TTV Racing

Flywheels &
Special Clutches

Race Clutch Catalogue

Made in England

Welcome to TTV Racing

TTV Racing Ltd is a family run business located in the East of England. TTV has been precision engineering for over 30 years, designing and manufacturing automotive parts for original equipment and motorsport, club racer to world championship.

TTV are market leaders when it comes to the design and manufacturing of both race and road clutches and competition steel flywheels for our large customer base. Working with the very best vehicle and engine builders around the world and supplying our parts for applications such as World Rally and Touring Car Championships right through to OE equipment.

TTV Racing is also part of TTV Industrial Ltd, a large engineering machine shop where we have the knowledge and ability to design and manufacture all sorts of parts. We provide this service to many of our customers in motorsport around the world, solving problems and assisting design.

TTV Racing

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Special Clutches

TTV Racing Clutches

We have been manufacturing special clutches for some time for OE applications and Race Series around the world. Our small multi-plate clutches have been engineered to exceed the performance levels required in their class without compromise. Like all our racing components the clutches are made by us in the UK so spares are readily available along with helpful advice and information to support the product.

From stock TTV Racing can offer a full range of race clutch sizes; 140mm, 184mm, 200mm & 215mm.

Index

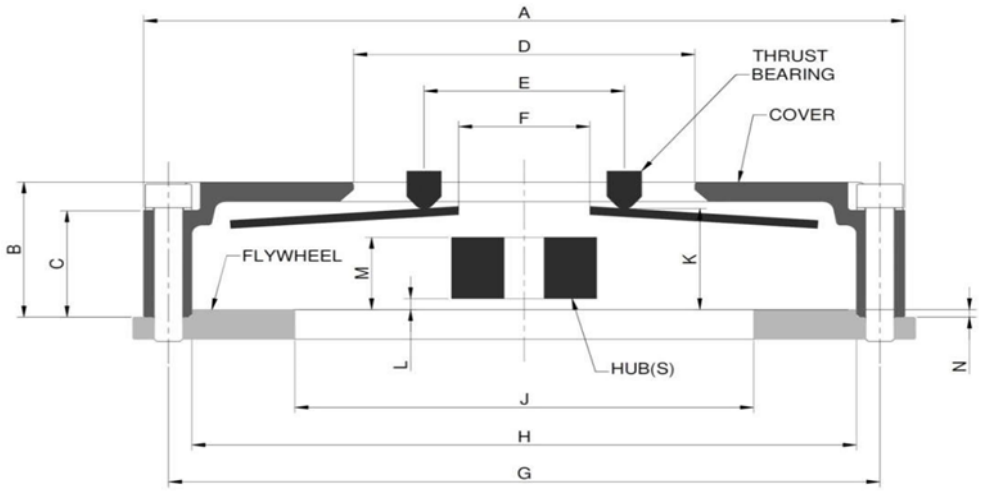
info@ttvracing.com **+44 (0)1473 730996** **www.ttvracing.com**

140mm Rally Clutch

5970 Series – Single Plate

- For lightweight vehicles, tarmac and sprint.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	167
B	Height of cover	42.3
C	Grip height	32.3
D	Minimum inside diameter of cover	69
E	Min/max thrust bearing fulcrum diameter	40/50
F	Minimum inside diameter of spring fingers	36
G	Mounting bolt/stud PCD - BASIC	154.45
H	Flywheel spigot diameter ±0.02	142.67
J	Flywheel inner diameter +0/-2	95
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.
- Please consult TTV racing if your input shaft diameter is between Ø30mm – Ø35mm.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
5970-05-001 (Low Ratio)	28	30.2	360 (266)	358	2x 2
5970-05-002 (High Ratio)	28	30.2	461 (340)	358	2x 2

- Setup heights are from flywheel friction face and based on using an Ø40mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø46mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 6 paddle.
- High temperature friction materials with low wear rate.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
5970-07-001	1.4455	0.00529
5970-07-002	1.4303	0.00517

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø40mm diameter.
- Release bearing travel must not exceed 3.8mm and should be limited by an external stop. Ensure spring fingers do not contact drive hubs.
- Release bearing should have enough backwards travel to allow the bearing to be free of the spring fingers when clutch is fully engaged at maximum wear.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 8 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 27Nm (20lbft) in a criss-cross pattern. Thread locking compound should be used.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	16.4	16.2	0.10
Drive Plate	7.5	7.1	0.15

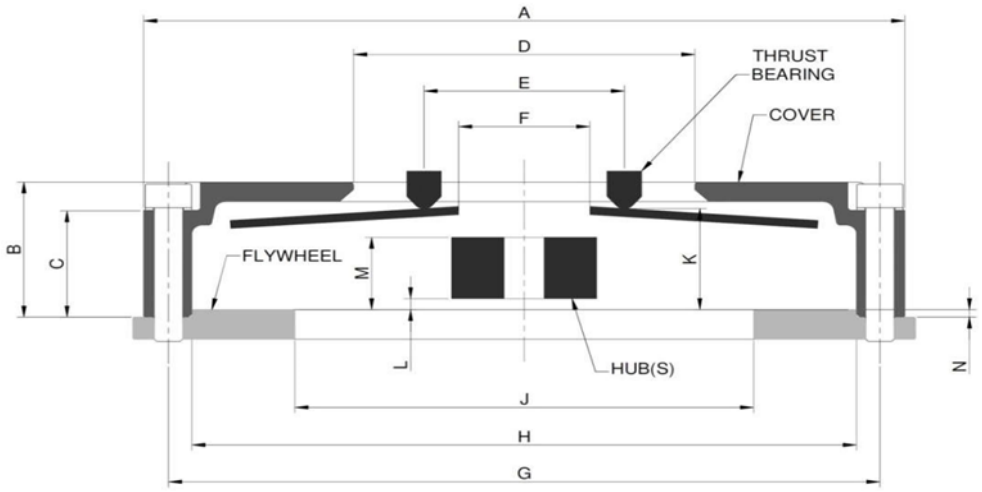
- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure and drive plates should be checked for flatness and wear.

140mm Rally Clutch

2804 Series – Twin Plate

- For rally, tarmac and sprint applications.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	167
B	Height of cover	48.5
C	Grip height	38.5
D	Minimum inside diameter of cover	69
E	Min/max thrust bearing fulcrum diameter	40/50
F	Minimum inside diameter of spring fingers	36
G	Mounting bolt/stud PCD - BASIC	154.45
H	Flywheel spigot diameter ±0.02	142.67
J	Flywheel inner diameter +0/-2	95
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.
- Please consult TTV racing if your input shaft diameter is between Ø30mm – Ø35mm.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
2804-04-001 (Low Ratio)	33.8	36	653 (482)	358	2x 2
2804-04-002 (High Ratio)	33.8	36	834 (615)	358	2x 2

- Setup heights are from flywheel friction face and based on using an Ø40mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø46mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 6 paddle.
- High temperature friction materials with low wear rate.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
2804-04-001	1.8954	0.00709
2804-04-002	1.883	0.00701

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø40mm diameter.
- Release bearing travel must not exceed 3.8mm and should be limited by an external stop. Ensure spring fingers do not contact drive hubs.
- Release bearing should have enough backwards travel to allow the bearing to be free of the spring fingers when clutch is fully engaged at maximum wear.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 8 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 27Nm (20lbft) in a criss-cross pattern. Thread locking compound should be used.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	12.6	12.4	0.10
Floater Plate	6.0	5.8	0.10
Drive Plate	5.6	5.2	0.15

- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure, floater and drive plates should be checked for flatness and wear.

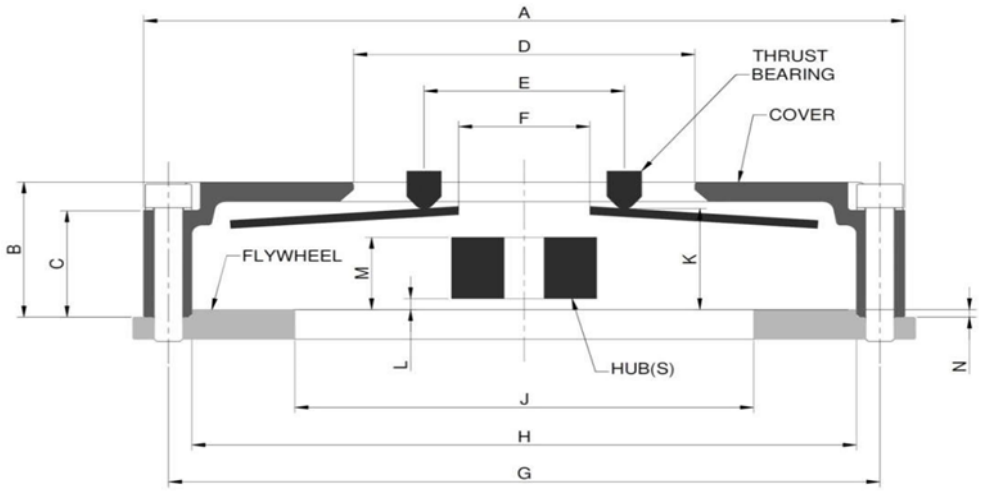
140mm Race Clutch

5969 Series – Twin Plate Sintered

TTV Racing
Flywheels &
Special Clutches

- For tarmac and sprint applications.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	167
B	Height of cover	42.3
C	Grip height	32.3
D	Minimum inside diameter of cover	69
E	Min/max thrust bearing fulcrum diameter	40/50
F	Minimum inside diameter of spring fingers	36
G	Mounting bolt/stud PCD - BASIC	154.45
H	Flywheel spigot diameter ±0.02	142.67
J	Flywheel inner diameter +0/-2	95
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.
- Please consult TTV racing if your input shaft diameter is between Ø30mm – Ø35mm.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
5969-07-001 (Low Ratio)	28	30.2	721 (532)	358	2x 2
5969-07-002 (High Ratio)	28	30.2	920 (679)	358	2x 2

