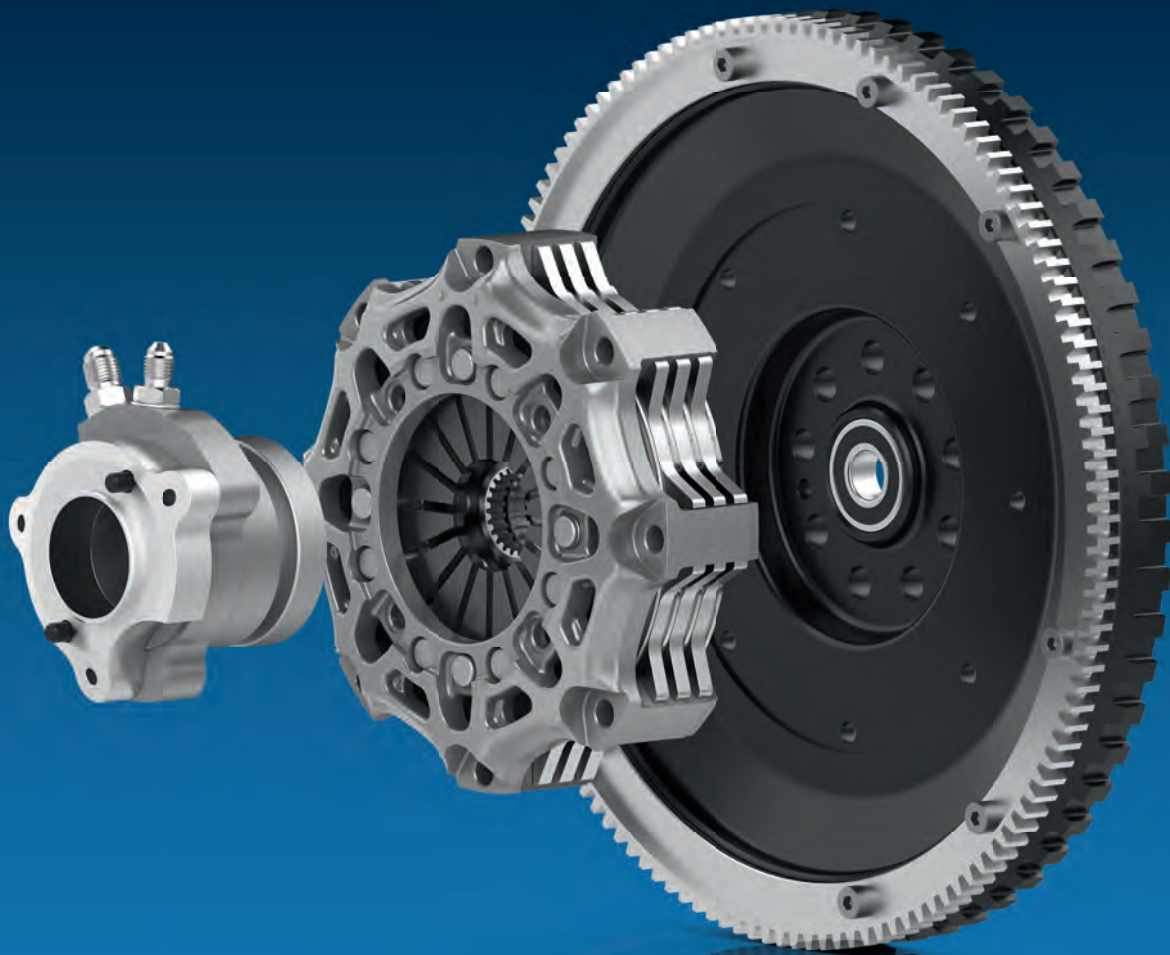


# Racing Clutch System (RCS)

ZF Race Engineering Product Range  
Version 01 | Valid from 04.2021



**ZF**  
*motorsport*



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# 03

## RCS Templates and Extensions

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**motorsport**

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A close-up, high-angle shot of a driver's eye, looking intensely forward. The eye is blue and framed by the dark interior of a racing helmet. The background is blurred, showing parts of the car's interior and a steering wheel with a blue and white logo.

**01**

**RCS – the technology  
for motorsports**



The engineers of ZF Race Engineering have been technical partners of several Formula 1 teams for years now. Their expertise is directly available in the ZF Racing Clutch System, which can be individually configured for all racing series.



Standard clutches have limited suitability for racing. Comfort is one of the main focuses of development work on standard clutches. As a result, these clutches tend to be relatively large and heavy.

Completely different requirements are placed on clutches used for racing. Here the focus is on reducing the weight and moment of inertia (Mol), in order to enable maximum engine acceleration as well as minimum shift duration. Both the weight and the Mol can be significantly reduced by decreasing the clutch diameter and by using special materials.

The clutch principle is based on friction – and friction generates heat. Larger clutches have the advantage of being able to absorb considerably more heat. Smaller clutches run a corresponding risk of overheating. For this reason, they feature friction linings made of sintered or carbon materials, which are more temperature-resistant than organic linings on standard clutches.

Sintered linings are twice as temperature-resistant as conventional organic linings, while carbon is as much as five to six times more resistant. Used in Formula One clutches, carbon has a very low weight in addition to its extremely high thermal resistance.



# Standard and racing clutch comparison

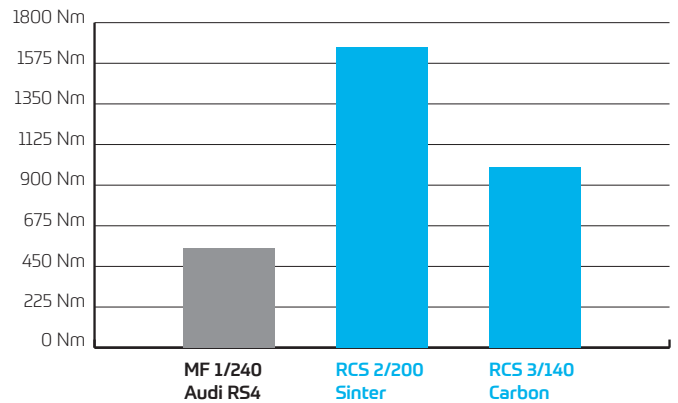
The following example shows the influence of clutch diameter on certain parameters. It compares a standard MF 1/240 (Audi RS4) clutch with a RCS 2/200 sinter pad and a RCS 3/140 carbon clutch.

The RCS 2/200 sinter clutch already shows considerable advantages over the standard MF 1/240 ①. It has 40 % less weight ②, and the MOI is 50 % lower ③.

The RCS 3/140 carbon clutch is around 70 % lighter ② and its MOI is approx. 90 % lower ③ than the standard unit. This illustrates the major role the clutch diameter plays in reducing weight when a racing clutch is used instead of a standard clutch.

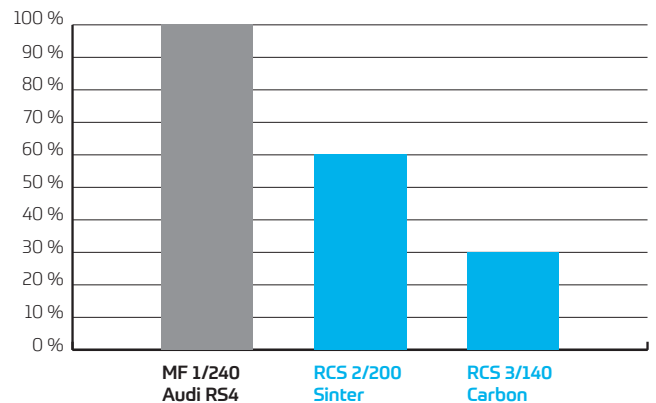
①

Racing clutches transmit higher levels of engine torque



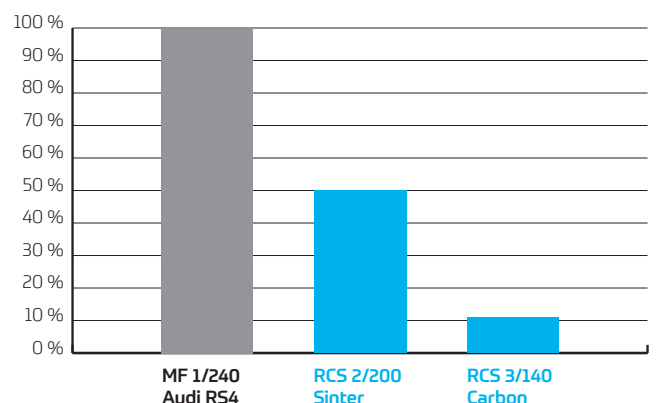
②

Racing clutches are considerably lighter than standard clutches



③

Racing clutches have significantly less moment of inertia than standard clutches



# Conversion of clutch weight into simulated vehicle weight ( $m_{sim}$ )

At first glance, one might think that the mass of a clutch (5-10 kg) is negligible in comparison to the mass of the vehicle to be accelerated (ca. 1000 kg). What is often overlooked here, however, is the reduction of transmission.

If the clutch itself has a moment of inertia (MOI) of  $0.061 \text{ kgm}^2$ , the MOI on the drive wheel will be 180 times higher (in first gear) for a reduction in transmission of 13.4:1 (13.42). If we convert this value into simulated vehicle mass ( $m_{sim}$ ), we arrive around 145 kg of additional weight to be accelerated in first gear. This inertia effect declines as the gear ratio decreases.

Users should be aware of the following point:

Weight improvements of the crankshaft, which reduces the moment of inertia will considerably increase vehicle acceleration performance in the lower gears.

The chart 4 clearly shows that a RCS 2/200 sinter clutch offers a weight advantage of more than 70 kg compared to a standard clutch (MF 1/240). A RCS 3/140 carbon clutch saves a full 130 kg.

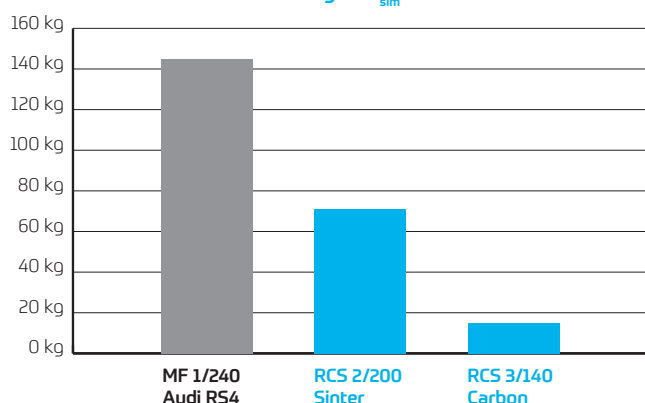
$$m_{sim} = \frac{J \times t^2}{r^2}$$

$m_{sim}$  = simulated vehicle mass [kg]  
 $J$  = moment of inertia [ $\text{kgm}^2$ ]  
 $t$  = reduction of transmission in gear tested [-]  
 $r$  = wheel radius [m]  
 $m_c$  = mass of clutch [kg]

	MF 1/240 Standard	RCS 2/200 Sinter	RCS 3/140 Carbon
$m_c$ =	7.34 kg	4.6 kg	1.98 kg
$J$ =	0.061 $\text{kgm}^2$	0.0304 $\text{kgm}^2$	0.0066 $\text{kgm}^2$
$t$ =	13.4:1	13.4:1	13.4:1
$r$ =	0.275 m	0.275 m	0.275 m
$m_{sim}$ =	<b>145 kg</b>	<b>71 kg</b>	<b>15 kg</b>

4

Clutch weight converted into simulated vehicle weight  $m_{sim}$



# Advantages of a ZF RCS clutch

With its modular Racing Clutch System, ZF Race Engineering offers a high degree of variability for racing clutches. The system can be configured to provide individual solutions for specific vehicles and tracks. Our clutches are developed for virtually all racing applications. Their low weight and moment of inertia are among the most important parameters for racing. ZF Race Engineering guarantees rapid availability and unproblematic exchange of individual components.

RCS clutches have not been developed for specific vehicles, but can be used in virtually all cars. However, adjustments have to be made, such as to the geometry of the flywheel, position of the releaser and the limitation of the clutch release travel.

To compile the right clutch a number of different parameters need to be considered. The most important factor is the application, because this determines the requirements that are placed on the clutch. Closely related factors include the type of vehicle, the engine torque, and the installation space. We provide individual solutions on the basis of these key features. The RCS range comprises 4 different clutch diameters: 115 mm, 140 mm, 184 mm, and 200 mm. Friction linings come in carbon, sintered, and organic materials. Another option is the number of friction discs. ZF RCS offers 1, 2, 3, or 4-disc clutches. The clutch clamping force should also be considered. Moreover, individual components can be produced in different materials. The following pages contain more detailed explanations of individual clutch parameters.





## Racing Clutch System

Four different diameters



Single or up to 4 discs and different friction linings



Necessary or optional components for adjusting the clutch actuation



Stud bolts, adapter plates for or whole flywheels



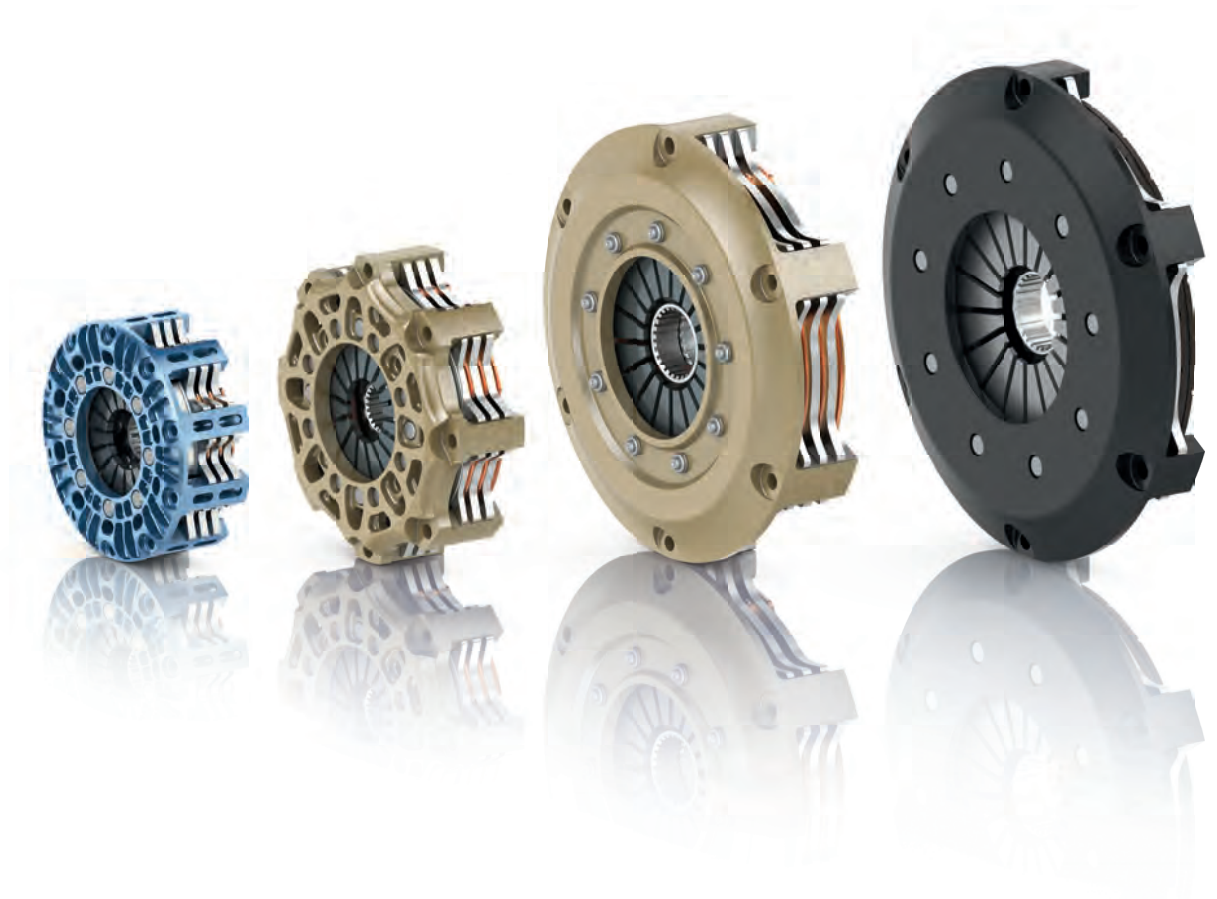
# Clutch diameter

Four clutch diameters (outer disc diameter) are available

- **115 mm (4.5")** => **RCS 115**
- **140 mm (5.5")** => **RCS 140**
- **184 mm (7.25")** => **RCS 184**
- **200 mm (7.875")** => **RCS 200**

The greater the clutch diameter, the more torque can be transmitted by the clutch. The smaller the clutch diameter, the less mass and inertia. This means that low inertia (low mass) allows the engine to accelerate quickly.

Larger clutches can accommodate much more heat and remain completely efficient, when smaller clutches may well overheat.



# Friction materials

**Carbon** is the high-tech material from Formula 1. It is very temperature resistant and very light. This friction material is often used under very severe conditions and provides the possibility of compact light-weight clutches.

**Advantages:**

Very light, extremely temperature resistant, good startline behavior, no flywheel wear, high durability, low mass and inertia

**Sinter**, due to its very light driven plates, is often used in applications such as circuit/track racing, formula series vehicles and touring vehicles.

**Advantages:**

Light, high temperature resistance, small clutch height, low mass and inertia

**Organic** is a soft friction lining and therefore gearbox protective but not very temperature resistant. This type of material is not used in extreme race conditions.

**Advantages:**

Easy on the transmission, soft clutch engagement low wear on the flywheel friction surface





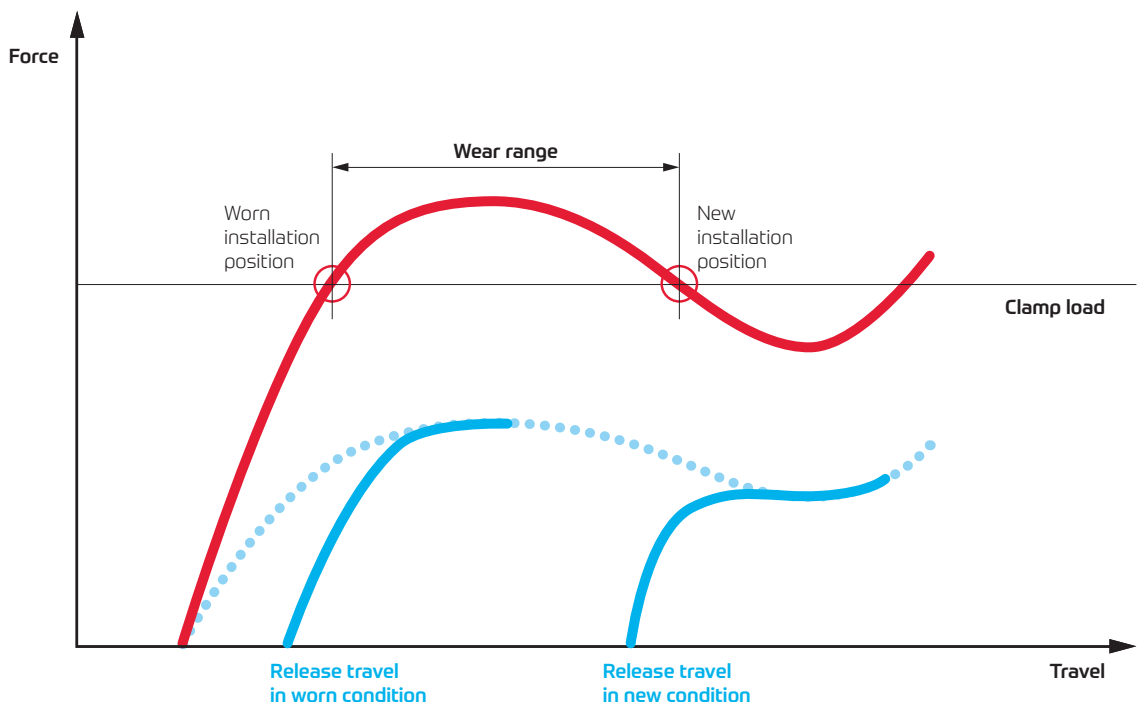
# Wear range and clamp load

## Clamp load

An engaged clutch creates the clamp load by using a diaphragm spring. The stronger the spring, the more engine torque can be transmitted by the clutch. To operate the clutch the release load must be applied by the driver. The higher the release load, the more difficult it is to operate the clutch.

## Wear range

The wear range covers the wear of the clutch discs. Each clutch is designed for a certain wear range within which the engine torque is transmitted safely. Should the clutch plate(s) be used for a period beyond the prescribed wear range, the torque capacity will decrease and the clutch will begin to slip.

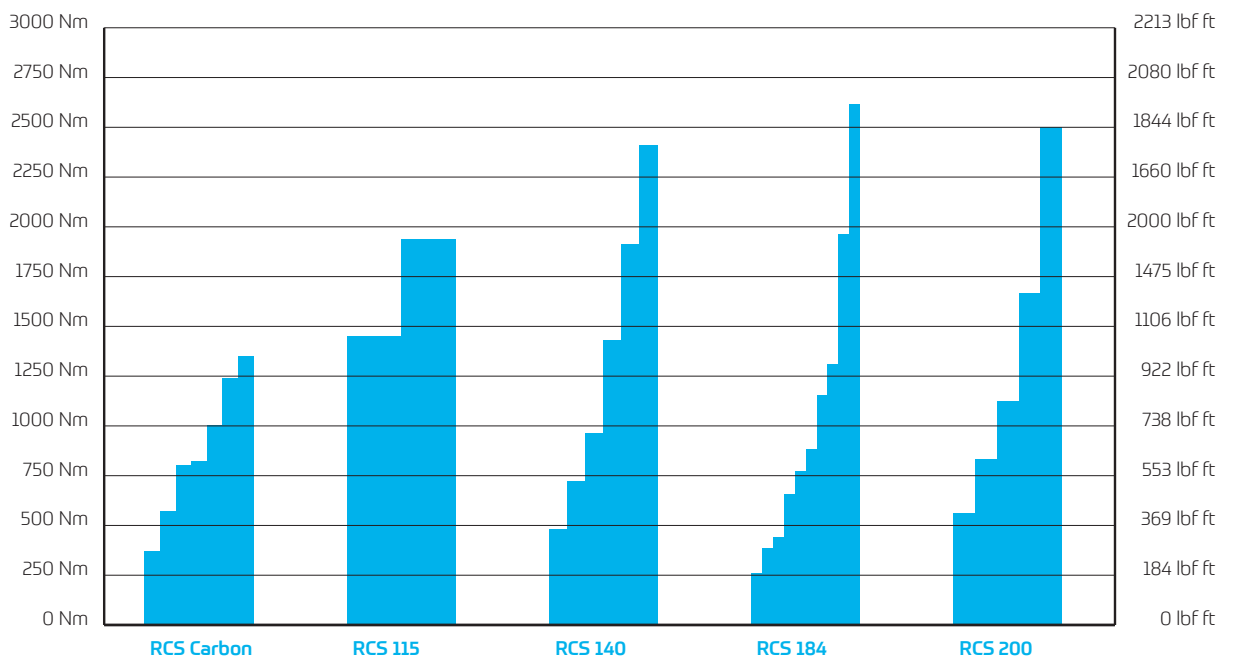


# Torque of all RCS clutches

Torque handling capability is dependent upon: friction lining, diameter of the clutch, number of friction discs (clutch plates), clamp load and the wear range.

In the diagram all RCS clutches are listed and sorted according to clutch designation and torque.

## Maximum transmittable torque of all RCS clutches



# General information

## RCS 115, 140, 184, 200

For these clutches all components are listed separately in chapter two of this catalogue. For a single plate clutch the housing, pressure plate and driven disc must be ordered individually. For a multi-plate clutch additional intermediate plates and driven discs must be ordered.

In addition, it is necessary to specify the required spline of the gearbox input shaft. The various driven discs with its spline sizes are listed in each category.

### Selection criteria ①

Select your clutch based on the torque and its dimensions. An overview of the maximum transmittable torque of all RCS clutches can be seen in the chart on page V10.

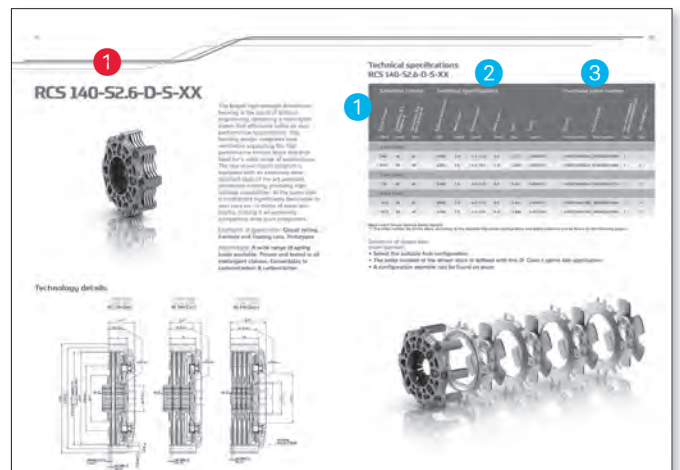
### Technical specifications ②

For each clutch the following specific technical data is given in the chart on page V10:

- Mass
- Inertia
- Maximum wear range
- Release travel and wear travel of the releaser

### Information needed for ordering ③

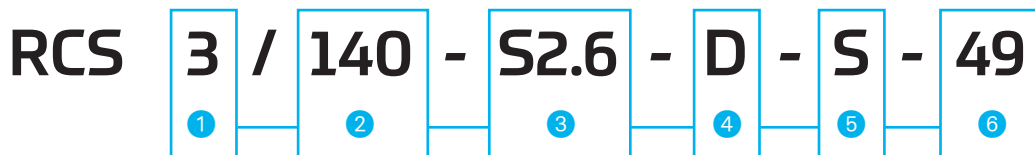
To select the required clutch, the selection criteria with the respective order numbers are listed on the product pages.





# RCS clutch coding

## Part description guide - Clutches | Example



## Part description guide - Discs | Example



① Number of discs: 1 | 2 | 3 | 4

② Friction disc diameter: 115 | 140 | 184 | 200 | ...

③ Facing: S2.6 Sinter Facing 2.6 mm  
S3.4 Sinter Facing 3.4 mm  
S5.2 Sinter Facing 5.2 mm  
S7.8 Sinter Facing 7.8 mm  
O7.8 Organic Facing  
Y Carbon

④ Actuation: D Push Type  
Z Pull Type  
ASC Anti Stall Clutch

⑤ Flywheel type: S Step (internal spigot)  
F Flat (external spigot)  
B Both (step and flat)

⑥ Release contact diameter: 38 | 44 | 49 | ...

⑦ Hub size: L = Long | M = Medium | K = Short | E = Extra

⑧ ZF Code: Spline size

# How to configure and order

**Select your clutch based torque and dimensions. 1**  
An overview of the maximum transmittable torque of all RCS clutches can be seen in the chart on page V10.


For our example we assume you would like to order a RCS 140mm with 2.6mm Sinter Facing, push type clutch » **RCS 140-S2.6-D-XX 2**

Based on the technical specifications and parameters you select the clutch version. Assuming your selection is the 3-Disc-Clutch with 49mm release diameter » **RCS 3/140-S2.6-D-49 3** the first parts of the order list would be:

- 1 x 003072000294    **Housing**
- 1 x 003002001770    **Pressure Plate**
- 2 x 003019000224    **Intermediate Plate**
- 3 x to be selected driven discs » continue to next page

9
10

## RCS 140-S2.6-D-S-XX 2



The forged high-strength Aluminium housing is the result of brilliant engineering, delivering a motorsport clutch that efficiently fulfills all your performance requirements. The housing design integrates heat ventilation supporting the high performance friction stack and thus ideal for a wide range of applications. The star in our clutch program is equipped with an extremely wear resistant state of the art patented aluminium coating, providing high mileage capabilities. At the same time it contributes significantly favourable to your race car, in terms of mass and inertia, making it an extremely competitive drive train component.

Examples of application: Circuit racing, Formula and Touring cars, Prototypes

Advantages: A wide range of spring loads available. Proven and tested in all motorsport classes. Convertable to carbon/carbon & carbon/sinter

### Technical specifications RCS 140-S2.6-D-S-XX 3

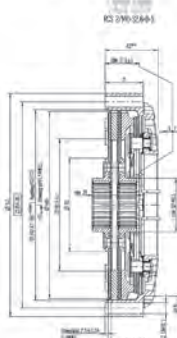
Selection criteria 1			Technical specifications							Purchase order number 3			
Clutch Version	Release Diameter [mm]	Clutch Housing Depth [mm]	Max. Torque [Nm]	Max. Torque [ft-lb]	Max. Torque [kgm]	Max. Torque [kgm]	Max. Torque [kgm]	Max. Torque [kgm]	Max. Torque [kgm]	Part number	Part number	Qty	Unit
90	98	48	850	1.8	4.0 ± 0.5	4.5	-2.72	0.00824		00072000294	003002001770	1	2
160	98	34	450	-1.5	4.8 ± 0.5	5.0	-2.506	0.00201		00072000294	003002001770	1	2
3 Disc-Clutch			240	1.5	4.0 ± 0.5	4.5	-2.88	0.00811		00072000294	003002001770	2	3 3
190	49	46	400	1.5	4.0 ± 0.5	4.5	-3.44	0.01821		00072000294	003002001770	3	4
190	38	38	420	1.5	8.5 ± 0.5	8.5	-3.588	0.01204		00072000294	003002001770	4	4

More clutch torque without extra weight!  
1 The order number for driven disc, according to the required hub spline configuration and spline selection can be found on the following pages

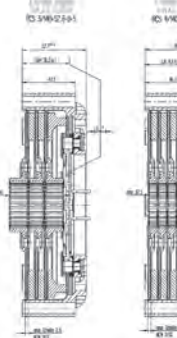
Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on page


### Technology details




IC 21W2241



IC 31W2241



IC 140241



Select your driven discs based on the hub configuration and your necessary ZF Code/spline profile. **4**

For our example we assume you need discs with **ZF Code 038** Spline profile and decided for **M|K|L** Hub configuration **5** » your order list completes with three different driven discs:

- 1 x 881864002396 **RCS 140-S2.6-K-038**
- 1 x 881864002423 **RCS 140-S2.6-M-038**
- 1 x 881864002367 **RCS 140-S2.6-L-038**

**Complete order list for our example  
RCS 3/140-S2.6-D-49 with M|K|L Hub configuration  
and 038 ZF Code/spline profile:**

- 1 x 003072000294 **Housing**
- 1 x 003002001770 **Pressure Plate**
- 2 x 003019000224 **Intermediate Plate**
- 1 x 881864002396 **Driven Disc RCS 140-S2.6-K-038**
- 1 x 881864002423 **Driven Disc RCS 140-S2.6-M-038**
- 1 x 881864002367 **Driven Disc RCS 40-S2.6-L-038**

11
12

### Hub configuration RCS 140-S2.6

**4** 2-Disc Clutch

3-Disc Clutch

4-Disc Clutch

Flywheel-Side

Gearbox-Side

#### Driven disc selection according to hub type RCS 140-S2.6

Disc	Dimensions	Optimum	Hub H	Disc 1°	Disc 2°	Disc 3°	Disc 4°	Disc 5°	Disc 6°	Disc 7°	Disc 8°	Disc 9°	Disc 10°	Disc 11°	Disc 12°	Disc 13°	Disc 14°	Disc 15°	Disc 16°	Disc 17°	Disc 18°	Disc 19°	Disc 20°	Disc 21°	Disc 22°	Disc 23°	Disc 24°	Disc 25°	Disc 26°	Disc 27°	Disc 28°	Disc 29°	Disc 30°	Disc 31°	Disc 32°	Disc 33°	Disc 34°	Disc 35°	Disc 36°	Disc 37°	Disc 38°	Disc 39°	Disc 40°	Disc 41°	Disc 42°	Disc 43°	Disc 44°	Disc 45°	Disc 46°	Disc 47°	Disc 48°	Disc 49°	Disc 50°	Disc 51°	Disc 52°	Disc 53°	Disc 54°	Disc 55°	Disc 56°	Disc 57°	Disc 58°	Disc 59°	Disc 60°	Disc 61°	Disc 62°	Disc 63°	Disc 64°	Disc 65°	Disc 66°	Disc 67°	Disc 68°	Disc 69°	Disc 70°	Disc 71°	Disc 72°	Disc 73°	Disc 74°	Disc 75°	Disc 76°	Disc 77°	Disc 78°	Disc 79°	Disc 80°	Disc 81°	Disc 82°	Disc 83°	Disc 84°	Disc 85°	Disc 86°	Disc 87°	Disc 88°	Disc 89°	Disc 90°	Disc 91°	Disc 92°	Disc 93°	Disc 94°	Disc 95°	Disc 96°	Disc 97°	Disc 98°	Disc 99°	Disc 100°																																																																																																																																																																																																																																																																																																																																																																																																
190	1532 HRC	174 307	19	34.5	35.8	37.8	39.8	41.8	43.8	45.8	47.8	49.8	51.8	53.8	55.8	57.8	59.8	61.8	63.8	65.8	67.8	69.8	71.8	73.8	75.8	77.8	79.8	81.8	83.8	85.8	87.8	89.8	91.8	93.8	95.8	97.8	99.8	101.8	103.8	105.8	107.8	109.8	111.8	113.8	115.8	117.8	119.8	121.8	123.8	125.8	127.8	129.8	131.8	133.8	135.8	137.8	139.8	141.8	143.8	145.8	147.8	149.8	151.8	153.8	155.8	157.8	159.8	161.8	163.8	165.8	167.8	169.8	171.8	173.8	175.8	177.8	179.8	181.8	183.8	185.8	187.8	189.8	191.8	193.8	195.8	197.8	199.8	201.8	203.8	205.8	207.8	209.8	211.8	213.8	215.8	217.8	219.8	221.8	223.8	225.8	227.8	229.8	231.8	233.8	235.8	237.8	239.8	241.8	243.8	245.8	247.8	249.8	251.8	253.8	255.8	257.8	259.8	261.8	263.8	265.8	267.8	269.8	271.8	273.8	275.8	277.8	279.8	281.8	283.8	285.8	287.8	289.8	291.8	293.8	295.8	297.8	299.8	301.8	303.8	305.8	307.8	309.8	311.8	313.8	315.8	317.8	319.8	321.8	323.8	325.8	327.8	329.8	331.8	333.8	335.8	337.8	339.8	341.8	343.8	345.8	347.8	349.8	351.8	353.8	355.8	357.8	359.8	361.8	363.8	365.8	367.8	369.8	371.8	373.8	375.8	377.8	379.8	381.8	383.8	385.8	387.8	389.8	391.8	393.8	395.8	397.8	399.8	401.8	403.8	405.8	407.8	409.8	411.8	413.8	415.8	417.8	419.8	421.8	423.8	425.8	427.8	429.8	431.8	433.8	435.8	437.8	439.8	441.8	443.8	445.8	447.8	449.8	451.8	453.8	455.8	457.8	459.8	461.8	463.8	465.8	467.8	469.8	471.8	473.8	475.8	477.8	479.8	481.8	483.8	485.8	487.8	489.8	491.8	493.8	495.8	497.8	499.8	501.8	503.8	505.8	507.8	509.8	511.8	513.8	515.8	517.8	519.8	521.8	523.8	525.8	527.8	529.8	531.8	533.8	535.8	537.8	539.8	541.8	543.8	545.8	547.8	549.8	551.8	553.8	555.8	557.8	559.8	561.8	563.8	565.8	567.8	569.8	571.8	573.8	575.8	577.8	579.8	581.8	583.8	585.8	587.8	589.8	591.8	593.8	595.8	597.8	599.8	601.8	603.8	605.8	607.8	609.8	611.8	613.8	615.8	617.8	619.8	621.8	623.8	625.8	627.8	629.8	631.8	633.8	635.8	637.8	639.8	641.8	643.8	645.8	647.8	649.8	651.8	653.8	655.8	657.8	659.8	661.8	663.8	665.8	667.8	669.8	671.8	673.8	675.8	677.8	679.8	681.8	683.8	685.8	687.8	689.8	691.8	693.8	695.8	697.8	699.8	701.8	703.8	705.8	707.8	709.8	711.8	713.8	715.8	717.8	719.8	721.8	723.8	725.8	727.8	729.8	731.8	733.8	735.8	737.8	739.8	741.8	743.8	745.8	747.8	749.8	751.8	753.8	755.8	757.8	759.8	761.8	763.8	765.8	767.8	769.8	771.8	773.8	775.8	777.8	779.8	781.8	783.8	785.8	787.8	789.8	791.8	793.8	795.8	797.8	799.8	801.8	803.8	805.8	807.8	809.8	811.8	813.8	815.8	817.8	819.8	821.8	823.8	825.8	827.8	829.8	831.8	833.8	835.8	837.8	839.8	841.8	843.8	845.8	847.8	849.8	851.8	853.8	855.8	857.8	859.8	861.8	863.8	865.8	867.8	869.8	871.8	873.8	875.8	877.8	879.8	881.8	883.8	885.8	887.8	889.8	891.8	893.8	895.8	897.8	899.8	901.8	903.8	905.8	907.8	909.8	911.8	913.8	915.8	917.8	919.8	921.8	923.8	925.8	927.8	929.8	931.8	933.8	935.8	937.8	939.8	941.8	943.8	945.8	947.8	949.8	951.8	953.8	955.8	957.8	959.8	961.8	963.8	965.8	967.8	969.8	971.8	973.8	975.8	977.8	979.8	981.8	983.8	985.8	987.8	989.8	991.8	993.8	995.8	997.8	999.8

**5**

The customer is required to check the chosen configuration and that it can be assembled cost free.

