

Drenth

motorsport gearboxes

Strain Gauge Gearlever User Manual With Switchbox



Pole Position
In gearboxes

25.03.0022

Introduction

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 to 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 analog input for flat shifting, then the gearlever can be connected directly to the ECU. A digital output can be added with the switchbox option. This digital output can be connected to the Drenth display unit. With this display unit you can only flat shift by up shifting. For more information about the optional Drenth display unit see chapter 'Options' or visit our website. When the mounted ECU is able to use the digital signal for flat shifting, the gearlever can be connected directly to the switchbox. Depended on manufacturer of mounted ECU you can either use the digital (with switchbox) or the analogue signal. It's possible to use flat shifting for up shifting and throttle-blip for downshifting, this can be realized when the car has 'drive by wire throttle system' and an ECU that supports this system.

This document contains information about the Strain Gauge Gearlever. It includes technical specifications and possible options. For more detailed information please contact Drenth Gearboxes.

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Made by Jeroen Grolleman, Modified by Damas Damen

*Drenth Motorsport Gearboxes
Fleuweweg 10
7468 AG Enter
The Netherlands
Phone: +31 (0)547 38 26 96
Fax: +31 (0)547 38 20 65
info@drenth-gearboxes.com*

Warning

If you want to install your gearlever. **Please be aware of;**

- The input of the gearlever is **5V** and the input of the switchbox is **12V**.
- Install the gearlever only with a **resistor** sparkplug cap and sparkplug lead. If you do not have this equipment, we cannot guarantee you a interference-free system.
- Do not install the system close to a high frequented device. For example an ignition coil or sparkplug lead.
- If you want to combine the gearlever with a shifter boot. Do not fix the shifter boot on the carbon plate. This can lead to technical problems and interference in the system.



Figure 1:
Gearlever with shifter boot

Technical Specifications

Wiring Specifications

Driving direction

Cable (≤2012)	Cable (≥2013)	Function	Remarks
Yellow	Brown	5 Volts	Can be shared with 5V from the ECU
Black	Black	Ground	Can be shared with ground from the ECU
Grey	Blue	Analogue Voltage Signal	When lever is in neutral position (no forces applied) the grey cable has an output of 2.5V. This voltage will increase as the up shifting force increases. The voltage will decrease as the downshifting force increases. (Figure 3) Can be shared with an analogue voltage input.

*Is different color in version 2012 and before. See wire diagram below.

Connection Diagram



Figure 2:
Connection diagram

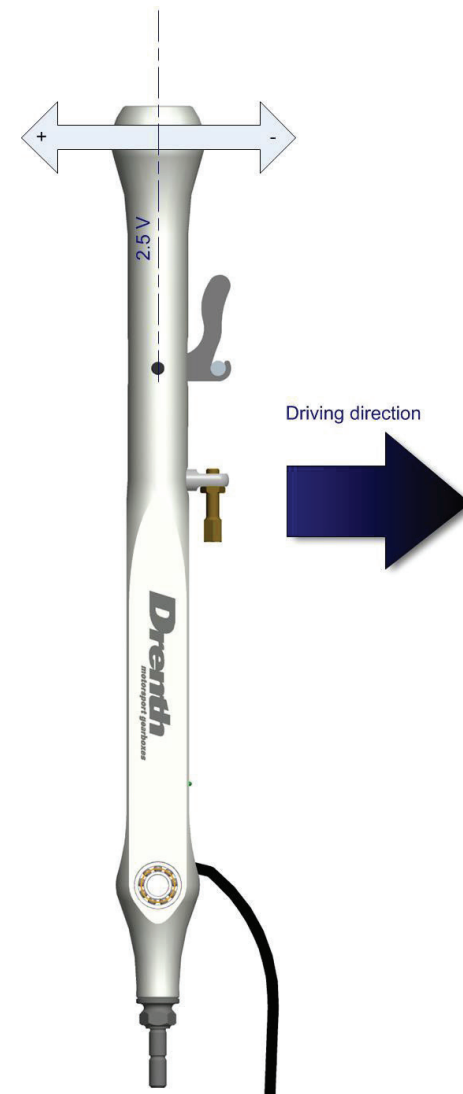


Figure 3:
Driving direction

Options

Switchbox

The switchbox converts the analogue signal of the gearlever to a digital signal for the Drenth display unit or a mounted ECU that is able to use a digital signal input for flat shifting. The upper and lower threshold can be adjusted with the use of two potentiometers. The switchbox is powered by 12V and converts it to 5v for the gearlever. Wiring specifications, connection diagram and threshold adjustment are described on the following pages.



