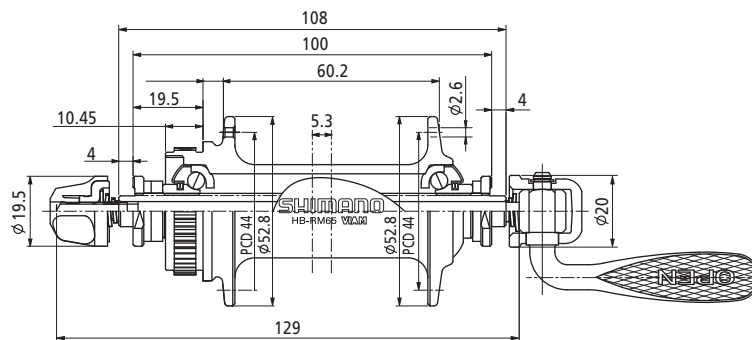
■ HB-M495-A



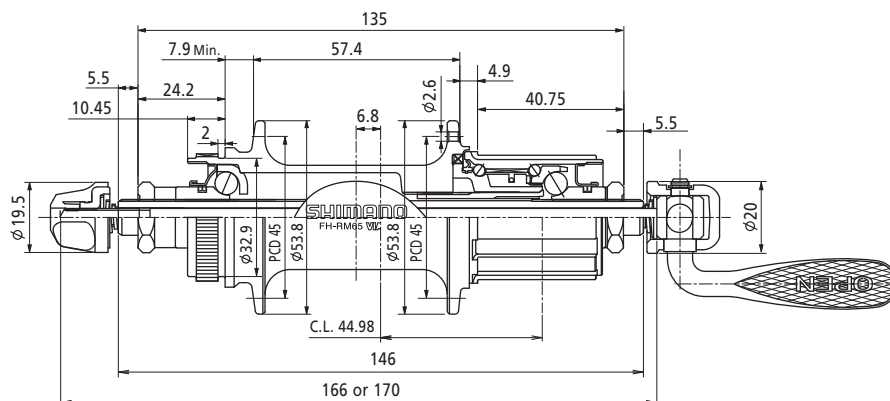
■ FH-M495-A



■ HB-RM65



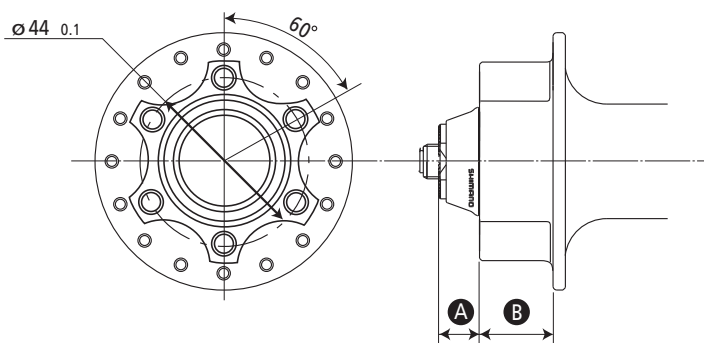
■ FH-RM65





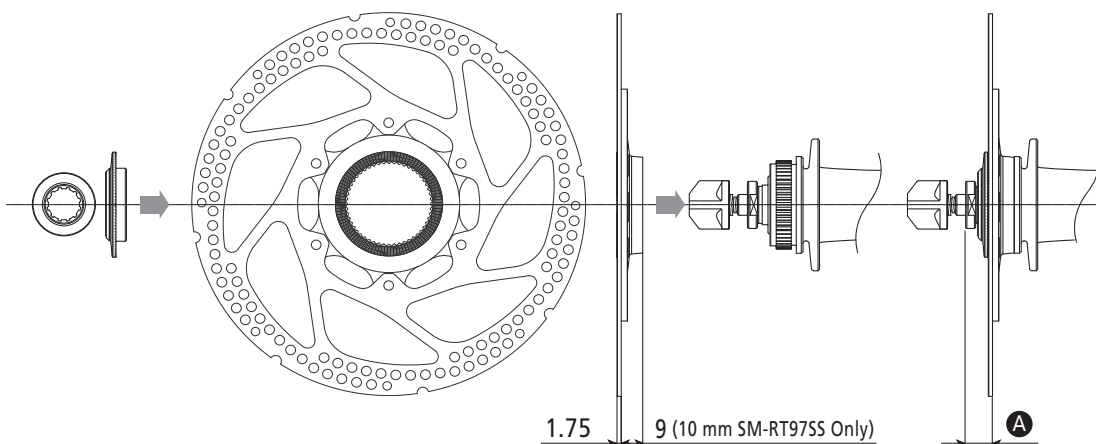
## Other series

Shimano disc is able to mount to the hubs with following dimensions. Following required dimensions are the 6 bolt standard.



	Dimension A	Dimension B
		M756/M525/M475
Front	10.5	15.3
Rear	15.25	16.9

## Rotor & Hub dimensions (Center lock type)



	Rotor size	Disc Hub	Dimension A (mm)
Front	160/180/203	QR/15 mm E-thru	10.5
	160/180/203	20 mm thru axle	15.25
Rear	160/180/203	All freehub	15.25
	140	All freehub	14.25

## Wheel spoke lacing

Check that the spokes have been laced as shown in the illustration.

A radial assembly cannot be used.

Lace the spokes as shown in Figure 1 below for the left side of the front wheel (the side where the rotor is installed), and the left and right sides of the rear wheel, and as shown in Figure 2 below for the right side of the front wheel.

Rotating direction of wheel

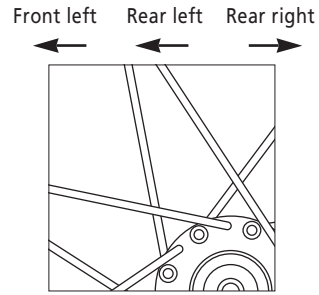


Fig. 1

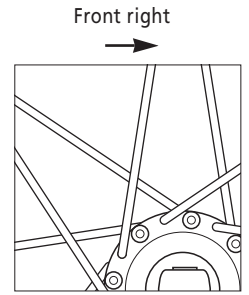
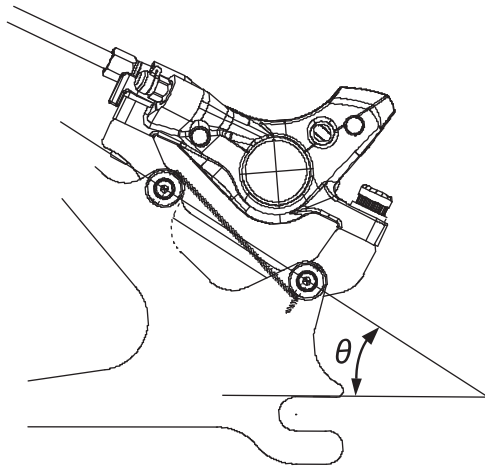


Fig. 2

## Recommended mounting boss angle on BMX dropout



Model No.	Rotor size	$\phi 140$ mm	$\phi 160$ mm	$\phi 180$ mm	$\phi 203$ mm
		$\theta$	$\theta$	$\theta$	$\theta$
BR-M975		Max 27°	Max 27°	Max 10°	Max 17°
BR-M775/M776		—	Max 27°	Max 27°	Max 27°
BR-M810/M665 BR-M535/M575/M486		—	Max 24°	Max 24°	Max 24°
BR-T665		—	Max 24°	—	—
BR-M595		—	Max 24°	Max 24°	Max 24°

If  $\theta$  angle is bigger than recommended, the wheel with rotor could not be set or detached.