1.83 and 1.84 series driven discs are not compatible to be used as the first disc on the gearbox / Input/output shaft with a release pressure of 20 Nm or 44 Nm respectively.

# 02

## RCS – Product Range



All RCS clutches are pictured on the following pages.

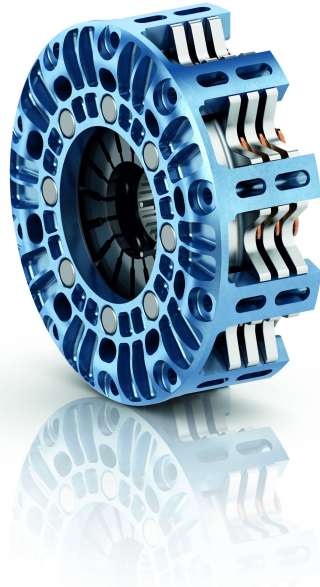
The first one of the two tables gives the technical data, in the second one you find the corresponding order numbers.

The clutches are according to torque, number of driven plates and the type of material used.





# RCS 115-S2.6-D-S-XX



This highly sophisticated clutch is the perfect blend of durability and performance. Designed for high-end applications it stands out with a remarkably low mass and an astonishingly favourable inertia. This makes it an excellent feature in your drivetrain in regards to acceleration and elasticity. The well elaborated high strength steel housing is the ideal containment for the impressive steel sinter friction stack. And by the way, size wise this is the closest you will get to a Formula 1 clutch.

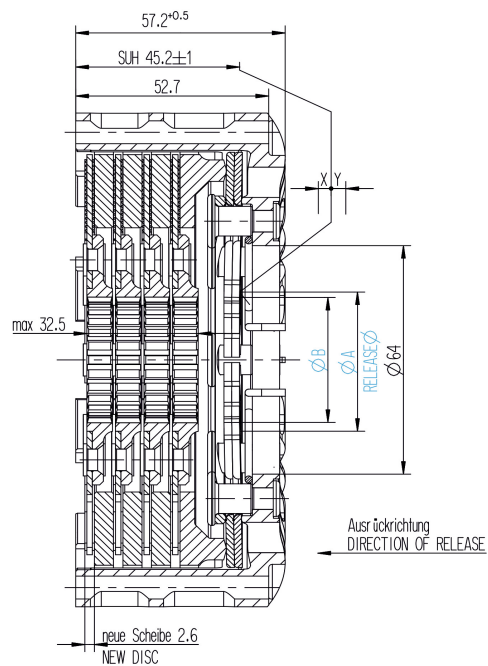
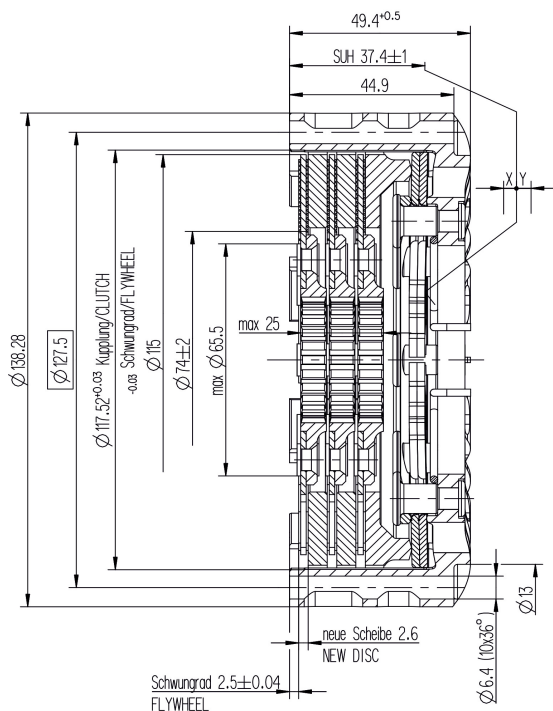
**Examples of application:** Circuit racing and formula cars, prototypes.

**Advantages:** Formula 1 style clutch with impressive torque capacity, incredibly low inertia

## Technology details

3-Scheiben Kupplung  
3-PLATE CLUTCH  
RCS 3/115-S2.6-D-S

4-Scheiben Kupplung  
4-PLATE CLUTCH  
RCS 4/115-S2.6-D-S



## Technical specifications RCS 115-S2.6-D-S-XX

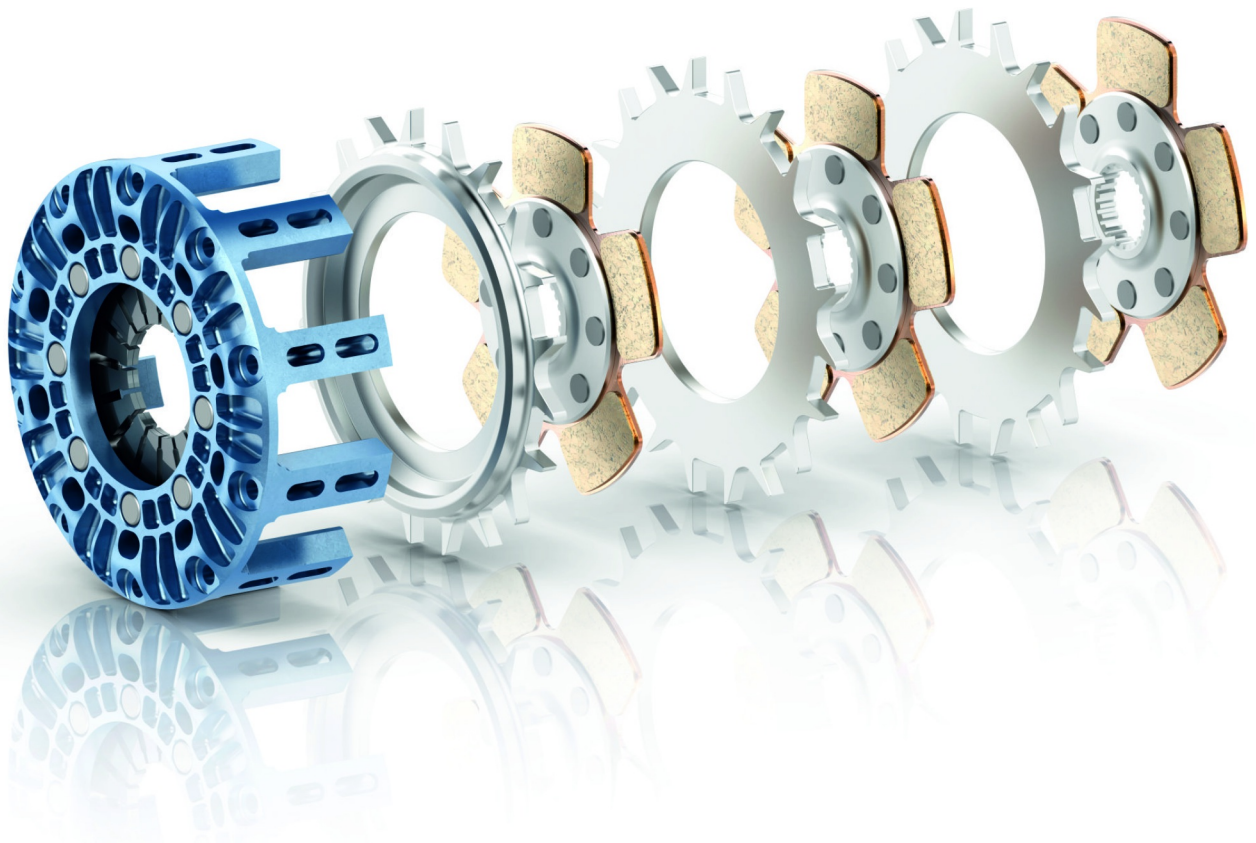
Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000479	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
<b>3-Disc Clutch</b>												
1450	38	35	5500	1.0	3.5 +0.5	4.0	2.7	0.006578	003072000369	003002002722	2	3
<b>4-Disc Clutch</b>												
1935	38	35	5500	1.0	3.5 +0.5	4.0	3.405	0.008475	003072000370	003002002722	3	4

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

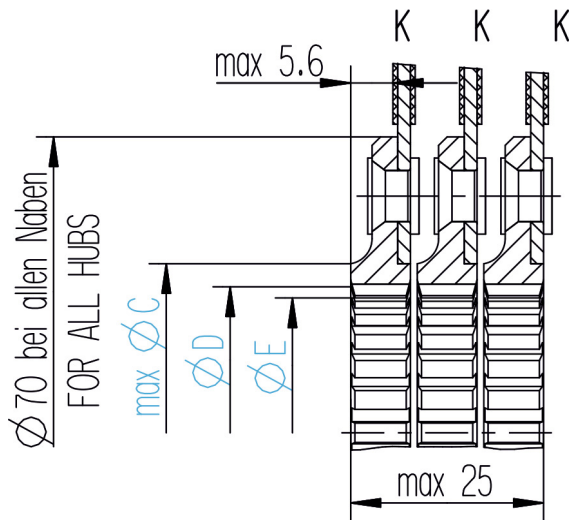
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14

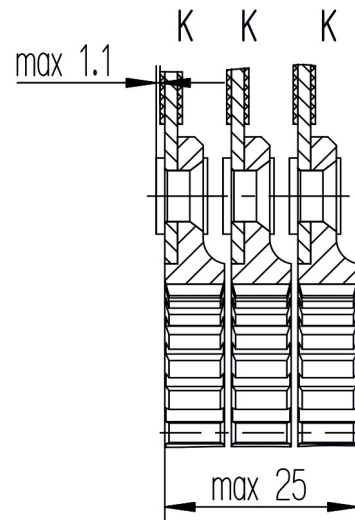


# Hub configuration RCS 115-2.6

## 3-Disc Clutch

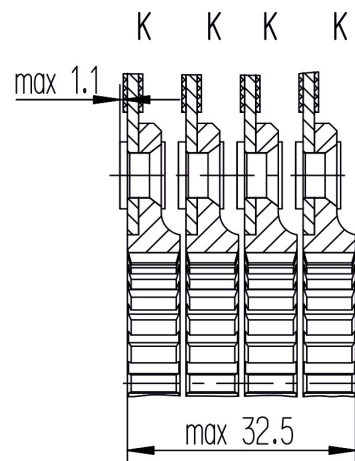
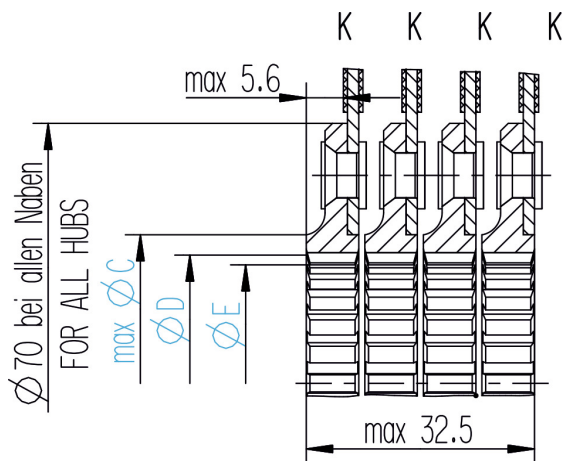


Flywheel  
Side



Gearbox  
Side

## 4-Disc Clutch



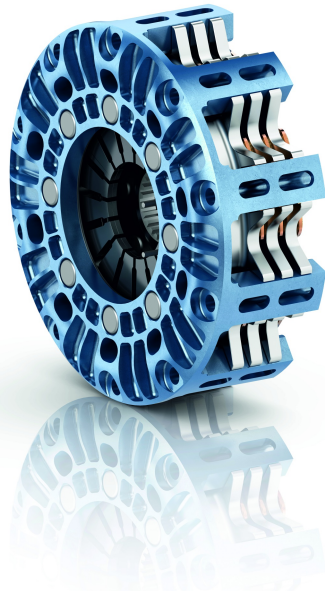
## Driven disc selection according to hub type RCS 115-2.6



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	K
002	1 SAE 10C	1" x 10T	10	30.50	20.60	25.80	881864001418
003	1 1/8 SAE 10C	1.12" x 10T	10	34.50	23.40	28.90	881864001419
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002447
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864001420
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864001437
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864001421
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864001422
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001423
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864001424
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002448
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864001425
076	24/48-22-30°		22	30.5	22.225	25.189	881864001435
081	20x18°		18	26.5	18.0	20.0	881864001340
091	24/48-23-30°		23	32.5	23.28	26.25	881864001426
092	23 x 3.14		23	30.5	21.8	24.2	881864001427
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864001428
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864001341
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002449
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864001342
802	25,2-1-30-24		24	32.5	22.6	25.2	881864001343
804	26x3.93		26	40.5	32.6	35.2	881864001344
808	24-48-25-30°		25	36.5	25.4	28.5	881864002450
812	24/48-28-30°		28	34.5	28.1	30.5	881864001345
820	22x3.93		22	34.5	26.5	29.0	881864001346
823	24/48-26-30°		26	34.5	23.83	28.68	881864002451
906	24/48-25-30°		25	34.5	24.87	28.04	881864001347
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864001429
924	18.65 x 15.7		14	28.5	15.7	18.65	881864001430
926	20/40-21-30°		21	34.5	25.4	28.5	881864001431
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864001432
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	R88186499Q105
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864001436
938	28 x 2.36		28	28.5	20.3	22.1	881864001433
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864001348
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864001434

The customer is required to check the chosen configuration and that it can be assembled clash free.

# RCS 115-S3.4-D-S-XX



This highly sophisticated clutch is the perfect blend of durability and performance. Designed for high-end applications it stands out with a remarkably low mass and an astonishingly favourable inertia. This makes it an excellent feature in your drivetrain in regards to acceleration and elasticity. The well elaborated high strength steel housing is the ideal containment for the impressive steel sinter friction stack. And by the way, size wise this is the closest you will get to a Formula 1 clutch.

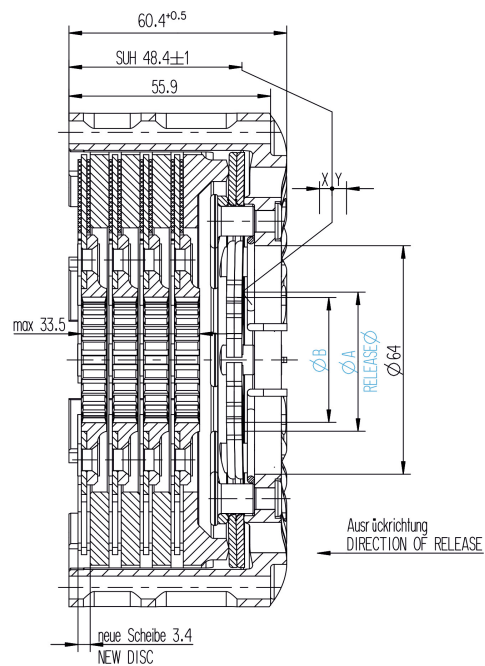
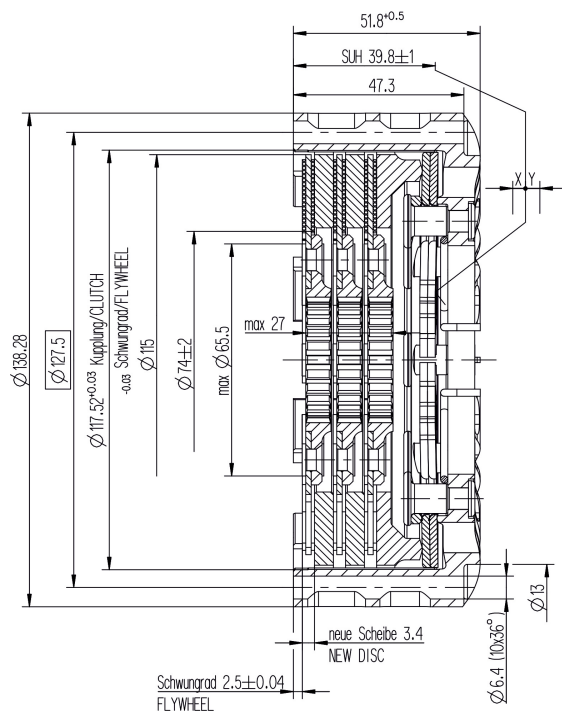
**Examples of application:** Circuit racing and formula cars, prototypes

**Advantages:** Formula 1 style clutch with impressive torque capacity, incredibly low inertia

## Technology details

3-Scheiben Kupplung  
3-PLATE CLUTCH  
RCS 3/115-S3.4-D-S

4-Scheiben Kupplung  
4-PLATE CLUTCH  
RCS 4/115-S3.4-D-S





## Technical specifications RCS 115-S3.4-D-S-XX

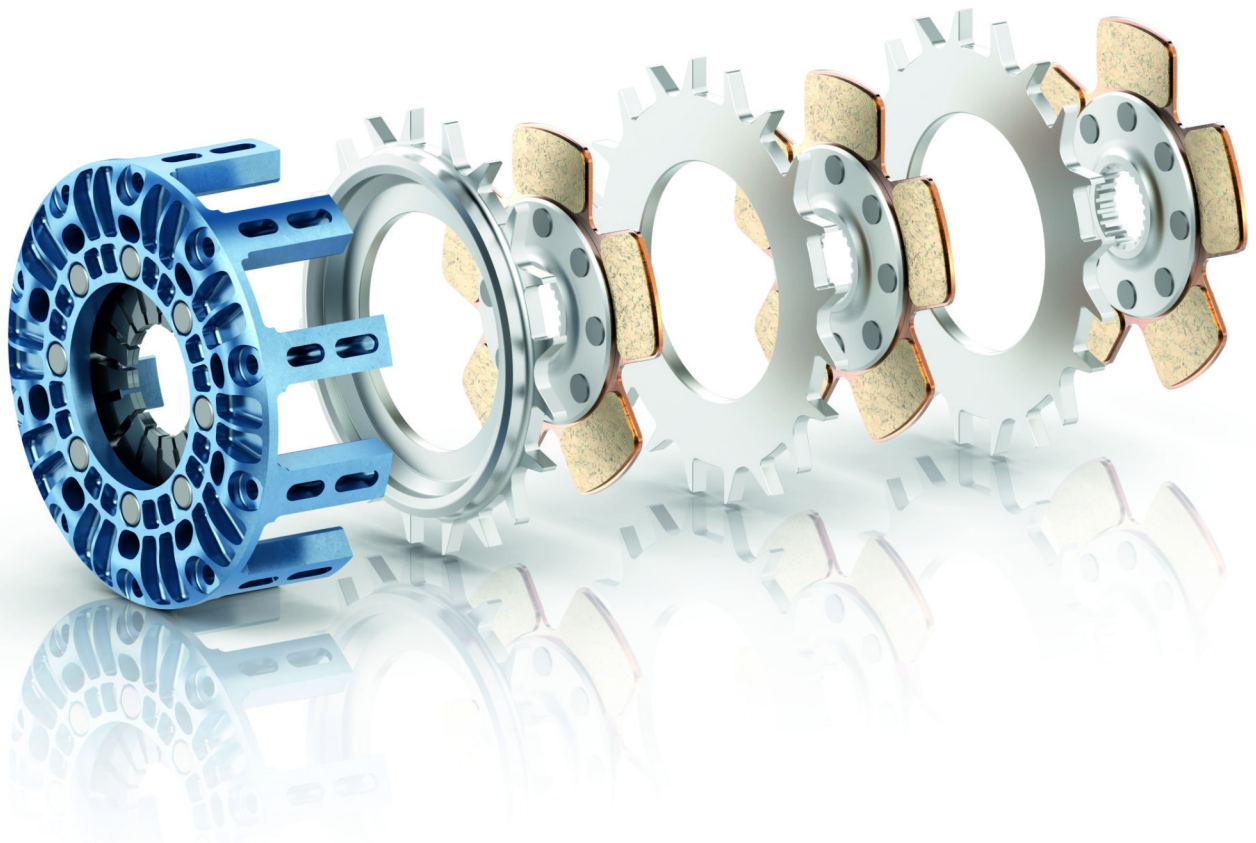
Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000479	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
<b>3-Disc Clutch</b>												
1450	38	35	5500	1.0	3.5 +0.5	4.0	2.813	0.006946	003072000324	003002002722	2	3
<b>4-Disc Clutch</b>												
1935	38	35	5500	1.0	3.5 +0.5	4.0	3.56	0.008995	003072000371	003002002722	3	4

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

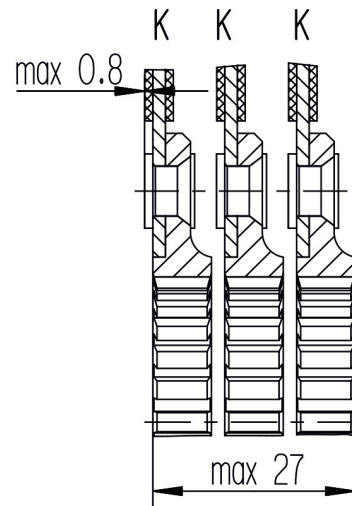
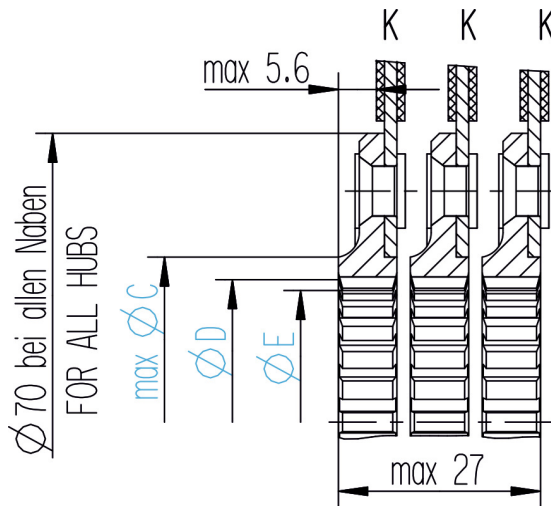
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14



# Hub configuration RCS 115-3.4

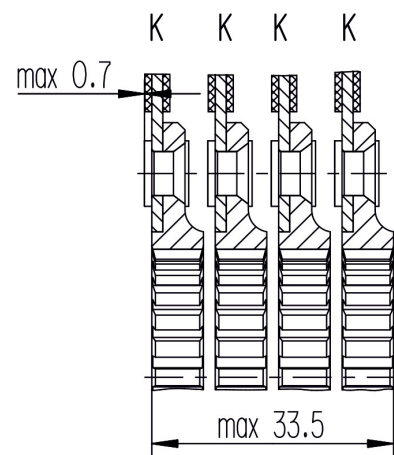
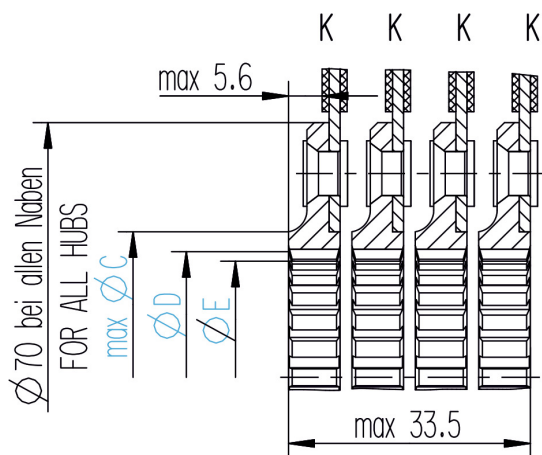
## 3-Disc Clutch



Flywheel Side

Gearbox Side

## 4-Disc Clutch





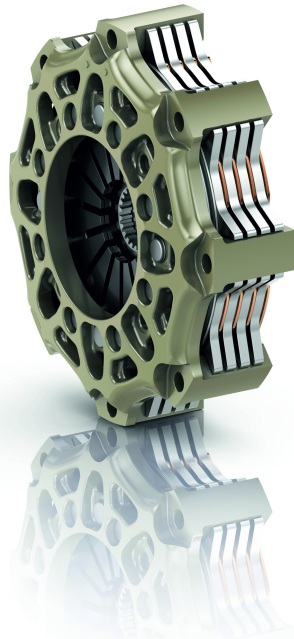
## Driven disc selection according to hub type RCS 115-3.4



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	K
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002454
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002455
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002456
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002457
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002458
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002459
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864002460
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864002461
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002462
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002463
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864002464
076	24/48-22-30°		22	30.5	22.225	25.189	881864002465
081	20x18°		18	26.5	18.0	20.0	881864002466
091	24/48-23-30°		23	32.5	23.28	26.25	881864002467
092	23 x 3.14		23	30.5	21.8	24.2	881864002468
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002469
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002470
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002471
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002472
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002473
804	26x3.93		26	40.5	32.6	35.2	881864002474
808	24-48-25-30°		25	36.5	25.4	28.5	881864002475
812	24/48-28-30°		28	34.5	28.1	30.5	881864002476
820	22x3.93		22	34.5	26.5	29.0	881864002477
823	24/48-26-30°		26	34.5	23.83	28.68	881864002478
906	24/48-25-30°		25	34.5	24.87	28.04	881864002479
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002480
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002481
926	20/40-21-30°		21	34.5	25.4	28.5	881864002482
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002483
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864002484
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002485
938	28 x 2.36		28	28.5	20.3	22.1	883082002486
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002487
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002488

The customer is required to check the chosen configuration and that it can be assembled clash free.

# RCS 140-S2.6-D-S-XX



The forged high-strength aluminium housing is the result of brilliant engineering, delivering a motorsport clutch that efficiently fulfils all your performance requirements. The housing design integrates heat ventilation supporting the high performance friction stack and thus ideal for a wide range of applications. The star in our clutch program is equipped with an extremely wear resistant state of the art patented aluminium coating, providing high mileage capabilities. At the same time it contributes significantly favourable to your race car, in terms of mass and inertia, making it an extremely competitive drivetrain component.

**Examples of application:** Circuit racing, formula and touring cars, prototypes

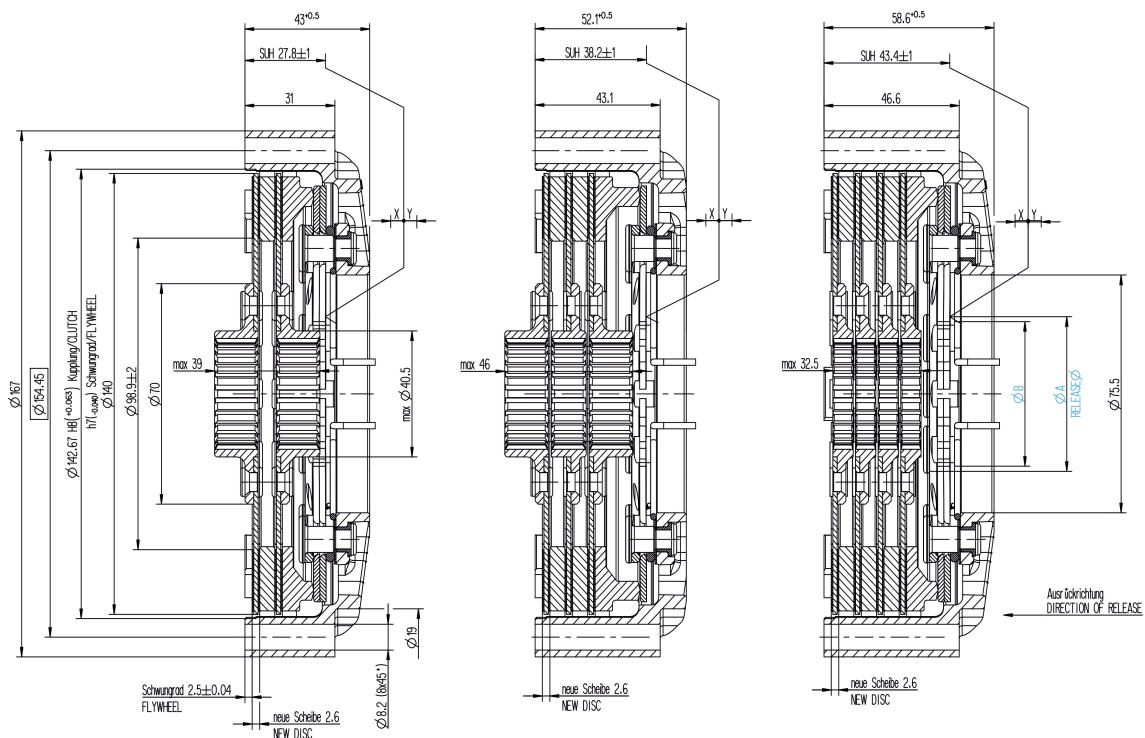
**Advantages:** A wide range of spring loads available. Proven and tested in all motorsport classes. Convertible to carbon/carbon and carbon/sinter.