- Setup heights are from flywheel friction face and based on using an Ø40mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø46mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 8 paddle.
- High temperature friction materials with low wear rate.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
5969-07-001	1.8461	0.00683
5969-07-002	1.8337	0.00675

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø40mm diameter.
- Release bearing travel must not exceed 3.8mm and should be limited by an external stop. Ensure spring fingers do not contact drive hubs.
- Release bearing should have enough backwards travel to allow the bearing to be free of the spring fingers when clutch is fully engaged at maximum wear.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 8 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 27Nm (20lbft) in a criss-cross pattern. Thread locking compound should be used.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	12.6	12.4	0.10
Floater Plate	6.0	5.8	0.10
Drive Plate	2.65	2.25	0.15

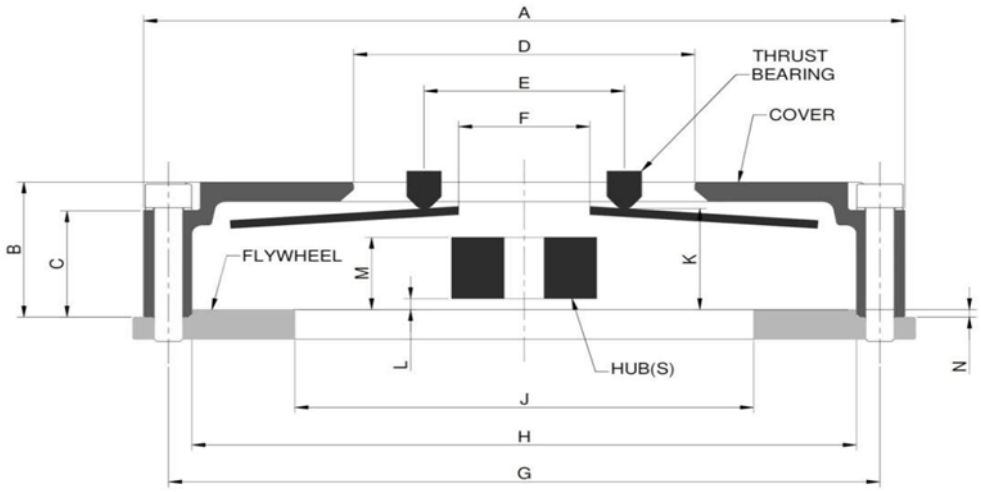
- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure, floater and drive plates should be checked for flatness and wear.

140mm Race Clutch

2803 Series – Triple Plate Sintered

- For tarmac and sprint applications.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	167
B	Height of cover	48.5
C	Grip height	38.5
D	Minimum inside diameter of cover	69
E	Min/max thrust bearing fulcrum diameter	40/50
F	Minimum inside diameter of spring fingers	36
G	Mounting bolt/stud PCD - BASIC	154.45
H	Flywheel spigot diameter ±0.02	165.75
J	Flywheel inner diameter +0/-2	95
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.
- Please consult TTV racing if your input shaft diameter is between Ø30mm – Ø35mm.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
2803-07-001 (Low Ratio)	36.6	38.8	1082 (798)	358	2x 2
2803-07-002 (High Ratio)	36.6	38.8	1382 (1019)	358	2x 2

- Setup heights are from flywheel friction face and based on using an Ø40mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø46mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 8 paddle.
- High temperature friction materials with low wear rate.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
2803-07-001	2.3577	0.00889
2803-07-002	2.3453	0.00881

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø40mm diameter.
- Release bearing travel must not exceed 3.8mm and should be limited by an external stop. Ensure spring fingers do not contact drive hubs.
- Release bearing should have enough backwards travel to allow the bearing to be free of the spring fingers when clutch is fully engaged at maximum wear.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 8 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 27Nm (20lbft) in a criss-cross pattern. Thread locking compound should be used.

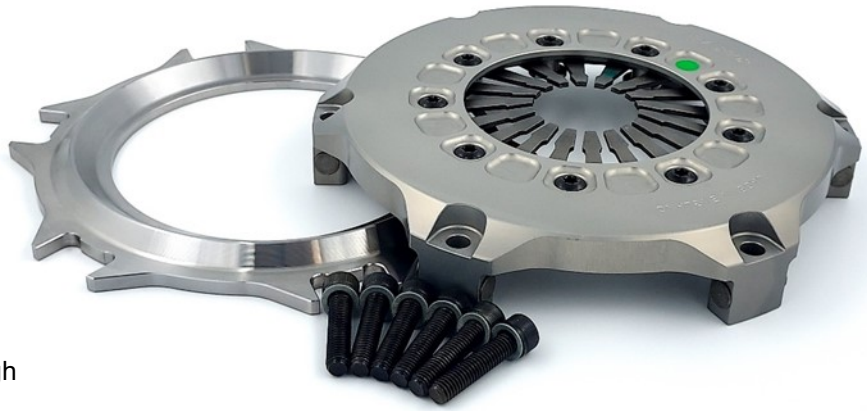
Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	12.6	12.4	0.10
Floater Plate	6.0	5.8	0.10
Drive Plate	2.65	2.25	0.15

- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure, floater and drive plates should be checked for flatness and wear.

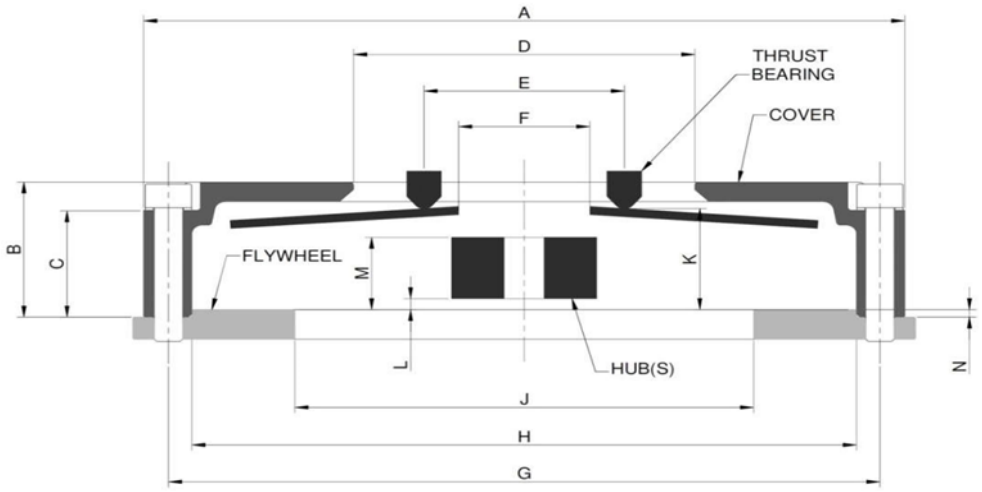
184mm Compact Race Clutch

2802 Series – Single Plate



- For rally, tarmac and sprint applications.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	214
B	Height of cover	34
C	Grip height	24.5
D	Minimum inside diameter of cover	96
E	Min/max thrust bearing fulcrum diameter	48/54
F	Minimum inside diameter of spring fingers	40
G	Mounting bolt/stud PCD - BASIC	200.025
H	Flywheel spigot diameter ±0.03	186.88
J	Flywheel inner diameter +0/-2	129
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
2802-04-001 (Green)	22.3	24.8	317 (234)	235	2.5
2802-04-002 (Blue)	21.9	24.4	363 (268)	275	2.65
2802-04-003 (Orange)	21.4	23.9	457 (337)	335	2.8
2802-04-004 (Silver)	21.6	24.1	531 (392)	390	3.0

- Setup heights are from flywheel friction face and based on using an Ø54mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø54mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 6 paddle.
- High temperature friction materials with low wear rate.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
2802-04-001	2.011	0.0126
2802-04-002	2.03	0.0127
2802-04-003	2.049	0.0128
2802-04-004	2.066	0.0129