# Caliper brake

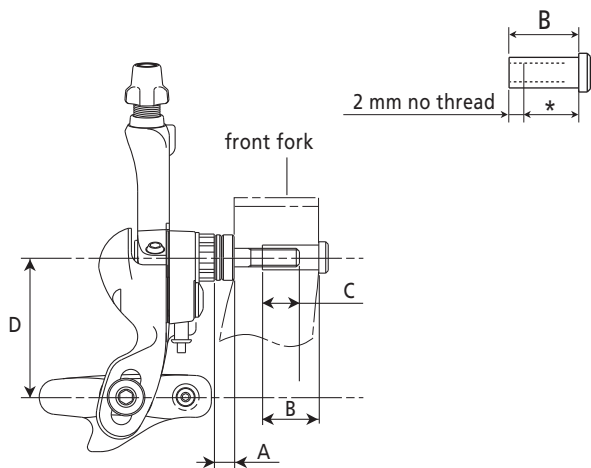
## Caliper brake assembling

### ■ Brake dimension

Securely tighten the caliper brake mounting nuts to the specified tightening torque.

- Use lock nuts with nylon inserts (self-locking nuts) for nut type brakes.
- For sunken nut type brakes, use sunken nuts of the appropriate length (C) which can be turned six times or more (over 5 mm); when re-installing, apply sealant (locking adhesive) to the nut threads.

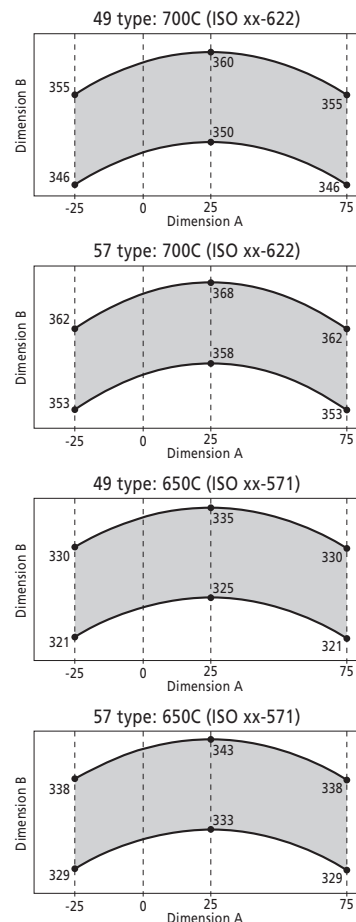
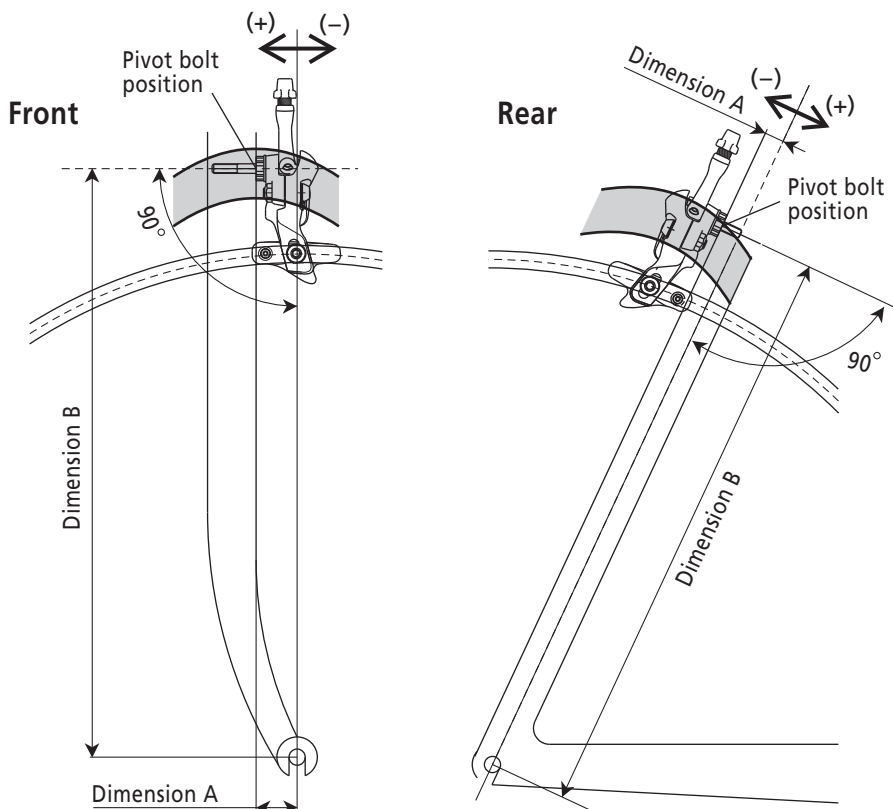
If the nuts become loose and brakes fall off, they may get caught up in the bicycle and the bicycle may fall over. Particularly if this happens with the front wheel, the bicycle may be thrown forward and serious injury could result.



Model No.	Washer (A)	Dimension "B"		D
		Front	Rear	
BR-7900 BR-7800	F: 1.8 mm X 1 R: 1.8 mm X 1			
<b>NEW</b> BR-6700 BR-6600G BR-6600 BR-5600 BR-5600L BR-R560	F: 2.0 mm	10.5 mm 12.5 mm 18.0 mm* 25.0 mm*	10.5 mm	39-49 mm
BR-4500	Option 2.0 mm			
BR-R650	F: 2.0 mm	10.5 mm 12.5 mm 18.0 mm*		47-57 mm
BR-R450	—			
BR-3400	—	25.0 mm*		39-49 mm

### ■ Caliper brake location

Please make the position of the pivot bolt in the acceptable range of Dimension A and Dimension B (the gray portion of the figure).