## Technology details

2-Scheiben Kupplung  
2-PLATE CLUTCH  
RCS 2/140-S2.6-D-S

3-Scheiben Kupplung  
3-PLATE CLUTCH  
RCS 3/140-S2.6-D-S

4-Scheiben Kupplung  
4-PLATE CLUTCH  
RCS 4/140-S2.6-D-S



## Technical specifications RCS 140-S2.6-D-S-XX

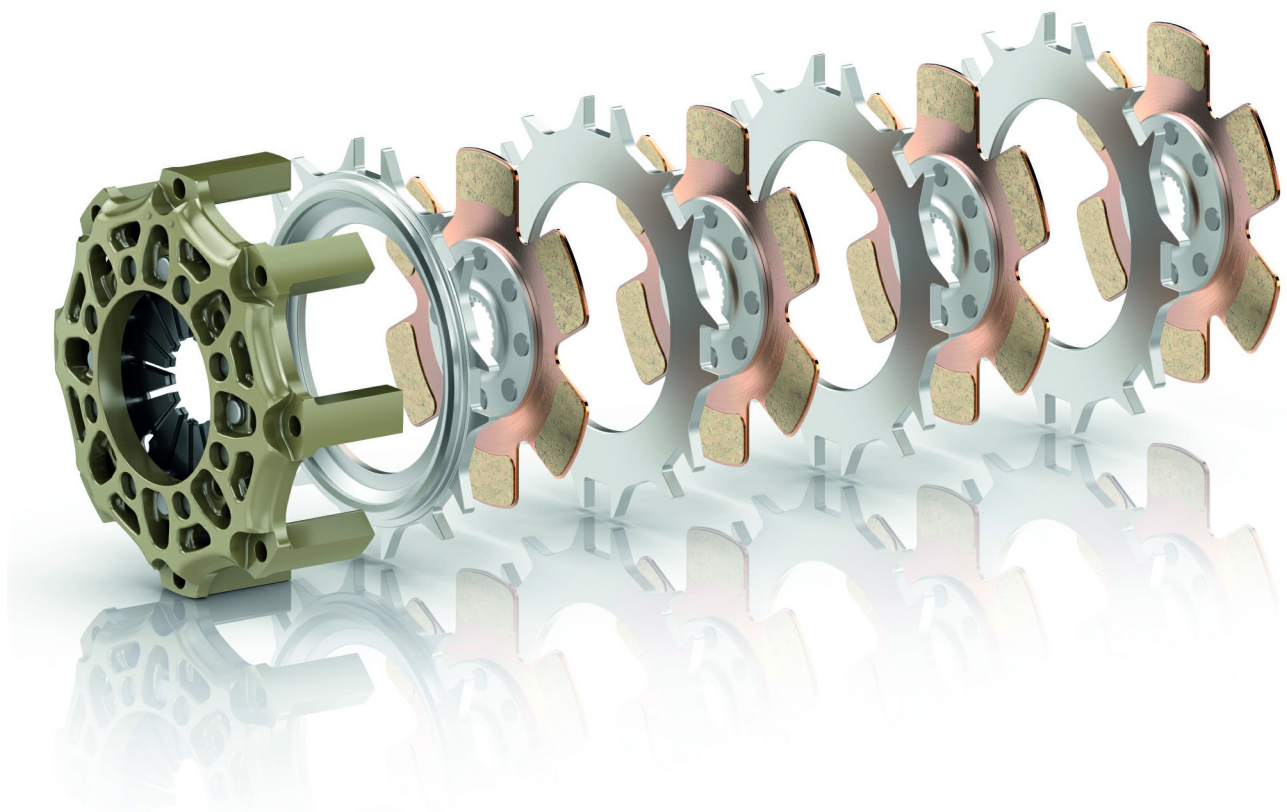
Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing$ A Release $\varnothing$	Dimension $\varnothing$ B Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 00301900024	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
<b>2-Disc Clutch</b>												
960	49	46	4900	1.5	4.0 +0.5	4.5	2.272	0.006920	003072000289	003002001469	1	2
960	38	34	4200	1.5	4.5 +0.5	5.0	2.305	0.007051	003072000296	003002001469	1	2
<b>3-Disc Clutch</b>												
720	49	46	2450	1.5	4.0 +0.5	4.5	2.85	0.009151	003072000294	003002001770	2	3
<b>4-Disc Clutch</b>												
1910	49	46	4900	1.5	4.0 +0.5	4.5	3.44	0.010921	003072000166	003002001469	3	4
1910	38	34	4200	1.5	4.5 +0.5	5.0	3.538	0.011204	003072000149	003002001469	3	4

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

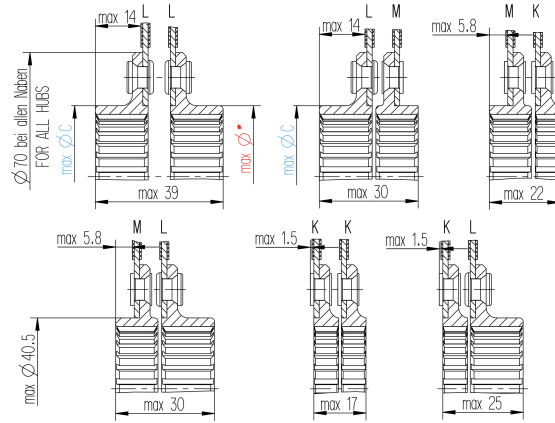
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14

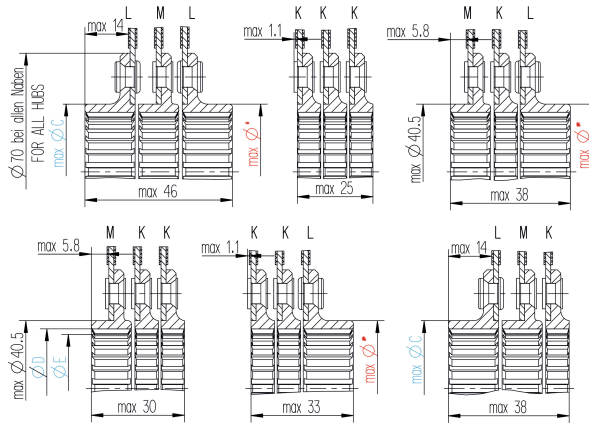


# Hub configuration RCS 140-S2.6

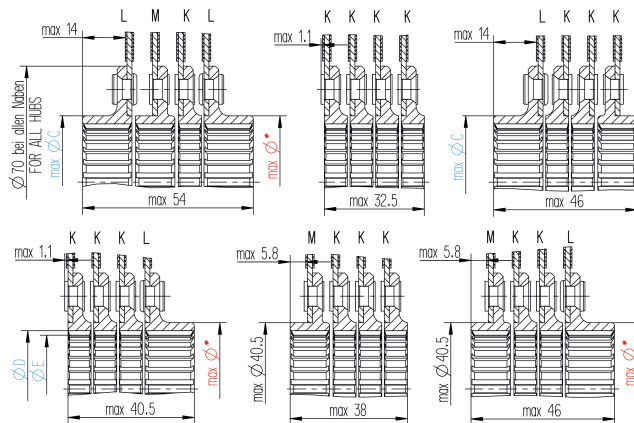
## 2-Disc Clutch



## 3-Disc Clutch



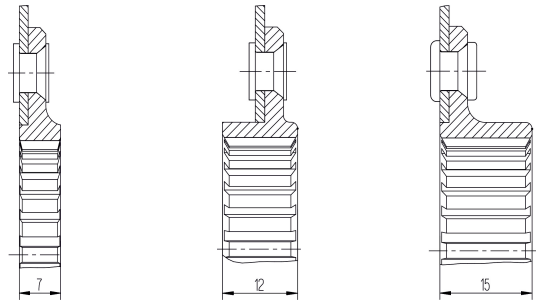
## 4-Disc Clutch



Flywheel Side

Gearbox Side

## Driven disc selection according to hub type RCS 140-S2.6



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	K	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002148	881864002152	881864002169
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002149	881864002153	881864002170
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002394	881864002421	881864002508
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002150	881864002154	881864002171
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002151	881864002155	881864002174
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002395	881864002422	881864002366
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864002396	881864002423	881864002367
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001777	881864001782	881864002368
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002397	881864001826	881864002369
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002398	881864002424	881864002370
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864002399	881864002425	881864002371
076	24/48-22-30°		22	30.5	22.225	25.189	881864002400	881864002426	881864002372
081	20x18°		18	26.5	18.0	20.0	881864002401	881864002427	881864002373
091	24/48-23-30°		23	32.5	23.28	26.25	881864001774	881864001779	881864002172
092	23 x 3.14		23	30.5	21.8	24.2	881864002402	881864002428	881864002374
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002403	881864002429	881864002375
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002404	881864002430	881864002376
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002405	881864002431	881864002377
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002406	881864002432	881864002378
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002407	881864002433	881864002379
804	26x3.93		26	40.5	32.6	35.2	881864002408	881864002434	881864002380
808	24-48-25-30°		25	36.5	25.4	28.5	881864002409	881864002435	881864002381
812	24/48-28-30°		28	34.5	28.1	30.5	881864002410	881864002436	881864002382
820	22x3.93		22	34.5	26.5	29.0	881864002411	881864002437	881864002383
823	24/48-26-30°		26	34.5	23.83	28.68	881864002412	881864002438	881864002384
906	24/48-25-30°		25	34.5	24.87	28.04	881864001776	881864001781	881864002385
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002413	881864002439	881864002386
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002414	881864002440	881864002387
926	20/40-21-30°		21	34.5	25.4	28.5	881864002415	881864002441	881864002388
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002416	881864002442	881864002389
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864001775	881864001780	881864002173
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002417	881864002443	881864002390
938	28 x 2.36		28	28.5	20.3	22.1	881864002418	881864002444	881864002391
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002419	881864002445	881864002392
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002420	881864002446	881864002393

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.







## Technical specifications RCS 140-S2.6-D-F-XX

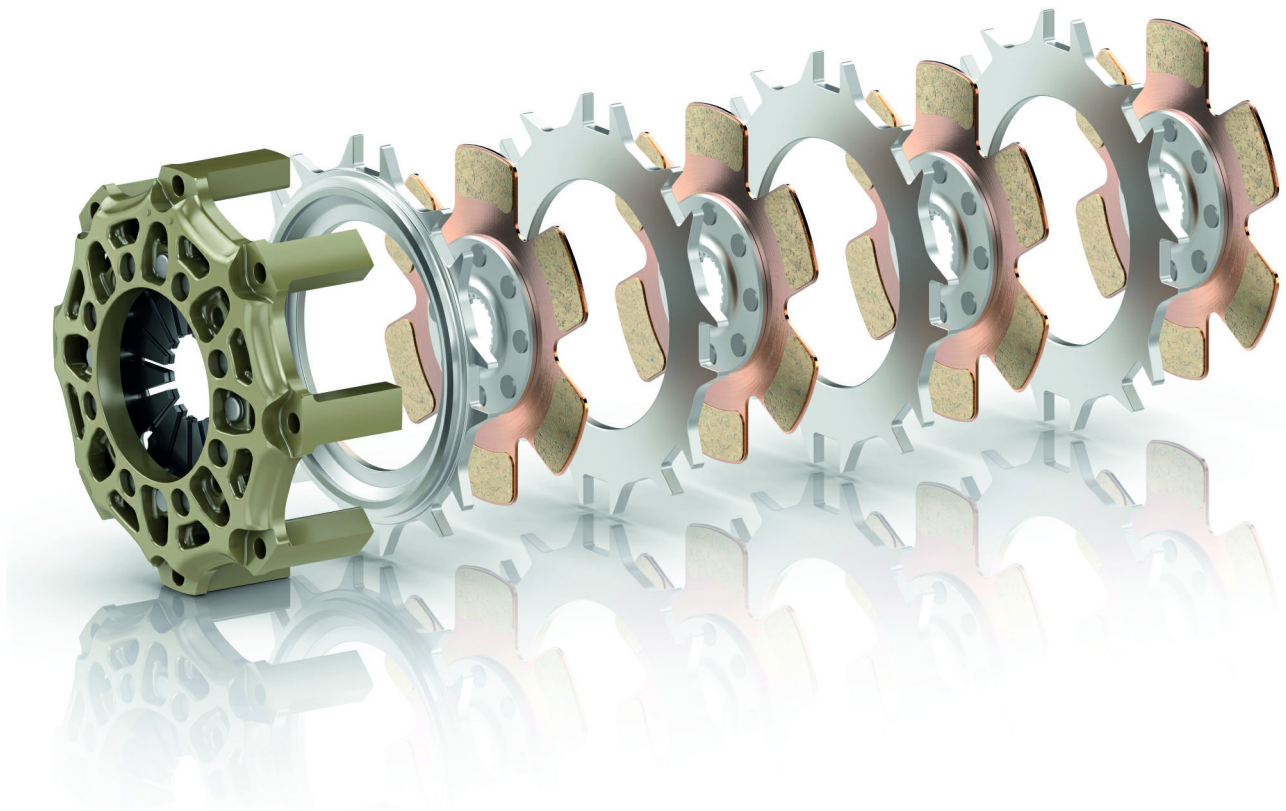
Selection criteria			Technical specifications							Purchase order number			
Clutch torque	Dimension $\varnothing$ A Release $\varnothing$	Dimension $\varnothing$ B Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000224	Qty driven disc*	
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty	
4-Disc Clutch													
1910	49	46	4900	1.5	4.0 +0.5	4.5	3.516	0.011207	003072000299	003002001470	3	4	
1910	38	34	4200	1.5	4.5 +0.5	5.0	3.586	0.011214	003072000306	003002001470	3	4	

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14

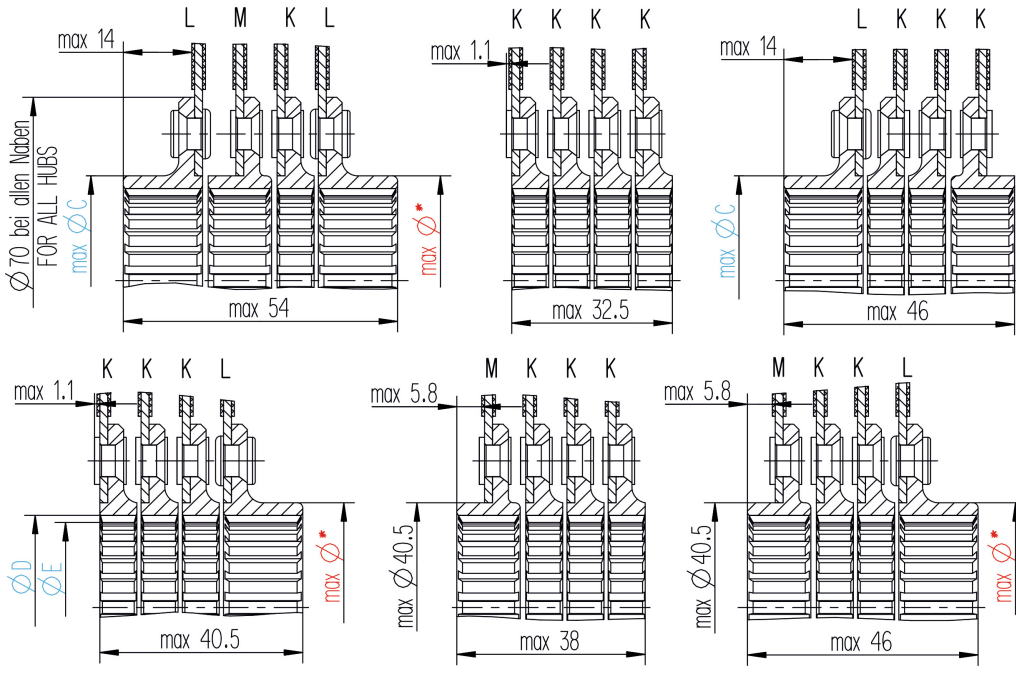


# Hub configuration RCS 140-S2.6

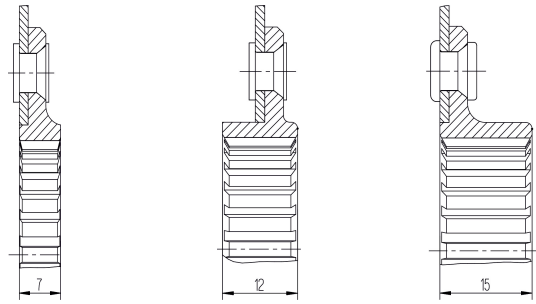
## 4-Disc Clutch

Flywheel Side

Gearbox Side



## Driven disc selection according to hub type RCS 140-S2.6

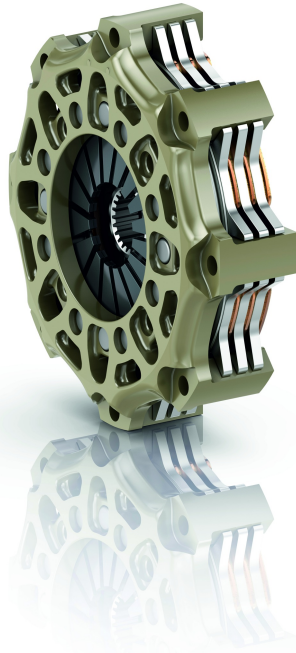


ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	K	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002148	881864002152	881864002169
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002149	881864002153	881864002170
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002394	881864002421	881864002508
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002150	881864002154	881864002171
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002151	881864002155	881864002174
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002395	881864002422	881864002366
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864002396	881864002423	881864002367
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001777	881864001782	881864002368
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002397	881864001826	881864002369
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002398	881864002424	881864002370
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864002399	881864002425	881864002371
076	24/48-22-30°		22	30.5	22.225	25.189	881864002400	881864002426	881864002372
081	20x18°		18	26.5	18.0	20.0	881864002401	881864002427	881864002373
091	24/48-23-30°		23	32.5	23.28	26.25	881864001774	881864001779	881864002172
092	23 x 3.14		23	30.5	21.8	24.2	881864002402	881864002428	881864002374
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002403	881864002429	881864002375
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002404	881864002430	881864002376
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002405	881864002431	881864002377
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002406	881864002432	881864002378
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002407	881864002433	881864002379
804	26x3.93		26	40.5	32.6	35.2	881864002408	881864002434	881864002380
808	24-48-25-30°		25	36.5	25.4	28.5	881864002409	881864002435	881864002381
812	24/48-28-30°		28	34.5	28.1	30.5	881864002410	881864002436	881864002382
820	22x3.93		22	34.5	26.5	29.0	881864002411	881864002437	881864002383
823	24/48-26-30°		26	34.5	23.83	28.68	881864002412	881864002438	881864002384
906	24/48-25-30°		25	34.5	24.87	28.04	881864001776	881864001781	881864002385
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002413	881864002439	881864002386
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002414	881864002440	881864002387
926	20/40-21-30°		21	34.5	25.4	28.5	881864002415	881864002441	881864002388
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002416	881864002442	881864002389
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864001775	881864001780	881864002173
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002417	881864002443	881864002390
938	28 x 2.36		28	28.5	20.3	22.1	881864002418	881864002444	881864002391
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002419	881864002445	881864002392
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002420	881864002446	881864002393

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.

# RCS 140-S3.4-D-S-XX



The forged high-strength aluminium housing is the result of brilliant engineering, delivering a motorsport clutch that efficiently fulfils all your performance requirements. The housing design integrates heat ventilation supporting the high performance friction stack and thus ideal for a wide range of applications. The star in our clutch program is equipped with an extremely wear-resistant state of the art patented aluminium coating, providing high mileage capabilities. At the same time it contributes significantly favourable to your race car, in terms of mass and inertia, making it an extremely competitive drivetrain component.

**Examples of application:** Circuit racing, formula and touring cars, prototypes

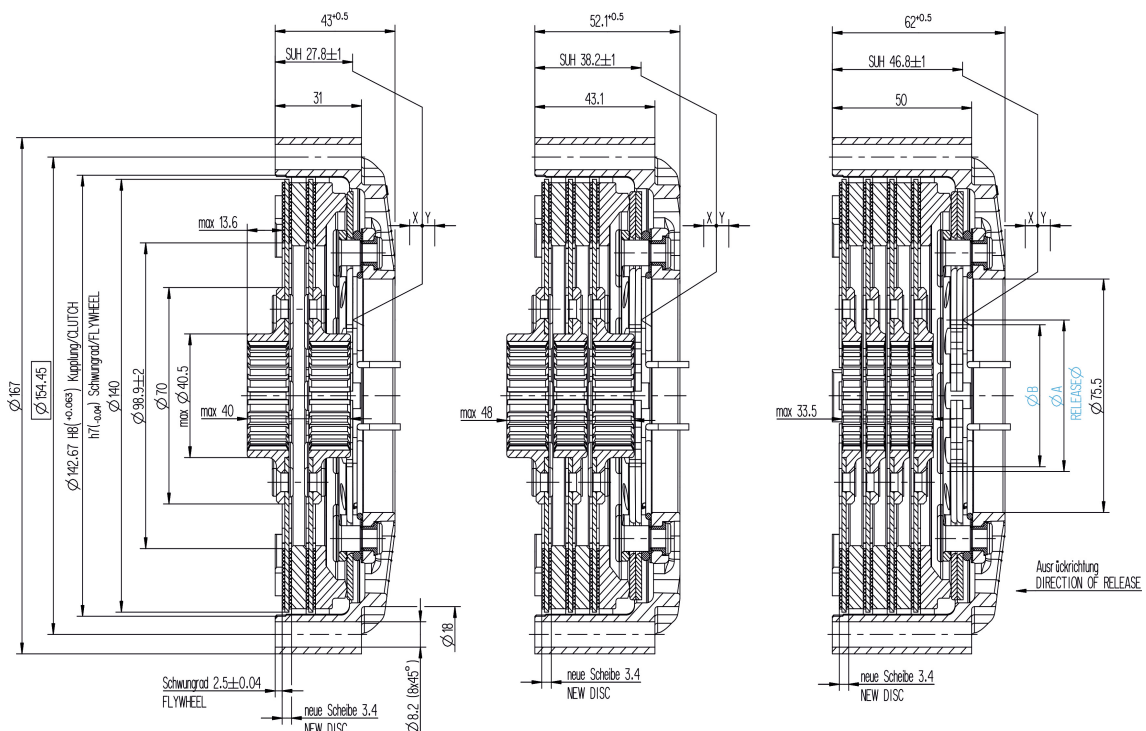
**Advantages:** A wide range of spring loads available. Proven and tested in all motorsport classes. Convertable to carbon/carbon and carbon/sinter

## Technology details

2-Scheiben Kupplung  
2-PLATE CLUTCH  
RCS 2/140-S3.4-D-S

3-Scheiben Kupplung  
3-PLATE CLUTCH  
RCS 3/140-S3.4-D-S

4-Scheiben Kupplung  
4-PLATE CLUTCH  
RCS 4/140-S3.4-D-S



## Technical specifications RCS 140-S3.4-D-S-XX

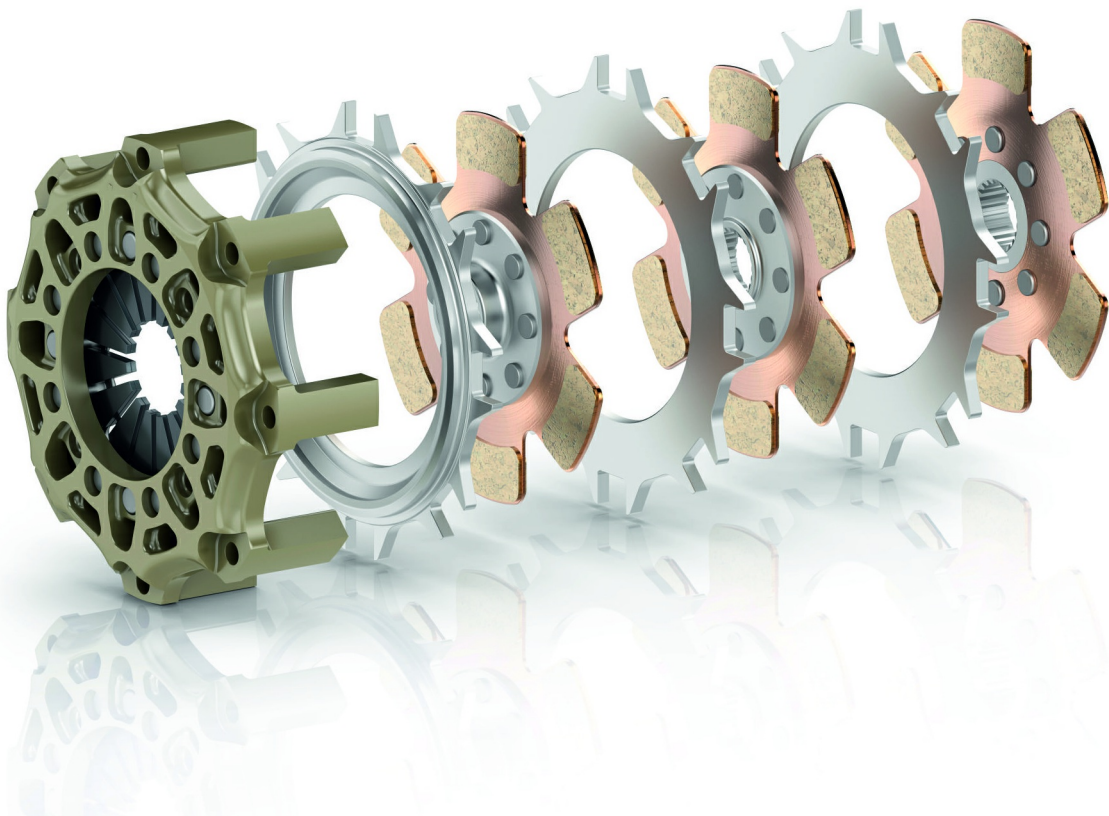
Selection criteria			Technical specifications							Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 00301900024	Qty driven disc*	
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty	
<b>2-Disc Clutch</b>													
480	49	46	2450	1.5	4.0 +0.5	4.5	2.106	0.006549	003072000293	003002002121	1	2	
960	49	46	4900	1.5	4.0 +0.5	4.5	2.291	0.007167	003072000291	003002001469	1	2	
<b>3-Disc Clutch</b>													
1430	49	46	4900	1.5	4.0 +0.5	4.5	2.996	0.009456	003072000290	003002002120	2	3	
1430	38	34	4200	1.5	4.5 +0.5	5.0	3.067	0.00945	003072000096	003002002120	2	3	
<b>4-Disc Clutch</b>													
1910	49	46	4900	1.5	4.0 +0.5	4.5	3.567	0.011403	003072000170	003002002120	3	4	
1910	38	34	4200	1.5	4.5 +0.5	5.0	3.635	0.011415	003072000171	003002002120	3	4	

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

### Selection of driven disc order number:

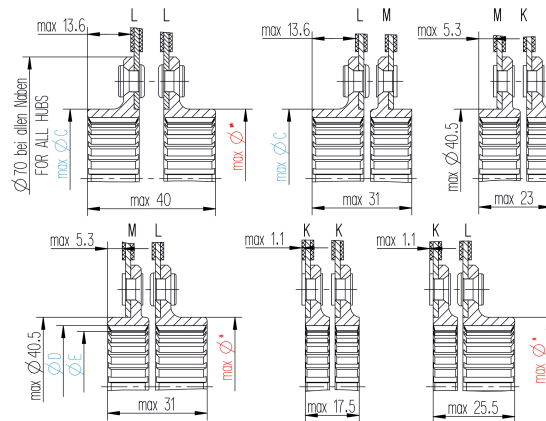
- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14



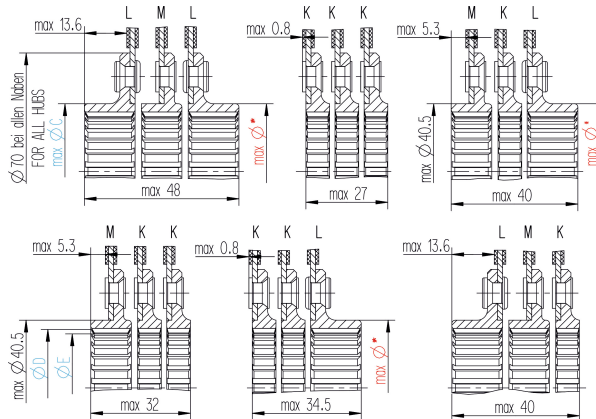


# Hub configuration RCS 140-S3.4

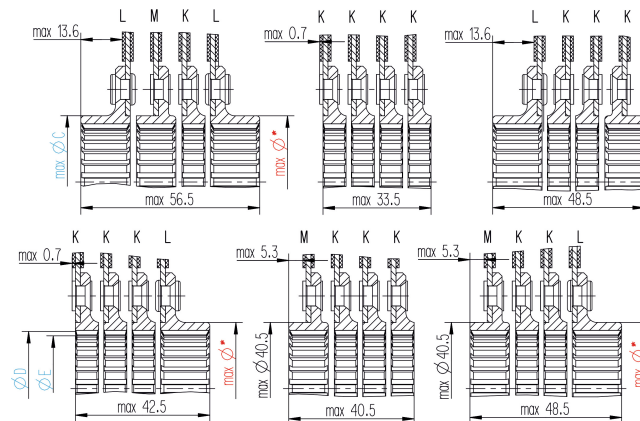
## 2-Disc Clutch



## 3-Disc Clutch



## 4-Disc Clutch

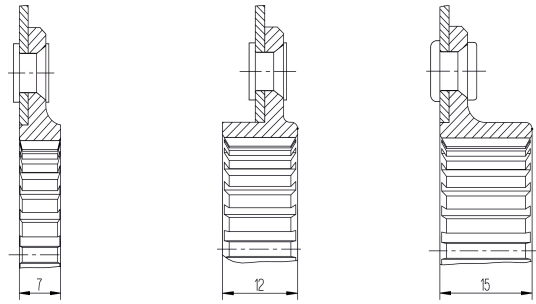


Flywheel Side

Gearbox Side



## Driven disc selection according to hub type RCS 140-S3.4

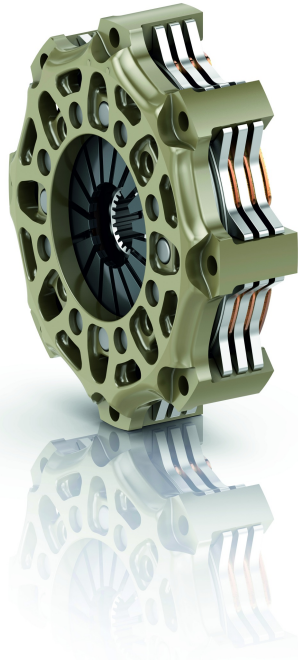


ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	K	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002143	881864001872	881864001841
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002144	881864001873	881864001842
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002334	881864002335	881864002329
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002145	881864001874	881864001843
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002146	881864001875	881864001844
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002340	881864001876	881864001845
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864002341	881864001877	881864001846
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001755	881864001823	881864001822
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002342	881864001879	881864001848
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002343	881864002336	881864002330
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864002344	881864001880	881864001849
076	24/48-22-30°		22	30.5	22.225	25.189	881864002345	881864001881	881864001850
081	20x18°		18	26.5	18.0	20.0	881864002346	881864001882	881864001851
091	24/48-23-30°		23	32.5	23.28	26.25	881864001752	881864001883	881864001852
092	23 x 3.14		23	30.5	21.8	24.2	881864002347	881864001884	881864001853
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002348	881864001885	881864001854
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002349	881864001886	881864001855
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002350	881864002337	881864002331
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002351	881864001887	881864001856
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002352	881864001888	881864001857
804	26x3.93		26	40.5	32.6	35.2	881864002353	881864001889	881864001858
808	24-48-25-30°		25	36.5	25.4	28.5	881864002354	881864002338	881864002332
812	24/48-28-30°		28	34.5	28.1	30.5	881864002355	881864001890	881864001859
820	22x3.93		22	34.5	26.5	29.0	881864002356	881864001891	881864001860
823	24/48-26-30°		26	34.5	23.83	28.68	881864002357	881864002339	881864002333
906	24/48-25-30°		25	34.5	24.87	28.04	881864001754	881864001892	881864001861
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002358	881864001893	881864001862
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002359	881864001894	881864001863
926	20/40-21-30°		21	34.5	25.4	28.5	881864002360	881864001895	881864001864
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002361	881864001896	881864001865
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864001753	881864001897	881864001866
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002362	881864001898	881864001867
938	28 x 2.36		28	28.5	20.3	22.1	881864002363	881864001899	881864001868
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002364	881864001900	881864001869
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002365	881864001901	881864001870

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.

# RCS 140-S3.4-D-F-XX



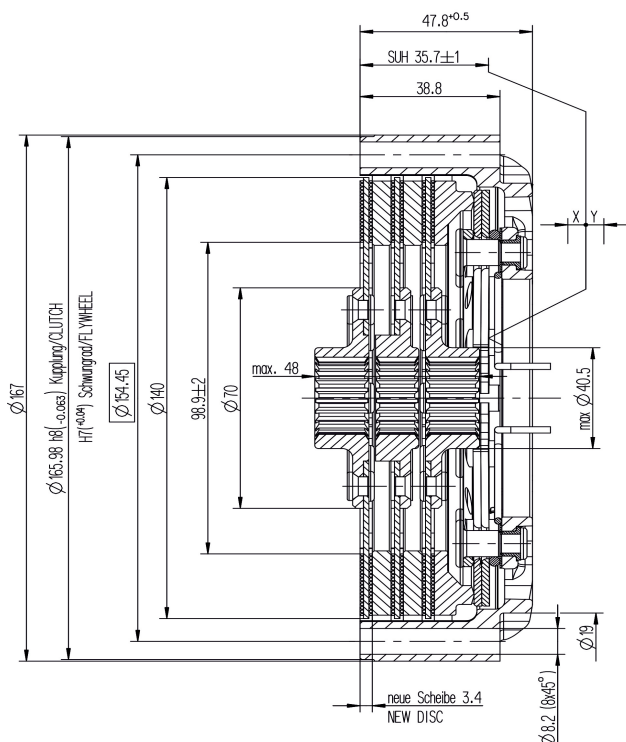
The forged high-strength aluminium housing is the result of brilliant engineering, delivering a motorsport clutch that efficiently fulfils all your performance requirements. The housing design integrates heat ventilation supporting the high performance friction stack and thus ideal for a wide range of applications. The star in our clutch program is equipped with an extremely wear resistant state of the art patented aluminium coating, providing high mileage capabilities. At the same time it contributes significantly favourable to your race car, in terms of mass and inertia, making it an extremely competitive drivetrain component.