Figure 4:
Interface

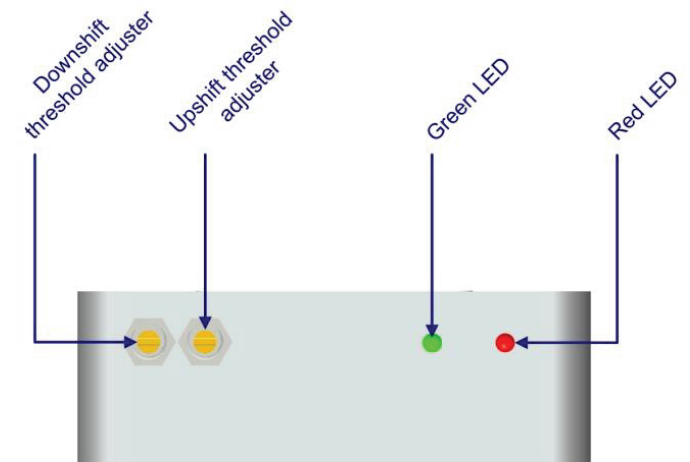


Figure 5:
Adjustment & Led
switchbox

Wiring specifications

Cable	Function	Remarks
Brown	12 Volts	Can be shared with 12V from Drenth Display (red wire)
Blue	Ground	Can be shared with ground from Drenth Display (black wire)
Black	Analogue Voltage Signal	When lever is in neutral position (no forces applied) the black cable will have an output of 2.5V. This voltage will increase as the up shifting force increases. The voltage will decrease as the downshifting force increases. Can be shared with an analogue voltage input from the ECU
White	Downshift Cut	When enough force is applied and the threshold is reached, the green indicator LED will light up and the white wire will be connected to ground. Can be shared with a digital input from the ECU
Grey	Upshift Cut	Can be connected directly to the yellow/black wire from the Drenth Display. When enough force is applied and the threshold is reached, the red indicator LED will light up and the grey wire will be connected to ground. Can be shared with a digital input from the ECU

Connection Diagram



Figure 6:
Connection diagram

Wiring specifications previous type

Cable	Function	Remarks
Brown	12 Volts	Can be shared with 12V from Drenth Display (red wire)
Blue	Ground	Can be shared with ground from Drenth Display (black wire)
Green	Analogue Voltage Signal	When lever is in neutral position (no forces applied) the green cable will have an output of 2.5V. This voltage will increase as the up shifting force increases. The voltage will decrease as the downshifting force increases. Can be shared with an analogue voltage input from the ECU
Yellow	Downshift Cut	When enough force is applied and the threshold is reached, the green indicator LED will light up and the yellow wire will be connected to ground. Can be shared with a digital input from the ECU
White	Upshift Cut	Can be connected directly to the yellow/black wire from the Drenth Display. When enough force is applied and the threshold is reached, the red indicator LED will light up and the white wire will be connected to ground. Can be shared with a digital input from the ECU