# Hub Dynamo

## Hub Dynamo line-up

Series	Model NO.	Output 6V- **W	BR Interchangeability			NUT	QR	Connector Design	O.L.D	wheel size	Tire Outer diameter (mm)
			V brake / Caliper brake	HRB (modulator Level)	Disc						
Shimano	DH-T708	3.0W	-	-	X	X (8mm thru axle)	-	E2	100 mm	26" – 28"	646 – 716 mm
	DH-3D72		-	-	X	-	X			26" – 28"	646 – 716 mm
	DH-3D30		-	-	X	X	X			16" – 28"	400 – 716 mm
	DH-3N80		X	-	-	-	X			26" – 28"	646 – 716 mm
	DH-3N72		X	-	-	-	X			26" – 28"	646 – 716 mm
	DH-3N30-QR		X	-	-	-	X			16" – 28"	400 – 716 mm
	DH-3N20(NT)		X	-	-	X	-			16" – 28"	400 – 716 mm
	DH-F703-S	2.4W	X	-	-	-	X		74 mm	16" – 20"	400 – 536 mm
	DH-3R30		-	(Hyper/Normal) X	-	X	X		100 mm	16" – 28"	400 – 716 mm
	DH-2D30		-	-	X	X	X			16" – 28"	400 – 716 mm
	DH-2N80-E		X	-	-	-	X			26" – 28"	646 – 716 mm
	DH-2N72		X	-	-	-	X			26" – 28"	646 – 716 mm
	DH-2N35		X	-	-	X	X			16" – 28"	400 – 716 mm
	DH-2N30-E		X	-	-	X	X			16" – 28"	400 – 716 mm
	DH-F702-S		X	-	-	-	X			74 mm	16" – 20"
DH-2R30-E	-	(Hyper/Normal) X	-	X	-	100 mm	26" – 28"	646 – 716 mm			
DH-2R30-ES	-	(Normal) X	-	X	-	100 mm	16" – 20"	400 – 536 mm			
Nexus	DH-3NA1	3.0W	X	-	-	X	-	E2	100 mm	26" – 28"	646 – 716 mm
	DH-3NB1-QR		X	-	-	-	X				
	DH-3RB1-QR		-	(Hyper) X	-	-	X				
Deore LX	DH-T665	3.0W	-	-	X	-	X		100 mm	26" – 28"	646 – 716 mm
	DH-T660-3N	3.0W	X	-	-	-	X				
	DH-T660-2N	2.4W	X	-	-	-	X				
Alfine	DH-S501N	3.0W	-	-	X	-	X		100 mm	26" – 28"	646 – 716 mm
	WH-S501-F		-	-	X	-	X				
	WH-S501-VF		X	-	-	-	X				
Capreo	DH-F703	3.0W	X	-	-	-	X		74 mm	16" – 20"	400 – 536 mm
	DH-F702	2.4W	X	-	-	-	X				

Followings are Japanese city bike version. Connector design of Japanese version is different.

Nexus	DH-2N30-J	2.4W	X	-	-	X	-	J2	93 mm	24" – 28"	-
	DH-2N30-JC		X	-	-	X	-	J2		20" – 24"	-
	DH-2N30-JW		X	-	-	X	-	J2	100 mm	24" – 28"	-
	DH-2N30-JWC		X	-	-	X	-	J2		20" – 24"	-
	DH-2N20-DT		X	-	-	X	-	E2		24" – 28"	-
	DH-2N20C-DT		X	-	-	X	-	E2		20" – 24"	-
	DH-2R30-J		-	X (Normal)	-	X	-	J2		26" – 28"	-
	DH-2R30-JC		-	X (Normal)	-	X	-	J2		20" – 24"	-

X: Yes

DH-3NA1 is specially designed for automatic inter-3 (AI-3S30) to meet each standard.

DH-3NB1/3RB1 are specially designed for Cyber Nexus (AI-8S40) to meet each standard.

Open output voltage of DH-T708/T665/3N80/3N72/3D72/2N80-E/2N72/S501/T660-2N/T660-3N is higher than other SHIMANO models. (Reference: Open output voltage: DH-T708/T665/3N80/3N72/3D72/2N80-E/2N72/S501/T660-2N/T660-3N--30km/h (26 inches): 35 Vrms, 140 Vpp, 70km/h (26 inches): 80 Vrms, 320 Vpp.

Lamps with electrical circuits such as automatic lamps may be damaged if the bicycle is ridden at high speeds with DH-T708/T665/3N80/3N72/3D72/2N80-E/2N72/S501/T660-2N/T660-3N.

If the type of lamp that use an electric circuit is combined with DH-T708/T665/3N80/3N72/3D72/2N80-E/2N72/T660-2N/T660-3N, please ask the lamp supplier whether it will be damaged or not.

- Use the 3.0W lamp or the 2.4W lamp + 0.6W rear lamp with the 3.0W dynamo.
- Use the 2.4W lamp with the 2.4W dynamo.
- Bulb life becomes shorter when is used for a small wheel bike except using 20"–24" inches dynamo.
- Shimano hub dynamo do not meet MTB specification.

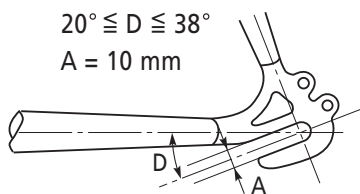
**Note:** Use a wheel with 3x or 4x spoke lacing except DH-F703/F702 series. Wheels with radial lacing cannot be used because the spokes and the wheel can be damaged when applying the brakes and brake noise can be generated.

# Nexus INTER-8

## Dropout dimensions

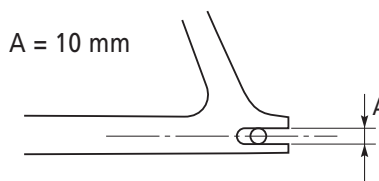
The Inter-8 hub is designed to be compatible with the following shapes of dropout.

### Standard dropout



### Reversed dropout

(Use with the chain puller.)



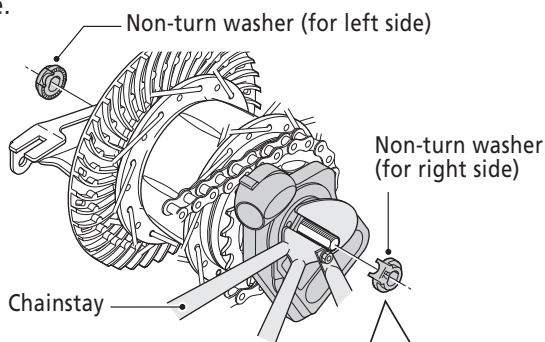
## Non-turn washer

Mainly 4 sets of non-turn washer are provided for usage with the different types of dropout.

### Shape & Colour

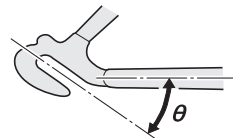
	For right hand side	For left hand side
5R/L	 5R: Yellow	 5L: Brown
6R/L	 6R: Silver	 6L: White
7R/L	 7R: Black	 7L: Gray
8R/L	 8R: Dark Blue	 8L: Dark Green

- Place the non-turn washers onto the right side and left side of the hub axle.



- Use whichever non-turn washers match the shape of the dropouts. Different non-turn washers are used at the left and right sides.

Dropouts	Non-turn washer		
	Mark/Color		Size
	Right	Left	
 Standard	5R/Yellow	5L/Brown	$\theta \leq 20^\circ$
	7R/Black	7L/Gray	$\theta \leq 38^\circ$
 Reversed	6R/Silver	6L/White	$\theta = 0^\circ$
	5R/Yellow	5L/Brown	$\theta = 0^\circ$
 Vertical	8R/Blue	8L/Green	$\theta = 60^\circ - 90^\circ$



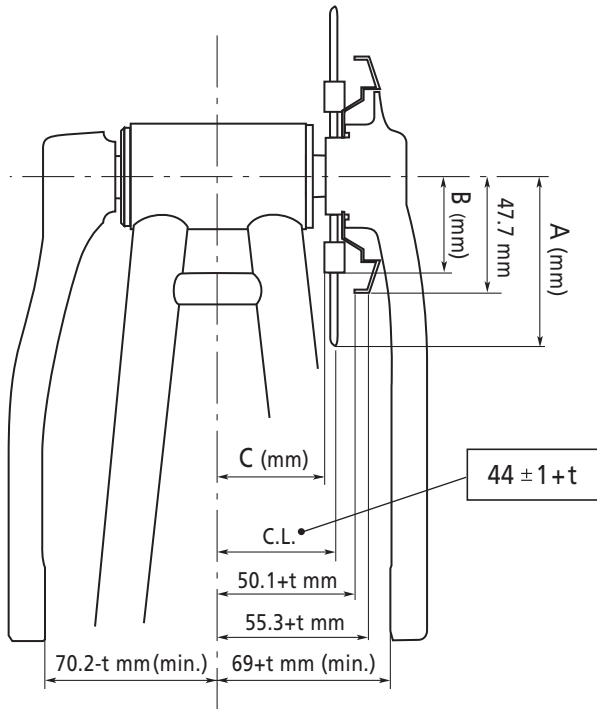
- The projecting parts should be on the dropouts side.
- Install the non-turn washers so that the projecting parts is securely in the dropouts grooves on either side of the hub axle.