**Examples of application:** Circuit racing, formula and touring cars, prototypes

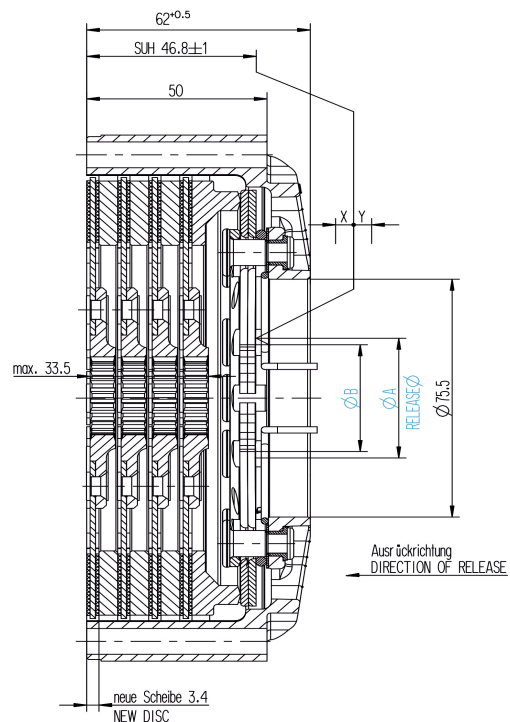
**Advantages:** A wide range of spring loads available. Proven and tested in all motorsport classes. Convertible to carbon/carbon and carbon/sinter

## Technology details

3-Scheiben Kupplung  
3-PLATE CLUTCH  
RCS 3/140-S3.4-D-F



4-Scheiben Kupplung  
4-PLATE CLUTCH  
RCS 4/140-S3.4-D-F



## Technical specifications RCS 140-S3.4-D-F-XX

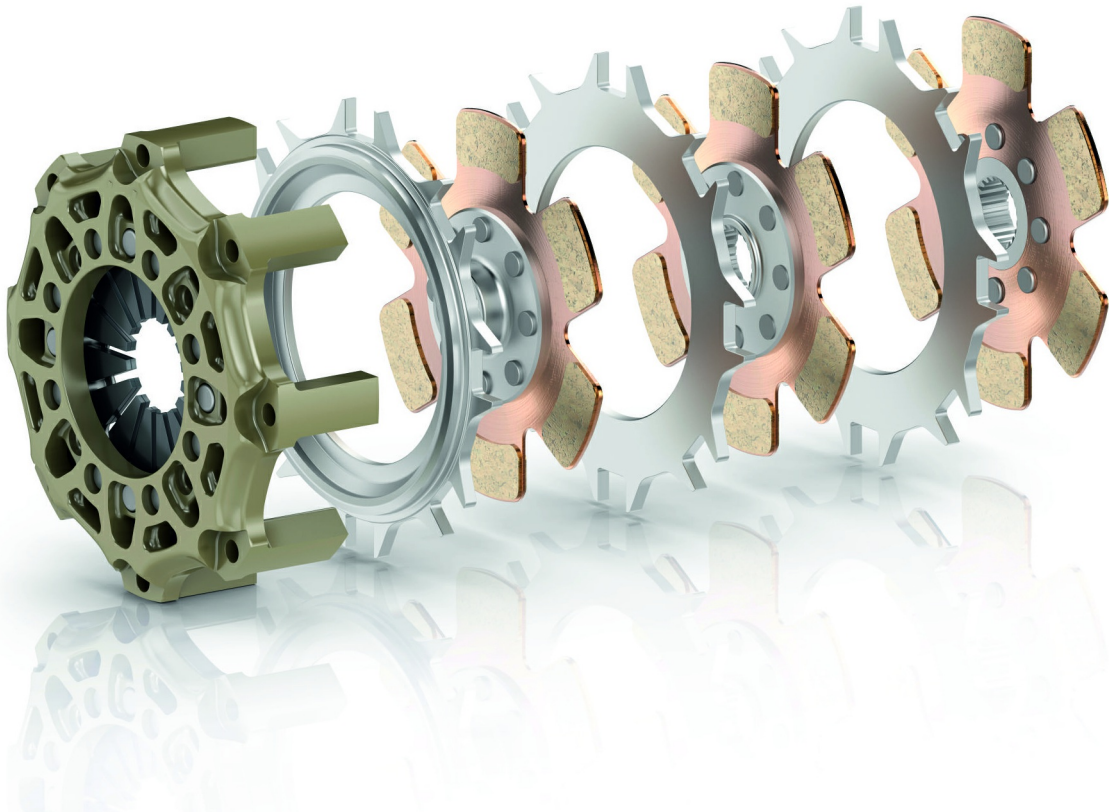
Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000224	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
<b>3-Disc Clutch</b>												
1430	49	46	4900	1.5	4.0 +0.5	4.5	2.94	0.009221	003072000298	003002002120	2	3
1430	38	34	4200	1.5	4.5 +0.5	5.0	3.011	0.00923	003072000308	003002002120	2	3
<b>4-Disc Clutch</b>												
1910	38	34	4200	1.5	4.5 +0.5	5.0	3.678	0.011585	003072000307	003002001470	3	4

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

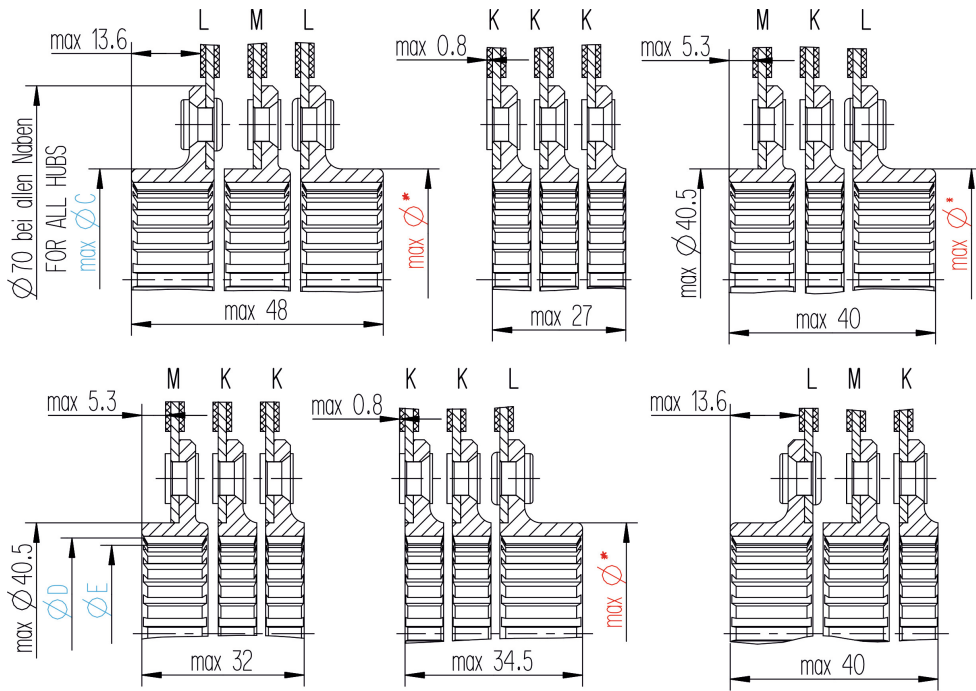
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14



# Hub configuration RCS 140-S3.4

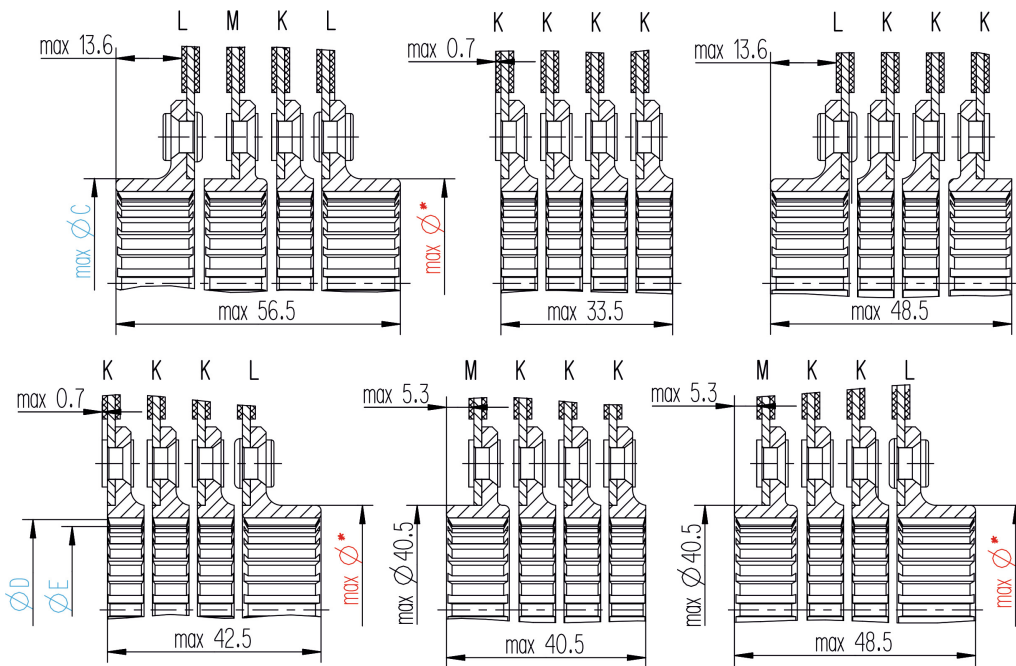
## 3-Disc Clutch



Flywheel Side

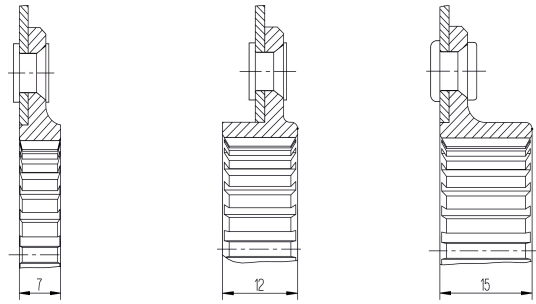
Gearbox Side

## 4-Disc Clutch





## Driven disc selection according to hub type RCS 140-S3.4

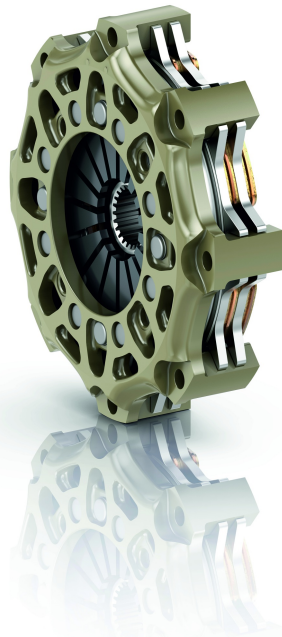


ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	K	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002143	881864001872	881864001841
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002144	881864001873	881864001842
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002334	881864002335	881864002329
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002145	881864001874	881864001843
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002146	881864001875	881864001844
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002340	881864001876	881864001845
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864002341	881864001877	881864001846
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001755	881864001823	881864001822
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002342	881864001879	881864001848
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002343	881864002336	881864002330
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864002344	881864001880	881864001849
076	24/48-22-30°		22	30.5	22.225	25.189	881864002345	881864001881	881864001850
081	20x18°		18	26.5	18.0	20.0	881864002346	881864001882	881864001851
091	24/48-23-30°		23	32.5	23.28	26.25	881864001752	881864001883	881864001852
092	23 x 3.14		23	30.5	21.8	24.2	881864002347	881864001884	881864001853
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002348	881864001885	881864001854
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002349	881864001886	881864001855
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002350	881864002337	881864002331
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002351	881864001887	881864001856
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002352	881864001888	881864001857
804	26x3.93		26	40.5	32.6	35.2	881864002353	881864001889	881864001858
808	24-48-25-30°		25	36.5	25.4	28.5	881864002354	881864002338	881864002332
812	24/48-28-30°		28	34.5	28.1	30.5	881864002355	881864001890	881864001859
820	22x3.93		22	34.5	26.5	29.0	881864002356	881864001891	881864001860
823	24/48-26-30°		26	34.5	23.83	28.68	881864002357	881864002339	881864002333
906	24/48-25-30°		25	34.5	24.87	28.04	881864001754	881864001892	881864001861
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002358	881864001893	881864001862
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002359	881864001894	881864001863
926	20/40-21-30°		21	34.5	25.4	28.5	881864002360	881864001895	881864001864
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002361	881864001896	881864001865
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864001753	881864001897	881864001866
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002362	881864001898	881864001867
938	28 x 2.36		28	28.5	20.3	22.1	881864002363	881864001899	881864001868
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002364	881864001900	881864001869
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002365	881864001901	881864001870

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.

# RCS 140-S5.2-D-S-XX



The forged high-strength aluminium housing is the result of brilliant engineering, delivering a motorsport clutch that efficiently fulfils all your performance requirements. The housing design integrates heat ventilation supporting the high performance friction stack and thus ideal for a wide range of applications. The star in our clutch program is equipped with an extremely wear resistant state of the art patented aluminium coating, providing high mileage capabilities. At the same time it contributes significantly favourable to your race car, in terms of mass and inertia, making it an extremely competitive drivetrain component.

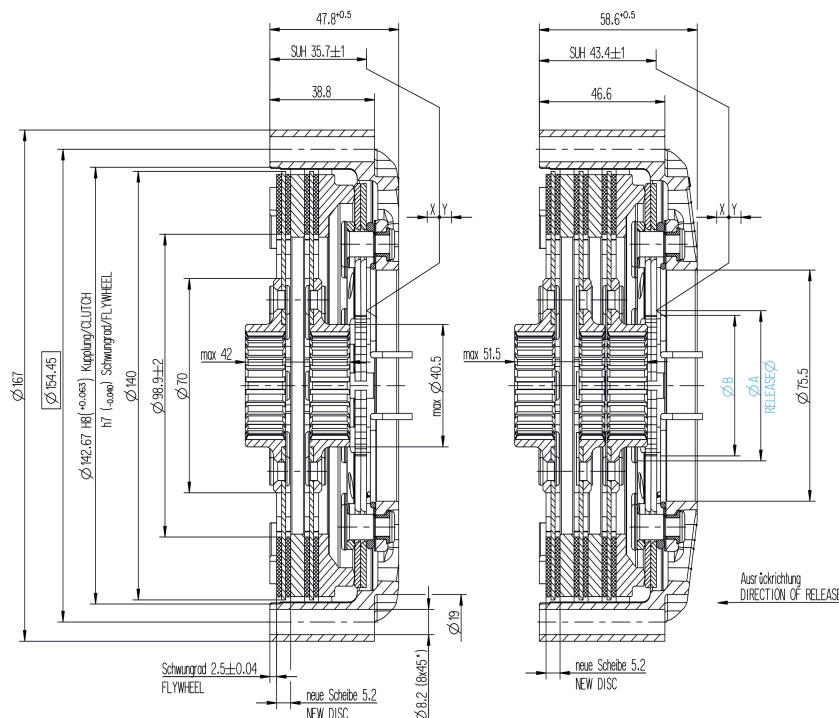
**Examples of application:** Circuit racing, formula and touring cars, prototypes

**Advantages:** A wide range of spring loads available. Proven and tested in all motorsport classes. Convertable to carbon/carbon and carbon/sinter

## Technology details

2-Scheiben Kupplung  
2-PLATE CLUTCH  
RCS 2/140-S5.2-D-S

3-Scheiben Kupplung  
3-PLATE CLUTCH  
RCS 3/140-S5.2-D-S



## Technical specifications RCS 140-S5.2-D-S-XX

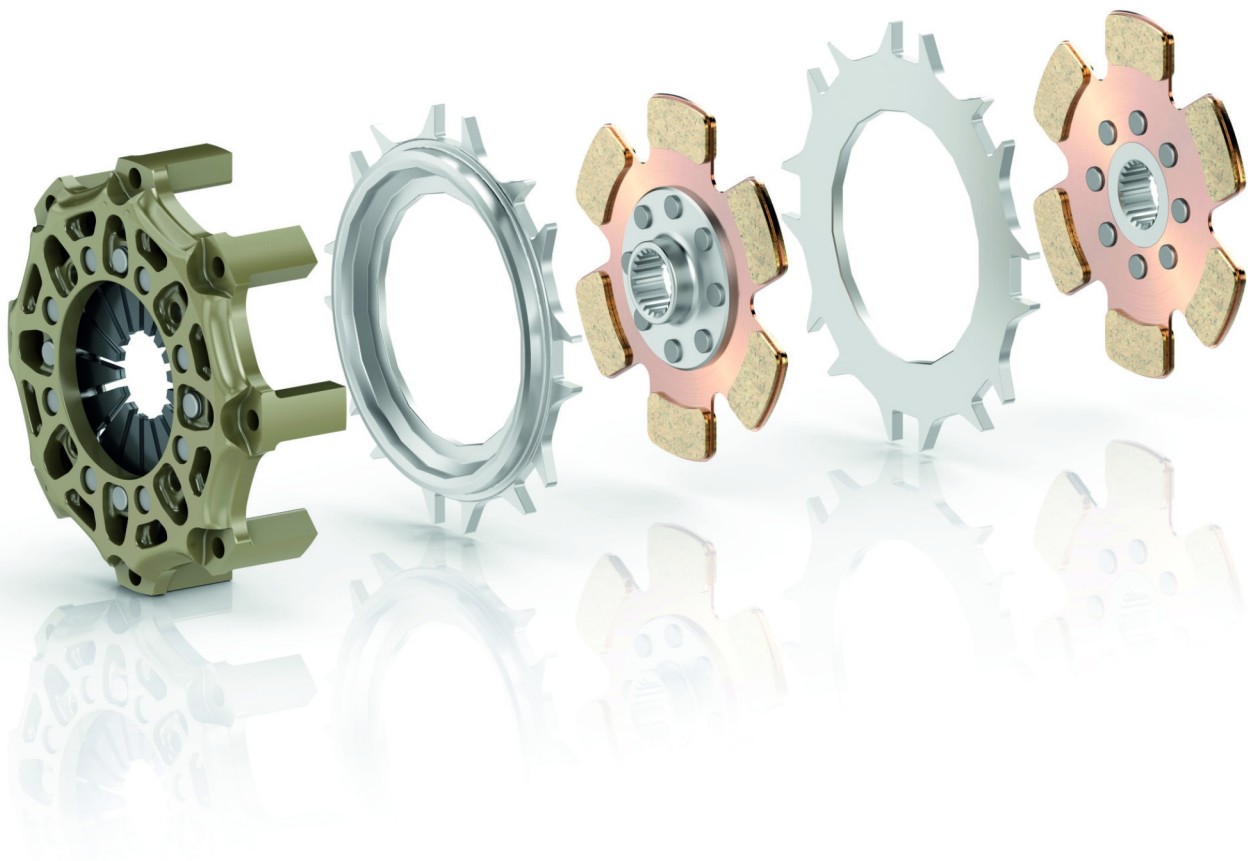
Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000224	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
<b>2-Disc Clutch</b>												
960	49	46	4900	1.5	4.0 +0.5	4.5	2.427	0.007754	003072000097	003002001470	1	2
960	38	34	4200	1.5	4.5 +0.5	5.0	2.467	0.007752	003072000297	003002001470	1	2
<b>3-Disc Clutch</b>												
1430	49	46	4900	1.5	4.0 +0.5	4.5	3.065	0.009713	003072000166	003002001469	2	3
1430	38	34	4200	1.5	4.5 +0.5	5.0	3.146	0.009808	003072000149	003002001469	2	3

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

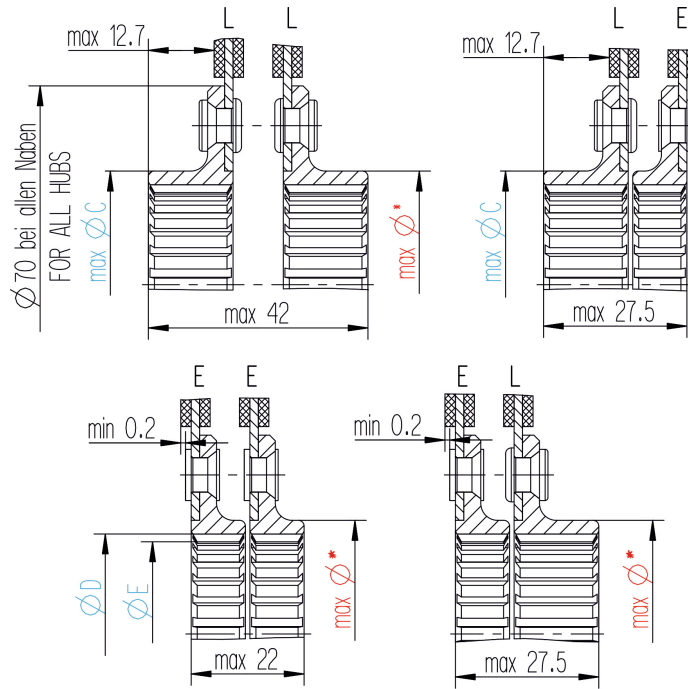
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14



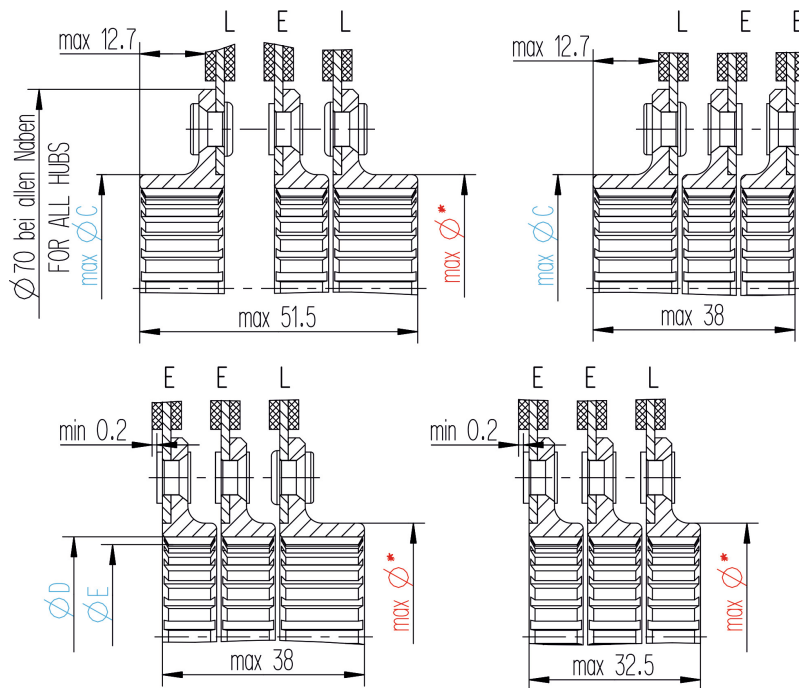
# Hub configuration RCS 140-S5.2

## 2-Disc Clutch



Flywheel Side

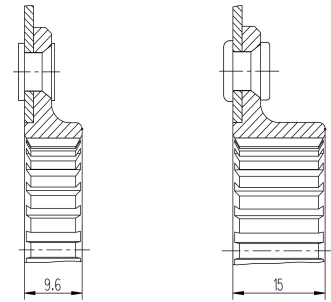
## 3-Disc Clutch



Gearbox Side



## Driven disc selection according to hub type RCS 140-S5.2



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	E	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002156	881864002161
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002157	881864002162
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002274	881864002300
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002158	881864002163
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002159	881864002164
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002275	881864002301
038	25 x 2.2	1" x 14T	14	32.5	22.0	25.0	881864002276	881864002302
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001803	881864002303
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864001804	881864002304
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002277	881864002305
075	25 x 2.3	25mm x 24T	24	32.5	23.0	25.0	881864002278	881864002306
076	24/48-22-30°		22	30.5	22.225	25.189	881864002501	881864002307
081	20x18°		18	26.5	18.0	20.0	881864002279	881864002308
091	24/48-23-30°		23	32.5	23.28	26.25	881864001805	881864002165
092	23 x 3.14		23	30.5	21.8	24.2	881864002280	881864002309
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002281	881864002310
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002282	881864002311
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002283	881864002312
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002284	881864002313
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002285	881864002314
804	26x3.93		26	40.5	32.6	35.2	881864002286	881864002315
808	24-48-25-30°		25	36.5	25.4	28.5	881864002287	881864002316
812	24/48-28-30°		28	34.5	28.1	30.5	881864002288	881864002317
820	22x3.93		22	34.5	26.5	29.0	881864002289	881864002318
823	24/48-26-30°		26	34.5	23.83	28.68	881864002290	881864002328
906	24/48-25-30°		25	34.5	24.87	28.04	881864002291	881864002319
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002292	881864002320
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002293	881864002321
926	20/40-21-30°		21	34.5	25.4	28.5	881864002294	881864002322
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002295	881864002323
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864001799	881864002166
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002296	881864002324
938	28 x 2.36		28	28.5	20.3	22.1	881864002297	881864002325
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002298	881864002326
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002299	881864002327

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.

# RCS 140-S5.2-D-F-XX



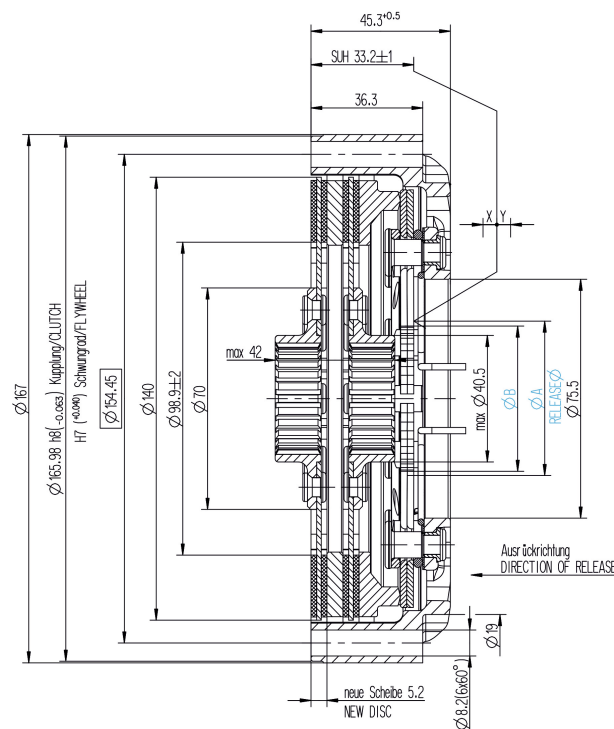
The forged high-strength aluminium housing is the result of brilliant engineering, delivering a motorsport clutch that efficiently fulfils all your performance requirements. The housing design integrates heat ventilation supporting the high performance friction stack and thus ideal for a wide range of applications. The star in our clutch program is equipped with an extremely wear resistant state of the art patented aluminium coating, providing high mileage capabilities. At the same time it contributes significantly favourable to your race car, in terms of mass and inertia, making it an extremely competitive drivetrain component.

**Examples of application:** Circuit racing, formula and touring cars, prototypes

**Advantages:** A wide range of spring loads available. Proven and tested in all motorsport classes. Convertable to carbon/carbon and carbon/sinter

## Technology details

2-Scheiben Kupplung  
2-PLATE CLUTCH  
RCS 2/140-S5.2-D-F



## Technical specifications RCS 140-S5.2-D-F-XX

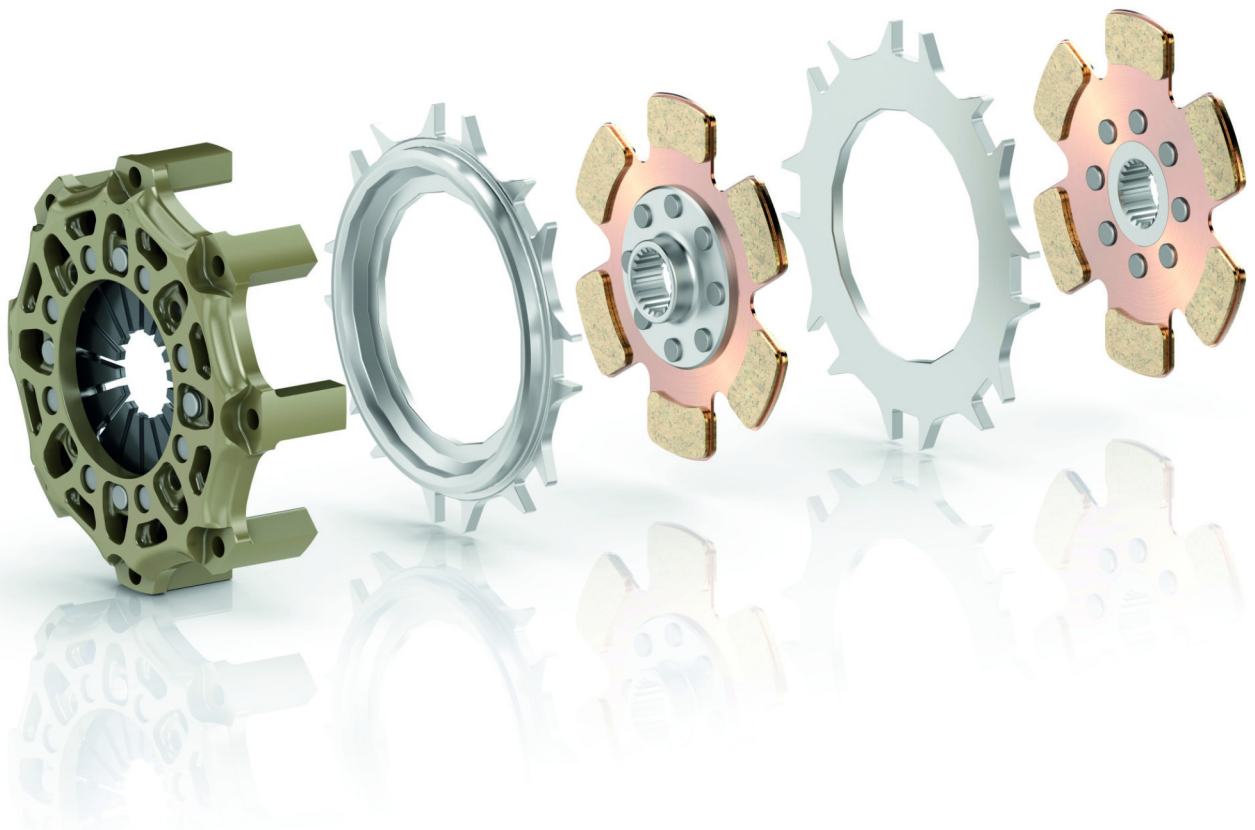
Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing$ A Release $\varnothing$	Dimension $\varnothing$ B Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000224	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
2-Disc Clutch												
960	49	46	4900	1.5	4.0 +0.5	4.5	2.418	0.007699	003072000180	003002001470	1	2

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

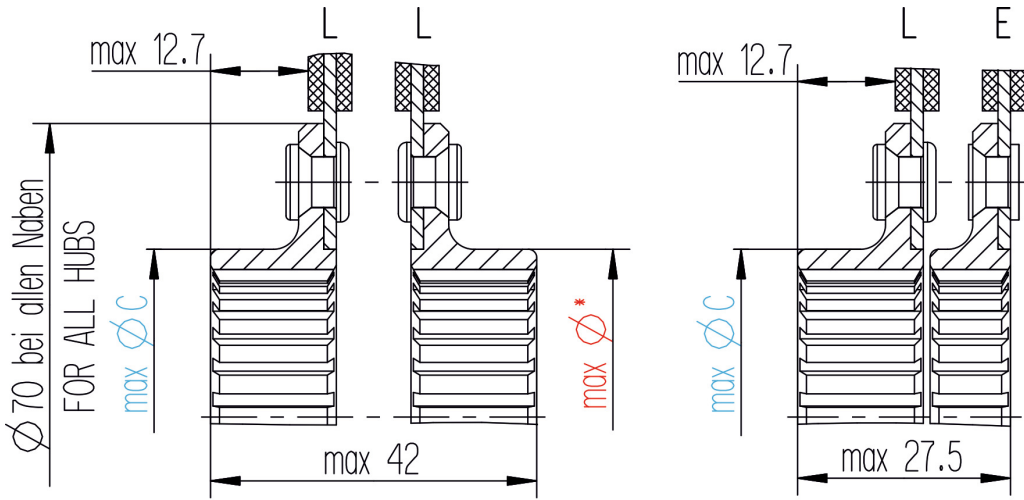
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14



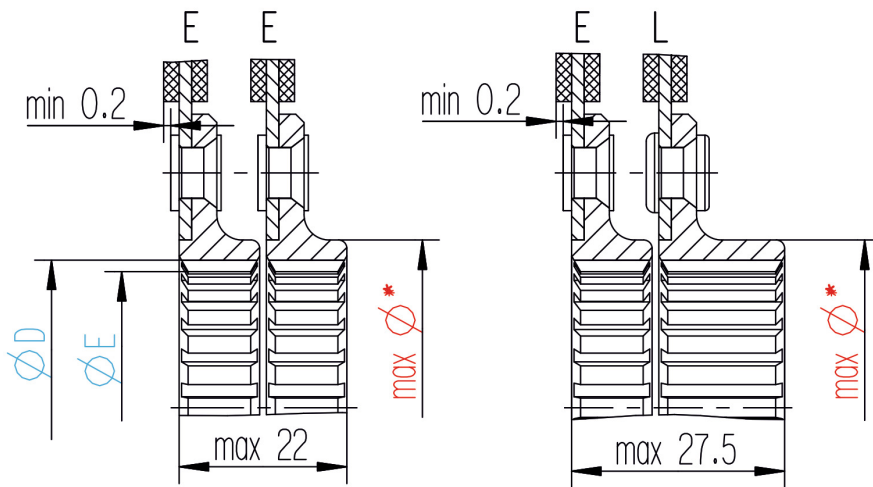
# Hub configuration RCS 140-S5.2

## 2-Disc Clutch



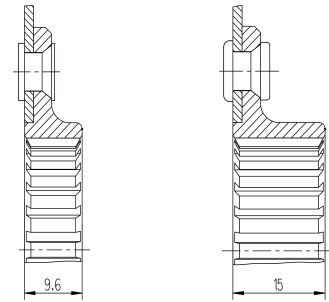
Flywheel Side

Gearbox Side





## Driven disc selection according to hub type RCS 140-S5.2

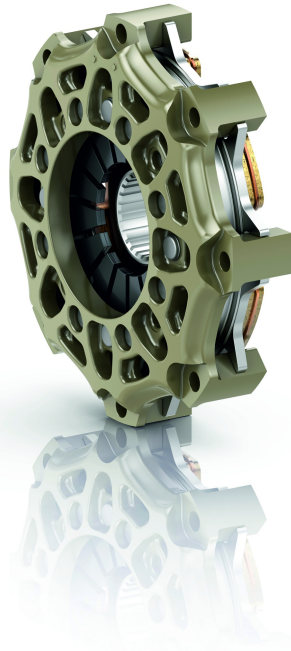


ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	E	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002156	881864002161
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002157	881864002162
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002274	881864002300
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002158	881864002163
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002159	881864002164
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002275	881864002301
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864002276	881864002302
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001803	881864002303
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864001804	881864002304
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002277	881864002305
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864002278	881864002306
076	24/48-22-30°		22	30.5	22.225	25.189	881864002501	881864002307
081	20x18°		18	26.5	18.0	20.0	881864002279	881864002308
091	24/48-23-30°		23	32.5	23.28	26.25	881864001805	881864002165
092	23 x 3.14		23	30.5	21.8	24.2	881864002280	881864002309
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002281	881864002310
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002282	881864002311
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002283	881864002312
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002284	881864002313
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002285	881864002314
804	26x3.93		26	40.5	32.6	35.2	881864002286	881864002315
808	24-48-25-30°		25	36.5	25.4	28.5	881864002287	881864002316
812	24/48-28-30°		28	34.5	28.1	30.5	881864002288	881864002317
820	22x3.93		22	34.5	26.5	29.0	881864002289	881864002318
823	24/48-26-30°		26	34.5	23.83	28.68	881864002290	881864002328
906	24/48-25-30°		25	34.5	24.87	28.04	881864002291	881864002319
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002292	881864002320
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002293	881864002321
926	20/40-21-30°		21	34.5	25.4	28.5	881864002294	881864002322
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002295	881864002323
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864001799	881864002166
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002296	881864002324
938	28 x 2.36		28	28.5	20.3	22.1	881864002297	881864002325
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002298	881864002326
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002299	881864002327

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.

