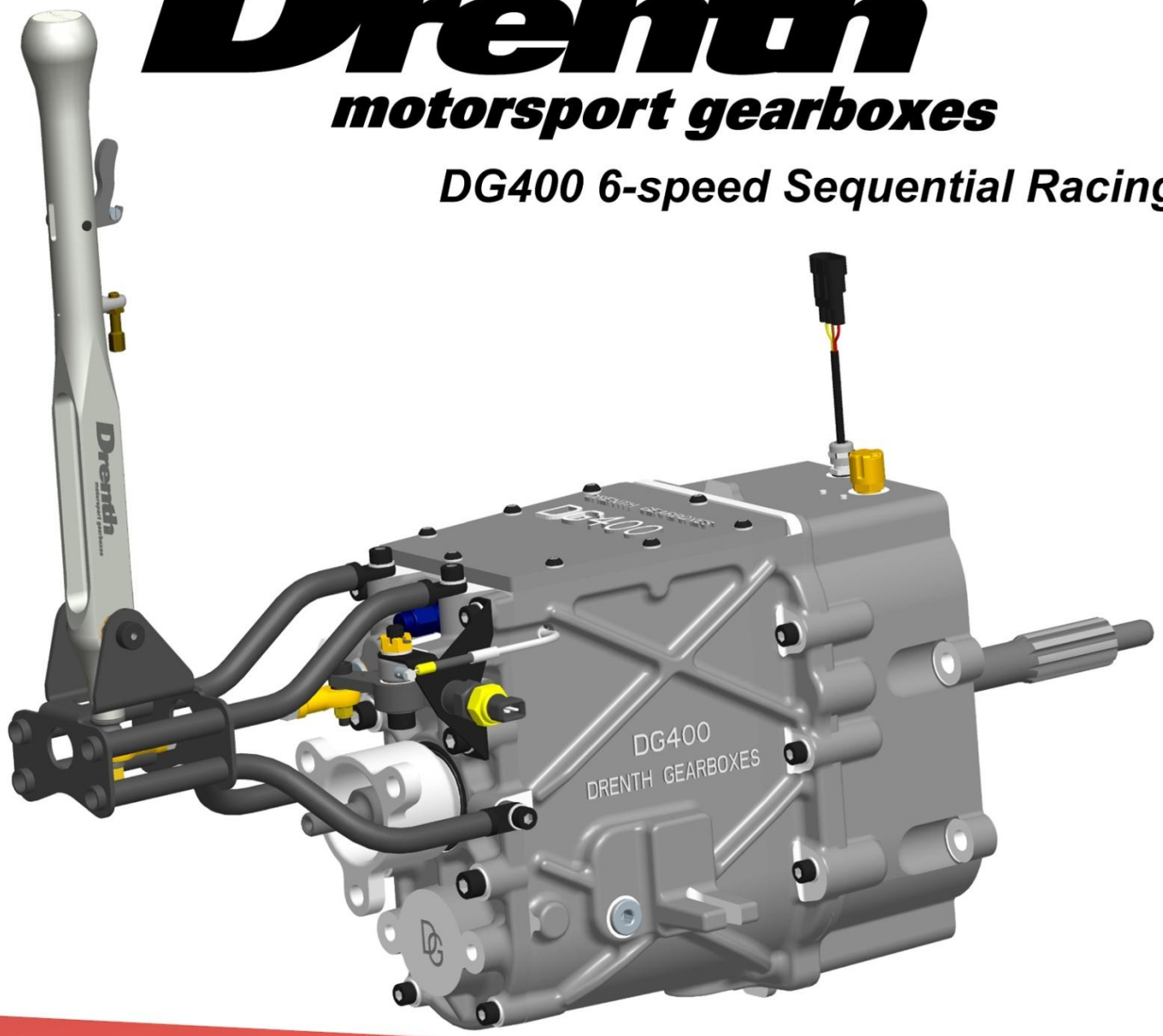
Drenth

motorsport gearboxes

DG400 6-speed Sequential Racing Gearbox



Pole Position
In gearboxes

25.03.0025

Introduction

The Drenth Gearbox 400 (DG400) 6-speed sequential racing gearbox is designed to be used in motorsport. Due to its compact design it fits into nearly any rear wheel driven car. The DG400 is already used in many cars like several BMW's (e30, e36, e46), Donkervoort's, Ford's and Honda S2000's. And has been successful in different race events like: 24hr Nürburgring, 24 hr Zolder, Belcar, 24 hr Dubai, Dutch SuperCars, VEGE Series, BRL, VLN, Hill climb's, rally's, Dakar and rally-cross.

This document contains information about the DG400 gearbox. It includes technical specifications, gear ratio set list and possible options. For more detailed information please contact Drenth Gearboxes.