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø50 - Ø54mm diameter.
- Release bearing travel must not exceed 5.5mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	13.0	12.8	0.10
Drive Plate	5.6	5.2	0.15

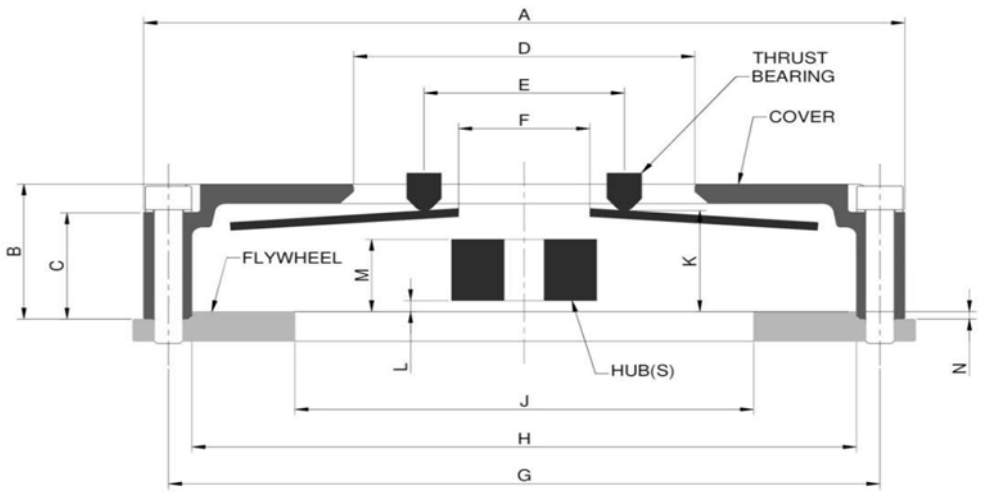
- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure and drive plates should be checked for flatness and wear.

184mm HD Rally Clutch

4905 Series – Single Plate

- For rally, circuit and sprint applications.
- Great heat capacity over compact race.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	214
B	Height of cover	39.5
C	Grip height	30
D	Minimum inside diameter of cover	96
E	Min/max thrust bearing fulcrum diameter	48
F	Minimum inside diameter of spring fingers	40
G	Mounting bolt/stud PCD - BASIC	200.025
H	Flywheel spigot diameter	186.88
J	Flywheel inner diameter	115
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
4905-03-000 (Green)	27.9	30.4	317 (234)	235	2.5
4905-03-001 (Blue)	27.5	30.0	324 (239)	275	2.65
4905-03-002 (Orange)	27.3	29.8	416 (307)	335	2.8
4905-03-003 (Silver)	27.2	29.7	464 (342)	390	3.0

- Setup heights are from flywheel friction face and based on using an Ø54mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø54mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 4 paddle.
- Optional 3 paddle plate reduces rotating mass and syncro loads.
- High temperature friction materials.
- Chrome-moly drive hub.

Clutch Mass and Inertias

Assembly Mass Kg	Assembly MMOI Kg.m^2
2.69	0.0167

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø50 - Ø54mm diameter.
- Release bearing travel must not exceed 5.5mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	16.0	15.8	0.10
Intermediate Plate	10	9.8	0.10
Drive Plate	8.0	7.8	0.15

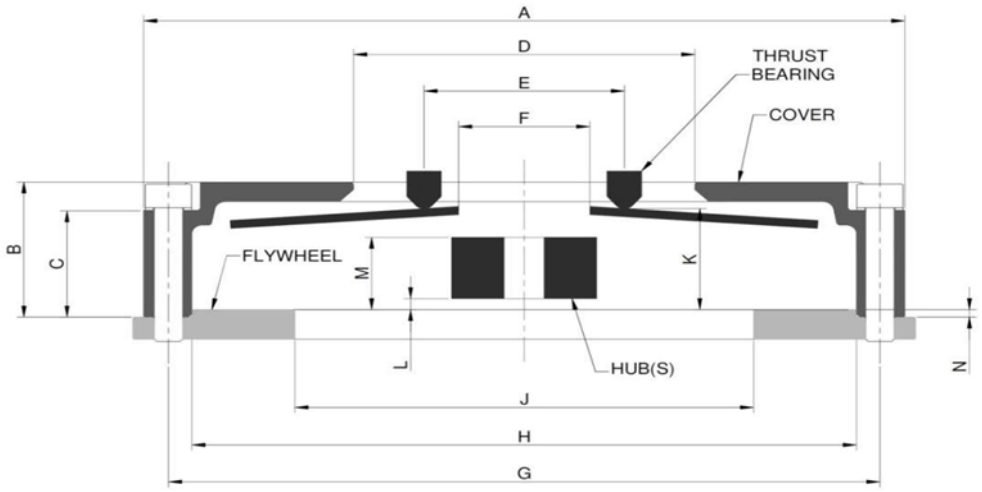
- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure, intermediate and drive plates should be checked for flatness and wear.

184mm Compact Race Clutch

2801 Series – Twin Plate

- For rally, tarmac and sprint applications.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	214
B	Height of cover	45.5
C	Grip height	36
D	Minimum inside diameter of cover	96
E	Min/max thrust bearing fulcrum diameter	48/54
F	Minimum inside diameter of spring fingers	40
G	Mounting bolt/stud PCD - BASIC	200.025
H	Flywheel spigot diameter ±0.03	186.88
J	Flywheel inner diameter +0/-2	129
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
2801-08-001 (Green)	33.9	36.5	515 (380)	235	2.5
2801-08-002 (Blue)	33.5	36.0	591 (436)	275	2.65
2801-08-003 (Orange)	33.0	35.5	742 (547)	335	2.8
2801-08-004 (Silver)	33.2	35.7	863 (637)	390	3.0

- Setup heights are from flywheel friction face and based on using an Ø54mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø54mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 6 paddle.
- High temperature friction materials with low wear rate.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
2801-08-001	2.787	0.0181
2801-08-002	2.806	0.0181
2801-08-003	2.825	0.0182
2801-08-004	2.842	0.0183

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø50 - Ø54mm diameter.
- Release bearing travel must not exceed 5.5mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	13.0	12.8	0.10
Floater Plate	6.0	5.8	0.10
Drive Plate	5.6	5.2	0.15

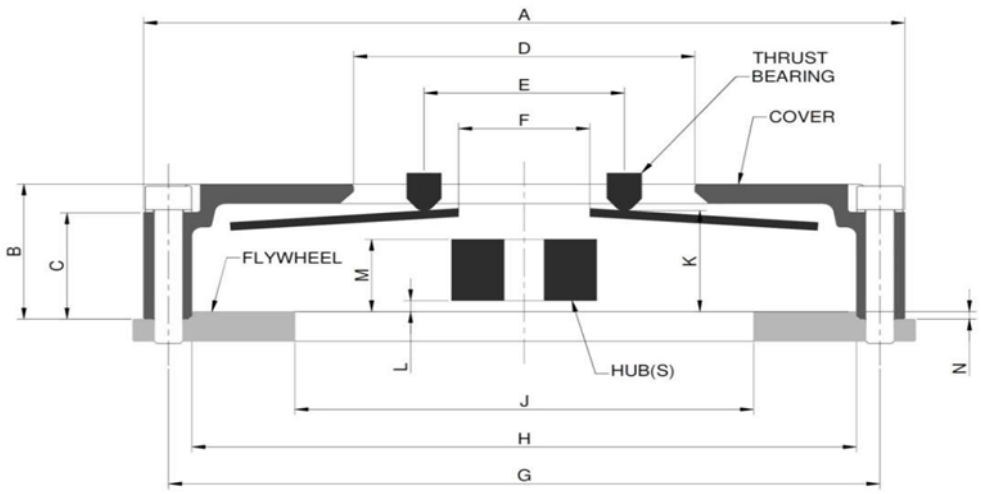
- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure, floater and drive plates should be checked for flatness and wear.

184mm HD Rally Clutch

4900 Series – Twin Plate

- For rally, circuit and sprint applications.
- Great heat capacity over compact race.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	214
B	Height of cover	57.5
C	Grip height	48
D	Minimum inside diameter of cover	96
E	Min/max thrust bearing fulcrum diameter	54
F	Minimum inside diameter of spring fingers	40
G	Mounting bolt/stud PCD - BASIC	200.025
H	Flywheel spigot diameter	186.88
J	Flywheel inner diameter	115
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
4900-03-001 (Green)	45.9	48.5	515 (380)	235	2.5
4900-03-002 (Blue)	45.5	48.0	648 (478)	275	2.65
4900-03-003 (Orange)	45.3	47.8	831 (613)	335	2.8
4900-03-004 (Silver)	45.2	47.7	928 (685)	390	3.0

- Setup heights are from flywheel friction face and based on using an Ø54mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø54mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 4 paddle.
- Optional 3 paddle plate reduces rotating mass and syncro loads.
- High temperature friction materials.
- Chrome-moly drive hub.