## Nexus chain case (front)

### Size information for creating the front chain case

Use the following values as a reference for creating the chain case.

< FC-NX75 >



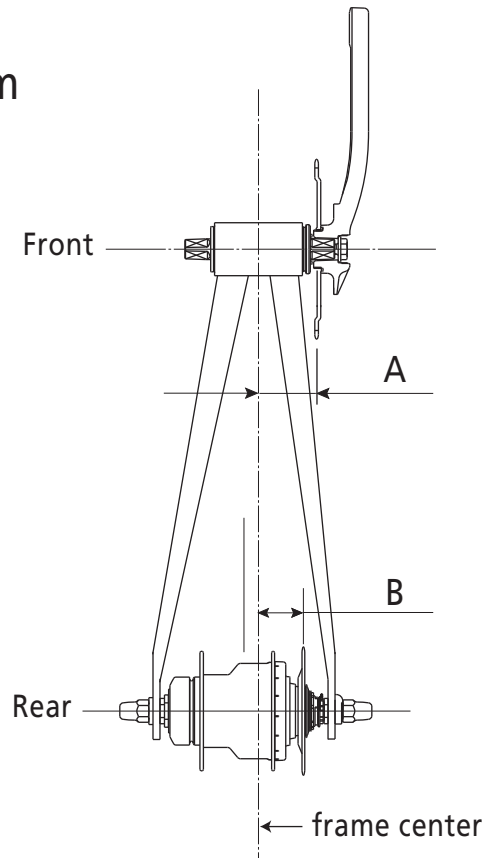
Dimension	38T	33T
A	79.7	69.5
B	70.5	55
C	41.5+t min	40.5+t min