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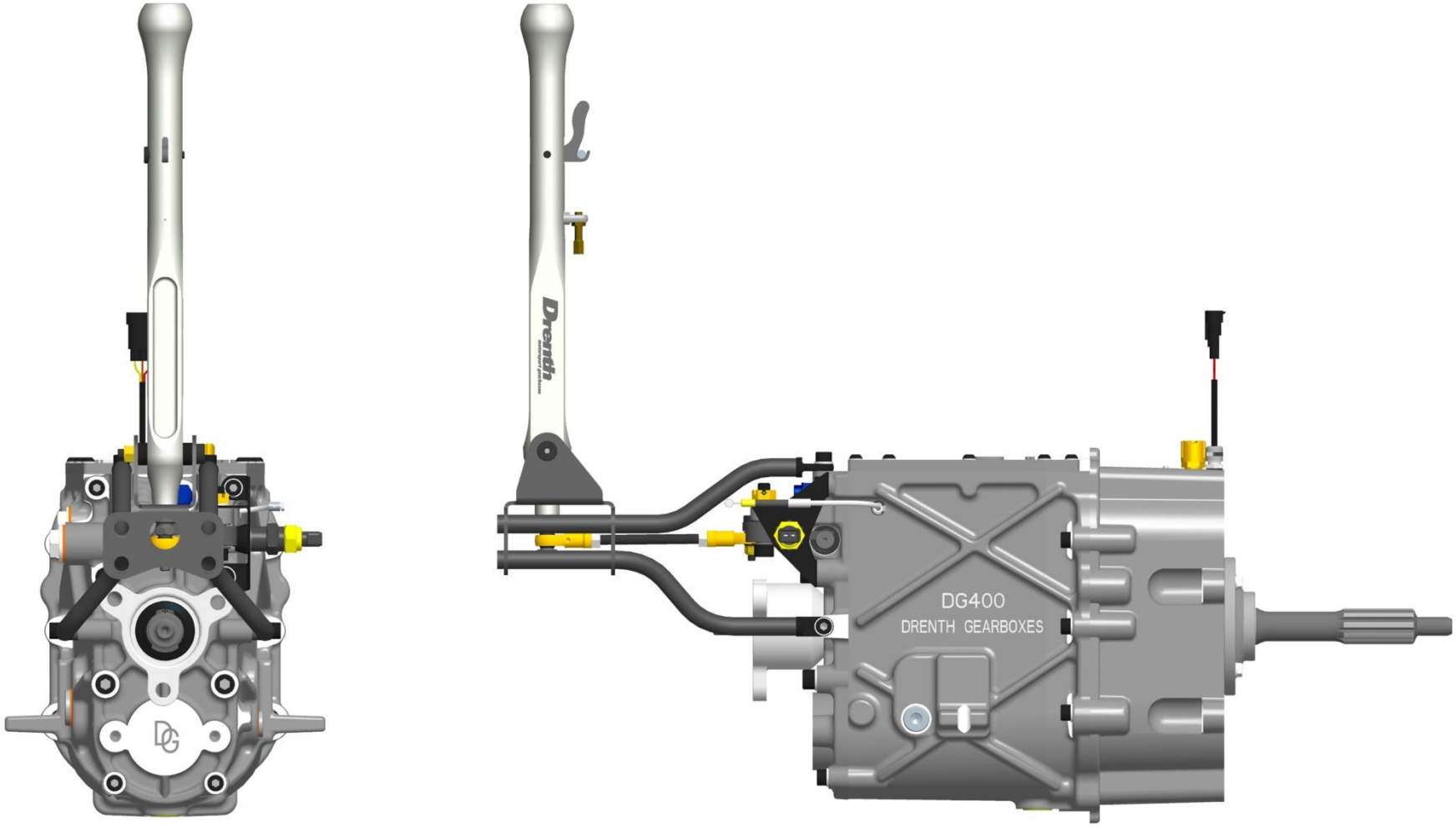
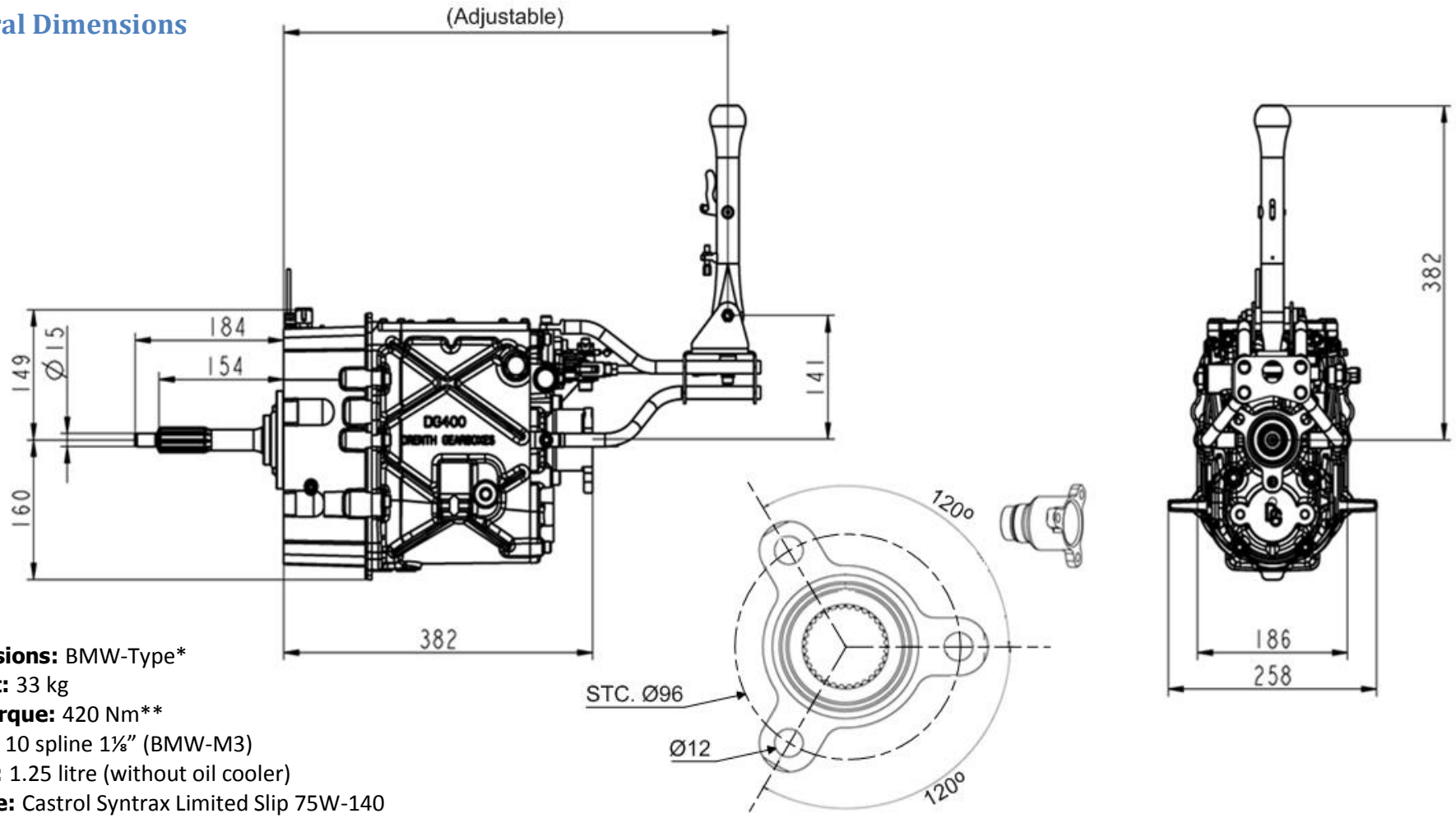


