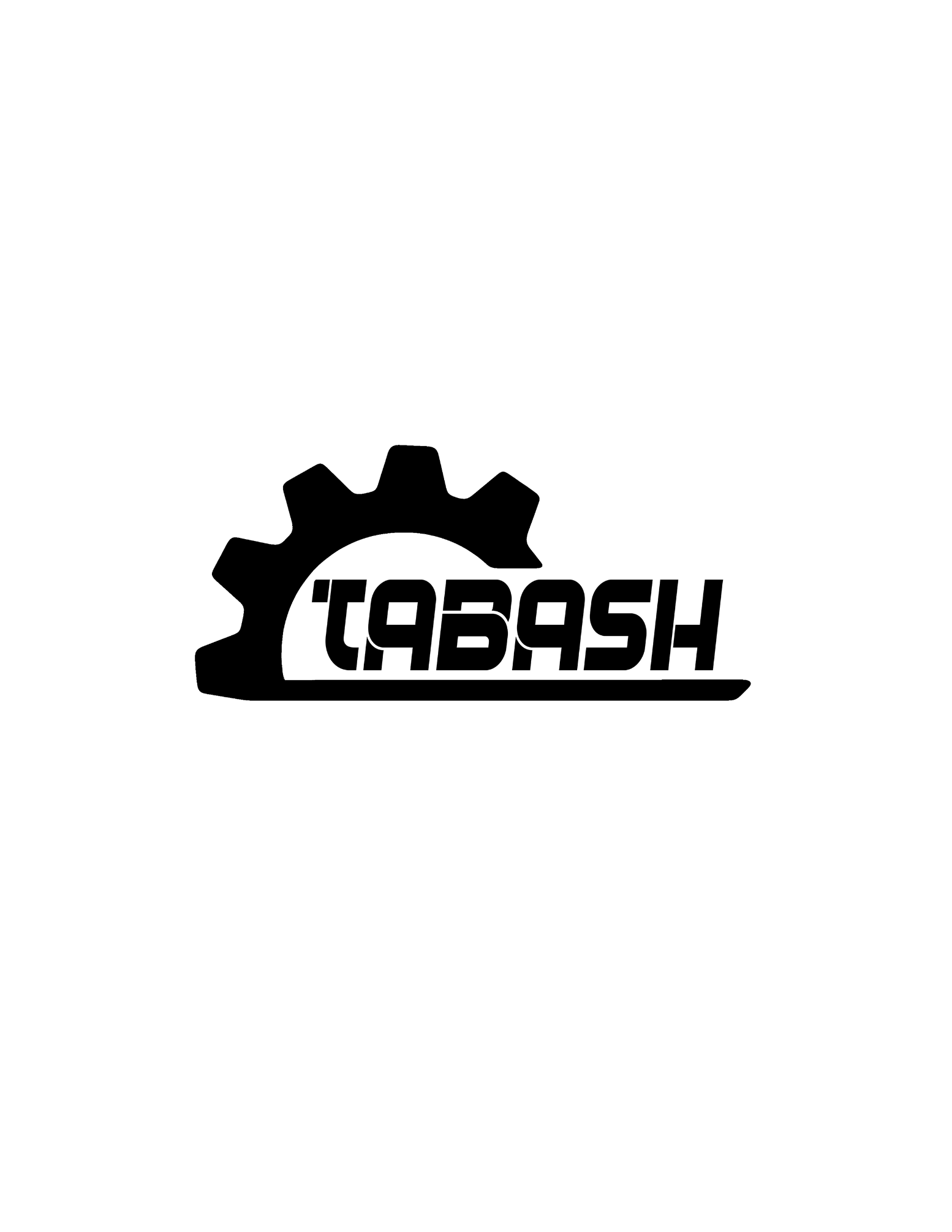
**Digital Gauge for Oil Pressure and Coolant Temperature Sensors** **V1**

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**Abstract:**

This project aims to develop a digital gauge cluster for monitoring live oil pressure and coolant temperature in a 2003 Ford Mustang GT while preserving the functionality of the stock gauges. By integrating additional sensors and innovative design strategies, the project enables simultaneous readings on both the OEM gauge cluster and the new digital display without compromising stock functionality. Utilizing cost-effective components for this project offers a practical and accessible solution for automotive enthusiasts seeking to enhance their vehicle's instrumentation. The project's methodology, results, and implications are explored, providing understanding into the technical intricacies and practical considerations of creating a digital gauge cluster for the 2003 Ford Mustang GT.