Connection Diagram

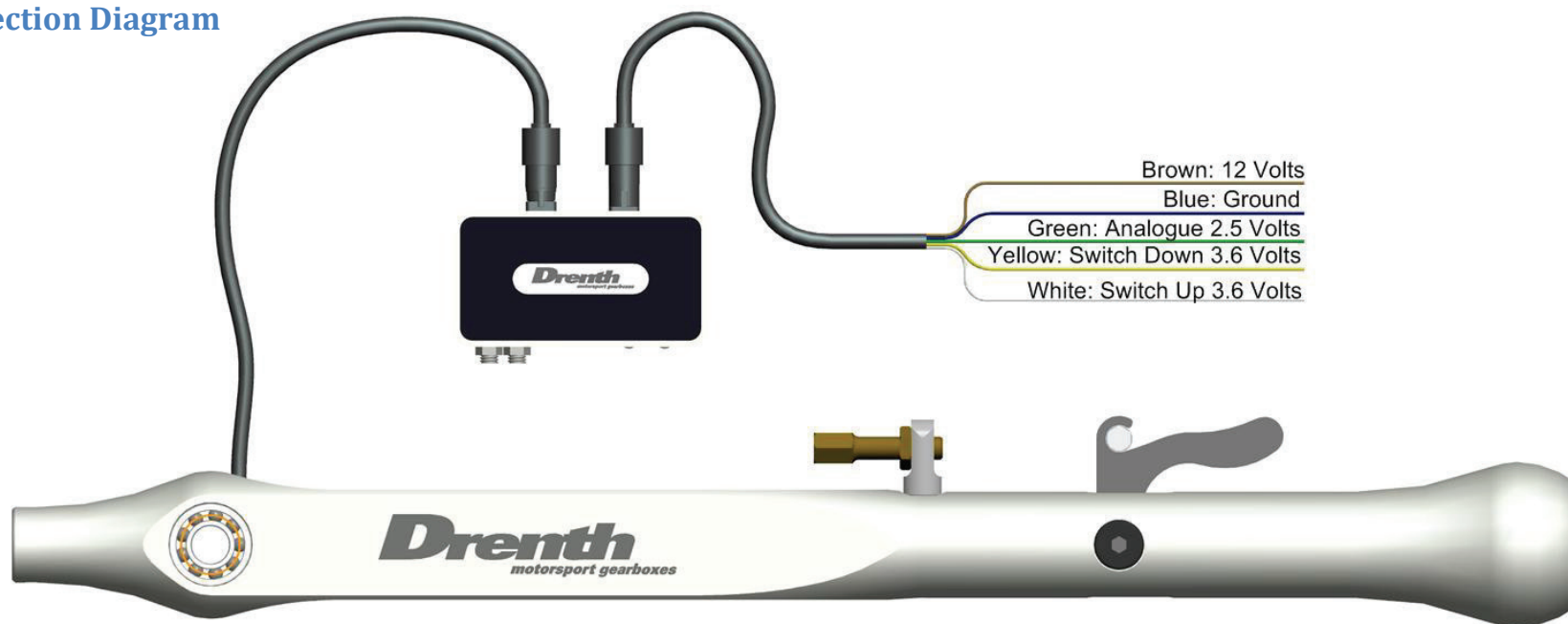


Figure 7:
Connection diagram

Program your switchbox

Important: The potentiometers do not have a function if they are not in 'program mode'. New settings only be remembered after step 4. If you turn off the power before step 4, the box settings return to the previous value.

1. Get gearlever into program mode
 - Connect a **Voltmeter** to the cables **ground** and **signal**
 - Push the gearlever forward (downshift) with a force of 20kg (+- 200N) and turn on the power. **After 5 seconds** the **Green** LED starts blinking. (Figure 8.1)

important: If you turn on the power, the force on the gearlever is mandatory. When the Green LED starts blinking, forcing is no longer necessary. The switchbox is now in program mode.

2. Check current setting
The voltmeter shows a value. This value is the current threshold setting. If this setting is correct, turn off the power. This means that you keep your current setting. If you want to change the setting, go to step 3.
3. Make a new setting
Your current setting is not correct. You can change this setting by rotate the right potentiometer. (Figure 8)
[CW = +] (Figure 8.2) **[CCW = -]** (Figure 8.3)

If you changed your setting, you can check your setting. Pull the gearlever backward (upshift) till the **Red** LED turns on. Check the new value on the Voltmeter. If this value still not is correct, repeat step 3.

Minimum value: 2.7 V

Recommended value: 3.0V

4. Save new setting in memory
Push the gearlever forward (downshift) with a force of 20kg (+- 200N). **After 5 seconds** the **Green** LED starts blinking. (Figure 8.4) Release the gearlever from pressure. The switchbox works with the new setting for the upshift.