Figure 1:
Rear and side view

Technical Specifications

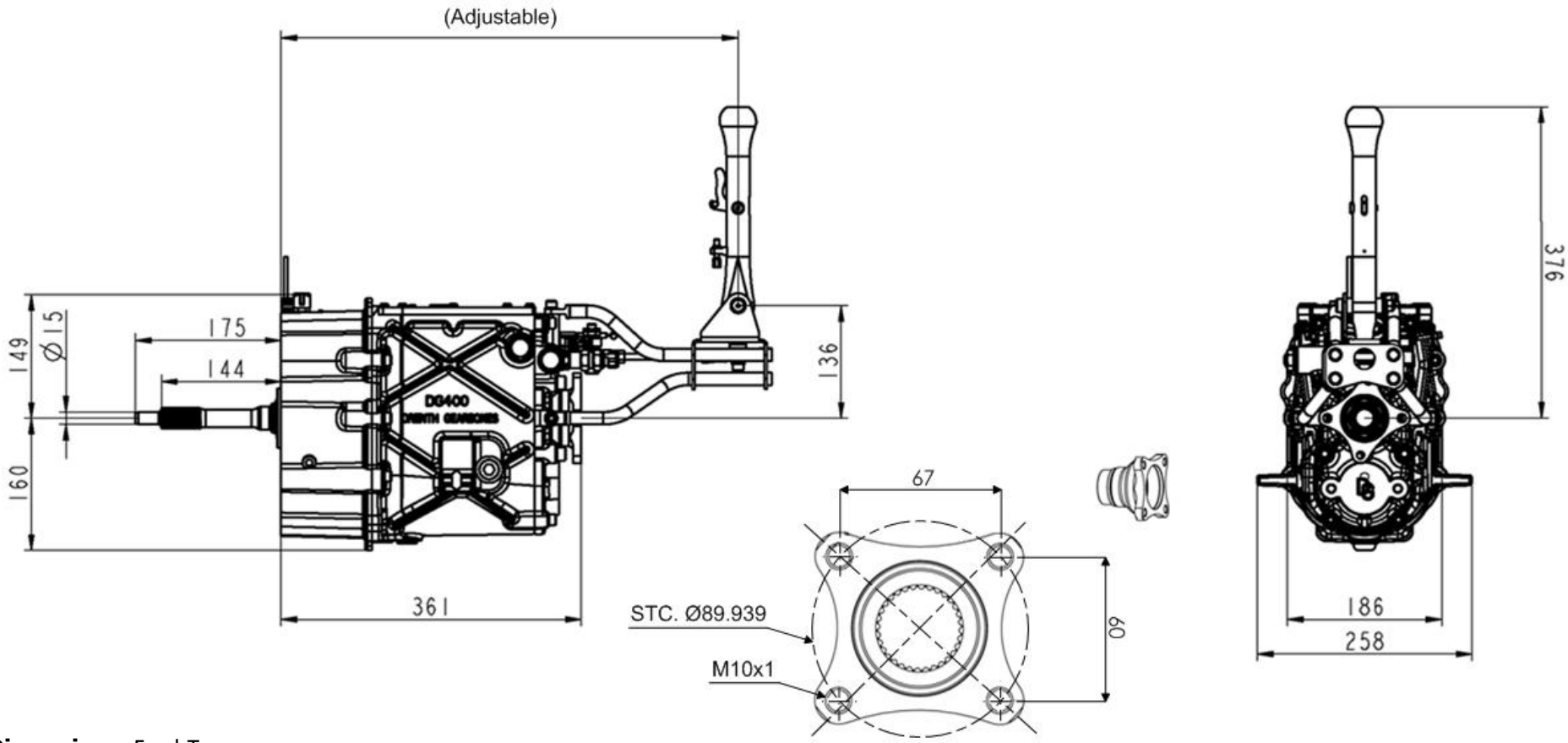
General Dimensions



Dimensions: BMW-Type*
Weight: 33 kg
Max torque: 420 Nm**
Spline: 10 spline 1⅛" (BMW-M3)
Oil qty: 1.25 litre (without oil cooler)
Oil type: Castrol Syntrax Limited Slip 75W-140

* Original 'Hardy-disc' can be used
** Depends on gear-ratio and car weight

Figure 2:
General dimensions BMW



Dimensions: Ford-Type
Weight: 33 kg
Max torque: 420 Nm*
Spline: 23 spline 1”
Oil qty: 1.25 litre (without oil cooler)
Oil type: Castrol SAF-XJ

Figure 3:
General dimensions Ford

* Depends on gear-ratio and car weight

Cross-Section

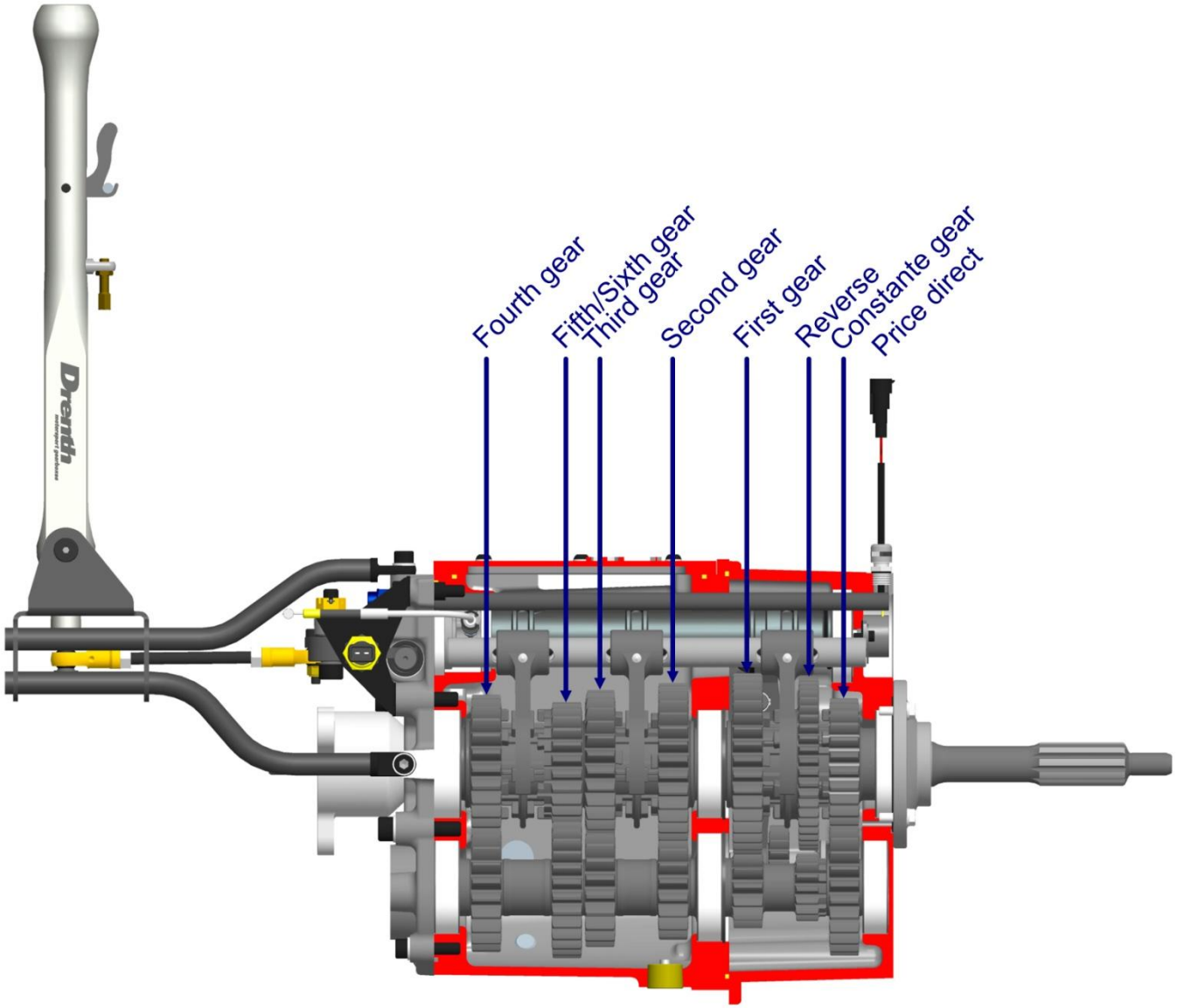


Figure 4:
Cross-section

Run-in Procedure

- Run through the gears while the gearbox is not mounted underneath the car. Also check if the gear indicator shows the correct information while going through the gears. If not check the calibration of the potentiometer.

- When this is working and the oil level is correct (1.25 litre), the gearbox can be mounted on a test bench or underneath the car. For the first test the wheels should be tilted from the ground. Before the test run make sure that the gearbox is in the neutral position. During the test run go through all the gears in a low rpm range. When the temperature starts to rise, the engine rpm may also go up. The temperature and the rpm build-up must go up evenly and check the given information on the gear indicator. During the run also concentrate on the noise production, vibrations and the temperature. When one of them is out of the ordinary, stop the test and see what could be wrong. The first test is done when all is operating correctly and the gearbox has reached its operating temperature.

- After the first test the gearbox is ready for a test drive. The procedure is the same as the first test. Slowly build-up the engine rpm and torque when the temperature level starts to increase. During the warm-up of the gearbox don't warm-up the brakes.