Clutch Mass and Inertias

Assembly Mass Kg	Assembly MMOI Kg.m^2
4.098	0.0256

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø50 - Ø54mm diameter.
- Release bearing travel must not exceed 5.5mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	16.0	15.8	0.10
Intermediate Plate	10	9.8	0.10
Drive Plate	8.0	7.8	0.15

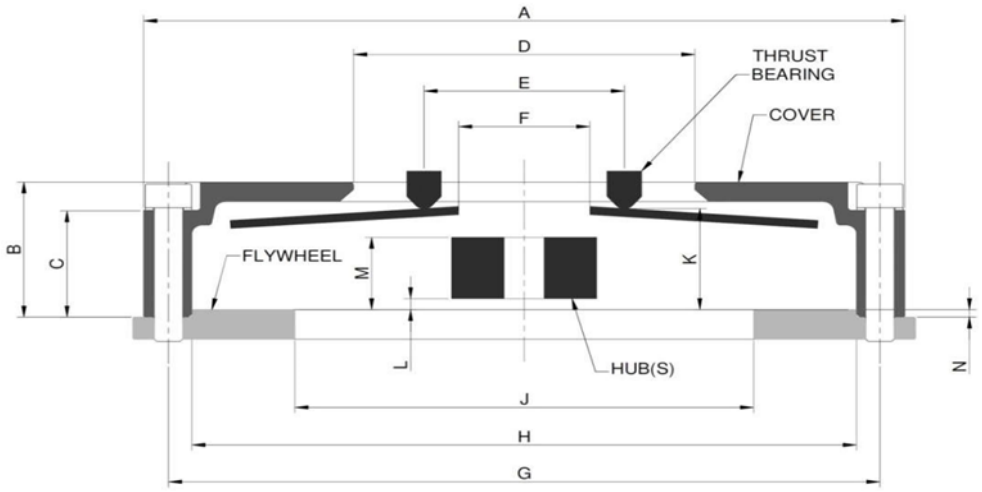
- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure, intermediate and drive plates should be checked for flatness and wear.

184mm Compact Race Clutch

4488 Series – Triple Plate

- For rally, tarmac and sprint applications.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	214
B	Height of cover	57
C	Grip height	47.5
D	Minimum inside diameter of cover	96
E	Min/max thrust bearing fulcrum diameter	48/54
F	Minimum inside diameter of spring fingers	40
G	Mounting bolt/stud PCD - BASIC	200.025
H	Flywheel spigot diameter ±0.03	186.88
J	Flywheel inner diameter +0/-2	129
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
4488-03-001 (Green)	45.3	47.9	772 (560)	235	2.5
4488-03-002 (Blue)	44.8	47.4	886 (654)	275	2.65
4488-03-003 (Orange)	45.0	47.6	1113 (821)	335	2.8
4488-03-004 (Silver)	44.7	47.3	1295 (955)	390	3.0

- Setup heights are from flywheel friction face and based on using an Ø54mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø54mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 6 paddle.
- High temperature friction materials with low wear rate.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
4488-03-001	3.572	0.0235
4488-03-002	3.589	0.0236
4488-03-003	3.602	0.0236
4488-03-004	3.627	0.0238

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø50 - Ø54mm diameter.
- Release bearing travel must not exceed 5.5mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	13.0	12.8	0.10
Floater Plate	6.0	5.8	0.10
Drive Plate	5.6	5.2	0.15

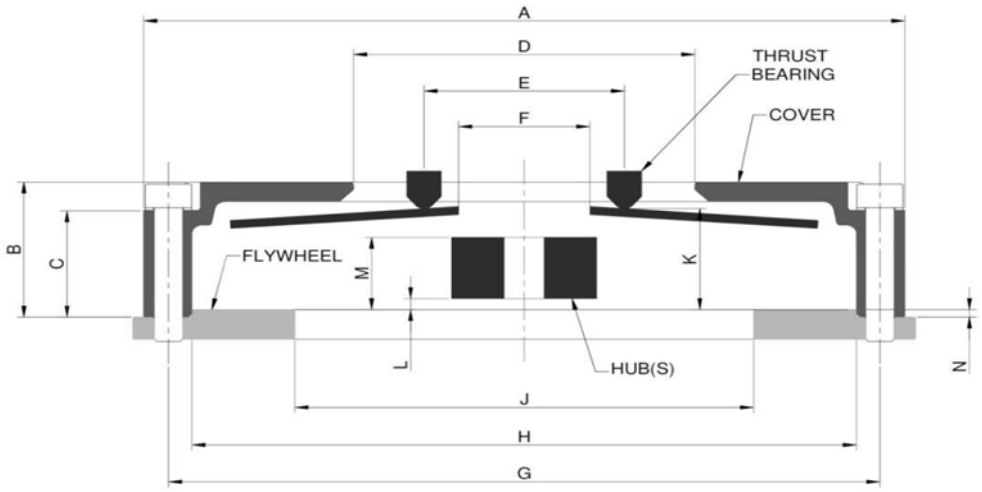
- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure, floater and drive plates should be checked for flatness and wear.

200mm Race Clutch

4906 Series – Single Plate

- For rally, tarmac and sprint applications.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	229
B	Height of cover	40
C	Grip height	29
D	Minimum inside diameter of cover	86
E	Min/max thrust bearing fulcrum diameter	48
F	Minimum inside diameter of spring fingers	40
G	Mounting bolt/stud PCD - BASIC	214
H	Flywheel spigot diameter ±0.03	202
J	Flywheel inner diameter +0/-2	133
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
4906-06-001 (Blue)	27.0	29.5	362 (267)	275	2.65
4906-06-002 (Orange)	26.8	29.4	464 (342)	335	2.8
4906-06-003 (Silver)	26.7	29.3	518 (382)	390	3.0

- Setup heights are from flywheel friction face and based on using an Ø54mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø54mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 4 paddle.
- Optional 6 paddle plate available.
- High temperature friction materials.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Assembly Mass Kg	Assembly MMOI Kg.m^2
2.652	0.018

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø50 - Ø54mm diameter.
- Release bearing travel must not exceed 5.5mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

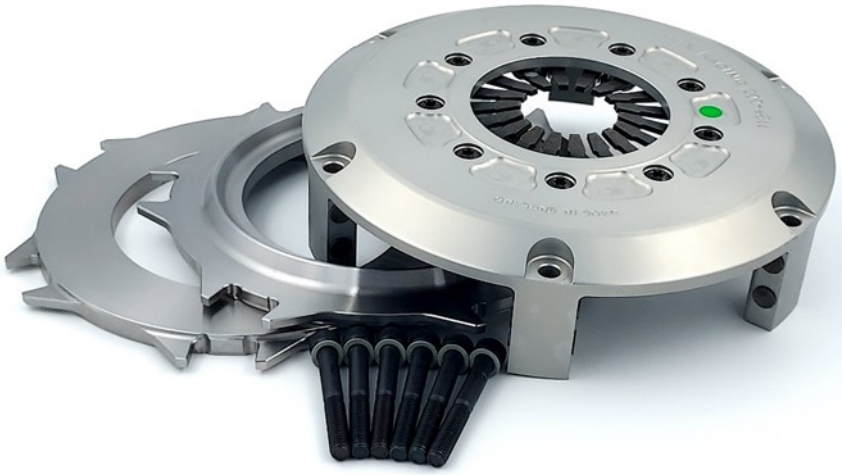
Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	16.0	15.8	0.10
Drive Plate	7.6	6.8	0.15

- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure and drive plates should be checked for flatness and wear.

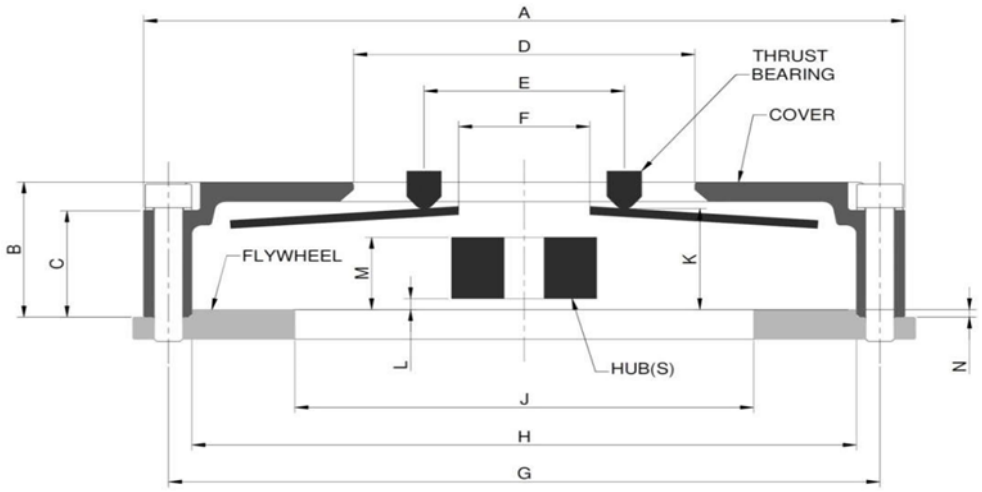
200mm Race Clutch

4811 Series – Twin Plate



- For rally, tarmac and sprint applications.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	229
B	Height of cover	57.5
C	Grip height	46.5
D	Minimum inside diameter of cover	86
E	Min/max thrust bearing fulcrum diameter	54
F	Minimum inside diameter of spring fingers	40
G	Mounting bolt/stud PCD - BASIC	214
H	Flywheel spigot diameter ±0.03	202
J	Flywheel inner diameter +0/-2	133
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height ±0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.

Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
4811-06-002 (Blue)	44.6	47.2	723 (533)	275	2.65
4811-06-003 (Orange)	44.4	47.0	928 (685)	335	2.8
4811-06-004 (Silver)	44.3	46.9	1036 (764)	390	3.0

- Setup heights are from flywheel friction face and based on using an Ø54mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø54mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 4 paddle.
- Optional 6 paddle plate available.
- High temperature friction materials.
- Chrome-moly drive hub.
- High strength rivets.

Clutch Mass and Inertias

Assembly Mass Kg	Assembly MMOI Kg.m^2
4.033	0.029

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, round nose type. Nominal Ø50 - Ø54mm diameter.
- Release bearing travel must not exceed 5.5mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	16.0	15.8	0.10
Intermediate Plate	10.0	9.8	0.10
Drive Plate	7.6	6.8	0.15

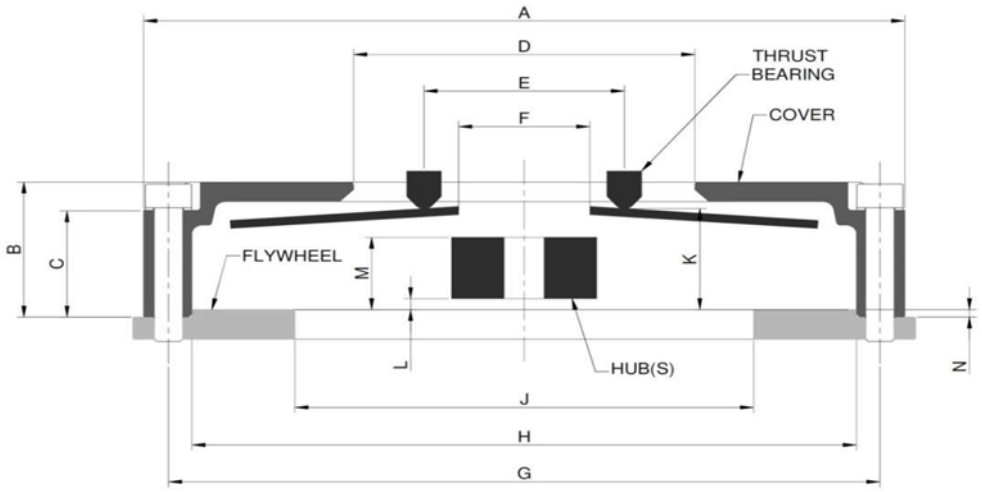
- Total allowable wear shall be no more than 0.8mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Pressure, intermediate and drive plates should be checked for flatness and wear.

215mm Race Clutch

3636 Series – Single Plate

- For rally, tarmac, sprint and drifting applications.
- Great alternative to twin 184 rally.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.
- Can be built to run with most OEM release bearings for plug and play installation.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	248
B	Height of cover	39.5
C	Grip height	31.5
D	Minimum inside diameter of cover	115
E	Min/max thrust bearing fulcrum diameter	45/50
F	Minimum inside diameter of spring fingers	39.5
G	Mounting bolt/stud PCD - BASIC	232
H	Flywheel spigot diameter +0.05/-0.05	219.050
J	Flywheel inner diameter +0/-2	152
L	Clutch face to start of hub(s)	2.5
M	Clutch face to end of hub(s)	17
N	Flywheel spigot step height +0.04/-0.04	2.5

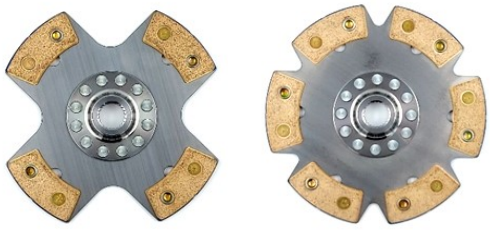
Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
3636-02-499 (Blue)	30.1	34.9	368 (271)	215	2.65
3636-02-500 (Orange)	31.0	35.8	492 (363)	224	2.8
3636-02-501 (Silver)	29.8	34.6	588 (434)	275	3.0

- Setup heights are from flywheel friction face and based on using an Ø50mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø50mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 4 paddle.
- Optional 6 paddle plate available.
- High temperature friction materials.
- Chrome-moly drive hub.
- High strength rivets.



Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
3636-02-499	3.418	0.0298
3636-02-500	3.452	0.0299
3636-02-501	3.49	0.0300

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, flat nose type. Nominal Ø50mm diameter.
- Release bearing travel must not exceed 10mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	16.0	15.8	0.10
Drive Plate	8.0	6.7	0.15

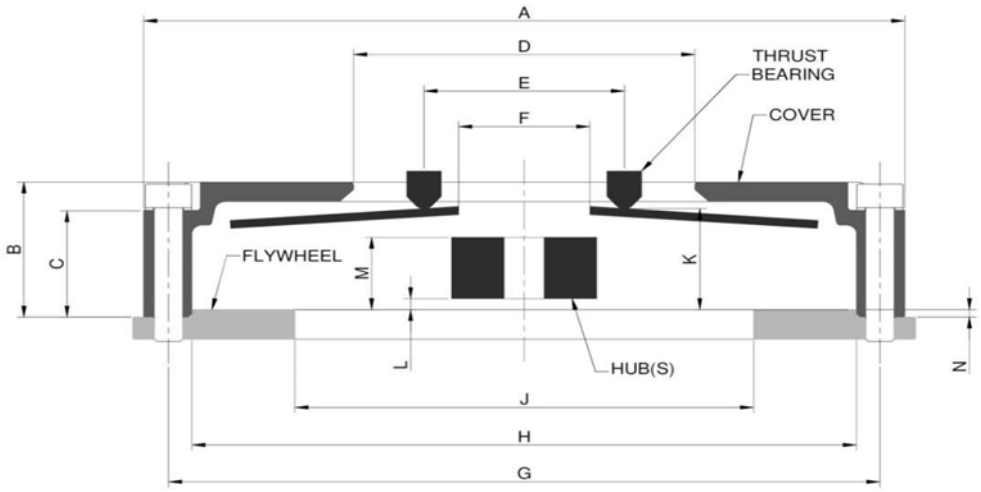
- Total allowable wear shall be no more than 1.3mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Excessive 'blueing' of the pressure plate indicates high heat generation from slippage and the clutch should be sent back to TTV Racing for evaluation of clamp load and warping.
- Pressure and drive plates should be checked for flatness and wear.

215mm Race Clutch

3637 Series – Twin Plate

- For heavy duty rally, tarmac, sprint and drifting applications.
- Great alternative to twin 184 rally.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.
- Can be built to run with most OEM release bearings for plug and play installation.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	248
B	Height of cover	57.5
C	Grip height	49.5
D	Minimum inside diameter of cover	115
E	Min/max thrust bearing fulcrum diameter	45/50
F	Minimum inside diameter of spring fingers	39.5
G	Mounting bolt/stud PCD - BASIC	232
H	Flywheel spigot diameter +0.03/-0.03	219.3
J	Flywheel inner diameter +0/-2	152
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Flywheel spigot step height +0.04/-0.04	2.5

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.

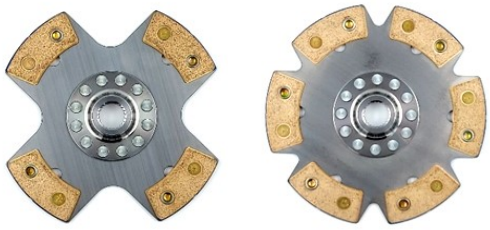
Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
3637-02-499 (Blue)	47.7	52.5	598 (441)	215	2.65
3637-02-500 (Orange)	48.6	53.4	800 (590)	275	2.8
3637-02-501 (Silver)	47.8	52.6	956 (705)	305	3.0

- Setup heights are from flywheel friction face and based on using an Ø50mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø50mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 4 paddle.
- Optional 6 paddle plate available.
- High temperature friction materials.
- Chrome-moly drive hub.
- High strength rivets.



Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
3637-02-499	5.306	0.0471
3637-02-500	5.336	0.0473
3637-02-501	5.374	0.0475

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, flat nose type. Nominal Ø50mm diameter.
- Release bearing travel must not exceed 10mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	16.0	15.8	0.10
Floater Plate	10.0	9.8	0.10
Drive Plate	8.0	7.35	0.15

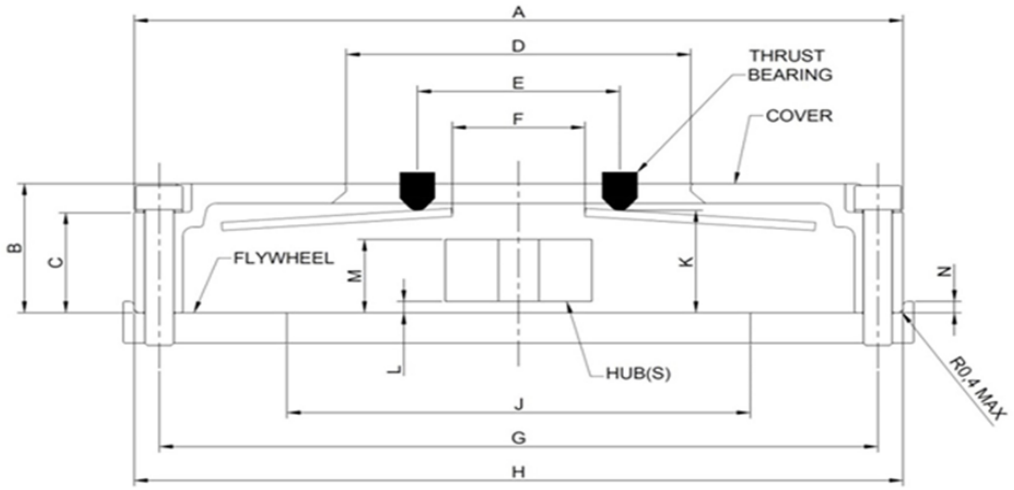
- Total allowable wear shall be no more than 1.3mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Excessive 'blueing' of the pressure plate indicates high heat generation from slippage and the clutch should be sent back to TTV Racing for evaluation of clamp load and warping.
- Pressure, floater and drive plates should be checked for flatness and wear.

215mm Race Clutch

4272 Series – Triple Plate

- For heavy duty rally, tarmac, sprint and drifting applications.
- Great alternative to twin 184 rally.
- Hi-tensile fixings & antivibration washers.
- Hardened drive wear pads.
- Chrome-moly pressure plate for high wear resistance.
- Can be built to run with most OEM release bearings for plug and play installation.

Clutch Dimensions



Dim	Description	mm
A	Diameter of cover	248
B	Height of cover	66
C	Grip height	58
D	Minimum inside diameter of cover	115
E	Min/max thrust bearing fulcrum diameter	45/50
F	Minimum inside diameter of spring fingers	38
G	Mounting bolt/stud PCD - BASIC	232
H	Flywheel pot diameter +0.015/-0.015	244.986
J	Flywheel inner diameter +0/-2	152
L	Clutch face to start of hub(s)	-
M	Clutch face to end of hub(s)	-
N	Minimum flywheel spigot step height	3

- Dimensions “L” and “M” are dependent on hub configurations selected at time of order. Please consult TTV Racing for details.
- Clutch cover is “dog driven” in flywheel. Please consult TTV Racing for flywheel machining details.

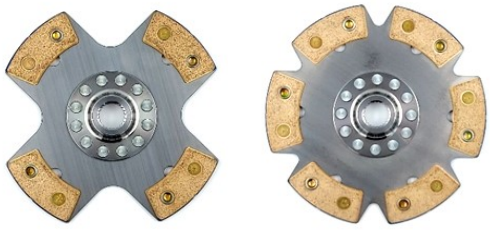
Clutch Performance Specifications

Clutch Type (Spring Colour)	Setup Height "K" mm		Torque Capacity Nm (lbft)	Max Release Load Kg	Spring Thickness mm
	New	Worn			
4272-03-001 (Orange)	60.6	65.4	1200 (885)	275	2.8
4272-03-002 (Silver)	59.8	54.6	1434 (1058)	305	3.0

- Setup heights are from flywheel friction face and based on using an Ø50mm release bearing. Heights are subject to a tolerance of ±0.5mm.
- Release loads are based on an Ø50mm release bearing. A smaller diameter bearing will reduce release loads.

Drive Plates

- Standard drive plate is 4 paddle.
- Optional 6 paddle plate available.
- High temperature friction materials.
- Chrome-moly drive hub.
- High strength rivets.



Clutch Mass and Inertias

Clutch Type	Assembly Mass Kg	Assembly MMOI Kg.m^2
4272-03-001	5.943	0.0534
4272-03-002	5.981	0.0536

Notes: Mass and inertias are for cover assemblies only and are estimated values.

Release Bearing Specification

- Release bearing should be of the steel caged, flat nose type. Nominal Ø50mm diameter.
- Release bearing travel must not exceed 10mm and should be limited by an external stop.
- Release bearing should be free of the spring fingers when clutch is fully engaged.

Clutch Fastener Specifications

- Clutch should be fastened to the flywheel using 6 off M8 studs/ mechanical locking nuts or M8 cap head screws/ safety washers.
- Fastener strength should be grade 10.9 minimum.
- Fasteners to be gradually tightened to 22Nm (16lbft) in a criss-cross pattern.

Maintenance

Type	Thickness mm		Flatness mm
	New	Worn	
Pressure Plate	16.0	15.8	0.10
Floater Plate	7.0	6.8	0.10
Drive Plate	8.0	7.35	0.15

- Total allowable wear shall be no more than 1.3mm for the whole assembly.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch.
- Excessive 'blueing' of the pressure plate indicates high heat generation from slippage and the clutch should be sent back to TTV Racing for evaluation of clamp load and warping.
- Pressure, floater and drive plates should be checked for flatness and wear.

Concentric Slave Cylinders

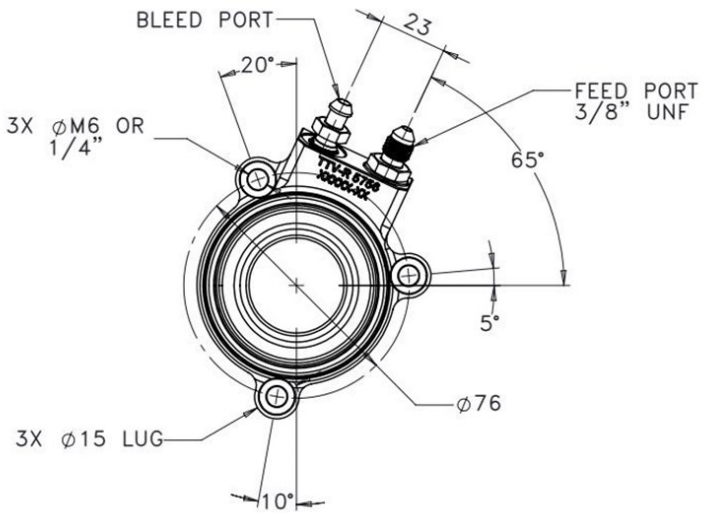
TTV Racing
Flywheels &
Special Clutches

TTV Hydraulic Slave Cylinders are manufactured in house by TTV Racing.

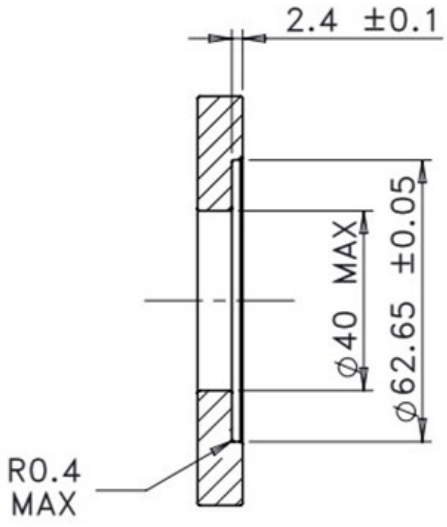
- Compact and standard setup heights.
- Machined from billet aluminum.
- Interchangeable with AP Racing CP3859, CP6859,CP8084, Tilton 1XXX Series and Alcon KSA Series.
- Stroke lengths available are 15mm and 18mm with an internal bore of up to 36mm for larger input shafts.
- Hard anodized with low friction body and piston to protect against corrosion and wear.
- Twin sealed system for long service life tested at 1200PSi.
- Teflon coated piston for smooth low resistance action.
- Sealed high quality high load bearing.
- Nitrided bearing contact face options:
  Round: 40mm for 5.5” 140mm Clutches.
  46mm & 50mm for 7.25” 184mm and 8” 200mm Clutches.
  Flat: 59mm OD, 44mm ID suitable for most clutch springs with a round faced contact point.
- Piston area: 923.6mm² (1.4316in²).
- Maximum pressure: 8.6MPa (1250psi).
- Hydraulic ports: M10x1 – 12mm min full.