# RCS 140-S7.8-D-S-XX



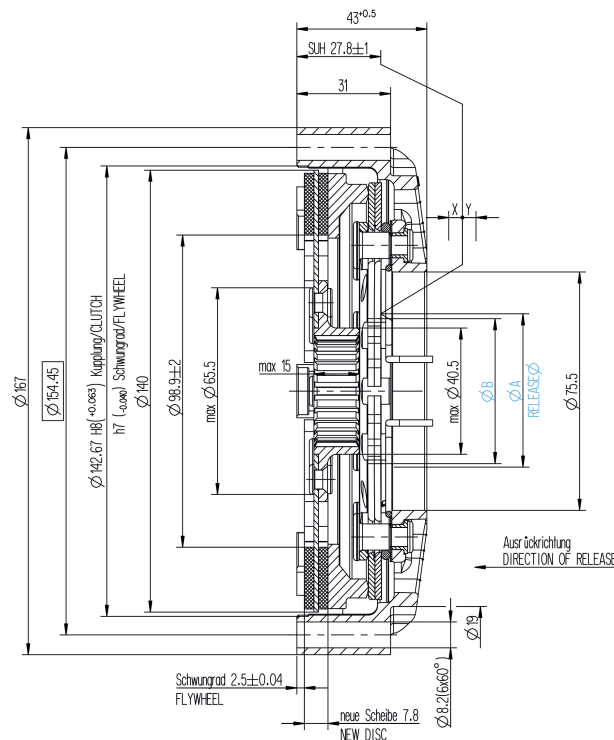
The forged high-strength aluminium housing is the result of brilliant engineering, delivering a motorsport clutch that efficiently fulfils all your performance requirements. The housing design integrates heat ventilation supporting the high performance friction stack and thus ideal for a wide range of applications. The star in our clutch program is equipped with an extremely wear resistant state of the art patented aluminium coating, providing high mileage capabilities. At the same time it contributes significantly favourable to your race car, in terms of mass and inertia, making it an extremely competitive drivetrain component.

**Examples of application:** Circuit racing, formula and touring cars, prototypes

**Advantages:** A wide range of spring loads available. Proven and tested in all motorsport classes. Convertable to carbon/carbon and carbon/sinter

## Technology details

1-Scheiben Kupplung  
1-PLATE CLUTCH  
RCS 1/140-S7.8-D-S



## Technical specifications RCS 140-S7.8-D-S-XX

Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000224	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
1-Disc Clutch												
480	49	46	4900	1.5	4.0 +0.5	4.5	1.774	0.005711	003072000289	003002001470	0	1
480	38	34	4200	1.5	4.5 +0.5	5.0	1.823	0.005786	003072000296	003002001470	0	1

More clutch torque without safety margin!

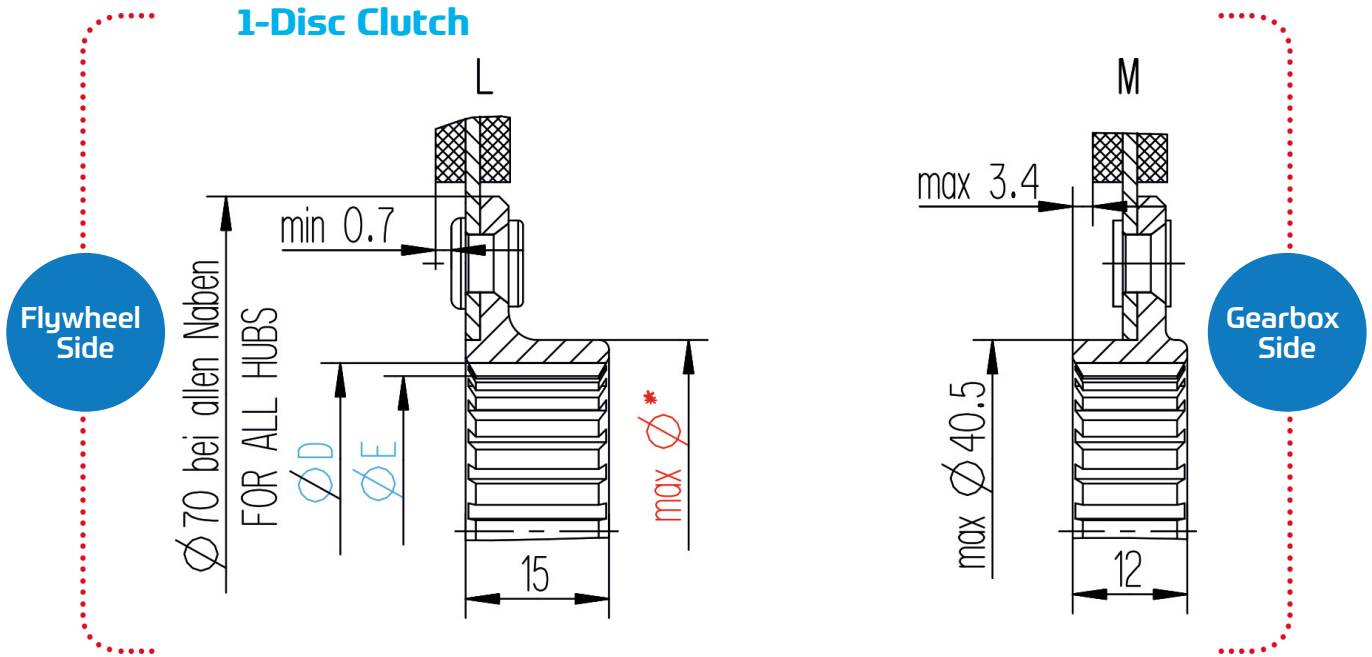
\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14

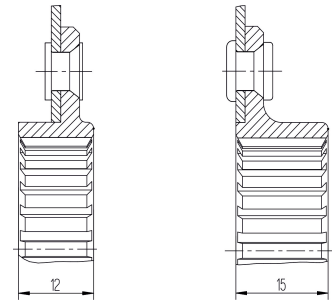


# Hub configuration RCS 140-S5.2





## Driven disc selection according to hub type RCS 140-S5.2



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002175	881864002179
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002176	881864002180
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002209	881864002502
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864001790	881864002181
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002177	881864002184
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002186	881864002213
038	25 x 2.2	1" x 14T	14	32.5	22.0	25.0	881864002187	881864002214
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001789	881864002215
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002188	881864002216
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002210	881864002503
075	25 x 2.3	25mm x 24T	24	32.5	23.0	25.0	881864002189	881864002217
076	24/48-22-30°		22	30.5	22.225	25.189	881864002198	881864002226
081	20x18°		18	26.5	18.0	20.0	881864002203	881864002229
091	24/48-23-30°		23	32.5	23.28	26.25	881864001786	881864002182
092	23 x 3.14		23	30.5	21.8	24.2	881864002190	881864002218
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002191	881864002219
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002204	881864002230
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002200	881864002504
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002205	881864002231
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002206	881864002232
804	26x3.93		26	40.5	32.6	35.2	881864002202	881864002233
808	24-48-25-30°		25	36.5	25.4	28.5	881864002211	881864002505
812	24/48-28-30°		28	34.5	28.1	30.5	881864002201	881864002234
820	22x3.93		22	34.5	26.5	29.0	881864002207	881864002235
823	24/48-26-30°		26	34.5	23.83	28.68	881864002212	881864002506
906	24/48-25-30°		25	34.5	24.87	28.04	881864001788	881864002228
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002192	881864002220
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002193	881864002221
926	20/40-21-30°		21	34.5	25.4	28.5	881864002194	881864002222
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002195	881864002223
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864001787	881864002183
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002199	881864002227
938	28 x 2.36		28	28.5	20.3	22.1	881864002196	881864002224
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002208	881864002236
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002197	881864002225

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.



## Technical specifications RCS 184-S2.6-D-S-XX

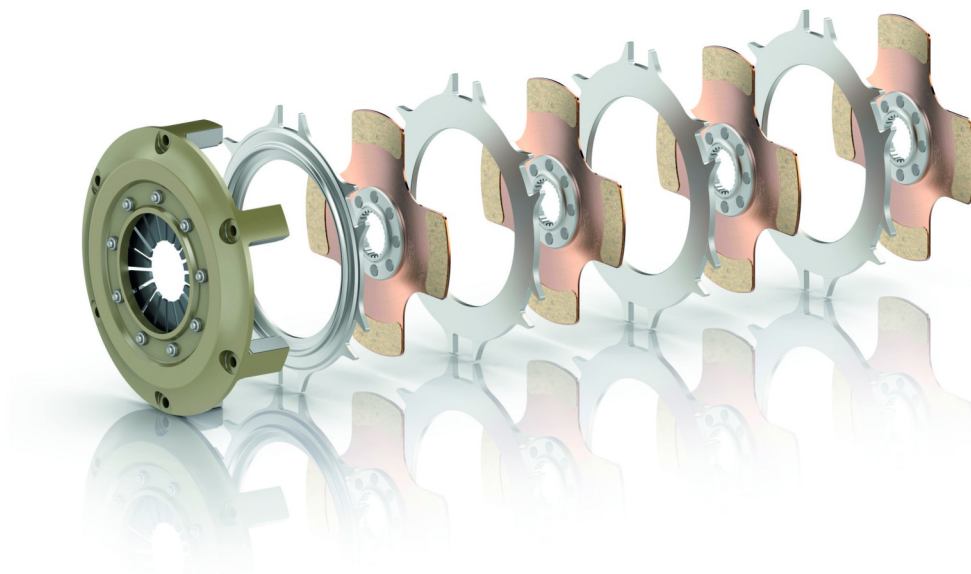
Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000336	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
<b>1-Disc Clutch</b>												
385	49	46	2400	1.5	5.0 +0.5	5.0	2.195	0.01255	003072999543	003002001897	0	1
654	49	46	4300	1.5	5.0 +0.5	5.0	2.247	0.012568	003072999542	003002001897	0	1
<b>2-Disc Clutch</b>												
769	49	46	2400	1.5	5.0 +0.5	5.0	3.055	0.017199	003072000130	003002001897	1	2
1308	49	46	4300	1.5	5.0 +0.5	5.0	3.105	0.017218	003072000125	003002001897	1	2
1308	44	37	3900	1.5		5.0	3.116	0.017167	003072000139	003002001897	1	2
<b>3-Disc Clutch</b>												
1154	49	46	2400	1.5	5.0 +0.5	5.0	4.06	0.022262	003072000134	003002001898	2	3
1962	49	46	4300	1.5	5.0 +0.5	5.0	4.111	0.022852	003072000126	003002001898	2	3
1962	44	37	3900	1.5	5.0 +0.5	5.0	4.172	0.023029	003072000140	003002001898	2	3
<b>4-Disc Clutch</b>												
2616	49	46	4300	1.5	5.0 +0.5	5.0	4.937	0.027736	003072000127	003002001897	3	4

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

### Selection of driven disc order number:

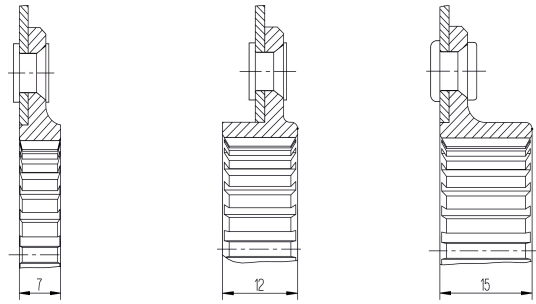
- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14







## Driven disc selection according to hub type RCS 184-S2.6



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	K	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864001448	881864001370	R88186499A085
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864001449	R88186499B086	R88186499B085
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864001939	881864001947	881864000914
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	R88186499C127	R88186499C086	R88186499C085
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	R88186499W127	R88186499W086	R88186499W085
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	R88186499D127	R88186499D086	R88186499D085
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	R88186499E127	881864001371	R88186499E085
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	R88186499F127	R88186499F086	R88186499F085
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	R88186499G127	R88186499G086	R88186499G085
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864001940	881864001948	881864001951
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864001450	R88186499H086	R88186499H085
076	24/48-22-30°		22	30.5	22.225	25.189	881864001457	R88186499U086	R88186499U085
081	20x18°		18	26.5	18.0	20.0	881864001358	881864001264	881864001259
091	24/48-23-30°		23	32.5	23.28	26.25	R88186499I127	R88186499I086	R88186499I085
092	23 x 3.14		23	30.5	21.8	24.2	R88186499K127	R88186499K086	R88186499K085
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864001451	881864001372	R88186499L085
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864001359	881864001265	881864001260
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864000950	881864000946	881864000942
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864001360	881864001266	881864001261
802	25,2-1-30-24		24	32.5	22.6	25.2	881864001361	881864001267	881864001262
804	26x3.93		26	40.5	32.6	35.2	881864000952	881864000948	881864000944
808	24-48-25-30°		25	36.5	25.4	28.5	881864001941	881864001949	881864001952
812	24/48-28-30°		28	34.5	28.1	30.5	881864000951	881864000947	881864000943
820	22x3.93		22	34.5	26.5	29.0	881864001362	881864001268	881864000945
823	24/48-26-30°		26	34.5	23.83	28.68	881864001942	881864001950	881864001953
906	24/48-25-30°		25	34.5	24.87	28.04	881864000953	881864000949	R88186499Y085
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864001452	881864001373	R88186499M085
924	18.65 x 15.7		14	28.5	15.7	18.65	881864001453	881864001374	R88186499N085
926	20/40-21-30°		21	34.5	25.4	28.5	881864001454	R88186499O086	R88186499O085
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864001455	881864001375	R88186499P085
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	R88186499Q127	R88186499Q086	R88186499Q085
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864001458	881864001377	R88186499V085
938	28 x 2.36		28	28.5	20.3	22.1	R88186499S127	R88186499S086	R88186499S085
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864001363	881864001269	881864001263
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864001456	881864001376	R88186499T085

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.



## Technical specifications RCS 184-S5.2-D-S-XX

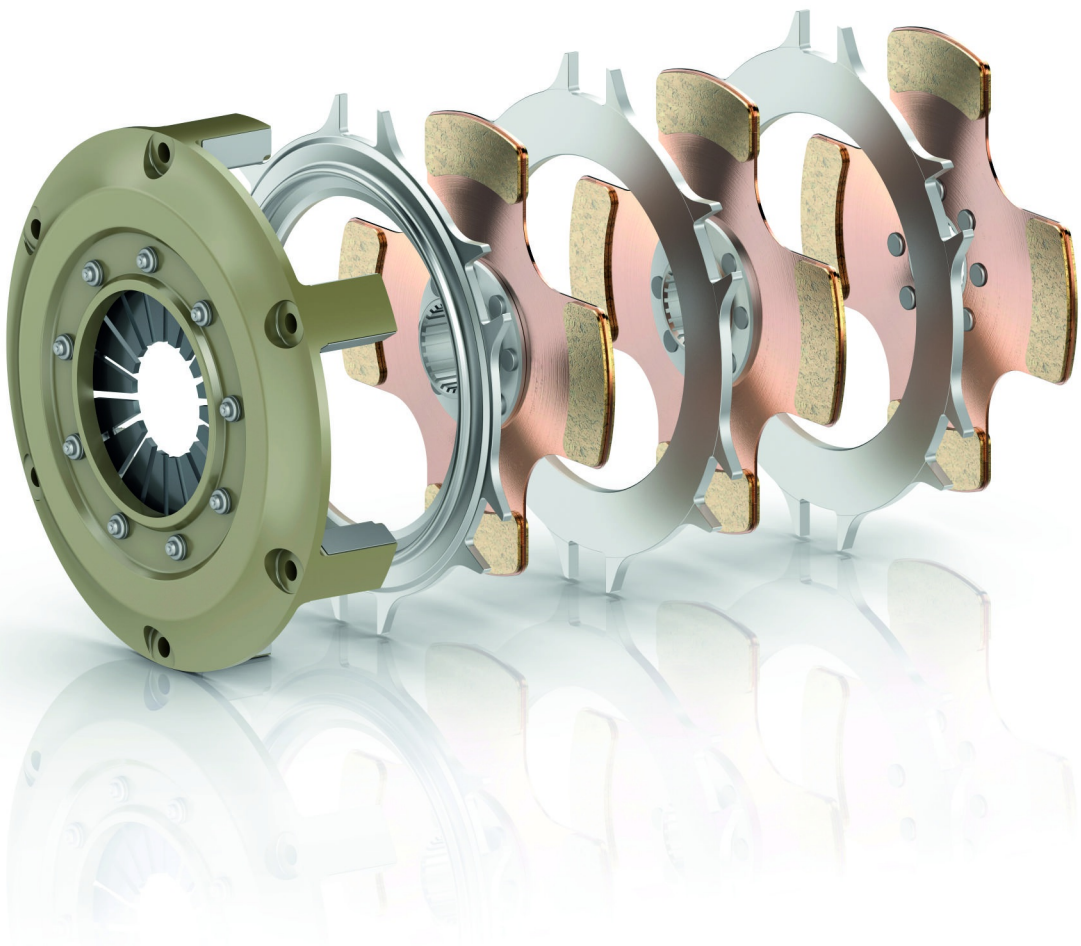
Selection criteria			Technical specifications							Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000336	Qty driven disc*	
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty	
<b>2-Disc Clutch</b>													
796	49	46	2400	1.5	5.0 +0.5	5.0	3.23	0.018217	003072000194	003002002665	1	2	
1308	49	46	4300	1.5	5.0 +0.5	5.0	3.28	0.018407	003072000167	003002002665	1	2	
<b>3-Disc Clutch</b>													
1962	49	46	4300	1.5	5.0 +0.5	5.0	4.351	0.024575	003072000127	003002001897	2	3	

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

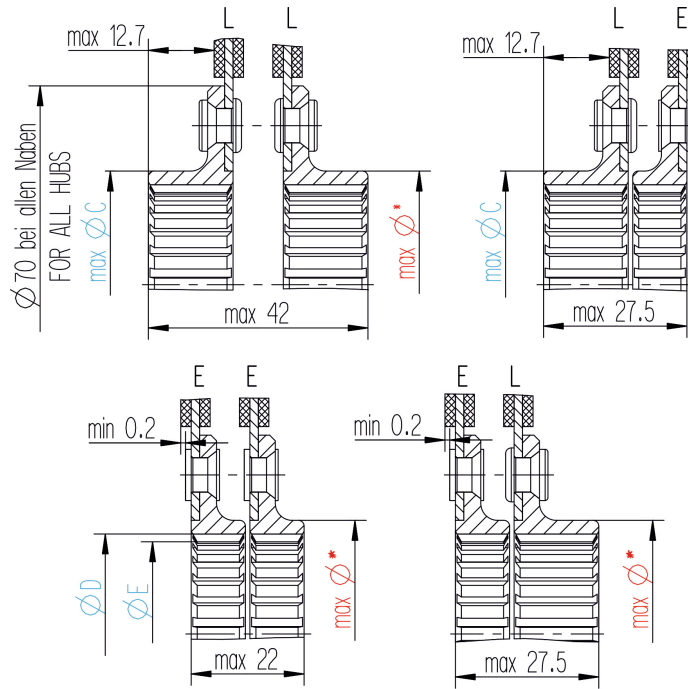
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14



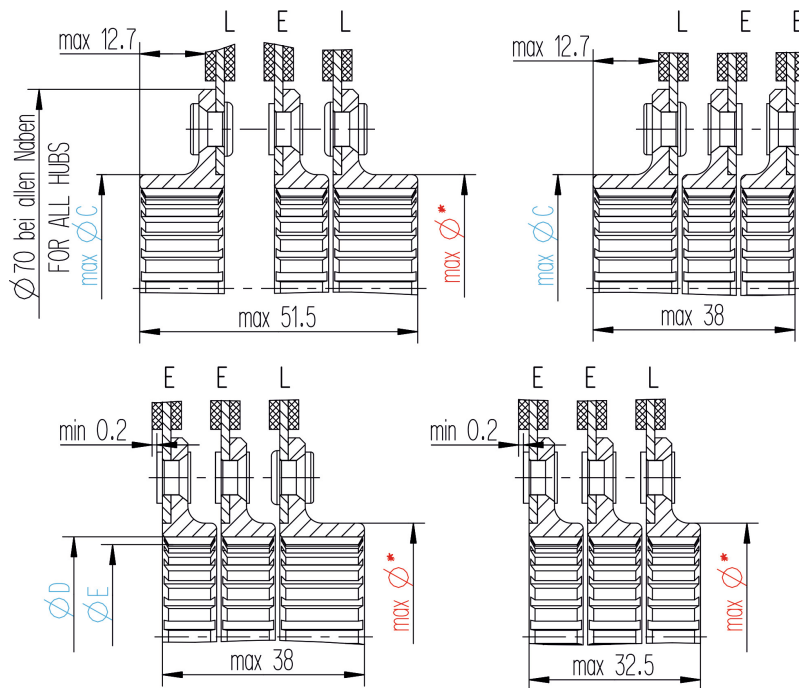
# Hub configuration RCS 184-S5.2

## 2-Disc Clutch



Flywheel Side

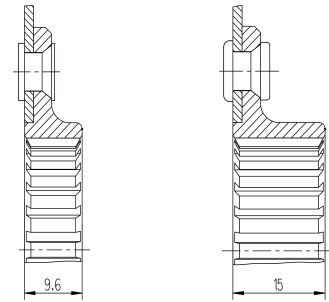
## 3-Disc Clutch



Gearbox Side



## Driven disc selection according to hub type RCS 184-S5.2



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	E	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864001904	881864001954
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864001905	881864001955
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864001906	881864001982
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864001907	881864001956
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864001908	881864001972
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864001909	881864001957
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864001910	881864001958
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864001911	881864001959
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864001912	881864001960
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864001913	881864001983
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	881864001914	881864001961
076	24/48-22-30°		22	30.5	22.225	25.189	881864001915	881864001970
081	20x18°		18	26.5	18.0	20.0	881864001916	881864001976
091	24/48-23-30°		23	32.5	23.28	26.25	881864001917	881864001723
092	23 x 3.14		23	30.5	21.8	24.2	881864001918	881864001962
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864001919	881864001963
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864001920	881864001977
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864001921	881864001973
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864001922	881864001978
802	25,2-1-30-24		24	32.5	22.6	25.2	881864001923	881864001979
804	26x3.93		26	40.5	32.6	35.2	881864001924	881864001945
808	24-48-25-30°		25	36.5	25.4	28.5	881864001925	881864001984
812	24/48-28-30°		28	34.5	28.1	30.5	881864001926	881864001974
820	22x3.93		22	34.5	26.5	29.0	881864001927	881864001980
823	24/48-26-30°		26	34.5	23.83	28.68	881864001928	881864001985
906	24/48-25-30°		25	34.5	24.87	28.04	881864001929	881864001975
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864001930	881864001964
924	18.65 x 15.7		14	28.5	15.7	18.65	881864001931	881864001965
926	20/40-21-30°		21	34.5	25.4	28.5	881864001932	881864001966
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864001933	881864001967
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864001934	881864001633
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864001935	881864001971
938	28 x 2.36		28	28.5	20.3	22.1	881864001936	881864001968
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864001937	881864001981
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864001938	881864001969

The customer is required to check the chosen configuration and that it can be assembled clash free.

# RCS 184-S7.8-D-S-XX

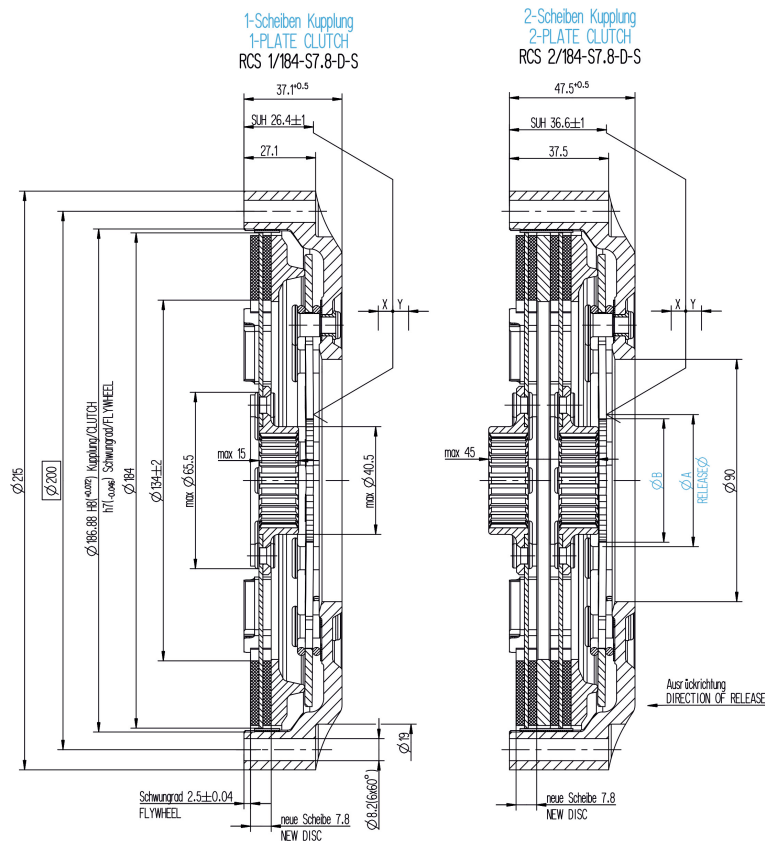


If you are looking for a clutch that can easily cope with the harsh demands of modern day motorsports, then you have found what you are looking for. This motorsports clutch is an excellent synthesis of robustness and reliability whilst maintaining its competitive character, due to its favourable mass and inertia properties. Keeping this in mind and knowing that it is used in race winning drivetrains, it additionally provides high thermal stability making it fit for off-track race applications, absorbing the unexpected misuse events.

**Examples of application:** Rally, circuit racing, touring cars

**Advantages:** Two spring loads available. two release diameters. Protection plates for housing increases wearresistance.