Gear Ratio Lists

Available gear ratios					
1st gear	***2nd, 3th and 4th gear***			***5th gear***	***6th gear***
2.604	2.148	1.678	1.303	1.184	1.000*
2.381	2.015	1.620	1.231	1.136	0.926
2.222	1.954	1.535	1.184	1.085	0.893
	1.900	1.505	1.136	1.000*	0.862
	1.838	1.471			
	1.794	1.406			
	1.736	1.354			

*Prise-direct on 5th and 6th gears

Available input shafts	
Part number	***Comments***
37.02.0113	Input shaft Ford
37.02.0114	Input shaft BMW
37.02.0119	Input shaft Opel
37.02.0619	Input shaft Honda S2000
37.03.0063	Input shaft Mazda MX5

Specials

Beside the standard gear ratio sets, it is also possible to get custom gear ratios for optimising the performance of the car. For more information about custom work please contact Drenth Motorsport Gearboxes.

Options

Oil Spray System

We recommend the use of the oil spray system if the engine torque exceeds 300 Nm. Can be fitted to either BMW-type or Ford-type. The oil spray system can be used with an external oil cooler and oil pump.

The system consist of:

Description	QTY.	Part Number
Plug oil pipe	1	37.02.0455
O-ring	1	37.02.0457
Multiseal	2	37.02.0458
Adaptor	2	37.02.0460
Oil pipe	1	37.02.0471
Mounting pin oil pipe	1	37.02.0472
Stop	1	37.02.0474
Complete Oil Spray System	1	37.02.0003

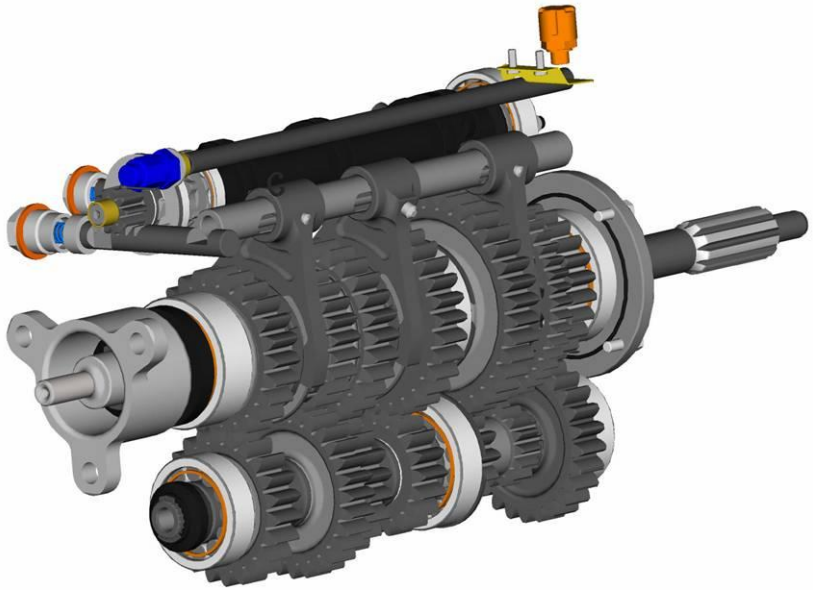


Figure 8:
Oil spray system

Internal oil pump

The internal oil pump can be used for the oil spray system and / or for an external oil cooler. Can be fitted to either BMW-type or Ford-type.

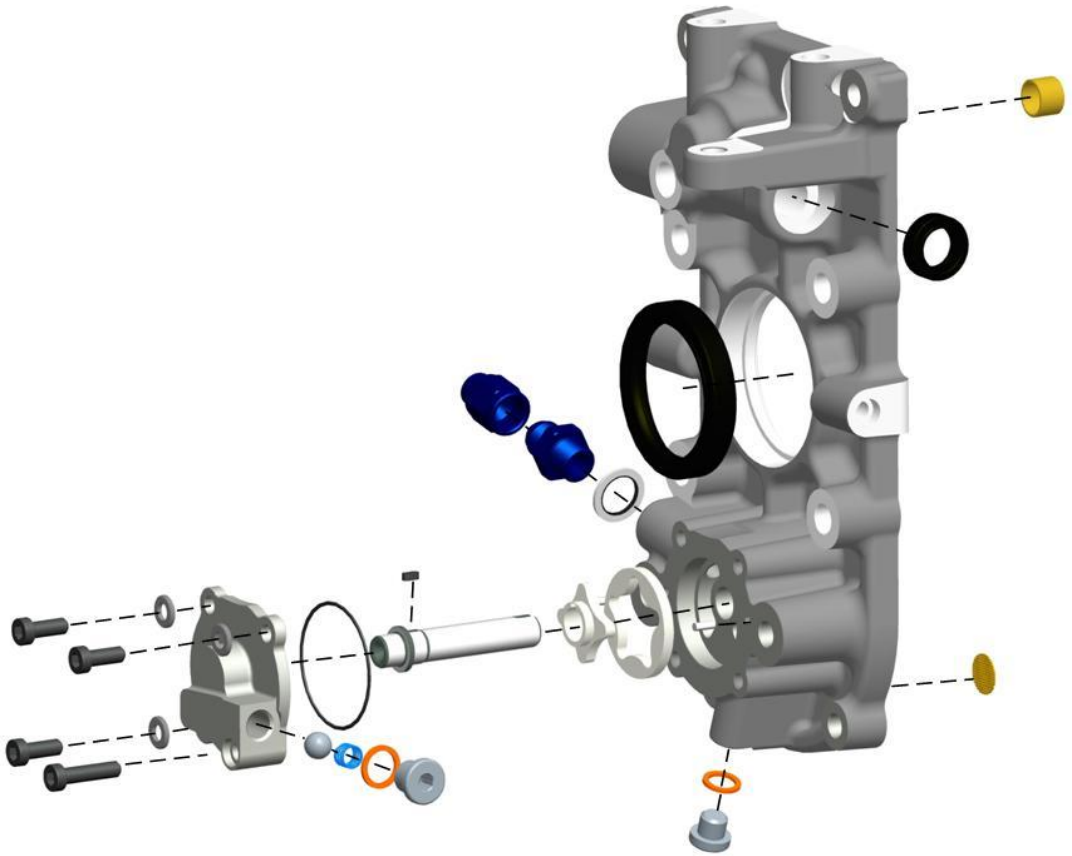


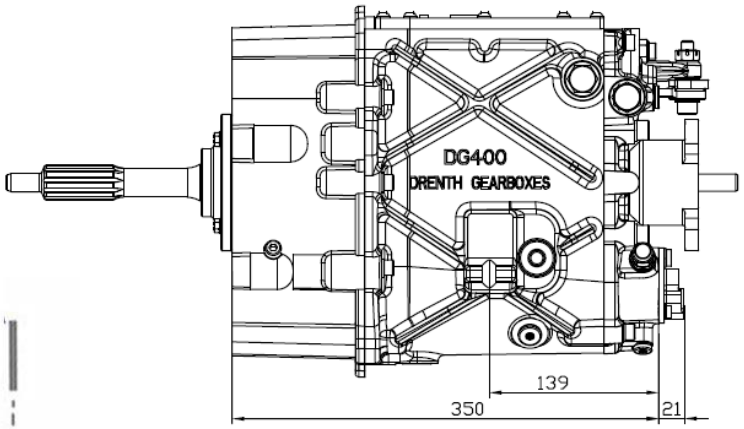
Figure 9: Oil pump

The system consist of:

Description	QTY.	Part number
Multiseal	1	37.02.0458
Oil seal - cardan flange	1	37.02.0190
Oil seal – selector rod	1	37.02.0326
Adaptor	1	37.02.0460
Stop	1	37.02.0474
Lid oil pump	1	37.07.0033
O-Ring	1	37.07.0047
Shaft oil pump	1	37.07.0041
Key Oil pump	1	37.07.0044
Oil pump internal	1	37.07.0031
Oil pump external	1	37.07.0032
Positioning pin 3x8	2	37.07.0046
Washer M10	1	37.07.0051
Oil plug	1	37.07.0050
Bolt M6 x16	3	37.07.0048
Washer M6	3	37.07.0049
Bolt M6 x25	1	37.07.0037
Ball oil valve	1	37.02.0433
Spring oil valve	1	37.07.0036
Washer M12	1	37.07.0038
Oil plug / Spring retainer	1	37.07.0039
End cover oil pump	1	37.07.0030
Complete Oil pump	1	37.02.0719
Oil pump Filter	1	37.07.0052
Positioning pin 3x28	1	37.07.0045
Adjustment secondary shaft	1	37.02.0716
Bearing	1	37.02.0024

When the oil pump is added to the gearbox the secondary shaft have to be adjusted.
This makes it possible to mount the positioning pin. The adjustment of the shaft is made by Drenth Gearboxes.
For more information contact our sales department or visit our website.

Figure 11:
Shaft oil pump



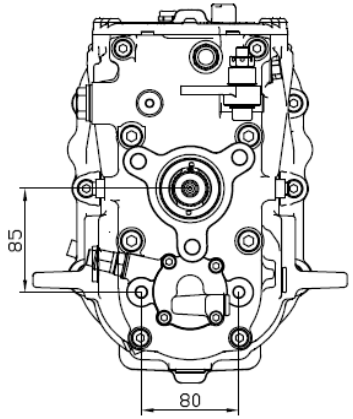
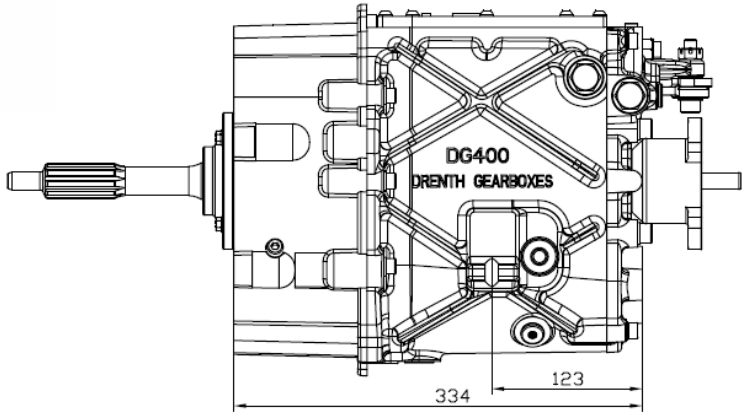


Figure 10:
Dimensions with oil pump



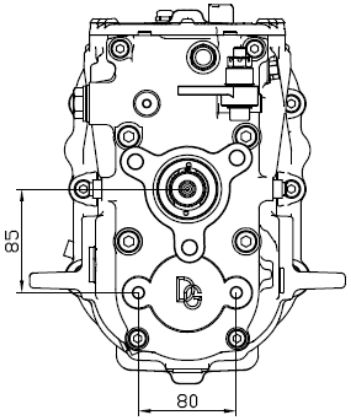


Figure 12:
Dimensions without oil pump

Gearlever

- There are 2 types gearlevers with different lengths available to suit the drivers need. For the dimensions see in the right top corner.

- The shifting rod is available in different lengths to suit car specifications. For the position of the gearlever.

    - 37.02.0354 = 130 mm
    - 37.02.0494 = 160 mm
    - 37.02.0495 = 180 mm
    - 37.02.0370 = 200 mm
    - 37.02.0369 = 240 mm
    - 37.02.0364 = 300 mm
    - 37.02.0590 = 360 mm

- There are 3 different studs available for shift length adjustment.

    - Short stud: 37.02.0610 (used with a short gearlever)
    - Intermediate stud: 37.02.0613 (used in combination with the gearbox mount and a long gearlever)
    - Long stud: 37.02.0612 (used in combination with the tunnel mount and a long gearlever)

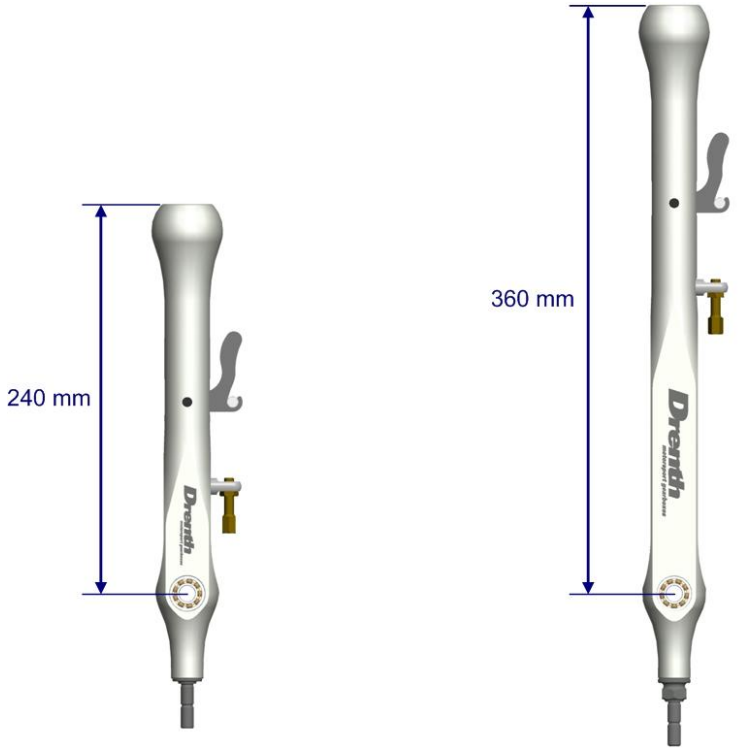


Figure 13:
Available gearlevers

D.M.S. Gearlever

The Strain Gauge Gearlever is specially designed to be used for flat shifting. A strain gauge is an accurate instrument to cut down the engine at the right moment, for a smooth gear change. Due its design it can be used in all types of cars with a sequential gearbox. The gearlever has an analogue output. If the mounted ECU is able to use the analogue input for flat shifting, then the gearlever can be connected directly to the ECU. A digital output can be added with the interface option. This digital output can be connected to the Drenth display unit.

Figure 14:
D.M.S. gearlever

Gearlever Mounting

- There are two possible constructions for mounting the gearlever.
    - A frame (gearbox mount) that's bolded directly on the gearbox.
    - A tunnel mount, gives more freedom in the decision of the mounting position. There is a steel version and an aluminium version.