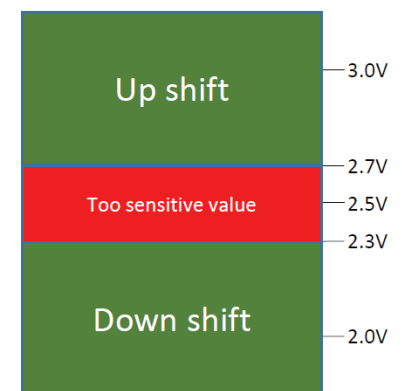
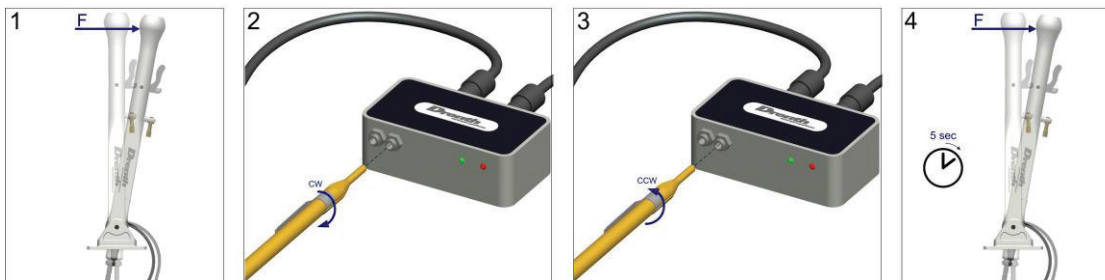


Figure 8:
Upshift adjustment

To adjust downshift threshold follow procedure described below:

1. Get gearlever into program mode
 - Connect a **Voltmeter** to the cables **ground** and **signal**
 - Push the gearlever backward (upshift) with a force of 20kg (+- 200N) and turn on the power. **After 5 seconds** the **Red** LED starts blinking. (Figure 9.1)

important: If you turn on the power, the force on the gearlever is mandatory. When the Red LED starts blinking, forcing is no longer necessary. The switchbox is now in program mode.

2. Check current setting
The voltmeter shows a value. This value is the current threshold setting. If this setting is correct, turn off the power. This means that you keep your current setting. If you want to change the setting, go to step 3.
3. Make a new setting
Your current setting is not correct. You can change this setting by rotate the left potentiometer. (Figure 9)
[CW = +] (Figure 9.2) **[CCW = -]** (Figure 9.3)

If you changed your setting, you can check your setting. Push the gearlever forward (downshift) till the **Green** LED turns on. Check the new value on the Voltmeter. If this value still not is correct, repeat step 3.

Maximum value: 2.3 V

Recommended value: 2.0V

4. Save new setting in memory
Pull the gearlever backward (upshift) with a force of 20kg (+- 200N). **After 5 seconds** the **Red** LED starts blinking. (Figure 9.4) Release the gearlever from pressure. The switchbox works with the new setting for the downshift.