## Technology details



## Technical specifications RCS 184-S7.8-D-S-XX

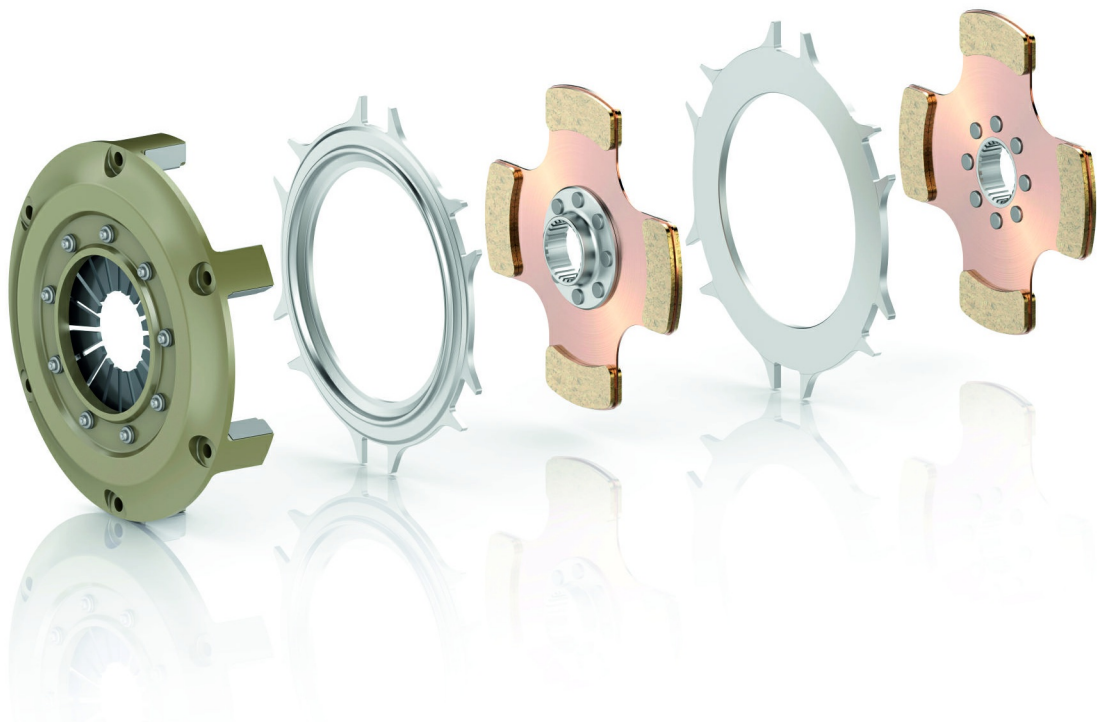
Selection criteria			Technical specifications							Purchase order number			
Clutch torque	Dimension $\varnothing$ A Release $\varnothing$	Dimension $\varnothing$ B Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000336	Qty driven disc*	
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty	
<b>1-Disc Clutch</b>													
385	49	46	2400	1.5	5.0 +0.5	5.0	2.322	0.013294	003072000130	003002001898	0	1	
654	49	46	4300	1.5	5.0 +0.5	5.0	2.372	0.013549	003072000125	003002001898	0	1	
654	44	37	3900	1.5	5.0 +0.5	5.0	2.387	0.013552	003072000139	003002001898	0	1	
<b>2-Disc Clutch</b>													
769	49	46	2400	1.5	5.0 +0.5	5.0	3.436	0.019597	003072000134	003002001897	1	2	
1308	49	46	4300	1.5	5.0 +0.5	5.0	3.486	0.019852	003072000126	003002001897	1	2	
1308	44	37	3900	1.5	5.0 +0.5	5.0	3.502	0.019855	003072000140	003002001897	1	2	

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

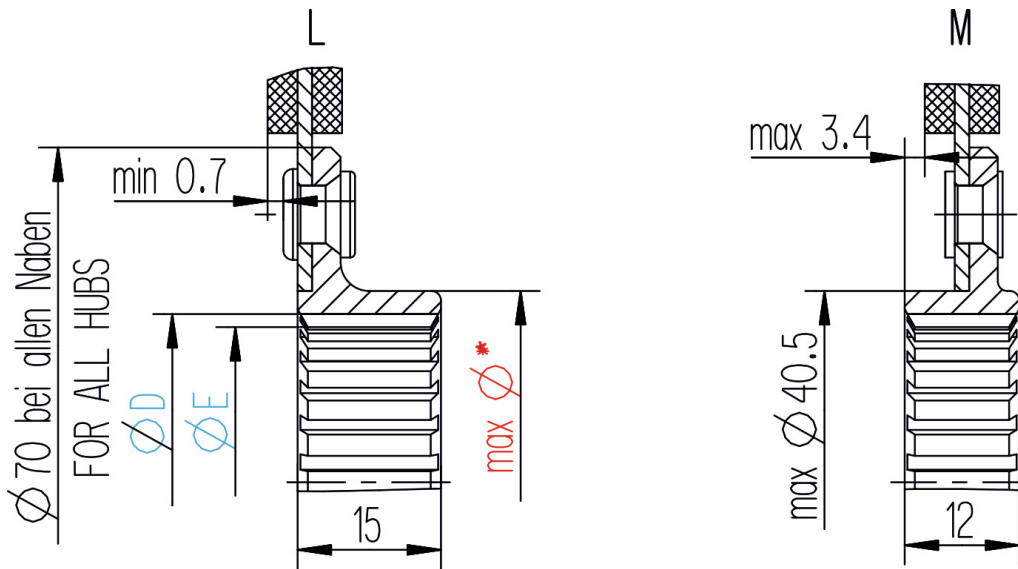
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14

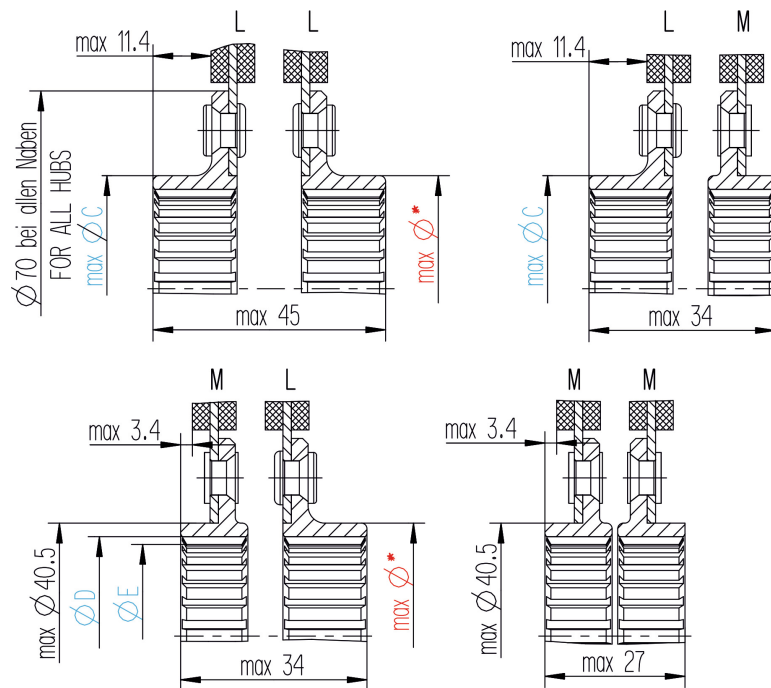


# Hub configuration RCS 184-S7.8

## 1-Disc Clutch



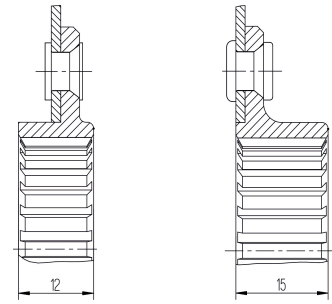
## 2-Disc Clutch



Flywheel Side

Gearbox Side

## Driven disc selection according to hub type RCS 184-S7.8



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864000687	881864002239
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864000688	881864002240
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864001997	881864002241
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864000689	881864002242
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864000707	881864002243
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864000690	881864002244
038	25 x 2.2	1" x 14T	14	32.5	22.0	25.0	881864000691	881864002245
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864000692	881864002246
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864000693	881864002247
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864001998	881864002248
075	25 x 2.3	25mm x 24T	24	32.5	23.0	25.0	881864000694	881864002249
076	24/48-22-30°		22	30.5	22.225	25.189	881864000705	881864002250
081	20x18°		18	26.5	18.0	20.0	881864001991	881864002251
091	24/48-23-30°		23	32.5	23.28	26.25	881864000695	881864002252
092	23 x 3.14		23	30.5	21.8	24.2	881864000696	881864002253
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864000697	881864002254
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864001992	881864002255
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864001988	881864002256
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864001993	881864002257
802	25,2-1-30-24		24	32.5	22.6	25.2	881864001994	881864002258
804	26x3.93		26	40.5	32.6	35.2	881864001990	881864002259
808	24-48-25-30°		25	36.5	25.4	28.5	881864001999	881864002260
812	24/48-28-30°		28	34.5	28.1	30.5	881864001989	881864002261
820	22x3.93		22	34.5	26.5	29.0	881864001995	881864002262
823	24/48-26-30°		26	34.5	23.83	28.68	881864002000	881864002263
906	24/48-25-30°		25	34.5	24.87	28.04	881864000709	881864002264
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864000698	881864002265
924	18.65 x 15.7		14	28.5	15.7	18.65	881864000699	881864002266
926	20/40-21-30°		21	34.5	25.4	28.5	881864000700	881864002267
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864000701	881864002268
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864000702	881864002269
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864000706	881864002270
938	28 x 2.36		28	28.5	20.3	22.1	881864000703	881864002271
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864001996	881864002272
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864000704	881864002273

The customer is required to check the chosen configuration and that it can be assembled clash free.





## Technical specifications RCS 184-07.8-D-S-XX

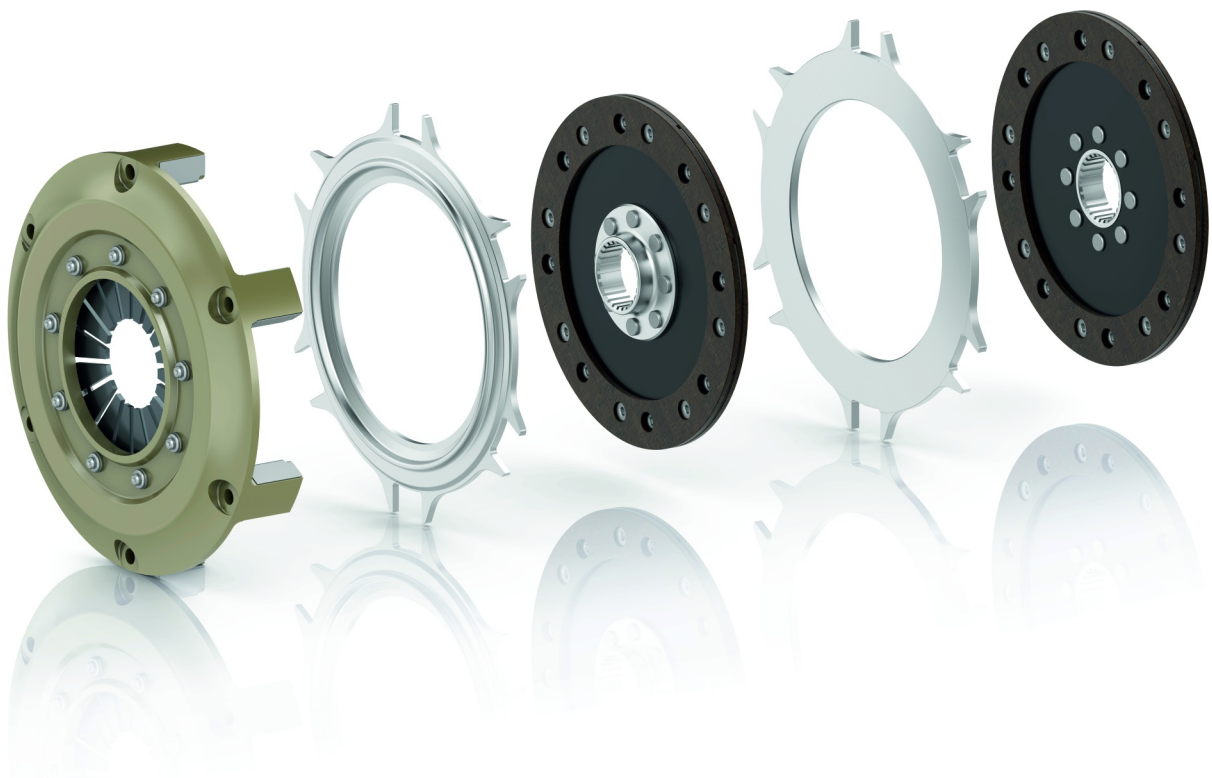
Selection criteria			Technical specifications						Purchase order number				
Clutch torque	Dimension $\varnothing$ A Release $\varnothing$	Dimension $\varnothing$ B Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000336	Qty driven disc*	
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty	
<b>1-Disc Clutch</b>													
260	49	46	2400	1.5	5.0 +0.5	5.0	2.274	0.013051	003072000130	003002001898	0	1	
441	49	46	4300	1.5	5.0 +0.5	5.0	2.324	0.013306	003072000125	003002001898	0	1	
441	44	37	3900	1.5	5.0 +0.5	5.0	2.34	0.013336	003072000139	003002001898	0	1	
<b>2-Disc Clutch</b>													
519	49	46	2400	1.5	5.0 +0.5	5.0	3.34	0.019111	003072000134	003002001897	1	2	
883	49	46	4300	1.5	5.0 +0.5	5.0	3.39	0.019366	003072000126	003002001897	1	2	
883	44	37	3900	1.5	5.0 +0.5	5.0	3.406	0.019369	003072000140	003002001897	1	2	

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

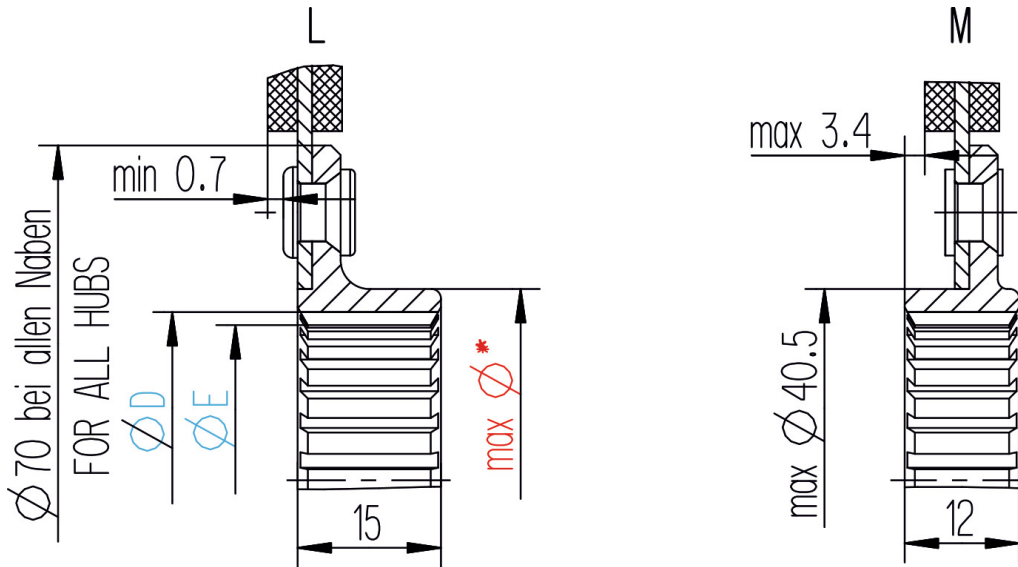
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14

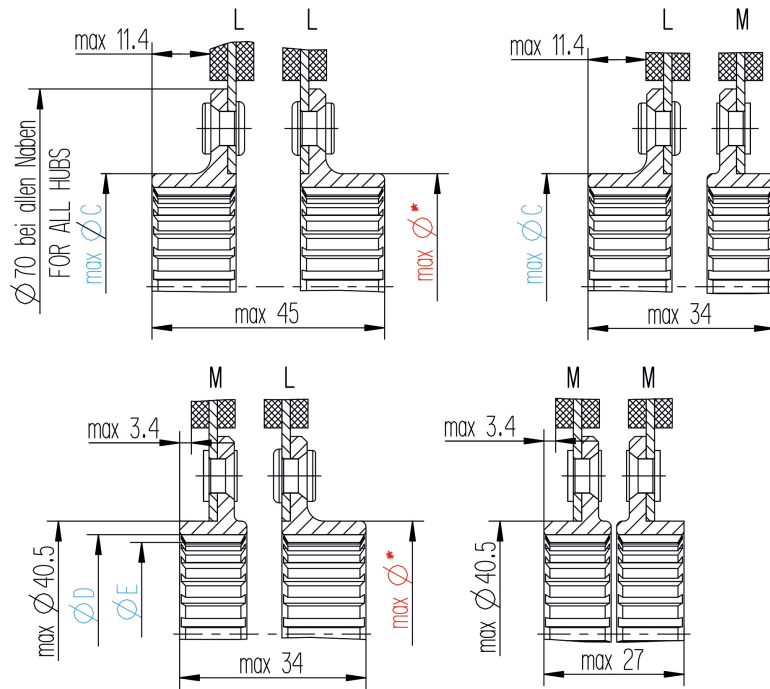


# Hub configuration RCS 184-07.8

## 1-Disc Clutch



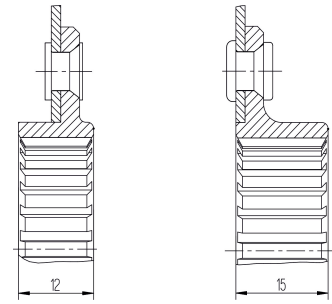
## 2-Disc Clutch



Flywheel Side

Gearbox Side

## Driven disc selection according to hub type RCS 184-07.8



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002072	R88186499A088
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002073	R88186499B088
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002103	881864002007
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002074	R88186499C088
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002090	881864001381
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002075	R88186499D088
038	25 x 2.2	1" x 14T	14	32.5	22.0	25.0	881864002076	R88186499E088
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864002077	R88186499F088
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002078	R88186499G088
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002104	881864002008
075	25 x 2.3	25mm x 24T	24	32.5	23.0	25.0	881864002079	R88186499H088
076	24/48-22-30°		22	30.5	22.225	25.189	881864002088	R88186499U088
081	20x18°		18	26.5	18.0	20.0	881864002092	881864001277
091	24/48-23-30°		23	32.5	23.28	26.25	881864002080	R88186499I088
092	23 x 3.14		23	30.5	21.8	24.2	881864002081	R88186499K088
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002101	R88186499L088
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002093	881864001278
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002094	881864002006
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002095	881864001279
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002096	881864001280
804	26x3.93		26	40.5	32.6	35.2	881864002097	881864001281
808	24-48-25-30°		25	36.5	25.4	28.5	881864002105	881864002009
812	24/48-28-30°		28	34.5	28.1	30.5	881864002098	881864001282
820	22x3.93		22	34.5	26.5	29.0	881864002099	881864000909
823	24/48-26-30°		26	34.5	23.83	28.68	881864002106	881864002010
906	24/48-25-30°		25	34.5	24.87	28.04	881864002091	R88186499Y088
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002082	R88186499M088
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002083	R88186499N088
926	20/40-21-30°		21	34.5	25.4	28.5	881864002084	R88186499O088
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002085	881864001378
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864002102	881864001379
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002089	R88186499V088
938	28 x 2.36		28	28.5	20.3	22.1	881864002086	R88186499S088
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002100	881864001283
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002087	881864001380

The customer is required to check the chosen configuration and that it can be assembled clash free.

\*) All red labelled driven discs are not compatible to be used as the first disc on the gearbox / diaphragm spring side with a release diameter of 38 mm or 44 mm respectively.





## Technical specifications RCS 200-S2.6-D-S-XX

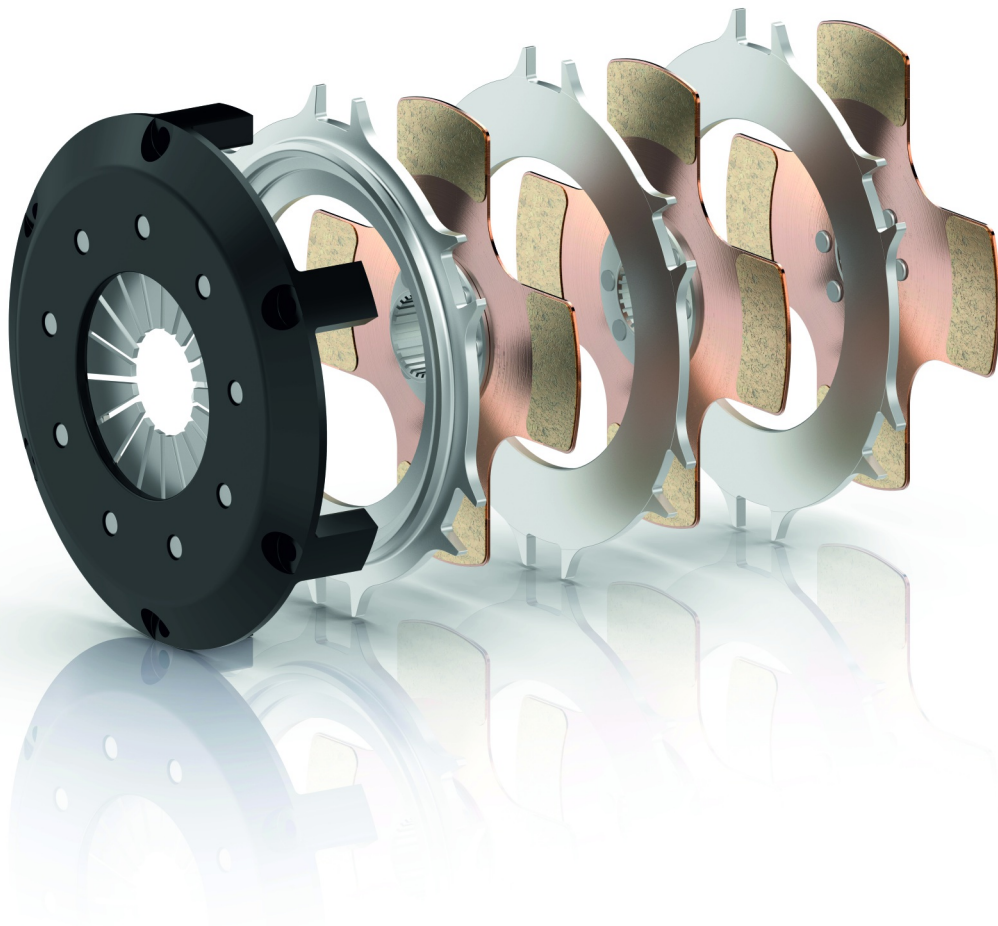
Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000380	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
<b>2-Disc Clutch</b>												
1665	49	46	3700	1.5	5.0 +0.5	6.0	4.019	0.02586	003072999556	003002001173	1	2
<b>3-Disc Clutch</b>												
2497	49	46	3700	1.5	5.0 +0.5	6.0	5.28	0.03398	003072999555	003002001365	2	3

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

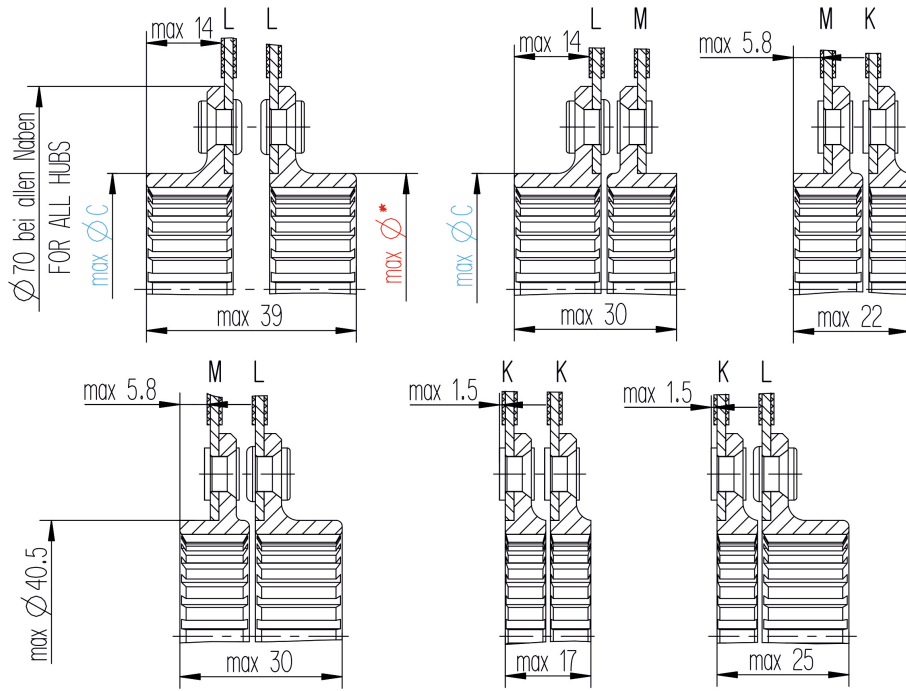
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14



# Hub configuration RCS 200-S2.6

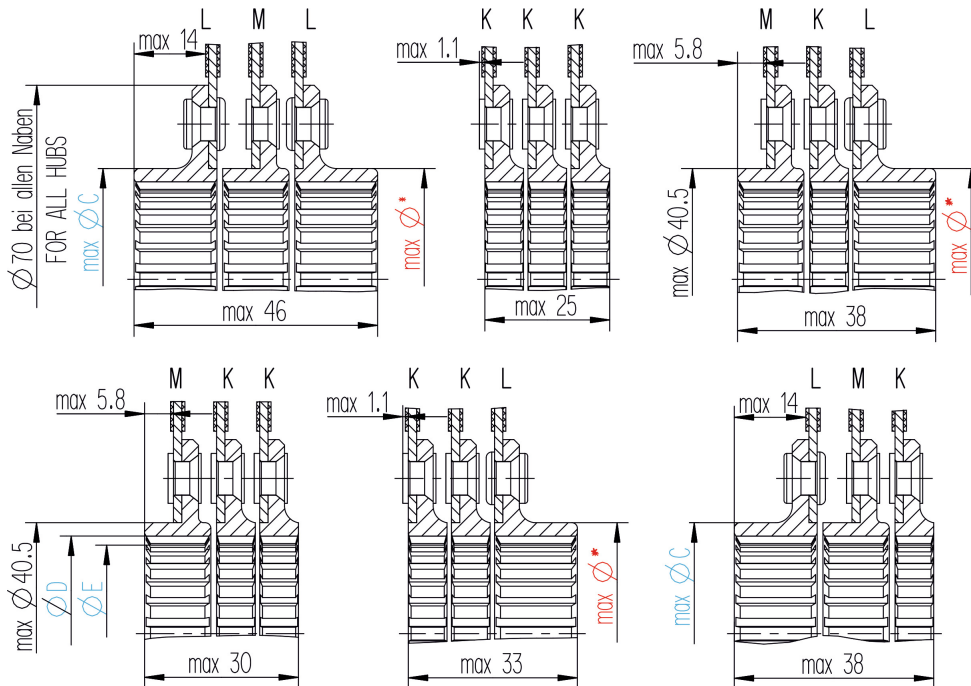
## 2-Disc Clutch



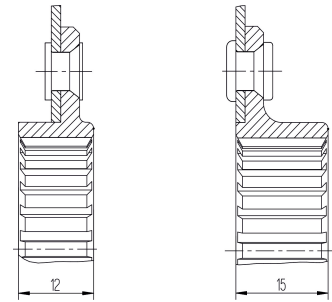
Flywheel Side

Gearbox Side

## 3-Disc Clutch



## Driven disc selection according to hub type RCS 200-S2.6



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864001405	R88186499A098
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864001406	R88186499B098
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002055	881864002051
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	R88186499C099	R88186499C098
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	R88186499W099	881864001404
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	R88186499D099	R88186499D098
038	25 x 22	1" x 14T	14	32.5	22.0	25.0	881864001407	R88186499E098
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	R88186499F099	R88186499F098
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	R88186499G099	R00184899G098
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002056	881864002052
075	25 x 23	25mm x 24T	24	32.5	23.0	25.0	R88186499H099	R88186499H098
076	24/48-22-30°		22	30.5	22.225	25.189	881864001414	R88186499U098
081	20x18°		18	26.5	18.0	20.0	881864001317	881864001309
091	24/48-23-30°		23	32.5	23.28	26.25	R88186499I099	R88186499I098
092	23 x 3.14		23	30.5	21.8	24.2	R88186499K099	R88186499K098
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864001408	881864001402
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864001318	881864001310
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864001319	881864001311
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864001320	881864001312
802	25,2-1-30-24		24	32.5	22.6	25.2	881864001321	881864001313
804	26x3.93		26	40.5	32.6	35.2	881864001322	881864001314
808	24-48-25-30°		25	36.5	25.4	28.5	881864002057	881864002053
812	24/48-28-30°		28	34.5	28.1	30.5	881864000912	881864000913
820	22x3.93		22	34.5	26.5	29.0	881864001323	881864001315
823	24/48-26-30°		26	34.5	23.83	28.68	881864002058	881864002054
906	24/48-25-30°		25	34.5	24.87	28.04	881864001324	R88186499Y098
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864001409	R88186499M098
924	18.65 x 15.7		14	28.5	15.7	18.65	881864001410	R88186499N098
926	20/40-21-30°		21	34.5	25.4	28.5	R88186499O099	R88186499O098
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864001411	881864001403
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	R88186499Q099	R88186499Q098
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864001415	R88186499V098
938	28 x 2.36		28	28.5	20.3	22.1	881864001412	R88186499S098
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864001325	881864001316
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864001413	R88186499T098

The customer is required to check the chosen configuration and that it can be assembled clash free.



## Technical specifications RCS 200-S7.8-D-S-XX

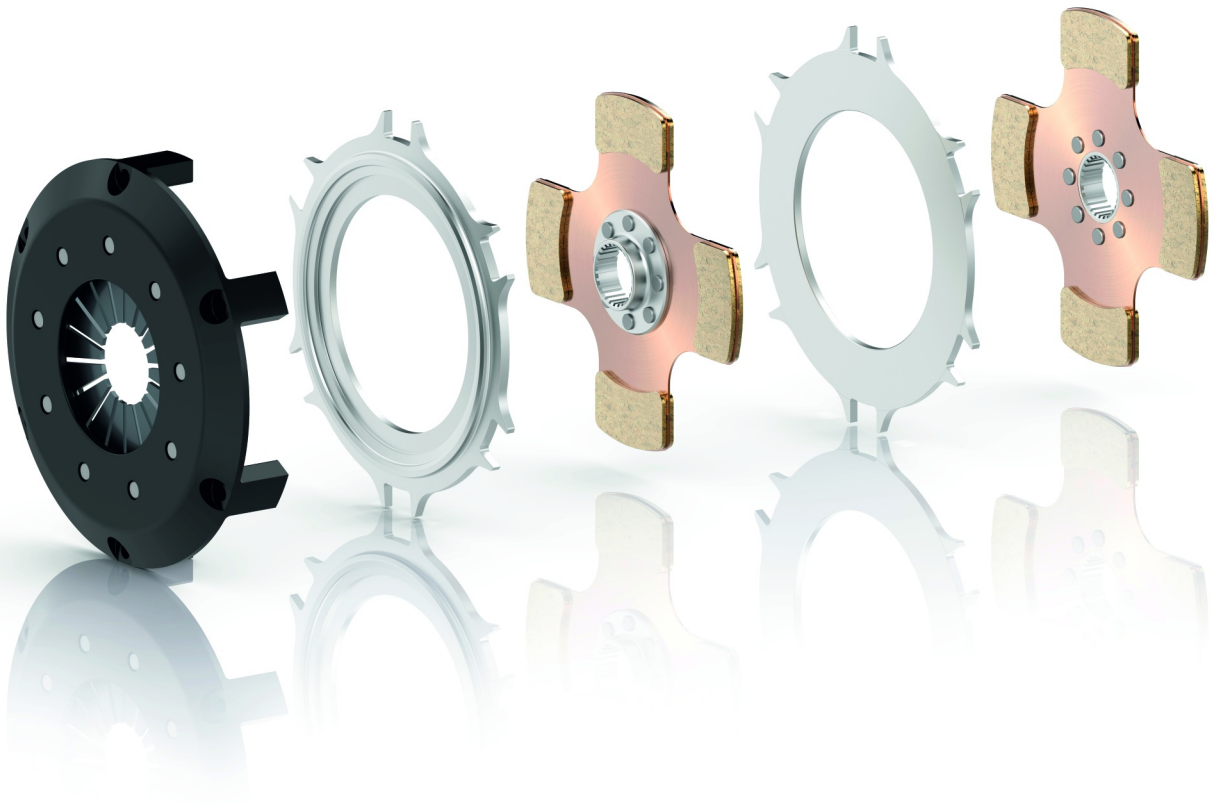
Selection criteria			Technical specifications						Purchase order number				
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000380	Qty driven disc*	
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty	
<b>1-Disc Clutch</b>													
832	49	46	3700	1.5	5.0 +0.5	6.0	3.152	0.02089	003072999556	003002001365	0	1	
<b>2-Disc Clutch</b>													
1665	49	46	3700	1.5	5.0 +0.5	6.0	4.517	0.02956	003072999555	003002001173	1	2	

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

### Selection of driven disc order number:

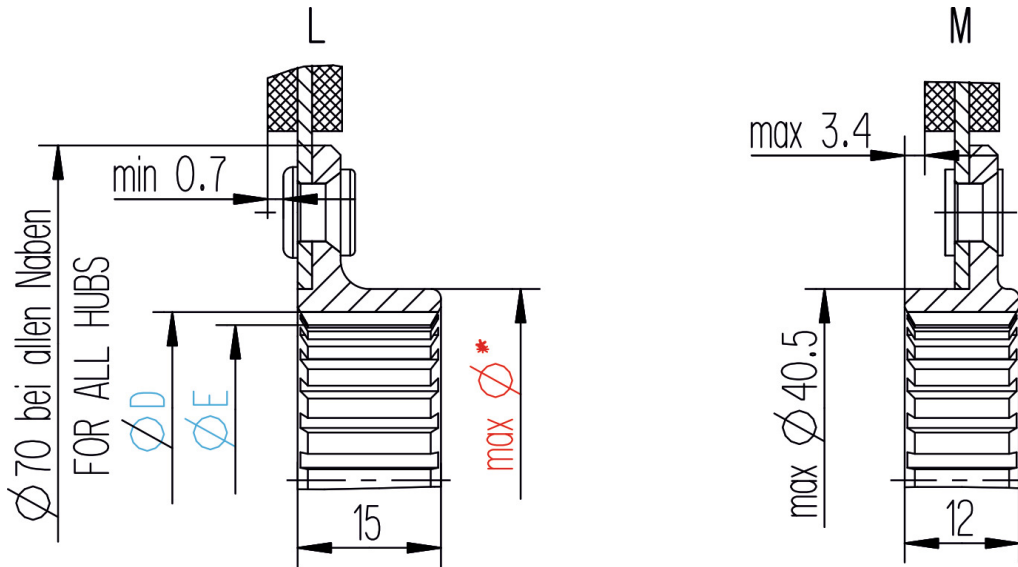
- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14



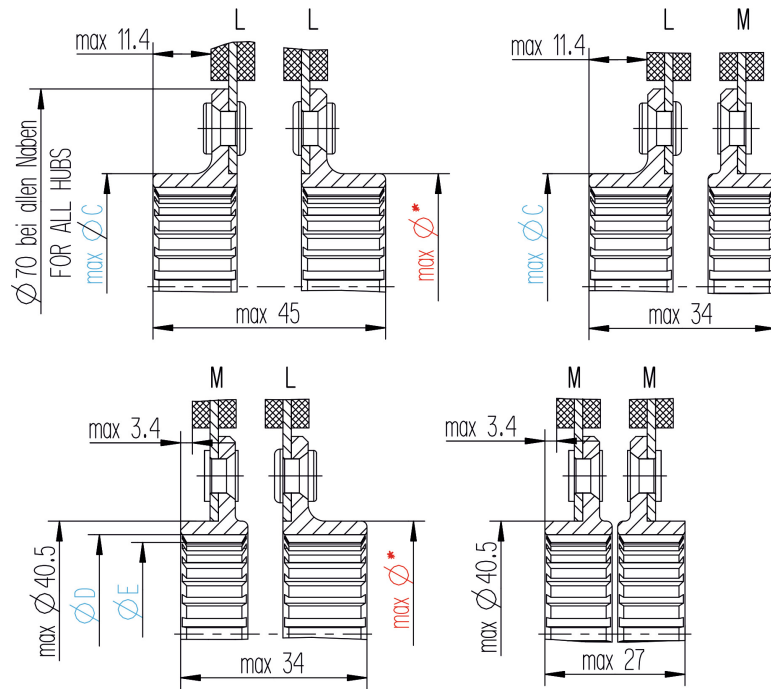


# Hub configuration RCS 200-S7.8

## 1-Disc Clutch



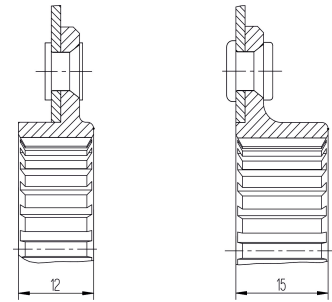
## 2-Disc Clutch



Flywheel Side

Gearbox Side

## Driven disc selection according to hub type RCS 200-S7.8



ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002561	881864002597
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002562	881864002598
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002563	881864002599
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002564	881864002600
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002565	881864002601
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002566	881864002602
038	25 x 2.2	1" x 14T	14	32.5	22.0	25.0	881864002567	881864002603
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864002568	881864002604
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002569	881864002605
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002570	881864002606
075	25 x 2.3	25mm x 24T	24	32.5	23.0	25.0	881864002571	881864002607
076	24/48-22-30°		22	30.5	22.225	25.189	881864002572	881864002608
081	20x18°		18	26.5	18.0	20.0	881864002573	881864002609
091	24/48-23-30°		23	32.5	23.28	26.25	881864002574	881864002610
092	23 x 3.14		23	30.5	21.8	24.2	881864002575	881864002611
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002576	881864002612
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002577	881864002613
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002578	881864002614
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002579	881864002615
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002580	881864002616
804	26x3.93		26	40.5	32.6	35.2	881864002581	881864002617
808	24-48-25-30°		25	36.5	25.4	28.5	881864002582	881864002618
812	24/48-28-30°		28	34.5	28.1	30.5	881864002583	881864002619
820	22x3.93		22	34.5	26.5	29.0	881864002584	881864002620
823	24/48-26-30°		26	34.5	23.83	28.68	881864002585	881864002621
906	24/48-25-30°		25	34.5	24.87	28.04	881864002586	881864002622
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002587	881864002623
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002588	881864002624
926	20/40-21-30°		21	34.5	25.4	28.5	881864002589	881864002625
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002590	881864002626
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864002591	881864002627
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002592	881864002628
938	28 x 2.36		28	28.5	20.3	22.1	881864002593	881864002629
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002594	881864002630
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002595	881864002631

The customer is required to check the chosen configuration and that it can be assembled clash free.