**Introduction:**

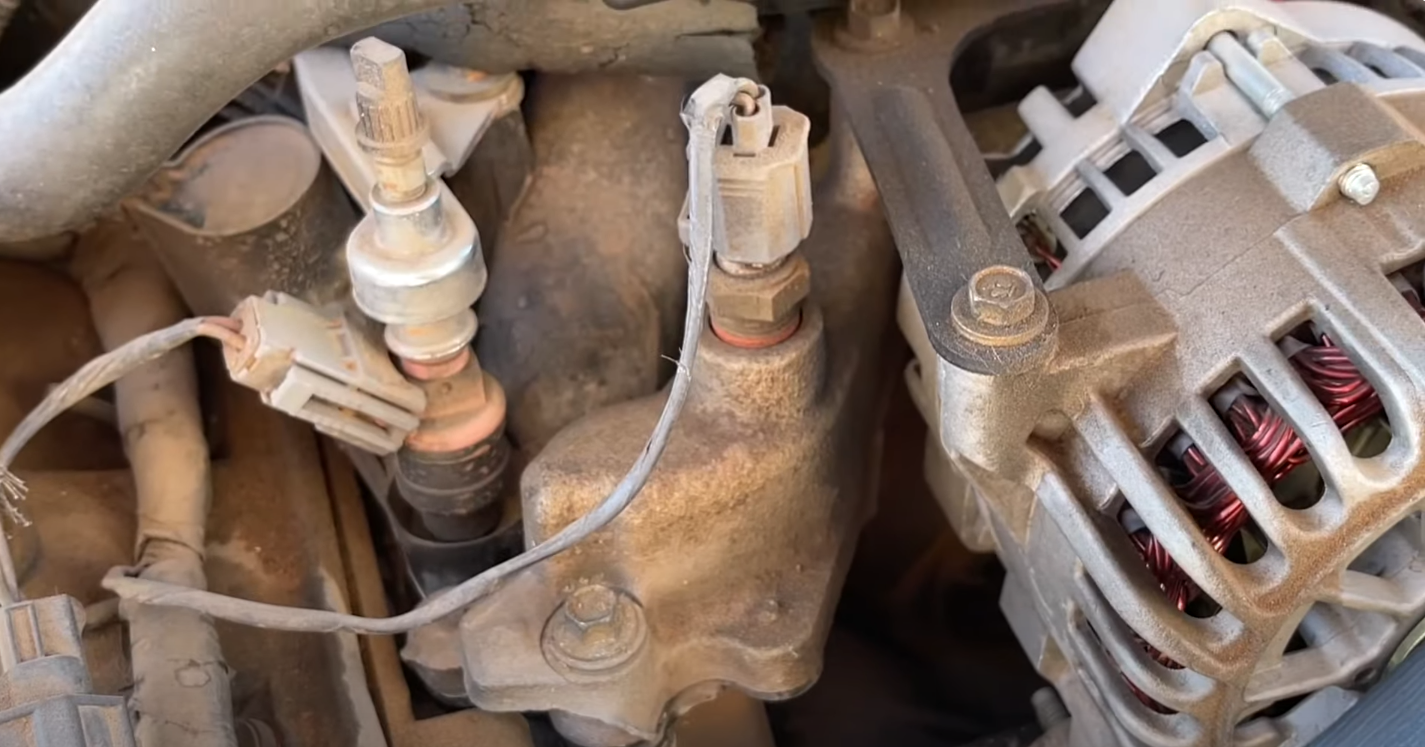
The automotive industry continues to evolve rapidly, driven by advancements in technology and a growing demand for enhanced vehicle performance, safety, and monitoring capabilities. Digital gauge clusters have emerged as a key innovation, offering drivers real-time access to critical vehicle data such as oil pressure and coolant temperature. In this context, the development of a digital gauge cluster tailored for the 2003 Ford Mustang GT represents an important advancement in modernizing classic muscle cars while retaining their timeless appeal. This article aims to provide valuable insights into the realm of automotive customization and performance enhancement.

