

Variables

year - Year when data was captured,

month - Month when data was captured,

day - Day when data was captured,

vin - Vehicle identification Number - all in range of 4k-9k except 3HSDZTZR5LN134290(34k),

wmi - World Manufacturer Identifier - manufacturer identification,

engine_cd - I dont understand what exactly it is - can be Diesel engine registration plate details (country)-anyway only one value TZ- leave it like that,

device_type - N2 and Xirgo are the types - they are basically communication / tracking equipment,

msg_ts - its the time stamp,

vin_utc_key - this looks like the concatenation of VIN number and the timestamp,

packet_id - I dont understand what exactly it is - it is 36 for all values - not to be bothered much,

reason_code - I dont understand what exactly it is - it is 9 for all values - not to be bothered much,

script_version - no idea about this, 4 values, 24% missing values,

deviceid - 105 distinct values , 5 more than VIN, this might be the id of the communication device, the more number might be due to any replacement of device or more than one device in a truck,

latitude - Vehicles location indicating factor,

longitude - Vehicles location indicating factor,

driveridcode1 - The value is 0, not to be bothered about this variable,

obdvin - This is same as the VIN but some values are missing here,

Engine Features

vehiclebattvolts - The battery voltage, its in range of 11-15,

fuel_total - fuel consumed so far by the truck (high consumption means high usage),

engine_rpm - RPM of the engine at the observation time (too high engine RPM during shifting is an indicator of some issue in engine), RPM can indicate speed as well,

coolant_tmp - Temperature of Coolant (High coolant temperature indicates engine overheating problem),

fuel_lvl_pct - Level of fuel in the tank, not much of importance in engine behavior - 40 % missing values,

driving_tme_sec - seems somewhat correlated to fuel total, so it might be driving time so far, 80 % missing values, better not to use this,

cruise_tme_sec - 100% missing values, really dont understand what it is, might be time when truck becomes a cruise ship, just kidding,

idle_tme_sec - time for which the truck was ideal,

idle_fuel_total - fuel consumed during ideal time, both seems like correlated,

pto_tme_total - what is pto??? , anyway 11% missing values and values available are mostly 0 (81%), not to be bothered about this variable,

pto_fuel_total - the fuel consumed so far during pto_tme_total,

gear - gear at time of observation , 15% missing values, 77% gear 1 and i dont know what is gear 0, anyhow doesnt seem like a predictive variable,

fuel_tmp - 29% missing values, 70% with temperature as 0, others with temp -40, this is interesting

oil_tmpl - This is the temperature of the oil in degree celcius it seems, seems like it has some predictive power (oil temp affects the overall performance of engine - in ideal case "oil temperature should be a few degrees warmer than the coolant. If the oil temperature is too high, problems can arise")

throt_pos - throttle valve position in internal combustion engines. The ignition timing and fuel injection timing (and potentially other parameters) are altered depending on the position of the throttle valve, and also depending on the rate of change of that position

mpg - 100% missing values, leave the variable

acel_pos - 29% missing values and 70% 0 , not predictive in nature,

engine_pct_load - Engine load % is normally a comparison of the actual engine output torque to the maximum engine output torque at the current engine operating speed

torque - Torque is a twisting force that speaks to the engine's rotational force and measures how much of that twisting force is available when an engine exerts itself

oil_lvl - 30% missing values and 70% zeroes, not predictive in nature,

oil_psi - oil pressure, oil pressure gauge should read somewhere between 25 to 65 PSI while the engine is running

High oil pressure -higher (think 80+ PSI), then you've got yourself a problem with high oil pressure. When this happens, it disrupts the ability of your engine to function correctly. More consistent pressure there is, the more strain there is on the engine and its components. On a low end, you might have to replace a part or two or have your oil passages cleaned. On the high end, a cracked engine block or blown head gasket.

Low oil pressure - Low oil pressure indicates insufficient lubrication is being provided to the motor. A reading less than 20 PSI or under the normal range on the gauge is cause for immediate attention. The problem could be as simple as a low oil level or a signal of serious engine problems.

coolant_psi - Coolant pressure - Depending on the model, this pressure can range from 4 to 30psi (30 to 200 kPa). The pressure relief valve allows excess pressure to escape when the system pressure increases with the temperature, 30% missing values and 70% zeroes, not predictive in nature,

intak_air_tmp - temperature of the intaken air by engine, Higher intake air temperatures impact the emissions of THC,

manifold_tmp - manifold temperature - temperature of the air inside the intake manifold - an inlet manifold or consumption manifold is the factor of an engine that transports the airfuel combination to the engine cylinders. The main cause of the intake manifold is to calmly distribute the combustion mixture to each intake port of the engine cylinder. The intake manifold is crucial for the most useful overall performance of an internal combustion engine.

effect of air intake temperature is dominant at higher engine speed compared with lower engine speed. The higher air intake temperature results in lower oxygen concentration will lead to a negative effect on the combustion rate, hence on the performance, means a maintenance is required. the data also looks fine, a variable to consider

vehiclespeed - speed of the vehicle, another good variable to consider

heading - No idea - might be distance travelled in the current run as values are not degree, and looks like distance

odometerinmeters - Reading of Odometer in meters

odometer - reading of Odometer in km