## Technical specifications RCS 200-07.8-D-S-XX

Selection criteria			Technical specifications						Purchase order number			
Clutch torque	Dimension $\varnothing A$ Release $\varnothing$	Dimension $\varnothing B$ Spring Inner $\varnothing$	Release force max.	Wear range	Release travel X	Wear travel Y	Mass	Inertia	Housing	Pressure plate	Qty intermediate plate 003019000380	Qty driven disc*
[Nm]	[mm]	[mm]	[N]	[mm]	[mm]	[mm]	[kg]	[kgm <sup>2</sup> ]	Part number	Part number	Qty	Qty
<b>1-Disc Clutch</b>												
561	49	46	3700	1.5	5.0 +0.5	6.0	3.179	0.02113	003072999556	003002001365	0	1
<b>2-Disc Clutch</b>												
1122	49	46	3700	1.5	5.0 +0.5	6.0	4.571	0.03004	003072999555	003002001173	1	2

More clutch torque without safety margin!

\*) The order number for driven discs, according to the required hub spline configuration and spline selection can be found on the following pages.

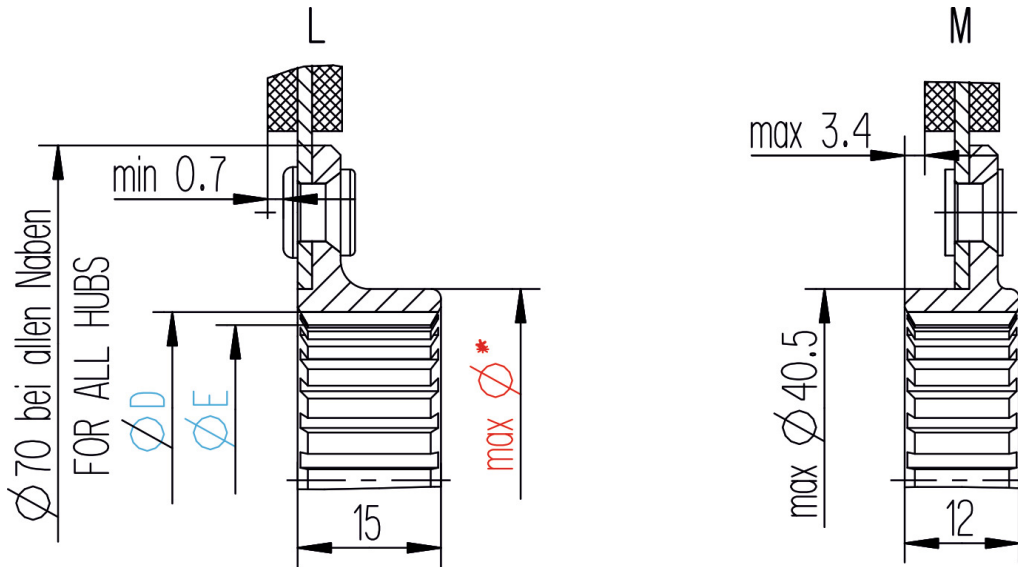
### Selection of driven disc order number:

- Select the suitable hub configuration
- The order number of the driven discs is defined with the ZF Code / spline size application
- A configuration example can be found on pages V13 & V14

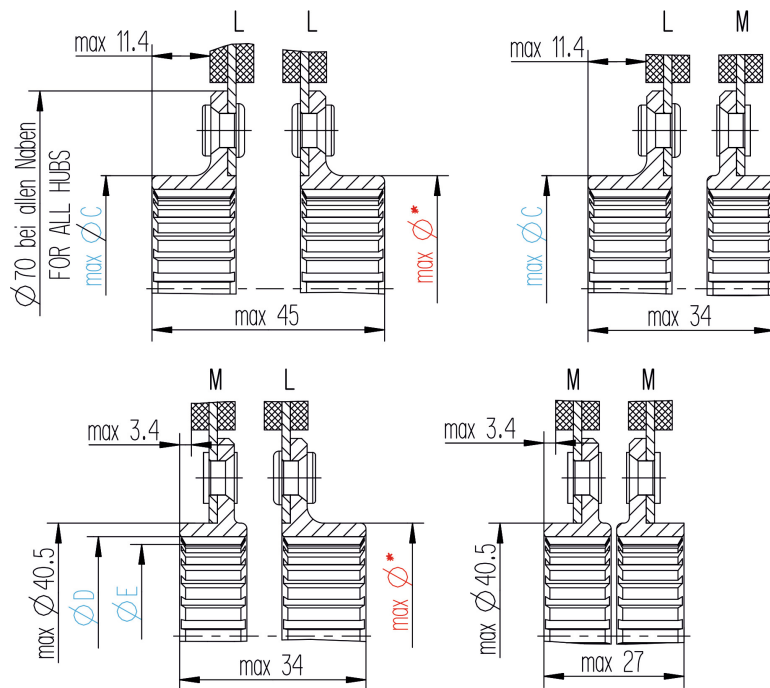


# Hub configuration RCS 200-07.8

## 1-Disc Clutch



## 2-Disc Clutch

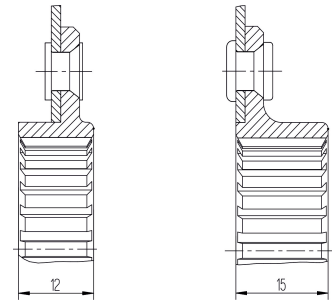


Flywheel Side

Gearbox Side



## Driven disc selection according to hub type RCS 200-07.8

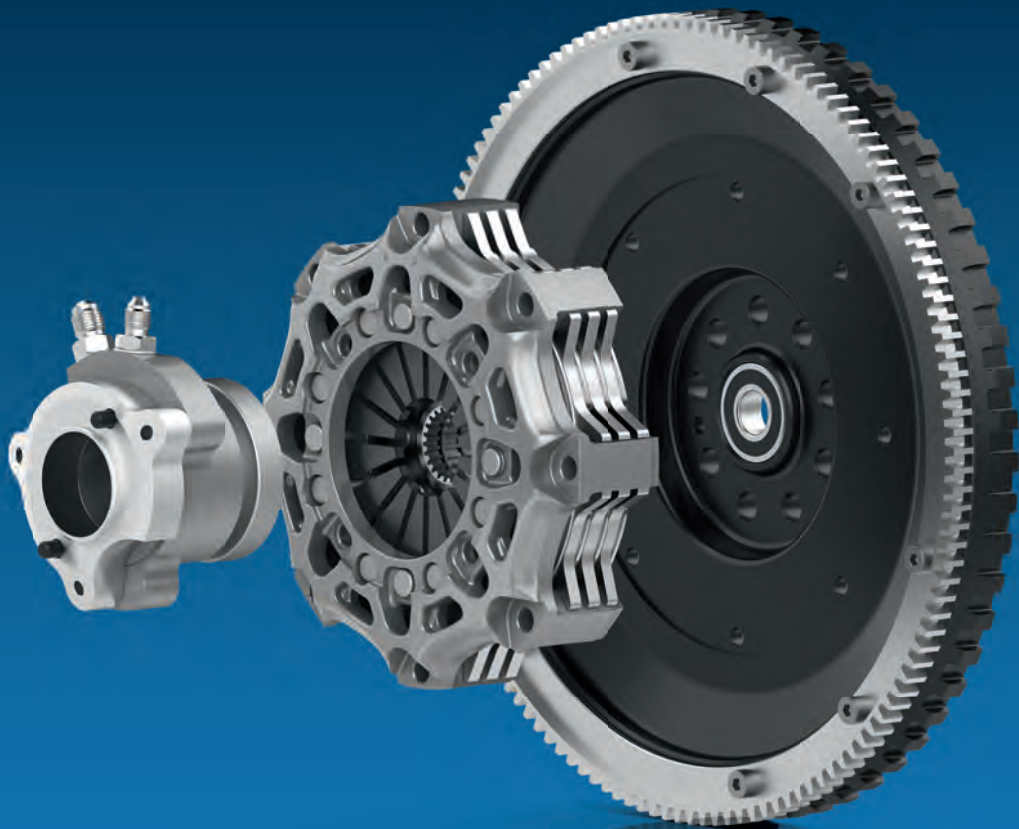


ZF Code	Spline basic	Spline inch	No of teeth	Dim. C [mm]	Dim. D [mm]	Dim. E [mm]	M	L
002	1 SAE 10C	1" x 10T	10	30.5	20.6	25.8	881864002072	R88186499A104
003	1 1/8 SAE 10C	1.12" x 10T	10	34.5	23.4	28.9	881864002073	R88186499B104
010	A10 x 16 x 20		10	26.5	16.0	20.0	881864002103	881864002067
013	A10 x 23 x 29	29mm x 10T	10	34.5	23.0	29.0	881864002074	R88186499C104
016	A10 x 28 x 35	1.25" x 10T	10	40.5	28.0	35.0	881864002090	R88186499W104
035	24 x 2.5	0.8" x 24T	24	25.5	18.27	20.4	881864002075	R88186499D104
038	25 x 2.2	1" x 14T	14	32.5	22.0	25.0	881864002076	R88186499E104
045	24/48-20-30°	0.875" x 20T	20	28.5	20.109	22.58	881864002077	R88186499F104
047	24/48-23-30°	1" x 23T	23	32.5	22.995	25.994	881864002078	R88186499G104
065	32/64-20-30°	17.3mm x 20T	20	24.5	15.08	17.305	881864002104	881864002068
075	25 x 2.3	25mm x 24T	24	32.5	23.0	25.0	881864002079	R88186499H104
076	24/48-22-30°		22	30.5	22.225	25.189	881864002088	R88186499U104
081	20x18°		18	26.5	18.0	20.0	881864002092	881864001331
091	24/48-23-30°		23	32.5	23.28	26.25	881864002080	R88186499I104
092	23 x 3.14		23	30.5	21.8	24.2	881864002081	R88186499K104
094	24/48-17-30°	20mm x 17T	17	25.5	16.92	19.9	881864002101	881864001416
522	NA	26mm x 24T	24	32.5	24.0	26.0	881864002093	881864001332
532	24/48-26-30°-5		26	34.5	26.5	29.55	881864002094	881864001333
575	N24T-1-30°	1" x 24T	24	32.5	23.1	25.6	881864002095	881864001334
802	25,2-1-30-24		24	32.5	22.6	25.2	881864002096	881864001335
804	26x3.93		26	40.5	32.6	35.2	881864002097	881864001336
808	24-48-25-30°		25	36.5	25.4	28.5	881864002105	881864002069
812	24/48-28-30°		28	34.5	28.1	30.5	881864002098	881864001337
820	22x3.93		22	34.5	26.5	29.0	881864002099	881864001338
823	24/48-26-30°		26	34.5	23.83	28.68	881864002106	881864002070
906	24/48-25-30°		25	34.5	24.87	28.04	881864002091	R88186499Y104
916	24/48-21-37.5°		21	30.5	21.387	24.308	881864002082	R88186499M104
924	18.65 x 15.7		14	28.5	15.7	18.65	881864002083	R88186499N104
926	20/40-21-30°		21	34.5	25.4	28.5	881864002084	R88186499O104
927	24/48-21-30°	0.92" x 21T	21	28.5	21.19	23.75	881864002085	R88186499P104
931	24/48-26-30°	1.16" x 26T	26	34.5	26.46	28.68	881864002102	881864001417
935	24/48-18-37.5°		18	26.5	18.22	21.01	881864002089	R88186499V104
938	28 x 2.36		28	28.5	20.3	22.1	881864002086	R88186499S104
962	21.8 x 1 x 20		20	28.5	19.12	21.8	881864002100	881864001339
980	32/64-26-37.5°		26	28.5	20.0	21.91	881864002087	R88186499T104

The customer is required to check the chosen configuration and that it can be assembled clash free.

# 03

## RCS – Templates and Extensions



In addition to our wide range of RCS clutches with organic and sinter driven discs, we also offer carbon clutches and centrifugal clutches.

On top of that we offer an extensive variety of add-ons such as adapter plates, shim plates, ring pistons and actuation systems, all the way up to plug-and-play clutch modules.



# Slave Cylinder

ZF Race Engineering offers a specially developed and designed slave cylinder (CSC = Concentric Slave Cylinder) for push-type actuation of RCS racing clutches.

## Advantages

Using housings, which are produced as a single component, we achieve the highest possible strength and prevent leakage.

The release bearing is designed for high rpm levels of race engines. The release diameter of the slave cylinder is specially adjusted to the release diameter of ZRE RCS clutches and is available in three different diameters:  
Ø 38 mm | Ø 44 mm | Ø 49 mm

ZRE slave cylinders are designed to generate the optimum friction in the system. This has been achieved by a special coating, as well as an optimal friction sealing system.

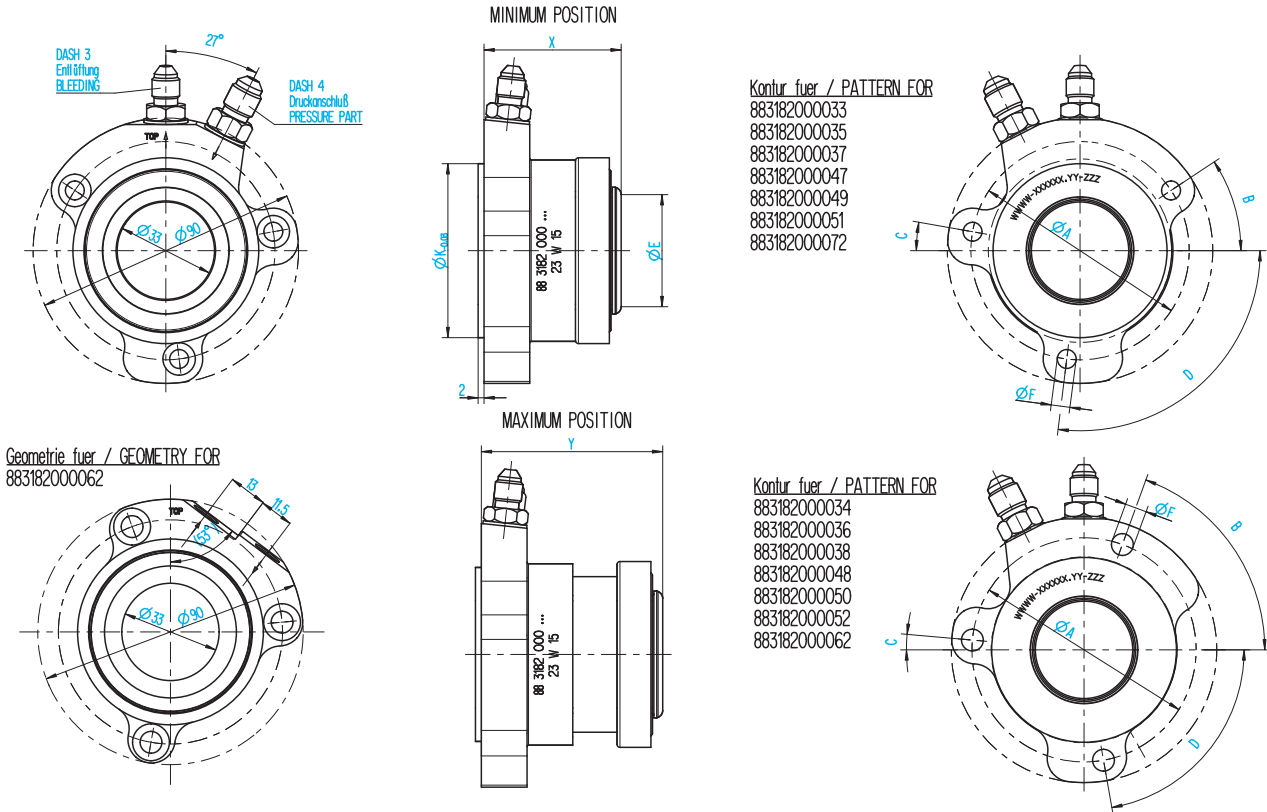
In general racing clutches have higher release forces. As a result of that, the pedal forces that the drivers must exert are also considerably higher. However, the slave cylinder developed specifically for racing



clutches, features a higher hydraulic volume, which lowers the pedal forces for the driver. The cross-sectional area of this slave cylinders is 820.7 mm

ZRE slave cylinders are available in different connection geometries and in two different working ranges (strokes).

## Technology in detail



- A** Pitch circle fixation holes
- B/C/D** Angle fixation holes
- E** Release diameter (contact diameter)
- F** Diameter fixation holes
- K** Centering diameter
- X** CSC in compression
- Y** CSC in rebound
- \*)** Hydraulic - adapter not included

## Slave Cylinder Variations

Part number	A [mm]	B [ ° ]	C [ ° ]	D [ ° ]	E [mm]	F [mm]	K [mm]	X [mm]	Y [mm]	Stroke [mm]	Replacement for
883182000033	74	33.5	10	97	38	6.6	58.99	46.5	61.5	15.0	---
883182000034	76	70	5	80	38	7.2	62.65	46.5	61.5	15.0	---
883182000035	74	33.5	10	97	44	6.6	58.99	46.5	61.5	15.0	---
883182000036	76	70	5	80	44	7.2	62.65	46.5	61.5	15.0	---
883182000037	74	33.5	10	97	49	6.6	58.99	47.0	62.0	15.0	---
883182000038	76	70	5	80	49	7.2	62.65	47.0	62.0	15.0	---
883182000072	74	33.5	10	97	38	6.6	58.99	50.0	62.0	15.0	883182999546
883182000047	74	33.5	10	97	38	6.6	58.99	43.3	55.3	12.0	---
883182000048	76	70	5	80	38	7.2	62.65	43.3	55.3	12.0	---
883182000049	74	33.5	10	97	44	6.6	58.99	43.3	55.3	12.0	---
883182000050	76	70	5	80	44	7.2	62.65	43.3	55.3	12.0	---
883182000051	74	33.5	10	97	49	6.6	58.99	43.8	55.8	12.0	---
883182000052	76	70	5	80	49	7.2	62.65	43.8	55.8	12.0	---
883182000062 *)	76	70	5	80	49	7.2	62.50	43.8	55.8	12.0	---



# CSC-Kits

ZF Race Engineering CSC's are combined with diverse adapters. Hereby differences in axial height between clutch and gearbox can be adjusted.

The kits are delivered pre-assembled and required mounting screws are included.

The maximum admissible outer diameter of the gearbox input shaft is  $\varnothing$  32.5 mm.

We provide various adapters to suit several mounting patterns.



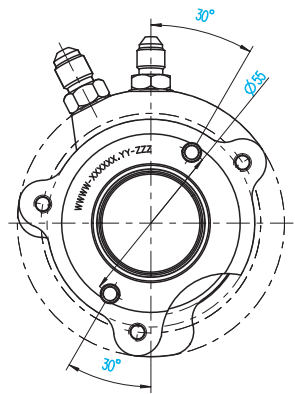
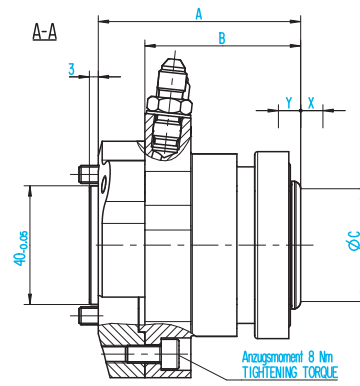
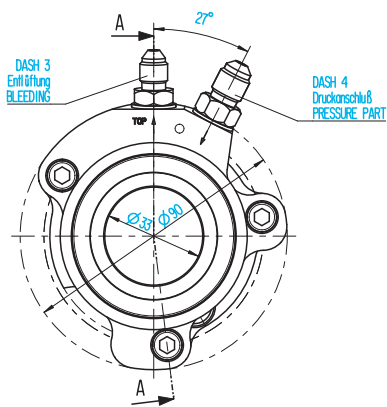
## Slave Cylinder Kits

Part number	A [mm]	B [mm]	C [mm]	X [mm]	Y [mm]	Stroke [mm]	Replacement for
883000001125	64.7	54.0	38.0	7.5	7.5	15.0	R88318299B535
883000001134	68.6	54.5	49.0	7.5	7.5	15.0	R88318299B522
883000001135	69.7	54.0	38.0	7.5	7.5	15.0	R88318299B538
883000001136	78.6	54.0	38.0	7.5	7.5	15.0	R88318299B518
883000001137	64.0	49.3	38.0	6.0	6.0	12.0	R88318299B526
883000001138	62.9	49.8	49.0	6.0	6.0	12.0	R88318299B533

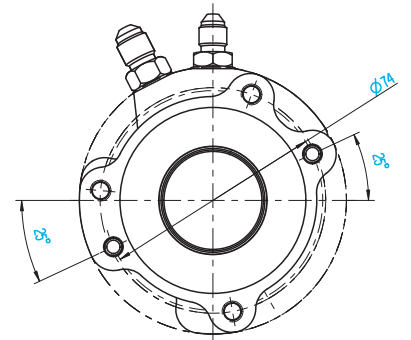
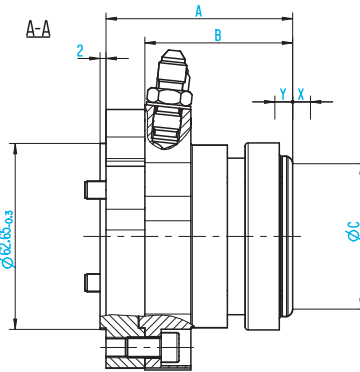
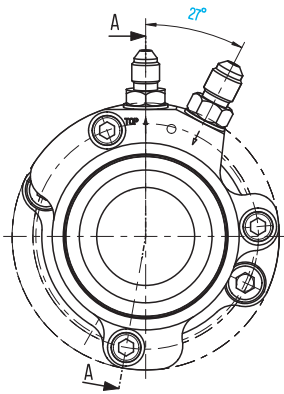
X Release travel  
Y Wear travel

## Variants CSC-Kits

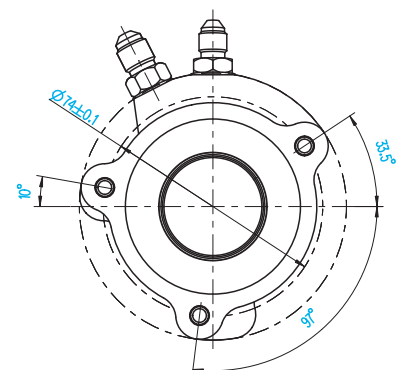
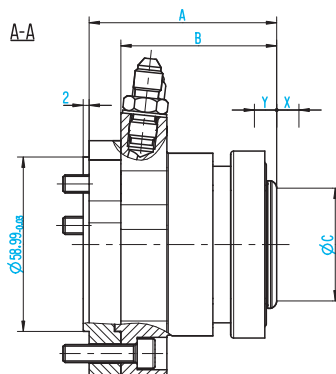
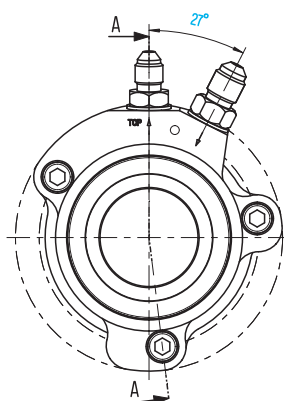
Variante / Variant:  
 883000001135  
 883000001136  
 883000001137



Variante / VARIANT:  
 883000001138



Variante / Variant:  
 883000001125  
 883000001134



# Ring Piston Assembly

ZF Race Engineering offers ring piston assemblies as spare parts for RCS slave cylinders. The ring pistons are built up of an aluminium piston, the bearing and integrated release ring.



## Technical Specifications

The contact diameter of the ring piston is specially adjusted to the contact diameter of our RCS clutches.

Available in three different contact diameters:

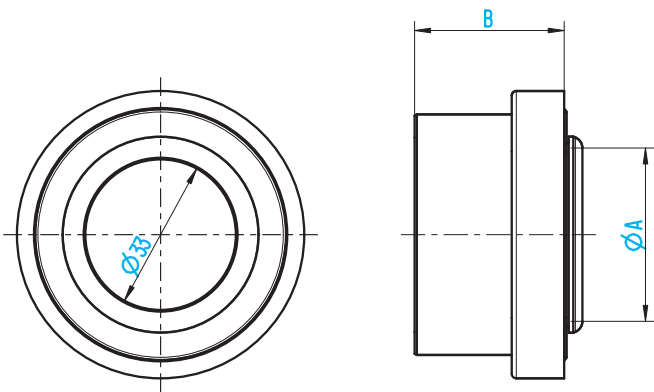
Ø 38 mm | Ø 44 mm | Ø 49 mm

Available in two different lengths related to the defined working range of 12 mm stroke or 15 mm stroke.

### Robustness:

The bearing is caulked into the piston. This prevents detachment of the bearing due to different thermal expansions.

Old bearings can be replaced if the concentric slave cylinder is still operating effectively.



.....  
A Contact diameter

## Ring piston assemblies

Part number	A [mm]	B [mm]	Designed for Slave Cylinder
			Part numbers
00315800017	49.0	29.6	883182000051   883182000052   883182000062
00315800019	49.0	32.8	883182000037   883182000038
00315800020	44.0	29.6	883182000049   883182000050
00315800021	44.0	32.8	883182000035   883182000036
00315800022	38.0	29.6	883182000047   883182000048   883182000094
00315800023	38.0	32.8	883182000033   883182000034   883182000072

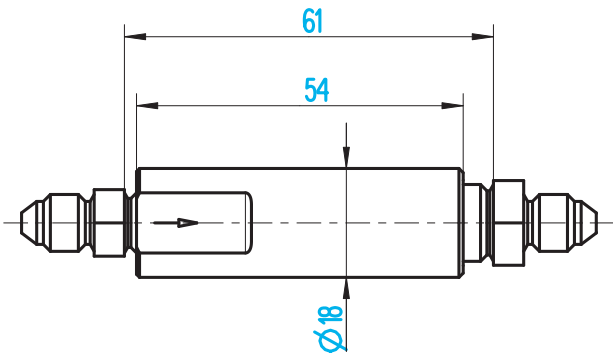
# Pre-Pressure Valve

The release ring should always be in contact with the diaphragm spring of the clutch and turn with it. The reason for that is to minimize the wear on the contact surfaces and to extend the durability of the bearing. Therefore, ZF Race Engineering offers residual-pressure valves.

This valve keeps up a residual pressure in the releaser and presses the bearing against the diaphragm spring. Thus, a permanent turning of the bearing is enabled. ZRE offers valves with 0.68 bar pre-pressure. On request, other valves and line connections are available.







## Pre-Pressure Valve details

Part number	Thread [Type]	Pre-pressure [bar]	Weight [g]	Length [mm]
003157999532	DASH 3	0,68 bar	68 g	100 mm

# Stud Bolts and K-Nuts

ZF Race Engineering offers stud bolts in various lengths for clutch installation. The bolts feature an expansion shaft with tight turned fit dimension and a flattened head as anti-rotation protection.

Fitting high quality K-Nuts can be ordered separately.



## M6 Stud Bolts

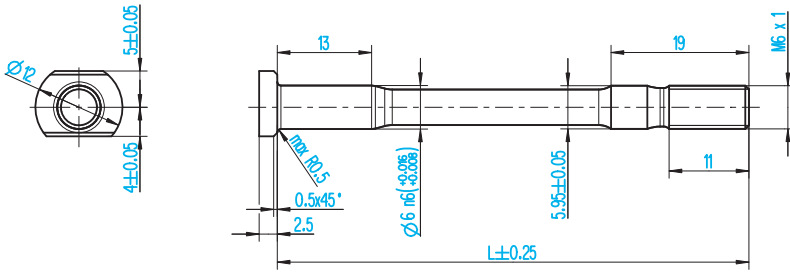
Type	Part number	L [mm]
RCS M6 x 57.5	003015000111	57.5
RCS M6 x 60.0	003015000112	60.0
RCS M6 x 62.5	003015000113	62.5
RCS M6 x 65.0	003015000114	65.0
RCS M6 x 67.5	003015000115	67.5
RCS M6 x 70.0	003015000116	70.0
RCS M6 x 72.5	003015000118	72.5
RCS M6 x 75.0	003015000119	75.0
RCS M6 K-Nut	003028999502	---

## M8 Stud Bolts

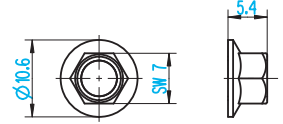
Type	Part number	L [mm]
RCS M8 x 45.0	003015000102	45.0
RCS M8 x 50.0	003015000103	50.0
RCS M8 x 55.0	003015000104	55.0
RCS M8 x 57.5	003015000105	57.5
RCS M8 x 60.0	003015000106	60.0
RCS M8 x 62.5	003015000107	62.5
RCS M8 x 65.0	003015000108	65.0
RCS M8 x 67.5	003015000109	67.5
RCS M8 K-Nut	003028999504	---

L Dimension stud length

## M6 Stud Bolts Dimensions



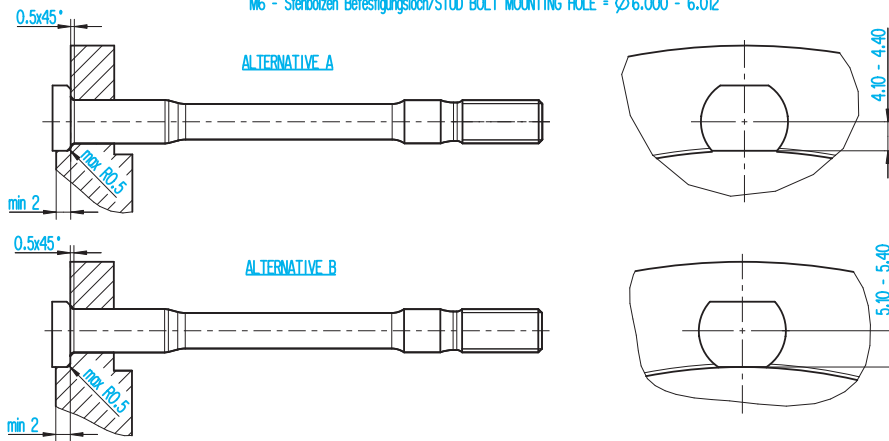
M6 x 1 K-NUT



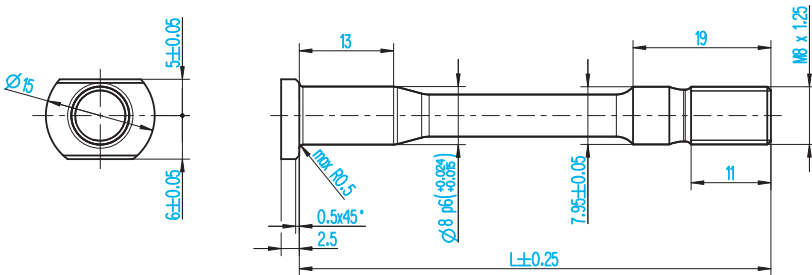
M6 x 1 - 10Nm (7.5lb/ft)  
Empfohlenes Anzugsmoment/  
RECOMMENDED TIGHTENING TORQUE

### Schwungrad Maße/FLYWHEEL DIMENSIONS

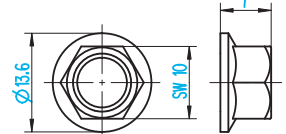
M6 - Stehbolzen Befestigungsloch/STUD BOLT MOUNTING HOLE =  $\varnothing 6.000 - 6.012$



## M8 Stud Bolts Dimensions



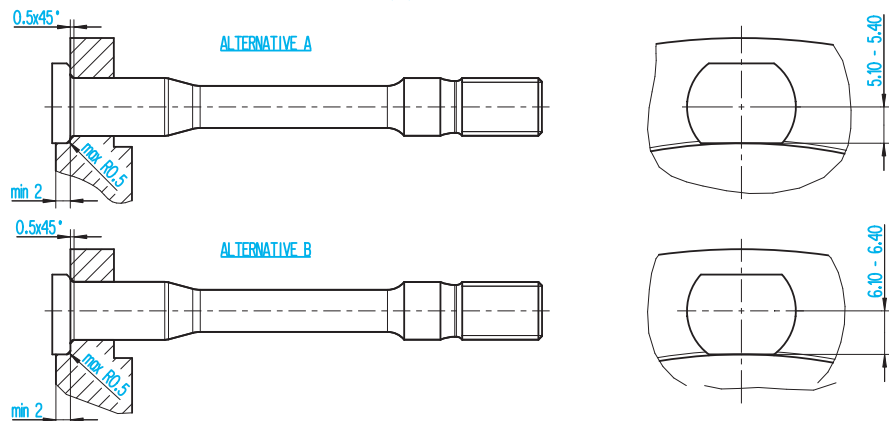
M8 x 1.25 K-NUT



M8 x 1.25 - 19Nm (14lb/ft)  
Empfohlenes Anzugsmoment/  
RECOMMENDED TIGHTENING TORQUE

### Schwungrad Maße/FLYWHEEL DIMENSIONS

M8 - Stehbolzen Befestigungsloch/STUD BOLT MOUNTING HOLE =  $\varnothing 8.005 - 8.020$



# Release Rings

As racing clutches are not developed for specific vehicles (see general information on RCS clutches), RCS clutches must be adapted to the installation space of the individual vehicle.