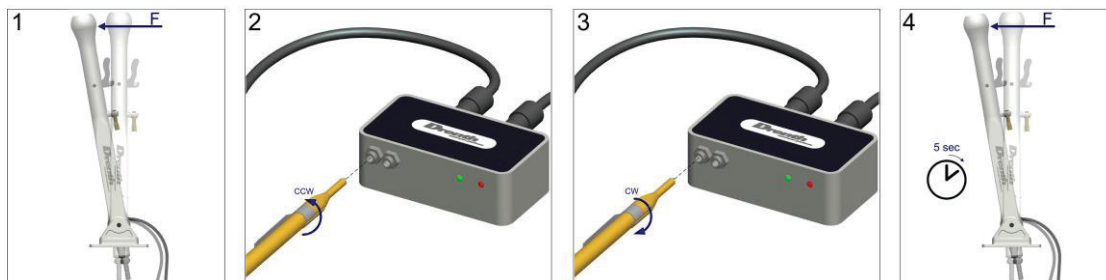
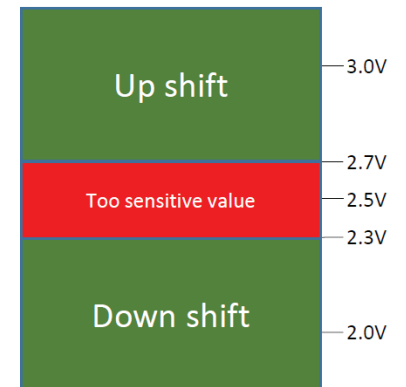
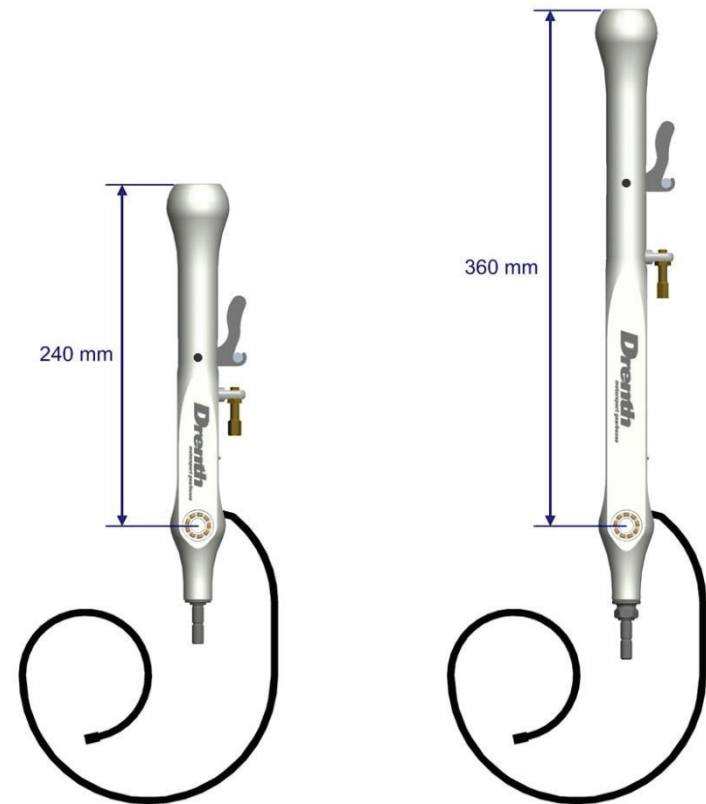


Figure 9:
Downshift adjustment



Gearlever

- There are 2 types gearlevers of with different lengths available to suit the drivers need. For the dimensions see figure 5 in the right top corner.
 - Short gearlever
 - Long gearlever
- There are 3 different studs available for shift length adjustment.
 - Short stud
 - Intermediate stud
 - Long stud
- A custom shifting rod can be made on request.