Slave cylinder spacers Available
3.5mm, 5.5mm, 7.5mm and 25mm.

Key Dimensions – All Dimensions In mm



Adapter Dimensions



Slave Cylinder Models

Part Number	Setup Height	Stroke	Min Height	Max Height[1]	Bore	Release Bearing Housing O.D.[2]
5756-S15-XXX	49.7	15	42.2	57.2	32	61
5756-L15-XXX	57.2	15	49.7	64.7	36	74
5756-S18-XXX	54.2	18	45.2	63.2	32	61
5756-L18-XXX	61.7	18	52.7	70.7	36	74

1 - Recommended to use a travel stop under clutch pedal.
2 - Check release bearing housing does not foul clutch cover at full travel.

Thrust Face Options

Part Number Suffix "XXX"	Description
40R	Ø40mm Round Nose[3]
46R	Ø46mm Round Nose[4]
50R	Ø50mm Round Nose
59F	Ø44mm I.D / Ø59mm O.D. Flat Face

3 - Typical 140mm (5.5") race clutches.
4 - Typical 184mm (7.25") race clutches.

Clutch Pedal Adjuster

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TTV Hydraulic Pedal Adjuster is designed to allow the clutch bite point to be lowered to a more comfortable position for the driver. Useful when using long travel OEM master cylinders with small diameter race clutches.

The unit simply connects into your hydraulic clutch line incorporating a variable size reservoir so you can adjust pedal positions after clutch bed in and over the life of the clutch.

Manufactured in aluminum to keep weight to a minimum.
The body and piston are hard anodized to protect against corrosion and wear.
High quality seal system is used for long term reliability.

Supplied Components

1x Clutch controller,
1x 7/16" JIC male union tee,
1x P-Clip

Additional Components Required

- Some hard or braided flexible lines may be required to extend the clutch lines.
- 7/16" - 20 JIC 37° female fittings and / or adaptors for hard or flexible braided line (do not confuse with M11).
- Suitable flaring tool for hard lines.

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General

A high-performance/ competition flywheel and clutch is designed to accept the loads from a particular torque rating, meet the requirements of the vehicle and to maximize its performance.
Discs with organic facings are bonded and riveted to their core plates giving a superior burst limit.
Discs with sintered metallic facings have a higher coefficient of friction giving greater torque capacity and heat resistance.
Due to the design of high-performance/ competition clutches, the pedal force can increase and the modulation range and disengagement travel can be reduced. Additional clutch and gearbox noises can appear during idle and acceleration/ deceleration. The pressure and intermediate plates on competition clutches are free floating and will generate additional rattling noises when the clutch is depressed.
Competition clutches are designed to have a low resistance to being accelerated, known as mass moment of inertia (MMOI), to maximize the amount of engine power that reaches the driven wheels rather than being absorbed by a relatively heavy flywheel and clutch assembly. This may require the idle speed to be raised in order to reduce vibration or gearbox noises.
High-performance/ competition clutches may, due to their nature, require drive off at higher rpm and with quicker disengagement. Please take note of the following so that the high-performance/ competition clutch in your vehicle gives trouble free use.

High-performance/ competition clutches, due to their light weight, can be very sensitive to the heat caused by excessive slippage and abuse. Maneuvering around pits/ paddock area, driving up steep inclines/ onto trailers, slipping the clutch on slow corners and holding the vehicle on the clutch at launch should be avoided. Prolonged exposure to high heat can cause failure and permanent damage to the clutch system.

REMEMBER; HEAT IS THE ENEMY OF THE CLUTCH!

Installation and Maintenance

Please Note: Clutch/ Flywheel should be installed by trained, professional technicians with the knowledge, tools and equipment for a safe, correct installation.

- Before proceeding, ensure that the clutch cover has the correct number, size and positions of fasteners and will bolt onto the flywheel. Clean the input shaft spline with a wire brush and check that the splines are not damaged or twisted. Check that the clutch disc(s) will engage and slide properly on the input shaft. Check release mechanism and other clutch system components for signs of wear and/ or damage and replace all worn or damaged components.
- It is very important to check that the gearbox input shaft is perpendicular to the bellhousing flange. This is especially important on some FWD and 4WD vehicles which do not have a pilot bearing to support the input shaft. Excessive runout of the shaft is a major cause of cracking of the solid clutch discs in high-performance/ competition clutches. Ensuring that the input shaft is true will help the clutch disc(s) to have a longer life. Runout at the tip of the shaft should be less than 0.13mm (total indicator reading).

- Remove all protective oils or greases from the friction surfaces on flywheel and cover assembly. Surfaces must be clean and dry. Lubricate spline with a small amount of graphite/ moly/ PTFE grease. Do not let any grease or greasy/ oily finger prints get on the friction surfaces of either the clutch disc(s) or pressure/ intermediate plate(s) and flywheel.
- Assemble clutch and clutch disc(s) onto flywheel. Use or fabricate a clutch alignment tool to insure disc(s) and cover are properly aligned with pilot bearing/ input shaft. Check that clutch disc(s) are correctly installed and have clearance from crank bolts and clutch cover internal components. Torque all clutch cover fasteners evenly to the value(s) stated in the specifications section in a progressive criss-cross pattern.
- Check that the clutch spring fingers are in the correct position (setup height) for the clutch release mechanism. Ensure that the clutch release bearing is the correct type for the clutch spring fingers and is of high quality. Poor quality release bearings may fail with the higher release loads that high-performance/ competition clutches have. The clutch release bearing must be setup with clearance to the clutch spring fingers to allow for clutch wear. Clearances are typically 3mm for competition clutches and 6mm for high-performance clutches. It may be necessary to remove any automatic adjustment system and convert it to full manual adjustment. The clutch release mechanism should be checked to ensure that it has enough travel to accommodate wear and release requirements.
- The clutch pedal should be fitted with adjustable, positive stops where possible. This should be setup to prevent clutch drag during disengagement but not over-stroke the clutch. Over-stroking the clutch during disengagement will permanently damage the clutch.
- Regular inspection and maintenance of the clutch is recommended for optimum performance over the life of the clutch. Intermediate and clutch discs can be checked for flatness and excessive wear using a straight edge and feeler gages. Flatness for pressure and intermediate plates shall not be more than 0.10mm. Clutch discs shall not be more than 0.15mm for organic and 0.13mm for sintered metallic discs.

Thread Size	Torque Value		
	N.m	lb-in	lb-ft
M6x1.0	12	108	-
M8x1.25	22	-	16

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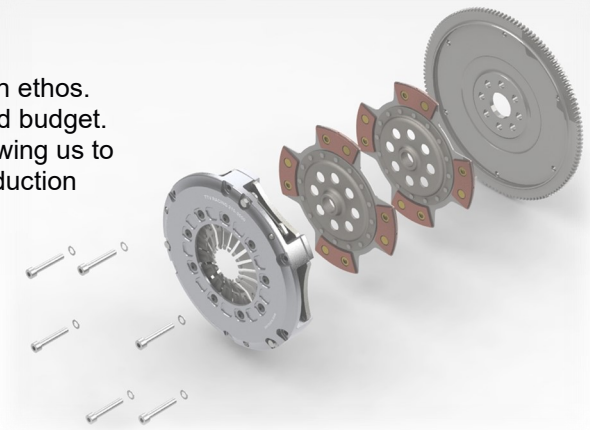
Services

We feel very lucky to have a worldwide customer base and we believe that service is the most important part of working with our customers, we work hard to give a level of service that exceeds expectation.
We also work hard to ensure that our customers understand what we do and why we do it that way.
We like to advise our customers and receive feedback so we can grow our brand and constantly develop our products as markets change.

Design



Beautifully engineered high quality products stem from our design ethos.
Careful consideration of the application, the customers needs and budget.
Reverse engineering and design is undertaken by us on site allowing us to keep control, we design for manufacture allowing us to keep production times down and product prices to a minimum. We design parts for all aspects of motorsport & OEM applications. We have extensive knowledge of machining a wide range of materials.
Engineering solutions to problem parts making our customers cars reliable and competitive.