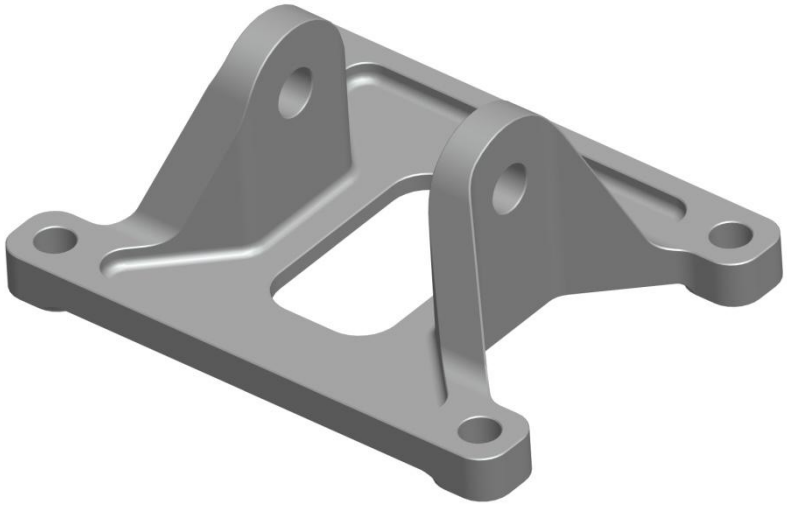
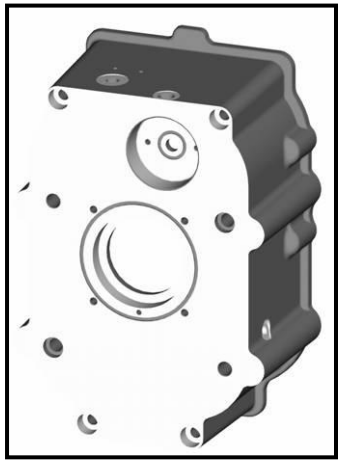


Figure 15:
Gearbox & tunnel mount

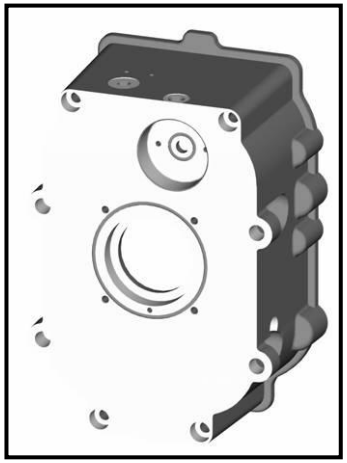
Constant Housing

There are two type available, Ford- and BMW- Type. To fit car-engine.



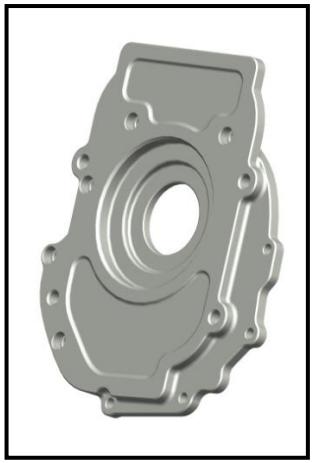
Ford Type:

37.02.0011



BMW Type:

37.02.0029

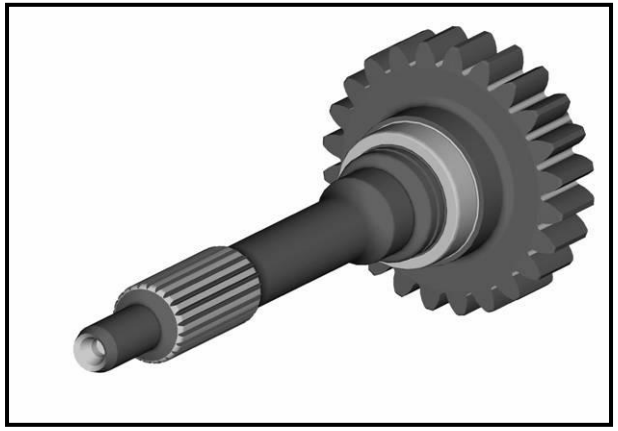


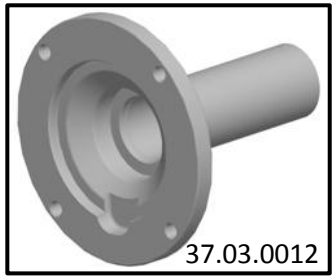
Adaptor plate:

Example RX8

Constant Shaft:

There are five types available, Ford-, BMW-, Opel-, Mazda- and Honda-type, to fit car-engine. Drenth gearboxes can also supply a bell house or adaptor plate to fit the gearbox on any rear wheel driven car, for example see picture right top corner. Optional for the Ford constant shaft is a clutch bearing support (37.03.0012), see figure next to the Ford constant shaft. A different constant shaft is available on request.

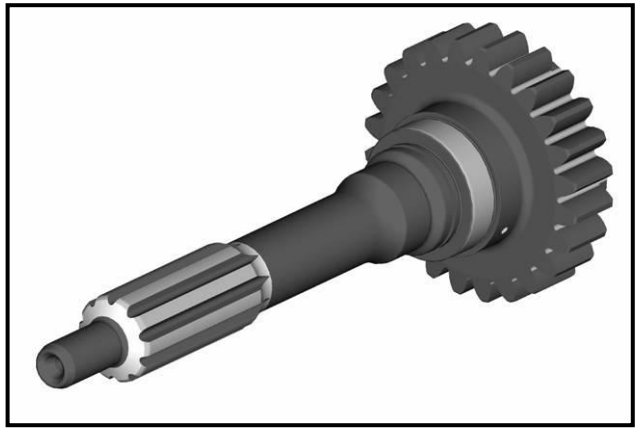




37.03.0012

Ford Type:

37.02.0113



BMW Type:

37.02.0114

Drenth Display Unit

The display unit houses several functions to adjust to the driver's needs and to fine-tune the gearbox.

The gear indicator displays the selected gear by measuring the position of the selector barrel with a rotary sensor. This function can be calibrated through the supplied software. It also can be used as a shift light when a preset level of RPM is reached. This preset level and the manner of indicating can be set with the supplied software.

The gear indicator, combined with the D.M.S gearlever, can act as a flatshift system (powershift) This means that you can accelerate (full throttle) and shift up without using the clutch or lifting the throttle. This can also be calibrated with the supplied software.

The set comes with a separate user manual. For more information contact our sales department or visit our website.