**Materials:**

1. **1/4” NPT Brass splitter fitting**: $10 (MAYBE)
   * Source: [Amazon](https://www.amazon.com/Anderson-Metals-Fitting-Forged-Street/dp/B006PKKZ4U/ref=sr_1_8?crid=8BDSOM6ZASMY&dib=eyJ2IjoiMSJ9.iUKqxpFY_FelKFzcRb0djKgfTAdpR0dki8DYf09slOPXuQzJKIlrAMSkD8SDZC324wxWwgA8txxlgQ1uIraL1BnzbDLVR64JnZKiRHY3wm2B0-RSKhfTUpNiUPRGoZ2cyQAqIiZsKK-nKBs2tysow7Z6uYqqOVHydNcic9Pdg77WqnuEqtadM6UqiFx6_v5bnqzrJbGWbakkramoxlpLIAW10OWKH7R6V0MIgapPhtE.PLSZQL3g_-W5JNQm2n0jO5YWI4Q4R8veVPXFMHitt9A&dib_tag=se&keywords=1%2F4+npt+tee&qid=1708594840&sprefix=1%2F4+npt+tee%2Caps%2C105&sr=8-8)
2. **3/8” NPT Brass splitter fitting**: $9
   * Source: [Amazon](https://www.amazon.com/gp/product/B006PKKXZ6/ref=ox_sc_act_title_2?smid=ATVPDKIKX0DER&psc=1)
3. **1/4 Oil Pressure Sensor from JUNKYARD**: $8 (GET PLUG AND WIRING)
   * Source: [UPullAndPay](https://www.upullandpay.com/auto-parts/parts-pricing/)
4. **3/8 ECT Sensor from JUNKYARD**: $8 (GET PLUG AND WIRING)
   * Source: [UPullAndPay](https://www.upullandpay.com/auto-parts/parts-pricing/)
5. **Arduino nano clone from AliExpress**: $5
   * Source: [AliExpress](https://www.aliexpress.us/item/3256805951350156.html?spm=a2g0o.order_list.order_list_main.17.1fb91802ncgzvC&gatewayAdapt=glo2usa)
6. **2.4 LCD Screen no touch from AliExpress**: $5
   * Source: [AliExpress](https://www.aliexpress.us/item/3256806137276331.html?spm=a2g0o.order_list.order_list_main.16.41b81802JLmNUY&gatewayAdapt=glo2usa)

**Total Cost: $45**

2003 Ford Mustang GT: Oil Pressure Sensor location, next to oil filter.

2003 Ford Mustang GT: Coolant Temperature Sensor location, to the left of alternator.

**Procedure:**

**ECT and Oil Pressure Calibration:**

Calibrating sensors like the Engine Coolant Temperature (ECT) and Oil Pressure sensors is a critical task that ensures accurate readings for optimal performance. These analog sensors, typically equipped with only two wires, require meticulous calibration procedures involving temperature-resistance measurements for ECT and pressure-resistance measurements for Oil Pressure.

For the ECT sensor, the process involves measuring specific temperatures and their corresponding resistance values, typically gathering around ten data points. Statistical methods are then applied to interpolate values within this range, resulting in a comprehensive data table for accurate interpretation of temperature readings. Household environments, such as using a pot of water on a stove alongside a thermometer, provide practical settings for generating temperature-resistance data points.

Similarly, calibrating the Oil Pressure sensor follows a similar process but involves pressure-resistance measurements. An air compressor with a pressure regulator set to different pressures serves as an ideal tool for obtaining data points. By measuring the sensor's resistance at various pressure settings, a dataset can be compiled, enabling accurate calibration through statistical analysis.

In both cases, the calibration process enhances the sensors' precision and reliability in interpreting temperature and pressure variations. Whether it's for automotive diagnostics or household temperature monitoring systems, a well-calibrated sensor ensures optimal performance and accurate data interpretation, contributing to improved efficiency and functionality.

ECT Data Points

25C = 24 kiloohms

|  |  |
| --- | --- |
| Engine Coolant Temperature (1998 Ford) | |
| Temperature (C) | Resistance (ohms) |
| -18 |  |
| 3 | 87,000 |
| 25 | 24,000 |
|  |  |
|  |  |
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