Manufacture

We operate from our purpose built factory using
a cellular format which allows us to respond quickly to orders and simplify manufacture.
Processes consist of:

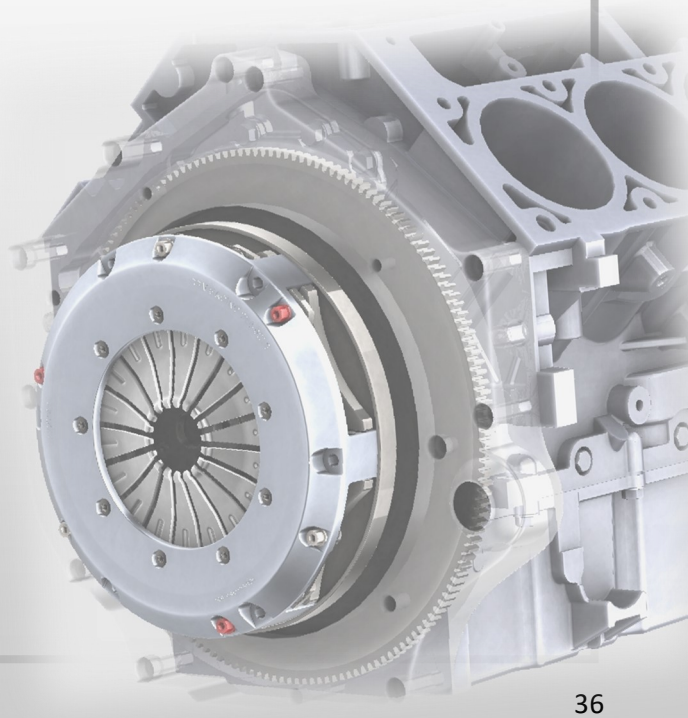
- Small batch & prototype cell,
- Production cells (High volume),
- Clutch component cell,
- Small component cell (pulleys, fittings, valve guides etc),
- Gear cutting balance & assembly cell,
- Tool making cell.

Test & Assembly

We have a range of equipment for testing materials and components.

Inspection

We have our own CMM for reverse engineering and ISIR inspections reports.
We also have 100% inspection measuring equipment allowing us to meet Tier 1 requirements with ease and minimal extra man hours.



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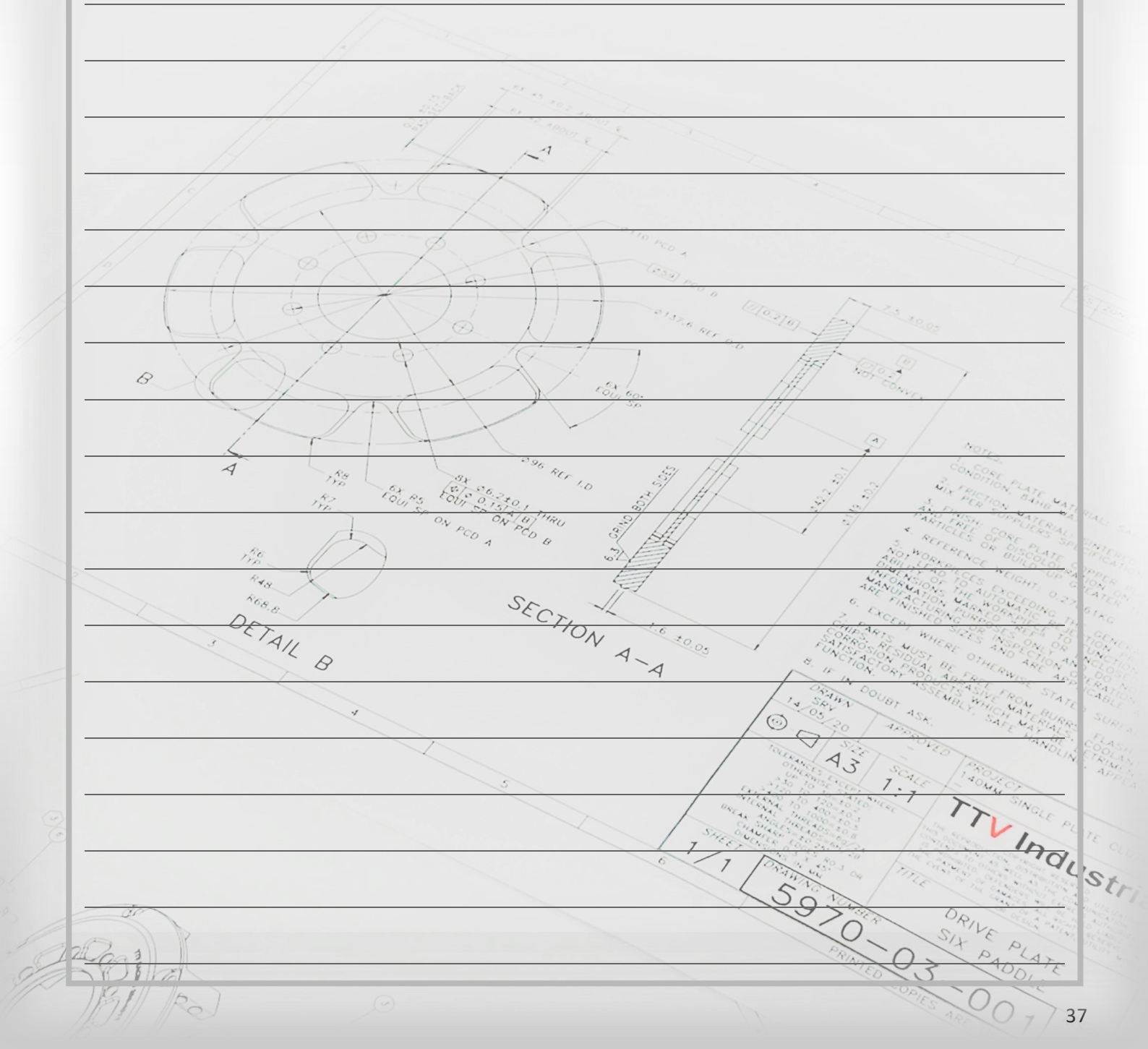
Notes



Flywheels

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Flywheels &
Special Clutches

TTV Racing design and manufacture steel flywheels for all types of motorsport and OEM applications.
Working closely with teams, engine builders and tuners around the world who rely on us to go the extra mile and deliver high quality parts that meet the demands of the application, from single seaters to drag racing we do it all.

CNC machined in our UK based factory from forged chrome moly steel. Our flywheels are dynamically balanced and incorporate an integral ring gear for high rpm safety.

What can we make for you?

Made in England

Flywheel & Clutch Design Form

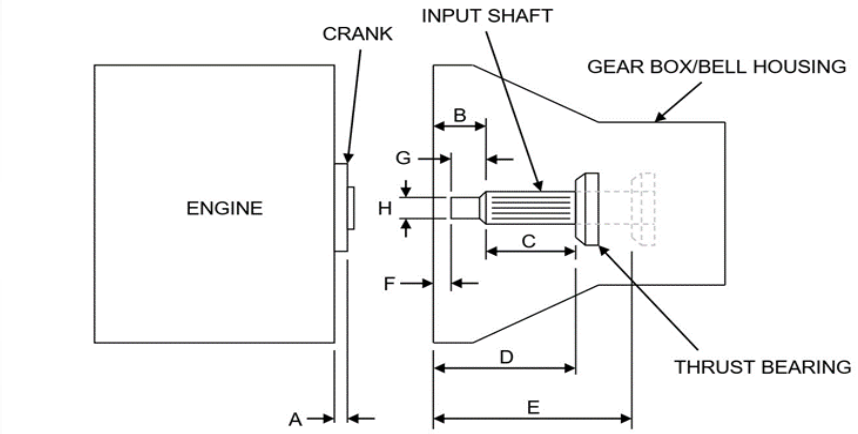
TTV Racing
Flywheels &
Special Clutches

The data form shown below may also be downloaded and printed from our website.
Alternatively the data can be written out in an e-mail referencing the data fields.
With this data we will be able to quote and design a flywheel or a flywheel and clutch kit to suit your application, ensuring the clutch sits properly on the gearbox splines and where required correctly meets your clutch release bearing. Where the flywheel or the clutch data is unknown, sample parts may still need to be sent to us to quote and reverse engineer.

Please send to: **info@ttvracing.com**

Name:		Address:	
Company:			
Email:		Telephone:	

Vehicle/Engine:		Torque:		Lbft / Nm
Gearbox Type:				2WD / 4WD
Spline Details:				
Clutch Details:				
Application:	(Circuit, Rallycross, etc.)			



A	Dimension from crank face to block where bell housing mates		mm/inch
B	Dimension from bell housing face to start of spline		mm/inch
C	Length of spline		mm/inch
D	Dimension from bell housing face to thrust bearing fully forward		mm/inch
E	Dimension from bell housing face to thrust bearing fully backwards		mm/inch
F	Dimension from bell housing face to start of pilot		mm/inch
G	Length of pilot		mm/inch
H	Diameter of pilot		mm/inch
J	Thickness of gearbox adaptor plate (if fitted)		mm/inch

Use a straight edge, steel rule or vernier caliper to measure dimensions. Please advise if there are any restrictions within the bell housing which could foul the clutch assembly. It is advisable to supply us with an OEM flywheel that matches the starter motor being used. This is so we can ascertain the correct number of teeth and tooth form (including lead-in chamfers).

Starter Motor Pinion Entry	Engine Side	Gearbox Side	
	Y / N	Y / N	
Release Bearing Type	Round Face	Flat Face	Bearing I.D / O.D
	Y / N	Y / N	

PLEASE ADD ADDITIONAL SHEETS IF MORE INFORMATION NEEDS TO BE SUPPLIED

TTV Racing

Flywheels &
Special Clutches

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