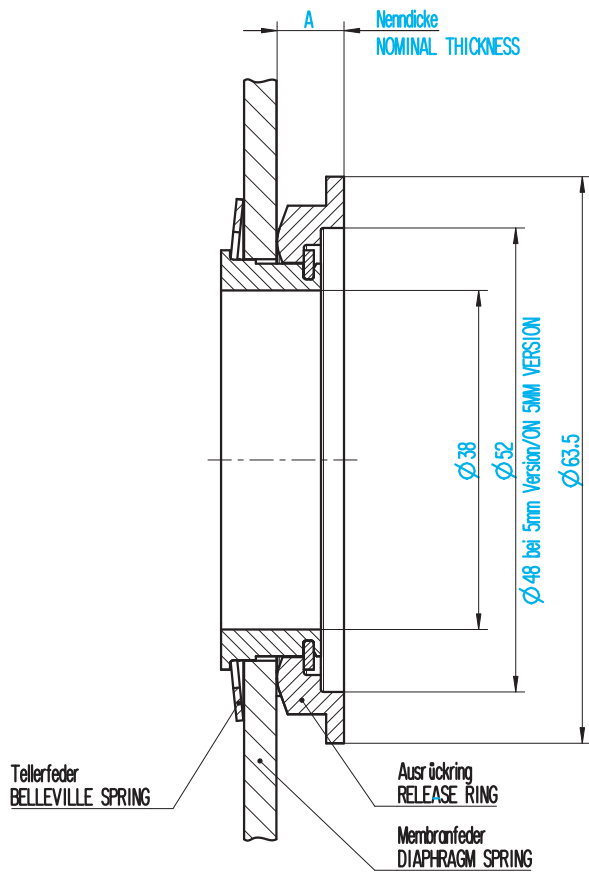


In order to fit to the axial position of the releaser / slave cylinder, so-called "release rings" can be mounted onto the clutch diaphragm spring. The release rings are available in different heights.

If a release ring is used, a release bearing / slave cylinder with a flat contact surface can be used. Stan-

dard release bearings usually have flat contact surfaces. A release ring should always be used for standard release bearings with flat contact surfaces.

The listed release rings are only suitable for clutch housing assemblies with diaphragm spring contact diameter  $\varnothing$  49 mm.



## Allocation of the release rings to the housing

For housings with **one diaphragm spring**

For housings with **two diaphragm springs**

Suitable Housings Part number	Part number	A [mm]
RCS 140 > 003072000147   003072000293 003072000294	003074000331	5.0
	003074000332	7.5
	003074000333	10.0
	003074000334	12.5
	003074000335	15.0
RCS 184 > 003072000125   003072000126 003072000127   003072000130 003072000134   003072000167 003072000194 and	003074999517	5.0
	003074000344	7.5
	003074000345	10.0
	003074000346	12.5
	003074000347	15.0
RCS 200 > 003072999555   003072999556	003074000348	20.0
	003074000349	25.0
	003074000350	30.0

Suitable Housings Part number	Part number	A [mm]
RCS 140 > 003072000097   003072000170 003072000290   003072000166 003072000289   003072000291	003074000336	5.0
	003074000337	7.5
	003074000338	10.0
	003074000339	12.5
	003074000343	15.0

.....  
A Nominal thickness



# Adapter Plates

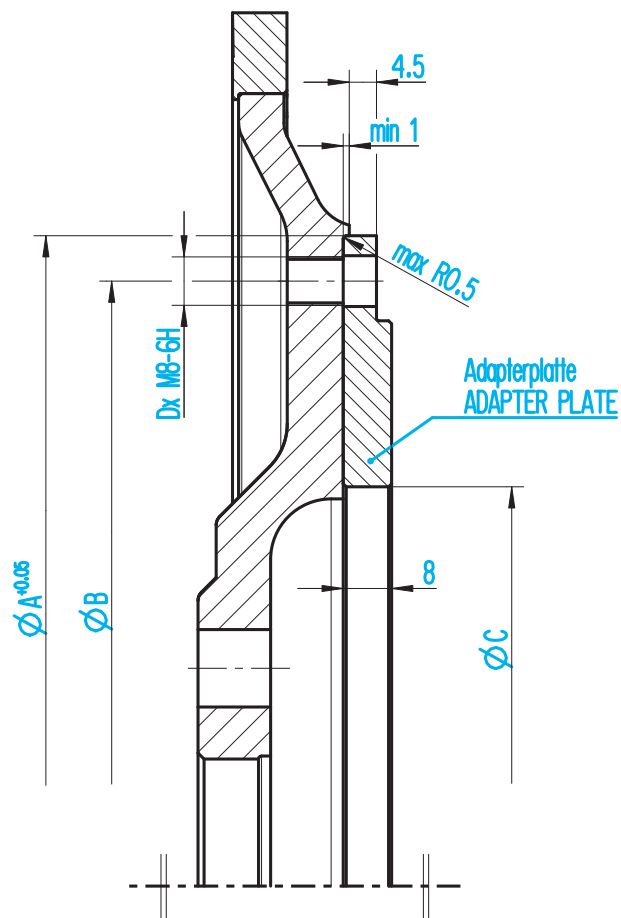
Adapter plates prevent wear of the flywheel. They must be centered on the flywheel and they offer the needed outline to adapt our RCS clutches

Ordinarily, clutches are bolted directly onto the flywheel. Wear results from the fact that the clutch works on a friction principle. This means that the clutch and the flywheel show the effect of abrasion. Due to the fact that flywheels are expensive components, optional adapter plates can be used to protect the flywheel from wear. Adapter plates are used as the friction partner to the clutch. The flywheel is not exposed to wear.

Therefore it does not need to be replaced. Adapter plates can also be used if the required clutch contour can't be applied to the existing flywheel.

The adapter plate is centred by the outer diameter of the flywheel. At least, centring must be 1 mm from the edge (please see illustration).





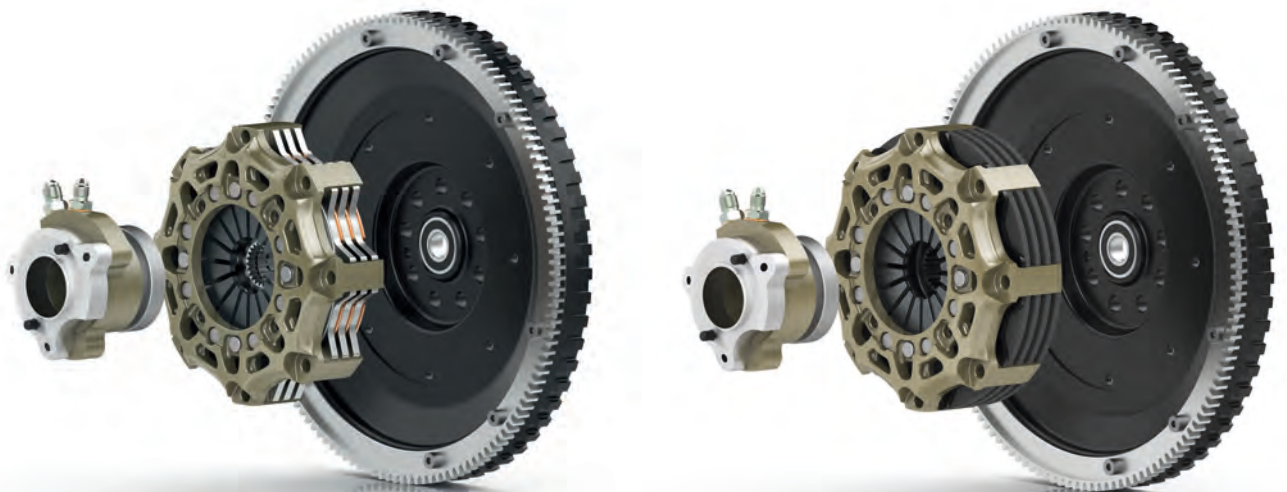
## Connecting dimensions for RCS adapter plates

Type	Part number	$\phi A$ [mm]	$\phi B$ [mm]	$\phi C^{-0.05}$ [mm]	D [piece]	Mass [kg]	Inertia [kg <sup>2</sup> ]
RCS 140	003021999524	167.0	154.45	97.0	8	0.77	0.0034
RCS 184	003021999525	215.0	200.0	132.0	6	1.22	0.0093
RCS 200	003021999526	227.0	214.0	132.0	6	1.48	0.0123

# Clutch Modules

ZF Race has developed complete racing clutch modules for a wide variety of vehicles. These modules include the following components:

- a specialised racing clutch
- a lightweight single mass flywheel
- a specialised slave cylinder (depending on module part number)



## Advantages

The major advantage of the racing clutch module over the standard series module, is the highly reduced mass and inertia of the components. This results in a major improvement of the acceleration properties of the vehicle. An important consideration is that the standard modules are designed for a high level of comfort, resulting in the higher mass of the modules.

Thus, this unnecessary weight significantly impairs the response of the engine and the acceleration of the vehicle. So with our lightweight racing clutch modules the performance of your engine can be vastly enhanced.

To actuate the racing clutch, either the existing standard clutch actuator or the specifically developed ZF Race slave cylinder can be used.

## Weight comparison of standard and racing clutch modules

### BMW | E36 / E46

Series/Standard  
RCS Clutch Module



### BMW | E 36 - M3

Series/Standard  
RCS Clutch Module



### BMW | E 46 - M3

Series/Standard  
RCS Clutch Module



### Mini | R56 - JCW

Series/Standard  
RCS Clutch Module



### Porsche | 993 / 996 / 997

Series/Standard  
RCS Clutch Module Sinter  
RCS Clutch Module Carbon



## RCS Clutch Modules

Vehicle Brand	Model type	RCS Clutch type	Max. Torque capacity [Nm]	Clutch actuation	Part number
BMW	E36 / E46	RCS 1/184-S7.8-D-S-49 SINTER	650 Nm	OE	883089000155
BMW	E 36 - M3	RCS 2/184-S7.8-D-S-49 SINTER	1.310 Nm	OE	883089000146
BMW	E 46 - M3	RCS 2/184-S7.8-D-S-49 SINTER	1.310 Nm	OE	883089000156
Mini	R56 - JCW	RCS 1/200-S7.8-D-S-49 SINTER	830 Nm	OE	883089000080
Porsche	993 / 996 / 997	RCS 3/140-S3.4-D-F-38 SINTER	1.450 Nm	CSC incl.	883089000096
Porsche	993 / 996 / 997	RCS 3/140-Y-D-F-38 CARBON	1.000 Nm	CSC incl.	883089000111

# Carbon Clutches

Carbon clutches are used in high end applications e.g. Formula 1, rallycross, endurance racing, a.s.o.



## Advantages

Their major advantage is that they have a much higher temperature resistance and at the same time offer a significant reduction in weight and inertia, when compared to a sinter-steel clutch.

On top of that the clutch life is increased significantly, compared to that of a steel sinter clutch, by using thicker pressure rings “shims” to compensate the carbon stack wear created during use. This ensures that the drive will find the bite point at the same clutch paddle position, as though the condition were as new.

The clamp load, setup height and release characteristic measurements are recorded individually for every single clutch. Furthermore, the pre-installed carbon stack thickness is documented in a file - clutch delivery document. This sheet is enclosed in each carbon clutch package and used for maintenance and the shimming procedure.

ZF Race Engineering offers a wide range of carbon clutches in the following two categories – pushed and pulled type.



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Please get in touch with us for more detailed information and drawings that will fit your specific requirements. We will gladly support and guide you with our expertise on your way to your brand new ZF Race Engineering carbon clutch - a masterpiece of German craftsmanship.

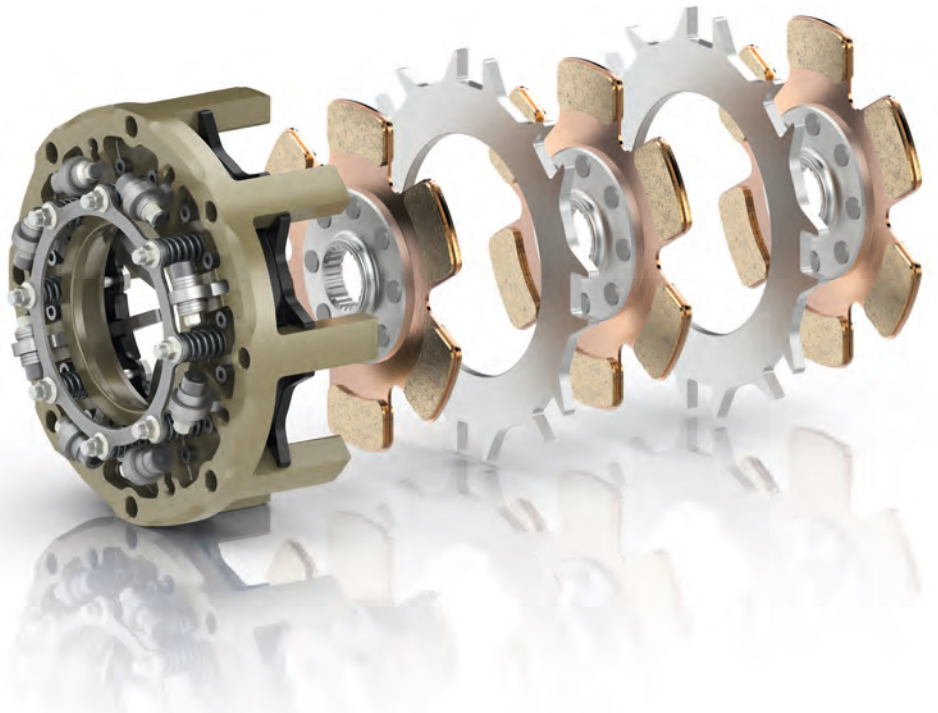
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# Anti Stall Clutches

ZF Race Engineering's Anti Stall Clutches are dry-running multi-plate clutches that have an engine speed dependent clamp load. Optionally the clutches can be disengaged by a push-type clutch slave cylinder.



## Advantages

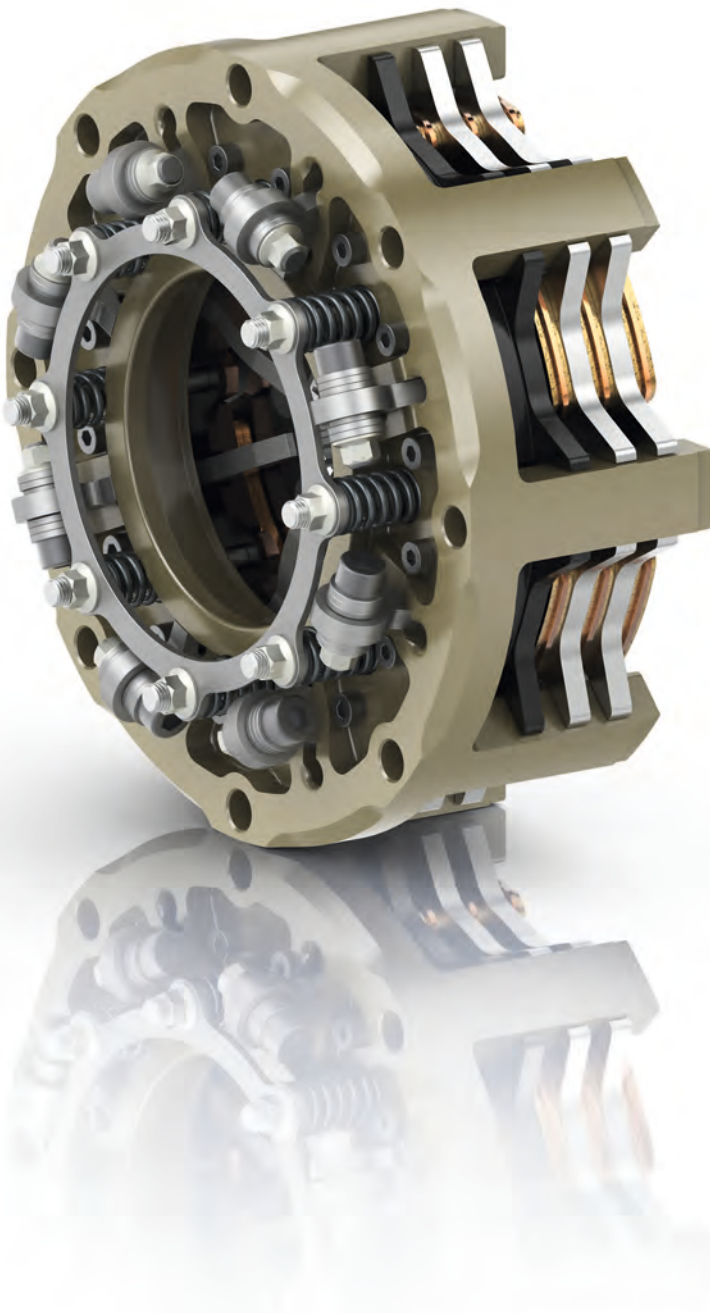
This clutch product range was particularly developed in order to optimise and simplify the clutch engagement on race cars with long first gear ratio, whilst maintaining compactness, lowest possible moment of inertia and maximum durability.

Excessive engine rpm at the launch as a safety against engine stall is no longer necessary.

This leads to a significantly lower heat generation inside the clutch

friction stack compared to conventional clutches. At idle rpm the clutch transmits no torque (normally open).

By their working principle centrifugal clutches are able to compensate for variations of the coefficient of friction (COF,  $\mu$ ). A decrease of  $\mu$  will result in a very slight increase in engine rpm. The engine-clutch system finds a new stable equilibrium immediately. Even a professional driver is hardly able to notice this.



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The development of this product is based on decades of ZF Race Engineering's expertise and experience in designing and building racing clutches. Several years of rig and track testing guarantee a top class, quality product.

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# Special Applications

On top of our modular racing clutch system, ZF Race Engineering offers a wide variety of services and special applications. From conception, through the design and simulation, including quality and project management, projects that satisfy the individual requirements of our customers can be handled by the expertise of our motivated specialist staff.

Among other things, small and special series can be supported and executed as well.

**Some of the high end developments we have successfully completed to the total satisfaction of our customers**

- **LMP1**
- **DAKAR**
- **Hypercar**
- **Helicopter**
- **Supersonic cars**
- **Marine application**
- **Test rigs**



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**Development example including:**

- Pulled type clutch with sinter/carbon friction material and cushion system
- Lightweight single mass flywheel with gear fit
- Bellhousing to cover the packaging
- Inbuilt pulled type clutch actuation at the bellhousing cover

Please get in touch with us for more detailed information about our special applications that will fit your specific requirements.

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# Installation Instructions

The RCS clutch is a vehicle independent developed clutch suitable for the installation into all sorts of vehicles. Thus the following points need to be checked prior to installation: the flywheel contour, the position, the travel and form of the releaser as well as the maximum available installation space. If necessary the installation needs to be adapted to suite the RCS clutch.

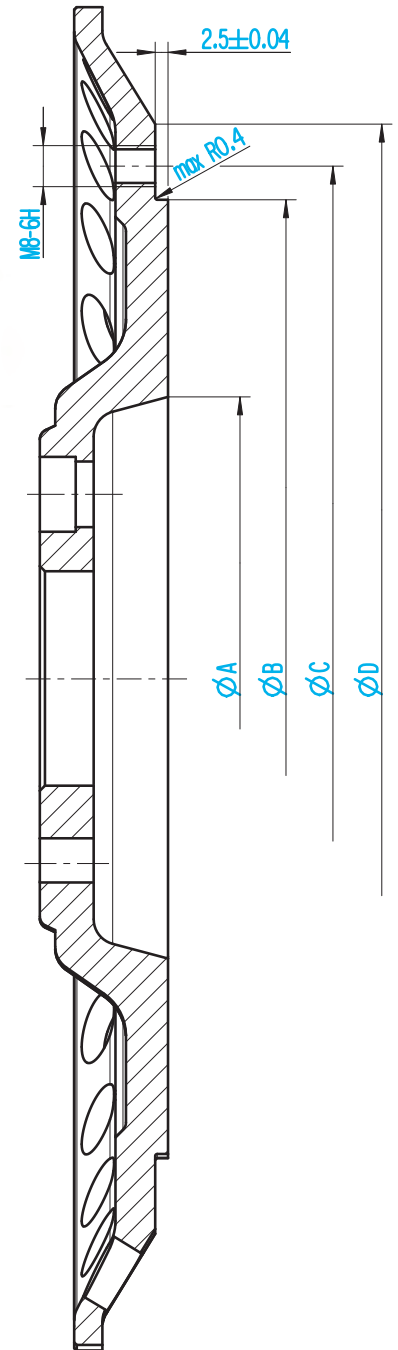
When installing a clutch the following points need to be considered.

## Releaser

- To position the releaser the setup height must be considered precisely (see "installation drawing").
- The releaser should always be in contact with the diaphragm spring (rotation in sync). The preload should be between 100 – 150 N to reduce the wear on the contact surface to a minimum and to extend the operational life of the bearing.
- The release travel must be limited, compared to the serial setup. Otherwise the clutch will be over-stroked (release travel please see installation drawing). This may lead to damage (loss of clamp load) of the diaphragm spring and eventually to malfunction.
- If the clutch is in new condition, the releaser must not be at its end stop. This is important because the diaphragm spring finger position changes during wear and therefore requires the releaser to provide an additional 6.0 mm of wear travel (wear travel refer to installation drawing).
- The releaser should have a convex shaped contact surface with an appropriate release diameter (see release diameter when selecting the RCS clutch housing assembly). With a flat surface it is recommended to use an additional release ring which is available as an accessory.

## Clutch

- With multi-plate clutches please ensure that the sinter paddles are aligned to each other.
- Lubricate the hub spline with a thin layer of enclosed special Sachs grease and move the clutch discs back and forth on the central shaft until the hub moves smoothly on the shaft. Remove any excessive grease.
- Under no circumstances should grease get in contact with the clutch disc friction facings.
- The spline of the gear input shaft must be in contact throughout the whole length of the hub



## Flywheel

- For the application of the ZF Race RCS clutch, it is essential, that the flywheel contour corresponds to the dimension stated in the table. The precise machining of the flywheel is necessary to guarantee a proper clutch function.
- To mount the clutch, it is recommended to use M8 screws with a property class of min. 10.9 and a hexagonal socket. In addition a plain washer should be used. The tightening torque is 20Nm.

### Allocation table

Clutch Size	Ø A [mm]	Ø B [mm]	Ø C [mm]	Ø D [mm]
RCS 115	max. 72.0	117.52 - 0.03	127.5 ± 0.1 (10x36°)	min. 138.5
RCS 140	max. 97.0	142.67 - 0.04	154.45 ± 0.1 (8x45°)	min. 167.0
RCS 184	max. 132.0	186.88 - 0.046	200.0 ± 0.1 (6x60°)	min. 215.0
RCS 200	max. 128.0	201.98 - 0.046	214.0 ± 0.1 (6x60°)	min. 228.0

- A Internal diameter
- B Centering diameter
- C Fixation diameter
- D External diameter



# Installation Drawing

## Measurements

Below you will find a step by step instruction, allowing you to determine the correct installation dimensions for the ZF Race RCS clutch kits.

1. Measure the distance from engine flange to the flywheel bolt surface to define dimension A.
2. To define the distance between the diaphragm spring and the engine flange, add the SUH (see clutch drawings) value to the measured dimension A.
3. Measure the distance from the engine flange to the contact surface of the slave cylinder at full stroke to define dimension B.
4. Measure the distance from the engine flange to the contact surface of the fully retracted slave cylinder to define dimension C.

Now that all required dimensions are defined, the installation space can be calculated using the equations seen below to ensure a perfect fit.

Equations to check the installation space:

$$B < A + SUH - X$$

$$C > A + SUH + Y$$

In the case that the defined dimensions do not match the equation requirements, the following modifications can be done. For instance:

1. Displace the position of the slave cylinder.  
Eg. move into the direction of the gearbox if dimension B is too big or into the direction of the engine if dimension C is too small.
2. Install an additional release ring (accessory) to the diaphragm spring fingers.  
Eg. if dimension B is OK but dimension C is too small
3. Install one of the ZF Race slave cylinder kits (accessory), available in different heights and fixation patterns.

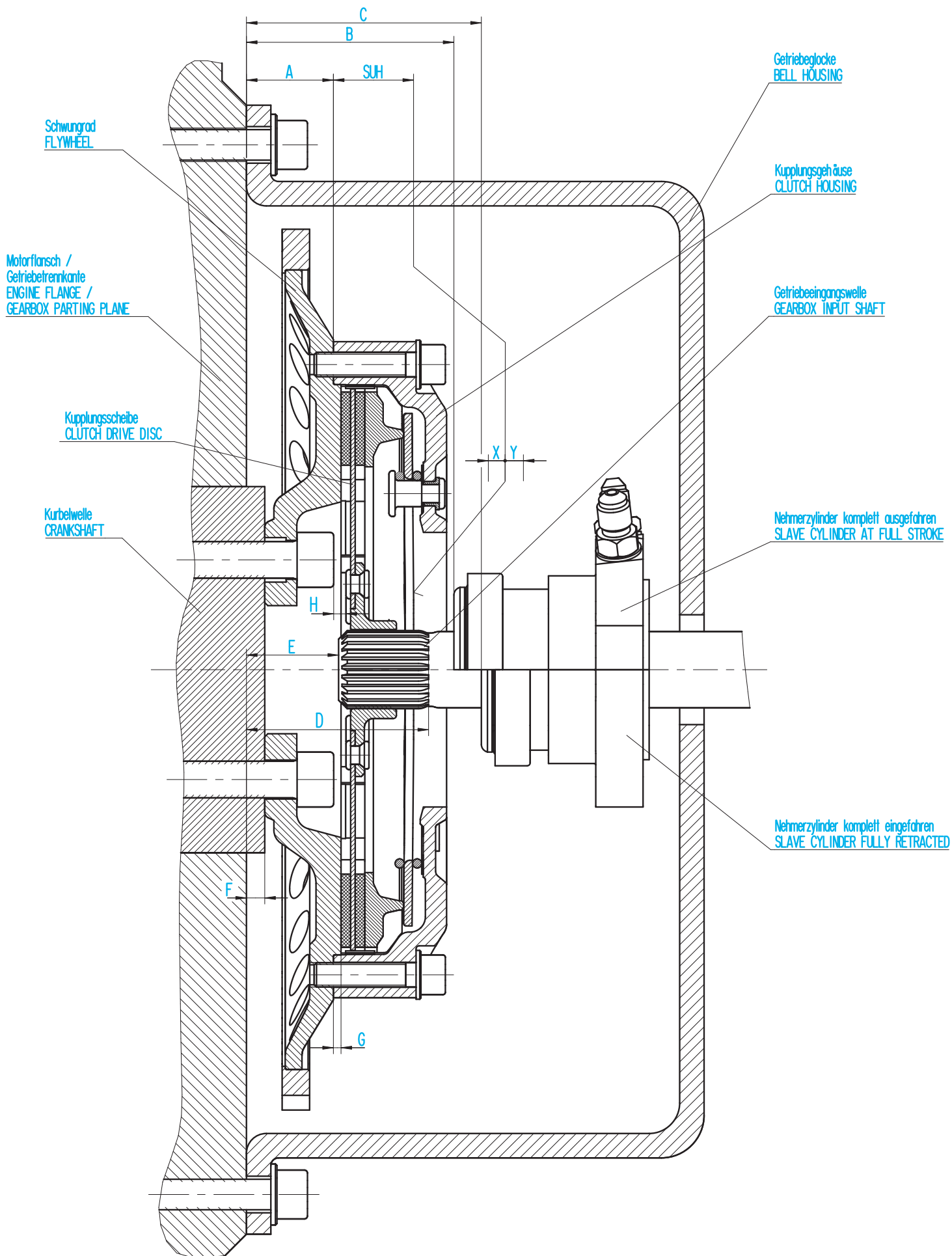
## Further Dimensions

Dimension D, E & F support the definition of the spline length and position of the gearbox input shaft. To define the axial position of the hub, please see the hub configuration pages of the corresponding clutch category.

Dimension G refers to the required centring step (see clutch drawings) of the flywheel.

Dimension H refers to the distance between the top of the crank shaft bolt heads and the friction stack/the first clutch disc, which is in contact with the flywheel. The minimum distance between these two components should be 1mm, to ensure that no interference/contact takes place when the friction stack/clutch plate reaches its maximum worn condition.

- A** Distance from engine flange to flywheel bolt surface
- B** Distance from engine flange to the slave cylinder at full stroke
- C** Distance from engine flange to the fully retracted slave cylinder
- D** Distance from engine flange to the end of spline of the gearbox input shaft
- E** Distance from engine flange to the beginning of spline of the gearbox input shaft
- F** Crank shaft overlap to the engine flange
- G** Flywheel step (if inner centering or outer centering)
- H** Distance from crank shaft bolt head to friction stack / clutch disc
- SUH** Setup height
- X** Release travel
- Y** Wear travel



# Glossary

## Components

**Base plate:**

Is used in combination with the elastic pressure ring (EPR).

**Clutch housing:**

Clutch cover assembly with pre-installed diaphragm spring without a pressure plate.

**Clutch drive disc:**

Transfers the torque to the gearbox input shaft with its internal toothed spline. A wide range of different splines are available.

**Diaphragm spring:**

A belleville spring with release fingers which creates the clamp load, necessary to transmit the engine torque.

**EPR:**

The so called elastic pressure ring is used to increase the modulation range, especially in carbon clutches by the means of being an additional elastic element.

**Fittings DASH/JIC/UNF:**

In racing or motorsports, fittings are usually given in "Dash" or AN size. The Dash notation refers to AN (Army-Navy) specifications. The most common type of racing or motorsport threading is JIC (SAE 37°). Its interior threading has a concave taper of 37° and its outer threading a convex taper of 37°. They are mutually sealing which eliminates the need for a sealing ring. This threading is also available with a flat seating, namely UNF threading, which requires a sealing ring.

**Intermediate plate:**

These are used in multiplate clutches to transfer the clamp load from one clutch disc to the next. They are sometimes also known as "floater plates".

**Pressure plate:**

The pressure plate has a fulcrum and through this transfers the diaphragm spring force with a pre-defined lever ratio to the clutch discs. Additionally it is also a friction partner in organic or sinter disc clutches.

## Features & Properties

### **Bent/tapered:**

Deformation of the pressure and intermediate plates caused by heat. If the warpage exceeds 0.2 mm the component must be exchanged.

### **Clamp load:**

The force applied by the diaphragm spring onto the friction stack. This is a crucial parameter to determine the transmittable torque of the clutch.

### **Release bearing diameter:**

This refers to the fulcrum edge of the release bearing that is in contact with the diaphragm spring fingers. Increasing the release bearing diameter will increase the release load and reduce the travel required to actuate the clutch.

### **Release load:**

Load or force which the driver must apply to operate the clutch.

### **Release travel:**

The distance that the piston of the releaser must move (slave cylinder/CSC) to disengage the clutch.

### **Setup height:**

This is the distance between the clutch mounting surface and the diaphragm spring fingers. This height is mostly abbreviated with "SUH" on our drawings.

### **Shimming:**

In the case of carbon or sinter carbon clutches we have the possibility of increasing the run time (mileage) by shimming out the wear. This is done by exchanging the base plate, the elastic pressure ring or both with a new component according to the shim table available on our clutch drawing.

### **Step/flat flywheel:**

Step flywheels and their friction surface are designed with a 2.5 mm centring step. The inner clutch housing legs are designed to fit to this spigot.

Pot or "flat" flywheels are designed with the clutch mounting surface and the friction surface on one plane. The outer clutch housing legs are designed to fit into this pot.

### **Wear travel:**

Wear of the friction stack results in a position change of the diaphragm spring. So, the diaphragm spring fingers move for the pushed type clutch into the direction of the gearbox. In case of a pulled type clutch the diaphragm spring fingers will move into the direction of the engine. Thus, the releaser needs to accommodate the position changes of the diaphragm spring fingers.

### **Wear width/range:**

Clutches are based on the principle of friction and this friction results in wear. As long as the clutch wear stays within its stated maximum, the clutch transfers the stated torque. If the maximum wear is exceeded, the transferable torque decreases and the clutch begins to slip.

## Friction Materials

### **Carbon:**

This is an exclusive friction material for extreme high thermal resistance, plus it is unaffected by thermal shock and mechanical fatigue. Due to its density and mass being very low it is preferably used in high class motorsport applications.

### **Organic:**

This friction material is suitable for low stress applications. Organic friction linings are used in almost every series production vehicles.

### **Sinter:**

This friction lining is very suitable for high torque applications. It also comes with a higher temperature resistance and operational life. Compared to other friction materials, sinter offers very high and consistent COF (coefficient of friction) and thus giving it the capability to transmit higher torque.

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