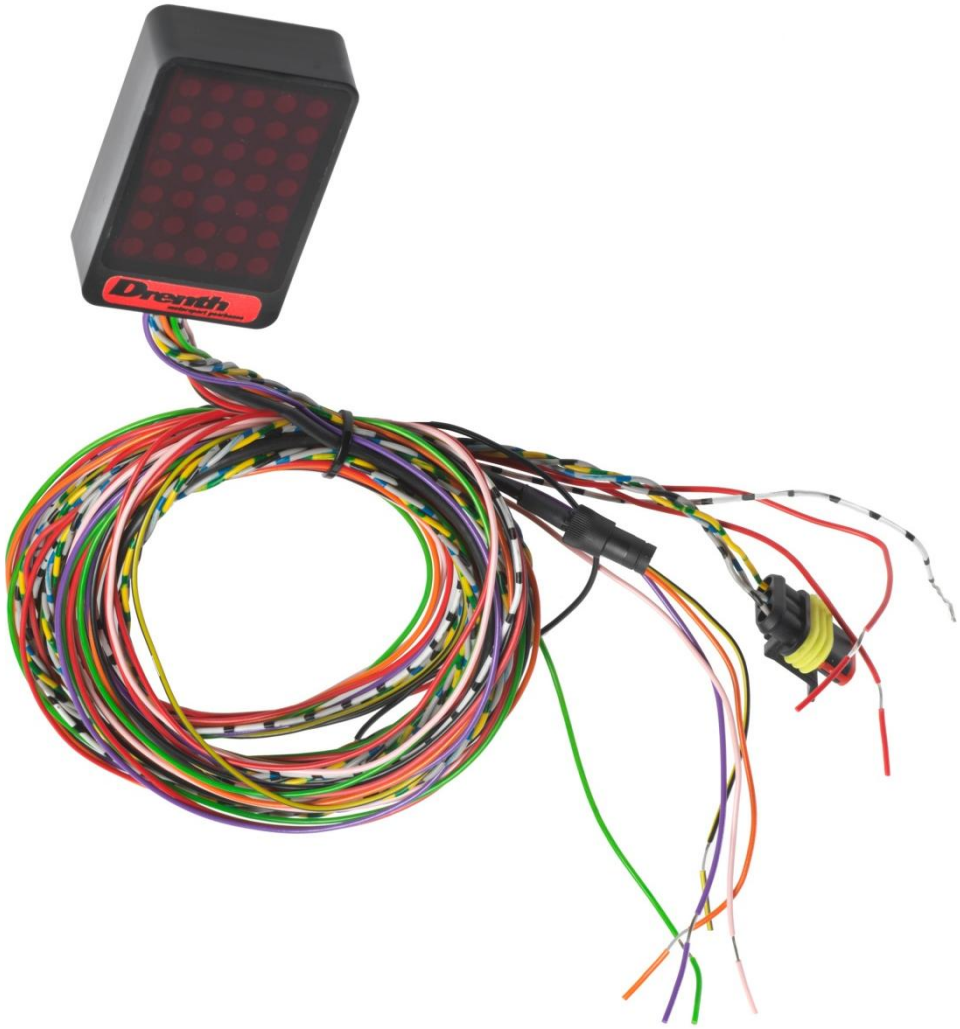


Figure 16:
Display unit

Drenth Gear Indicator

The Drenth Gear indicator is a display unit that can be used with any Drenth gearbox with a rotary sensor. Any gear order can be accommodated with up to 7 forward speeds besides neutral and reverse.

Programming the unit is achieved by the use of a single button and a user-friendly programming routine. Additionally, the unit features a counter to log the total number of gearshifts made – useful for tracking the life of critical gearbox components.

The set comes with a separate user manual. For more information contact our sales department or visit our website.

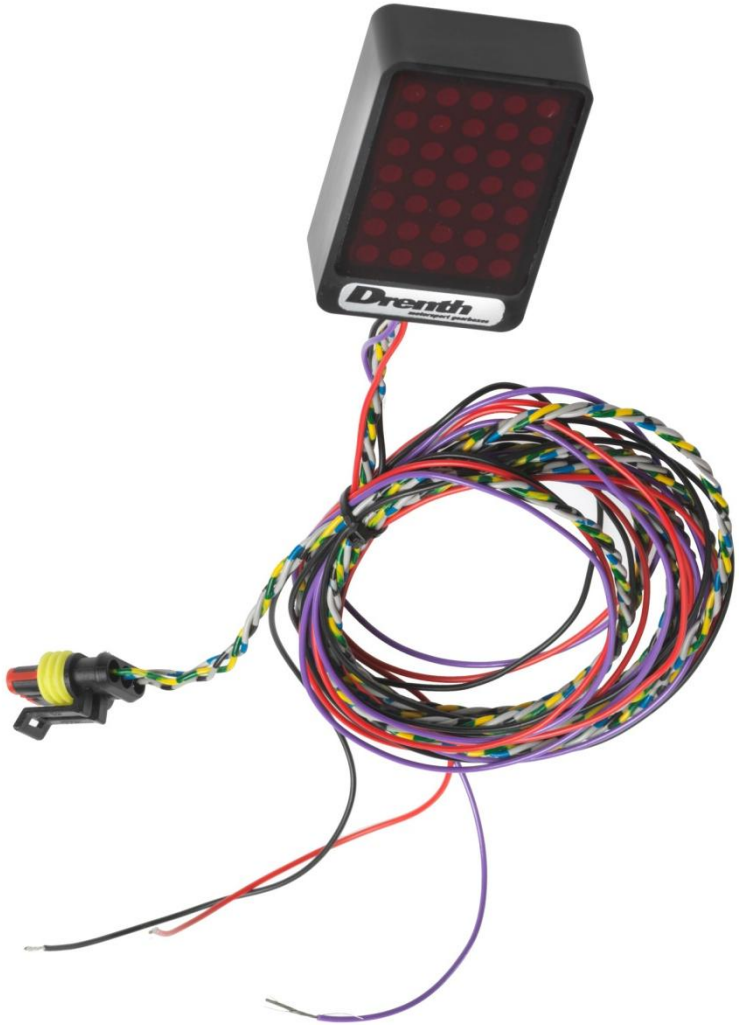


Figure 17:
Gear indicator

Oil breather catch tank

The DG400 gearbox needs an oil breather system for breathing the gearbox.
Drenth gearboxes recommends an oil breather catch tank for breathing the gearbox.

The following breather catch tank with the corresponding parts suits for a Drenth gearbox.

The tank needs to be placed vertical and above the gearbox for a smooth return of the oil.
For mounting the tank there are two 6 mm holes, the hose needs to be cut to size.

For more information, please contact our sales department.

The system consist of:

Description	QTY.	Part Number
Complete oil breather catch tank	1	25.03.0200
Oil breather catch tank	1	25.03.0201
Adaptor (hose)	2	25.03.0203
Oil hose (1 m)	1	25.03.0202

Figure 18:
Oil breather catch tank

Mounting Bracket

- There's a bracket available which is special developed for the BMW E46. The bracket fits directly on the original support bracket mounting place of the BMW.

- There are two support blocks available to soot the car specifications:
    - Aluminum blocks (for circuit racing)
    - Hard plastic block (for rally-(raid))

For more information please contact our sales department.

Description	QTY.	Part number
Washer M10	2	37.02.0027
Washer M8	4	37.02.0018
Nylock nut M8	2	37.02.0406
Bolt M8	4	38.10.0027
Main bracket DG400 vs S54	1	37.03.0082
Support Block(P.O.M)	2	37.03.0085
Support bracket DG400 vs S54	1	37.03.0083
Bolt M10x25	2	39.08.0300
Bolt M8x55	2	37.03.0086
Support Block (alu)	2	37.03.0084
Complete S54 vs DG400 bracket (ALU)	1	37.03.0081
Complete S54 vs DG400 bracket (POM)	1	37.03.0080