Chain Case Thickness  $t < 2.5$

## Chain line (Front & Rear)

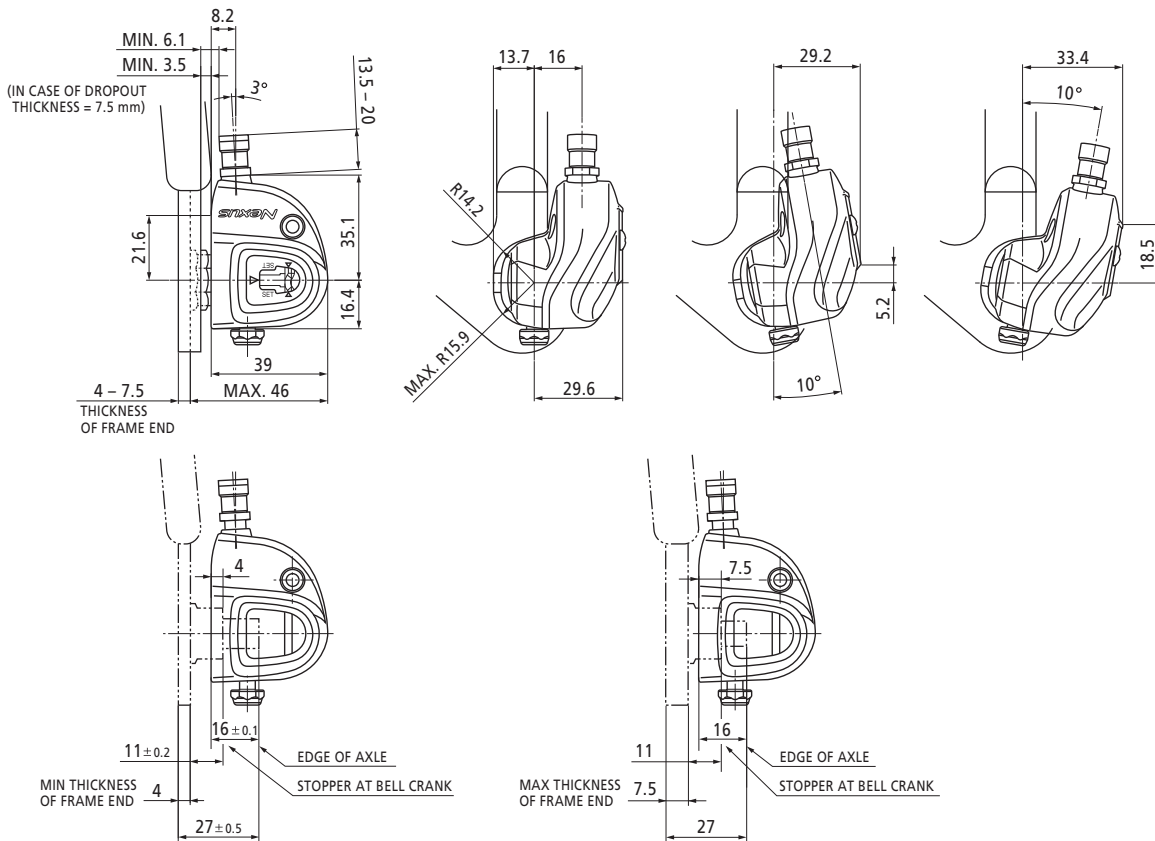
$$|A - B| \leq 5 \text{ mm}$$

A: Actual Front chain line  
B: Actual Rear chain line

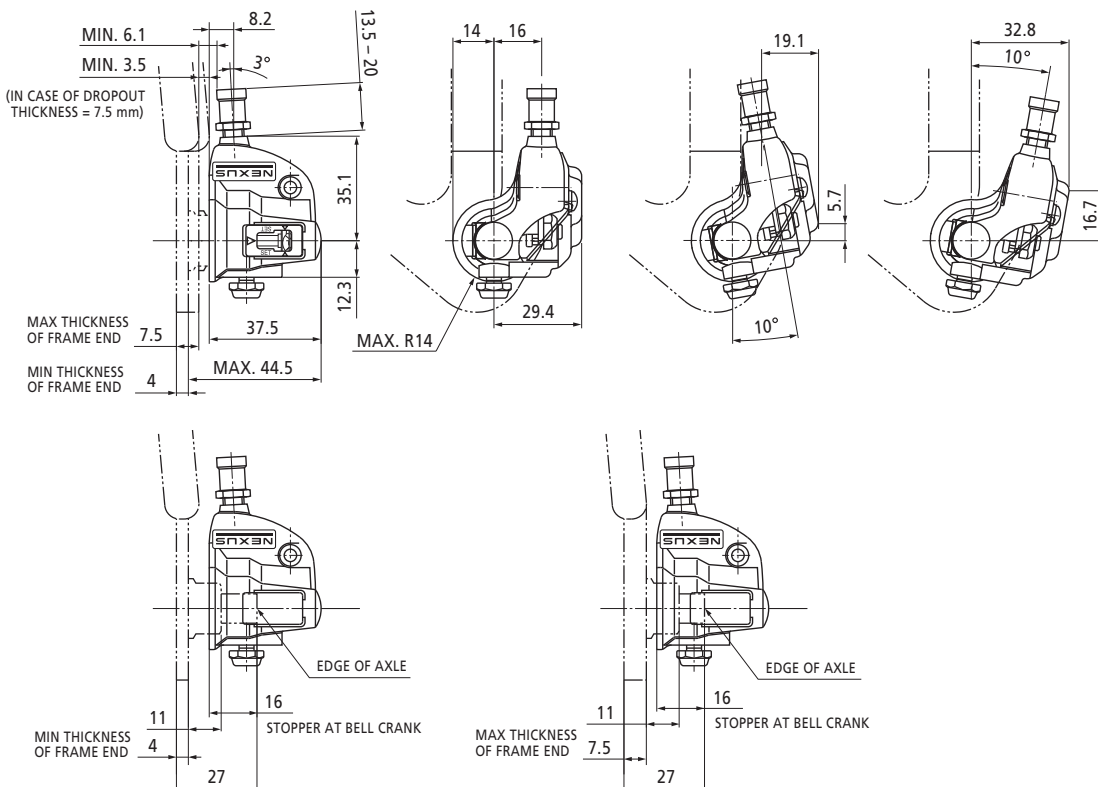


# Bell Crank

## Bell Crank 6

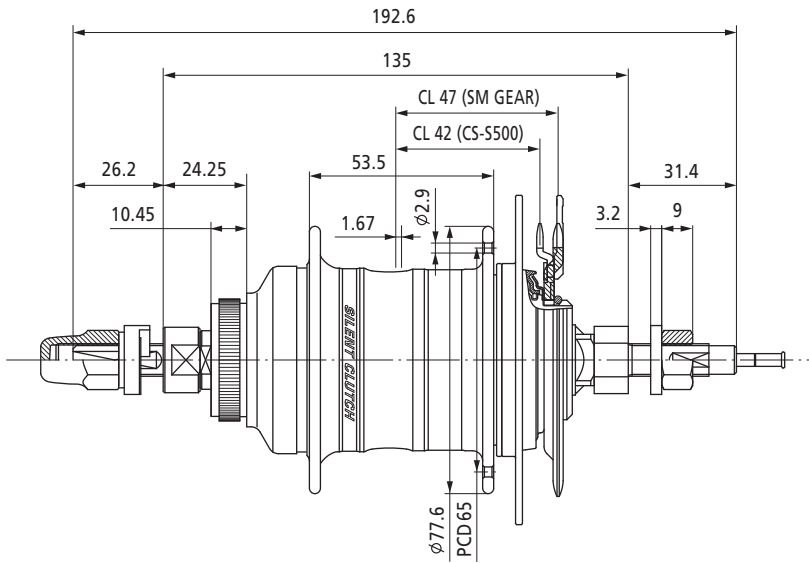


## Bell Crank 3



# Nexus Inter-3 disc brake

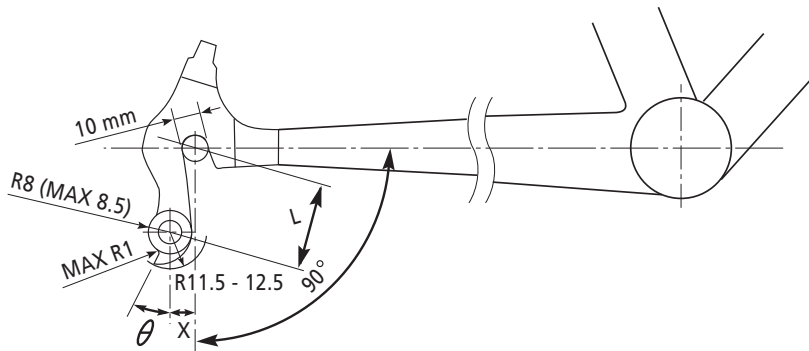
## SG-3D55



### Note:

CT-S500 is not compatible with BC-6 or BC-3

When using Shimano recommended derailleur mount dimensions, Bell crank interferes to chain tensioner.



L = 28 - 30 mm (MTB)

# Lamp system for Japanese market

## High mount lamp system combination

### Flashing combination

- LP-NX60 (LED front lamp w/stand light function keep flashing 1 minute after stop.)
- SL-3S60 (Right / Inter-3 shifter with position light)
- SM-3S60 (Left / Position light)
- EW-NX60 (Wire harness)
- 2.4W shimano hub dynamo w/J2 terminal



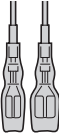

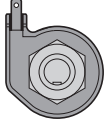
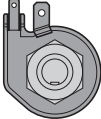
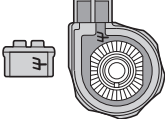
### Standard combination

- LP-FTX3 (LED front lamp) \*
- SL-3S60 (Right / Inter-3 shifter with position light)
- SM-3S60 (Left / Position light)
- EW-NX60 (Wire harness)
- 2.4W shimano hub dynamo w/J2 terminal

\* Xenon lamp is also available.

## Hub Dynamo

### Overview of terminal

Terminal type	J1	NEW J2		E2
LP				
DH				

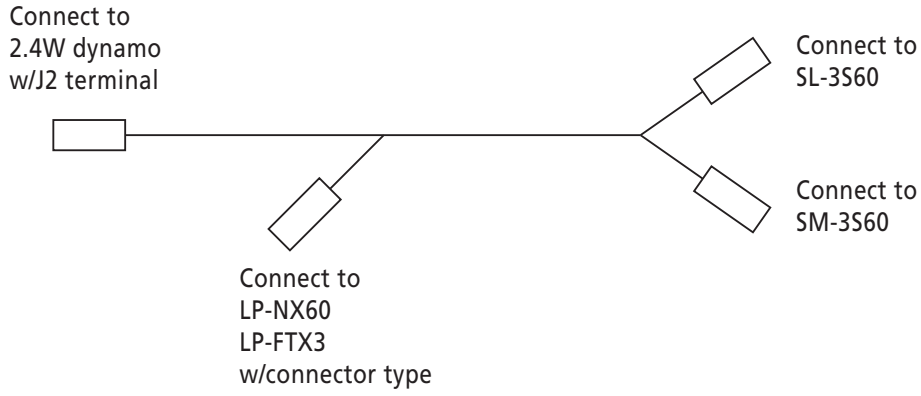
J1: Current Japanese market standard (single lamp cord)

J2: Single/double cord system compatible

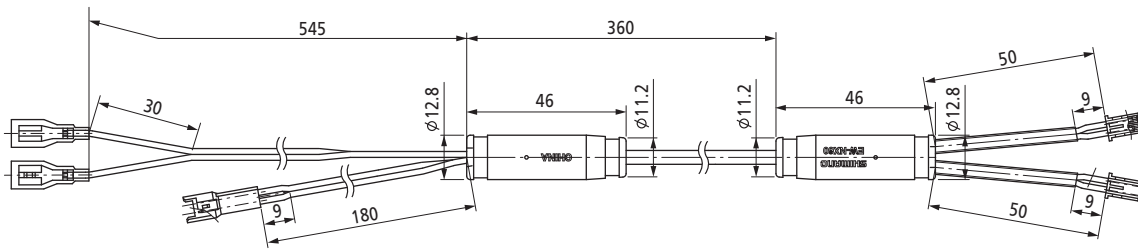
E2: Same as current European standard Shimano double terminal