*Figure 10:
Available gearlevers*

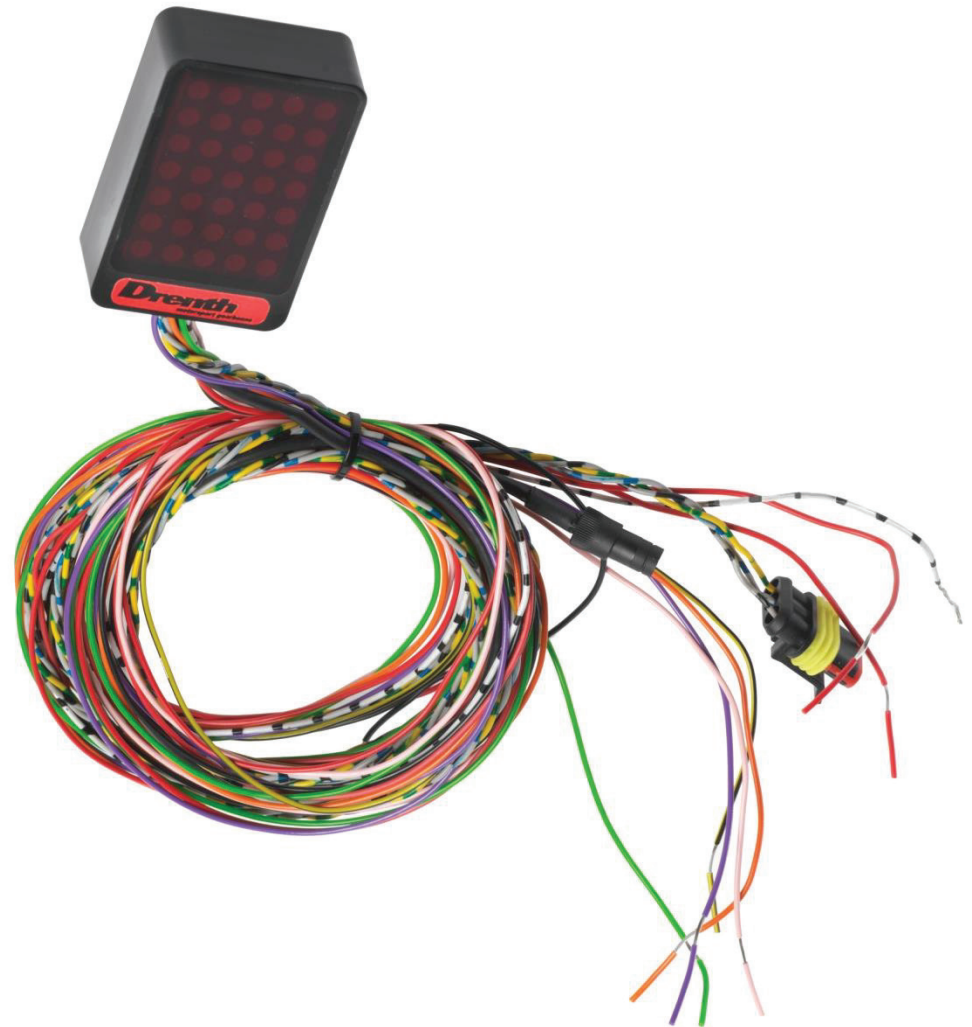
Drenth Display Unit

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 11:
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.

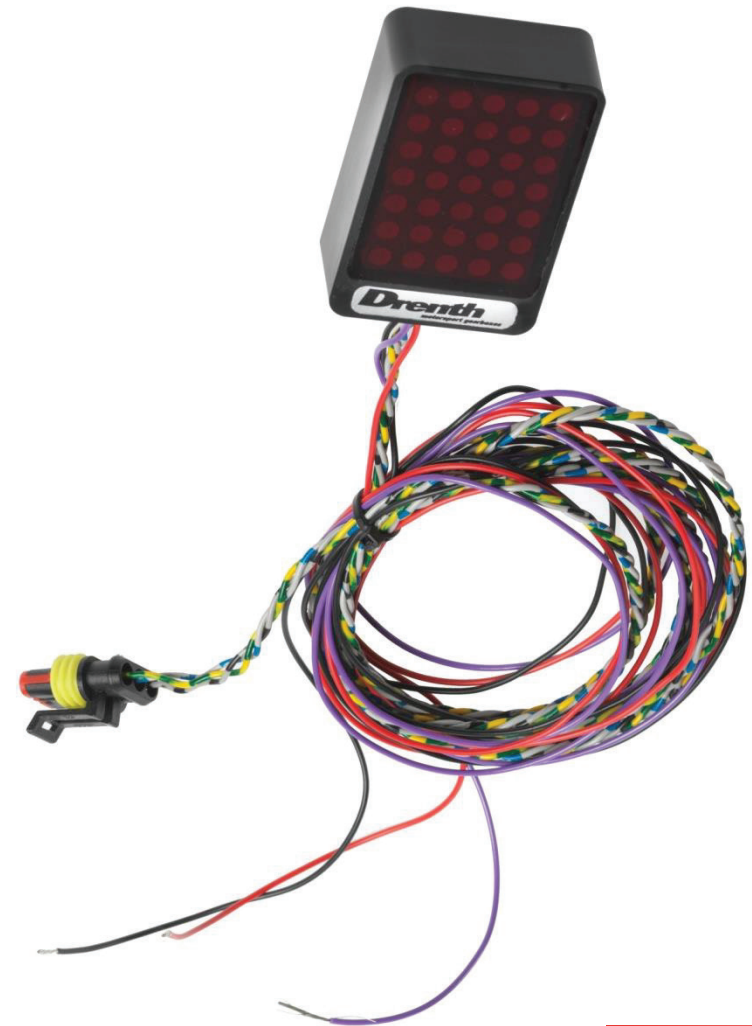


Figure 12:
Gear Indicator

Contact Information

Address

US Auto Performance LLC
9107 64th Avenue East
Bradenton, FL 34202
Direct: (941) 504-8686
Fax: (941) 458-4851
www.USAutoPerformance.com

Contact Persons

Geoff Mason
US Auto Performance LLC
Geoff@USAutoPerformance.com