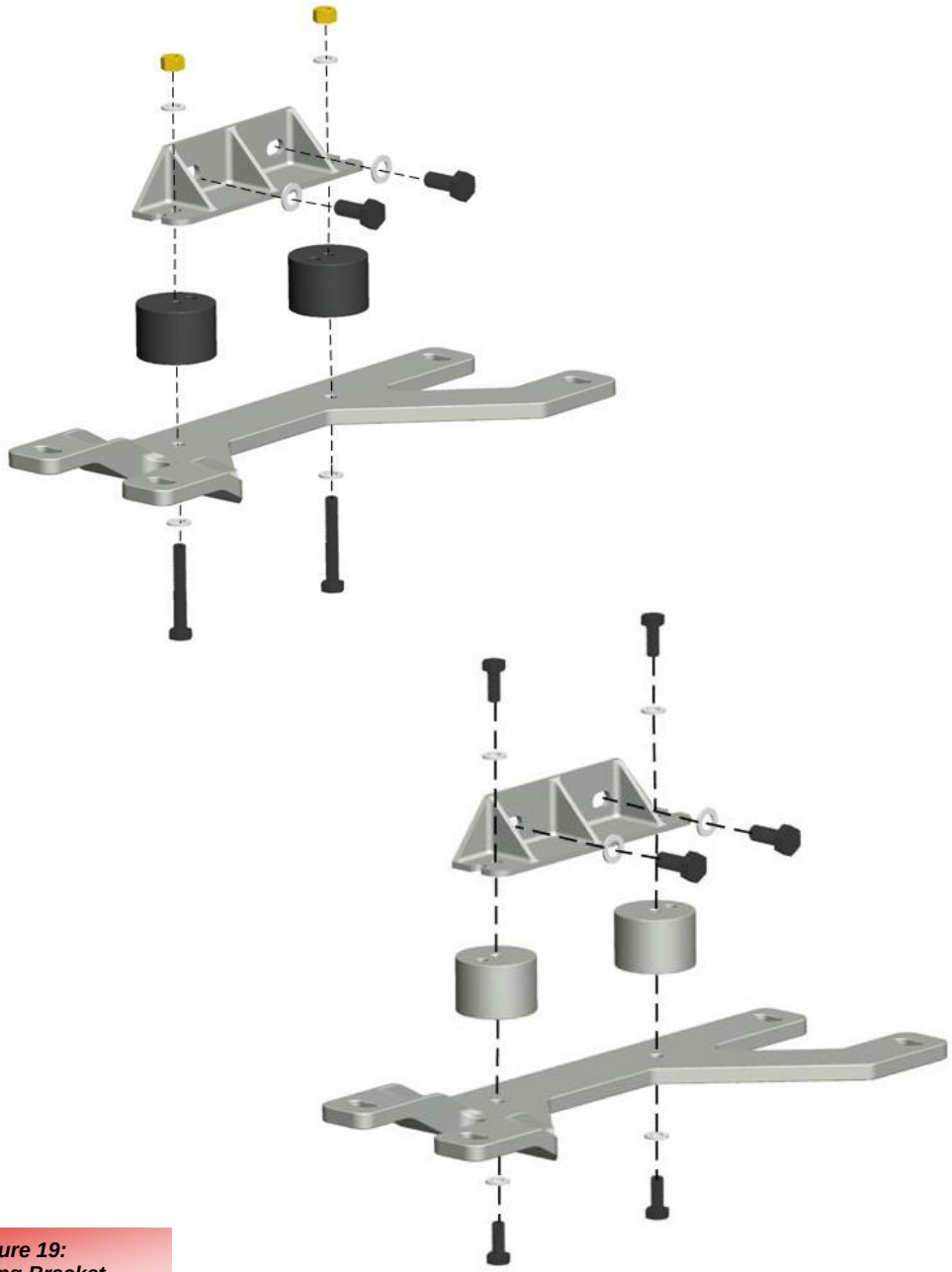


Figure 19: Mounting Bracket

Contact Information

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info@racingsport.es

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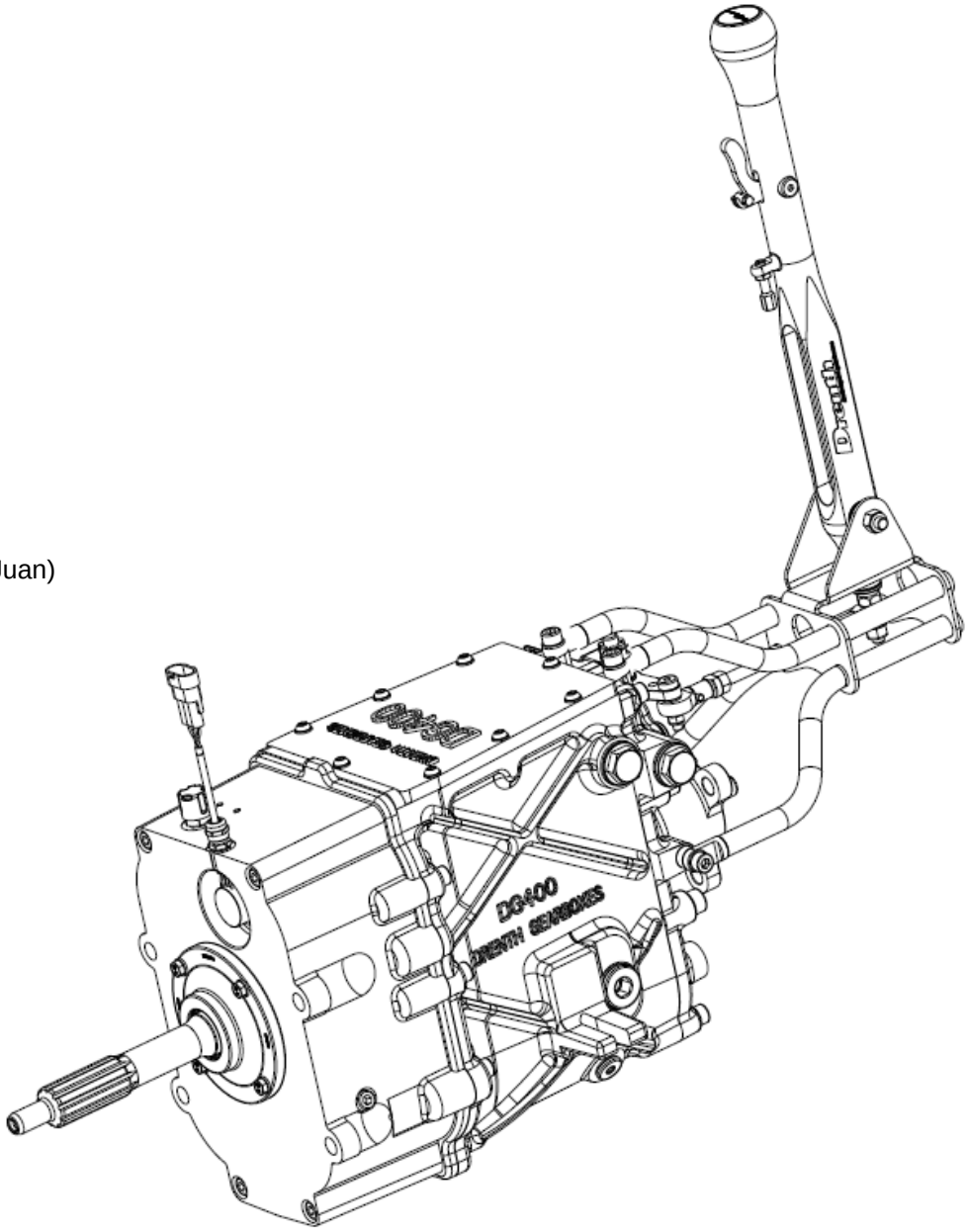

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Pole Position

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