## EW-NX60

- Wire harness for easy assemble.
- Use connector to connect each parts (Except DH)



## ■ Dimensions



## ■ Assembly



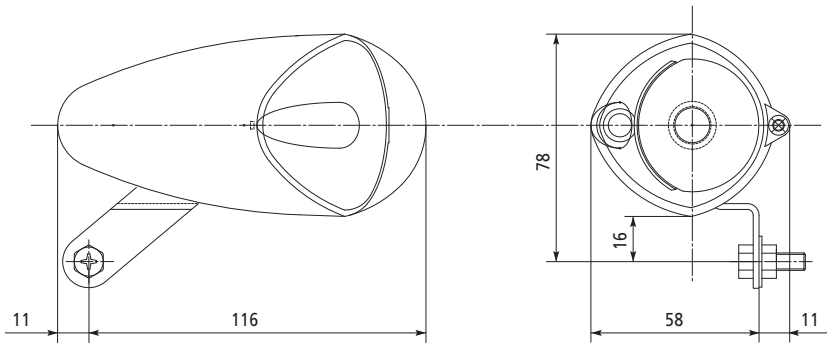
Example of EW-NX60 cable routing



## **LP-NX60**

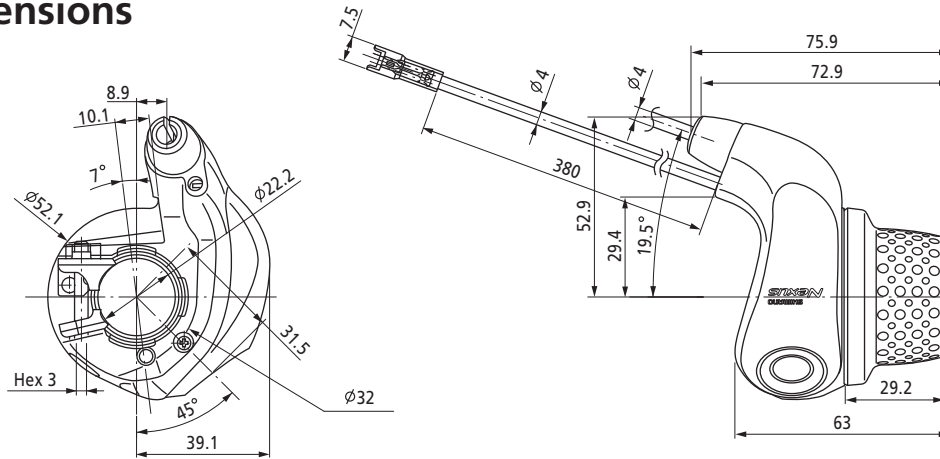
This LP-NX60 can also supply electricity to SL-3S60/SM-NX60 position light.  
SL position light blinks using this electric power also when the bikes stops.

### ■ Dimensions



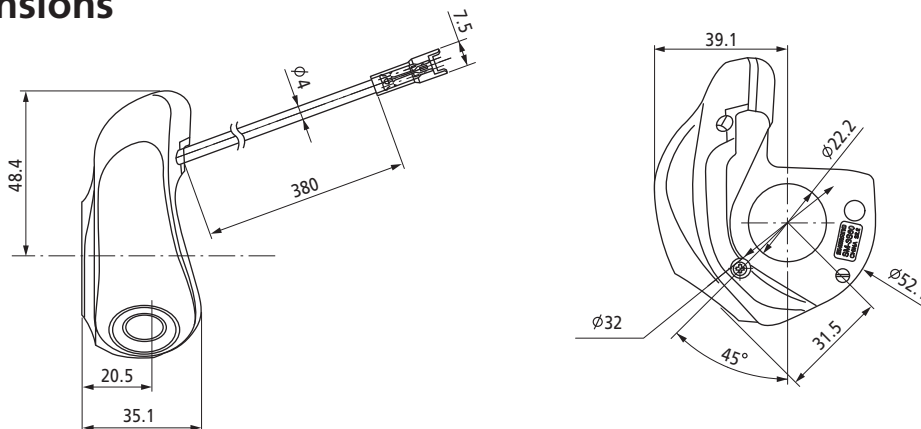
## **SL-3S60**

### ■ Dimensions



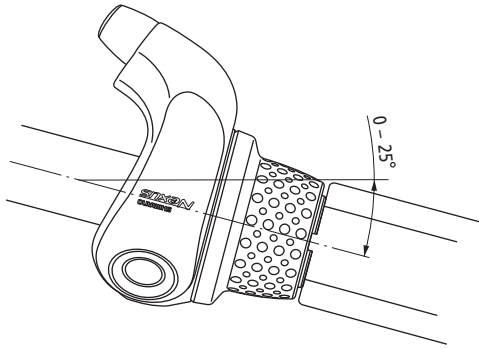
## **SM-3S60**

### ■ Dimensions

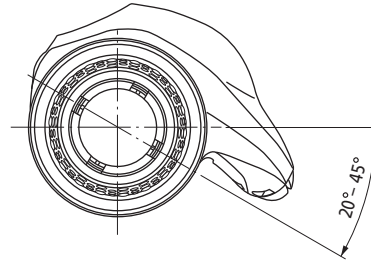


# SL/SM-3S60

## Assembly instruction



Recommendation for handle sweep  
Less than 25° to keep light direction  
frontward.

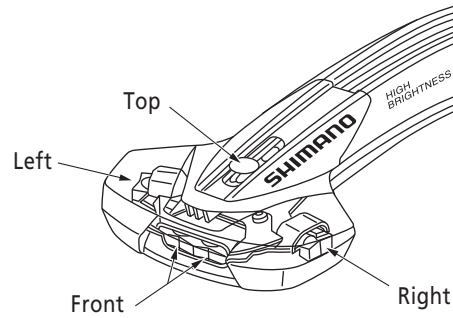


Recommendation for mounting angle  
20° to 45°

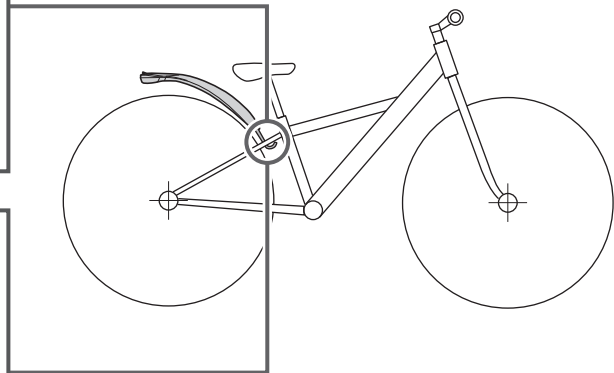
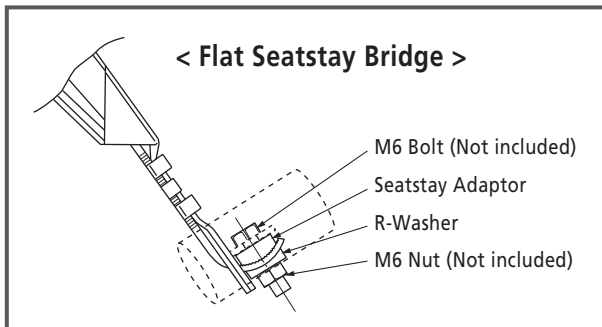
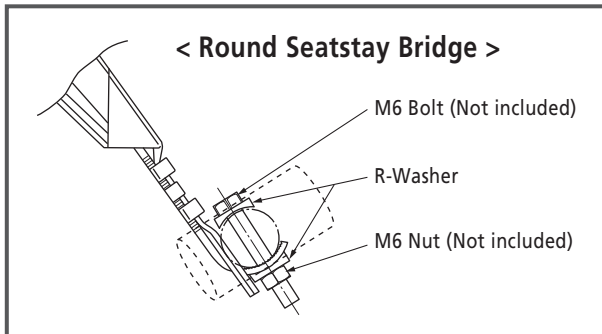
## Lamp (LP-RTX3)

### General

LP-RTX3 is a taillight using hub dynamo electric power. Because of using the battery, wastes do not come out. Since LED is used, it continues shining over a long period of time. This taillight is always turned on at the time of running. LP-RTX3 illuminates 4 different directions using 5 LED. This product satisfies a JIS regulation.



LP-RTX3 attached the taillight portion at the tip of stay of the mudguard style. As a result, it can shine in high position and a driver can find the bicycle easily. It can be assembled on either round or flat seatstay bridge.



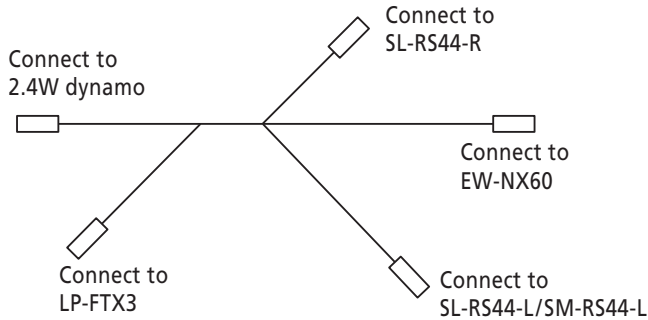
## Standard combination

LP-RTX3 will comply with JIS when it is used with

- LP-FTX3 (Front Lamp)
- SL-RS44-R (Position Light) - Special Specification
- SL-RS44-L/SM-RS44-L (Position Light) - Special Specification
- EW-NX60
- EW-NX60 short size
- 2.4W Shimano Dynamo J2 Terminal

## Cable specification (EW-NX60 & EW-NX60 short)

### < EW-NX60 >

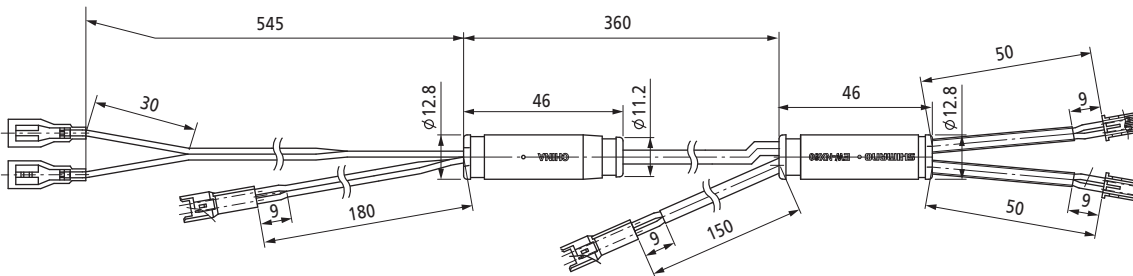


### < EW-NX60 short >

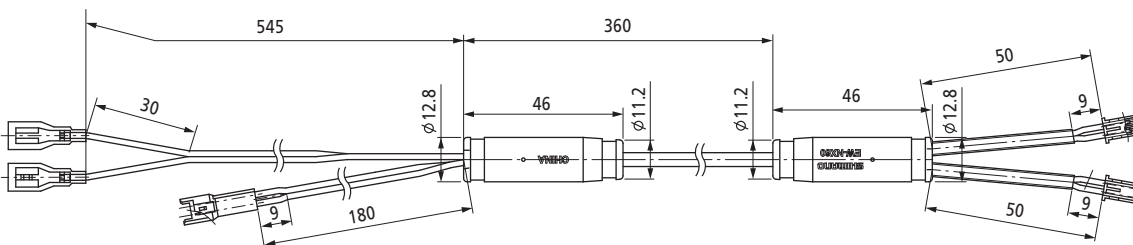


## The outside dimension of Model: EW-NX60

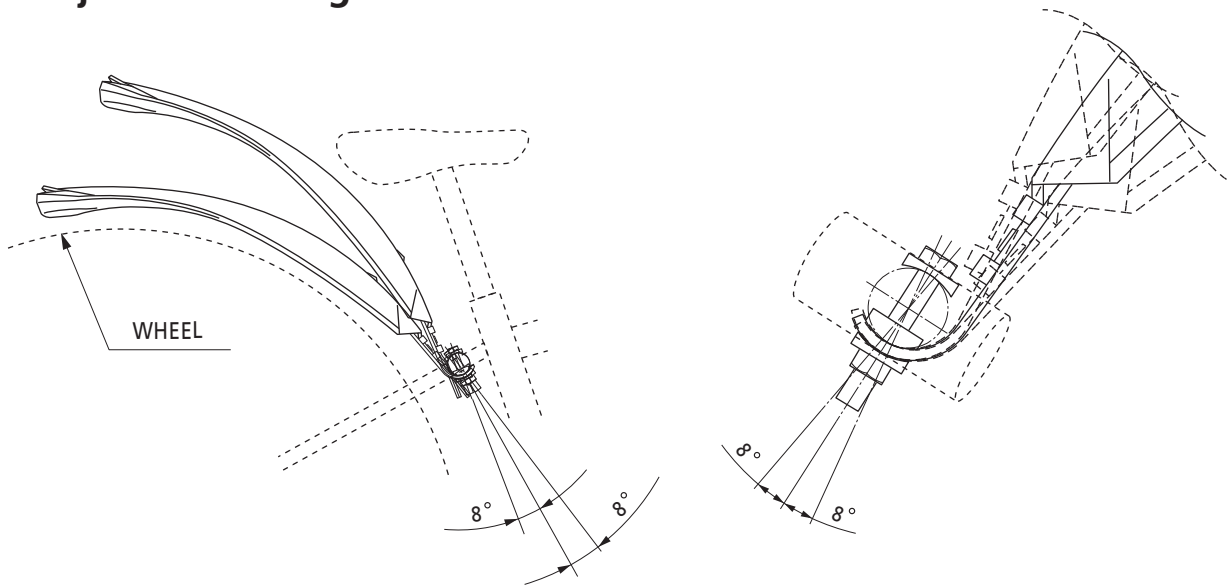
### < Type: with LP-RTX3 >



### < Type: without LP-RTX3 >



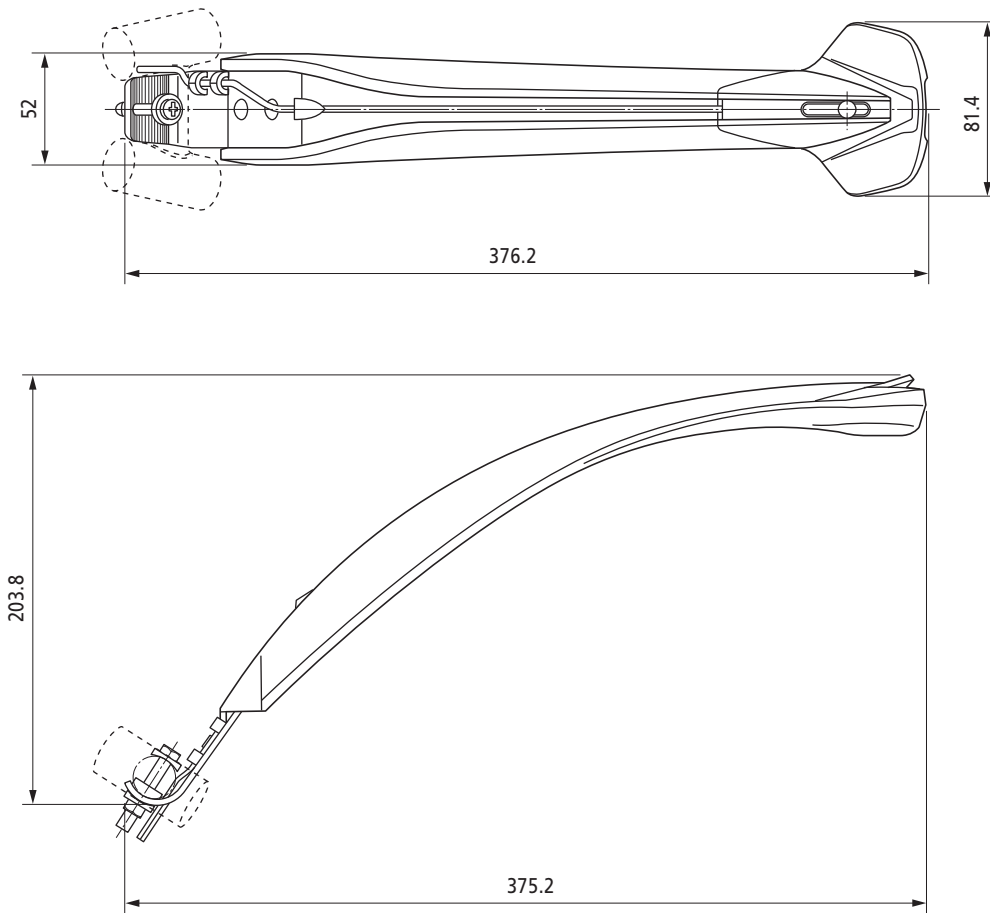
## ■ Adjustment Range of LP-RTX3



### Cautionary notes:

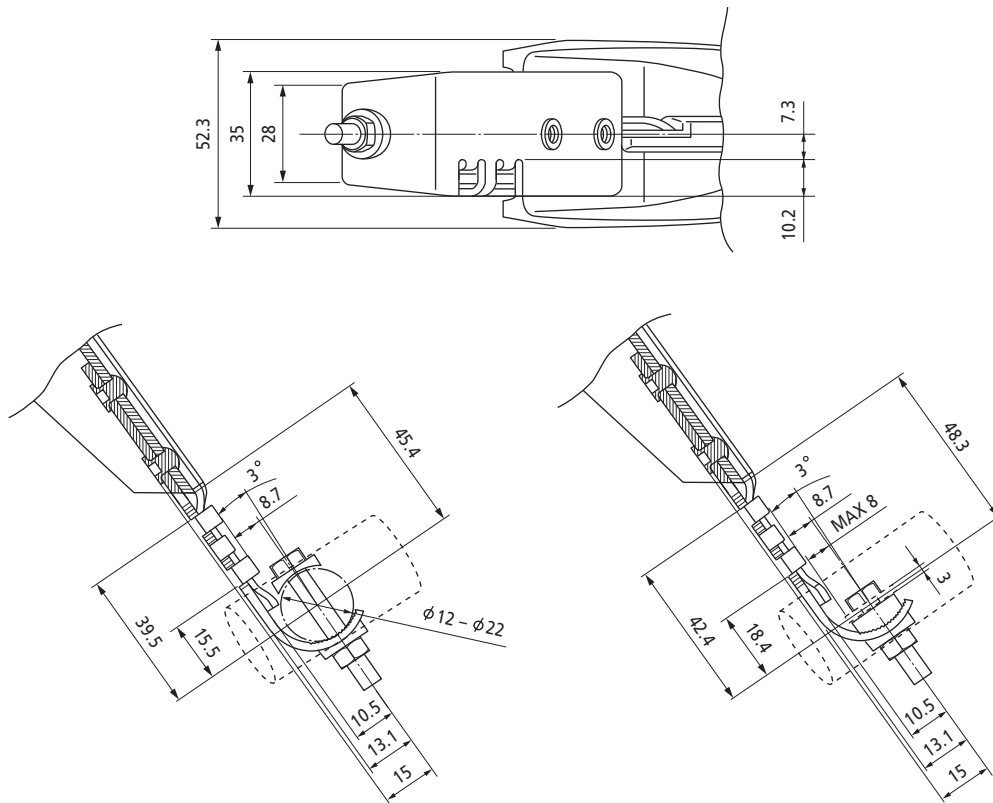
When a horseshoe lock is used on the bicycle, extra care is to be taken to ensure that there are sufficient clearance between LP-RTX3 and lock.

## ■ Overall dimensions



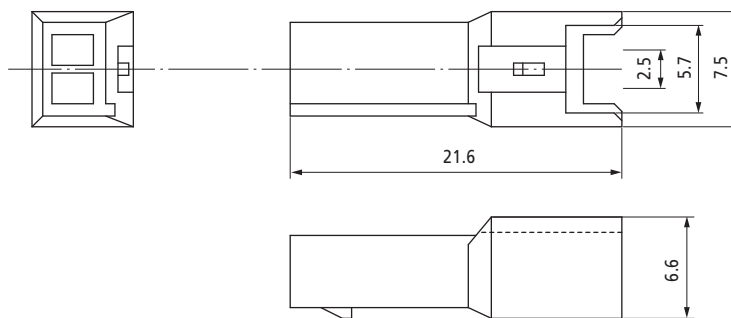
## Lower portion of LP-RTX3 dimensions

Note: Recommended diameter hole size for seatstay bridge is  $\phi 6 \pm 0.1$ .

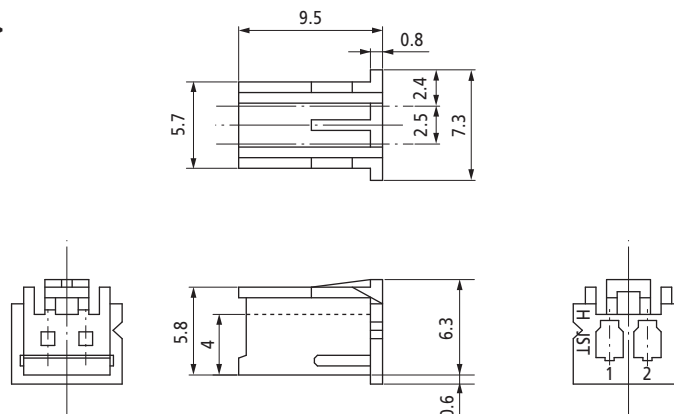


## The outside dimension of Model: EW-NX60 terminal

< Female terminal >



< Male terminal >



### ■ The outside dimension of Model: LP-FTX3

