

# NWDC IDEAverse

## TRIZ Engine Diagram

This is an engine which would allow someone to take a question and turn it into potential solutions with high levels of past success.

What is your problem?

I need to improve the gas mileage in my car.

Identify Nouns

Dictionary

Gas+Mileage+Car

Select parameters to Improve

Select undesired effect

Apply Altshuller Matrix

### 39 Engineering Parameters

1. Weight of moving object
2. Weight of nonmoving object
3. Length of moving object
4. Length of nonmoving object
5. Area of moving object
6. Area of nonmoving object
7. Volume of moving object
8. Volume of nonmoving object
9. Speed
10. Force
11. Tension, pressure
12. Shape
13. Stability of object
14. Strength
15. Durability of moving object
16. Durability of nonmoving object
17. Temperature
18. Brightness
19. Energy spent by moving object
20. Energy spent by nonmoving object
21. Power
22. Waste of energy
23. Waste of substance
24. Loss of information
25. Waste of time
26. Amount of substance
27. Reliability
28. Accuracy of measurement
29. Accuracy of manufacturing
30. Harmful factors acting on object
31. Harmful side effects
32. Manufacturability
33. Convenience of use
34. Repairability
35. Adaptability
36. Complexity of device
37. Complexity of control
38. Level of automation
39. Productivity

### 40 Inventive Principles

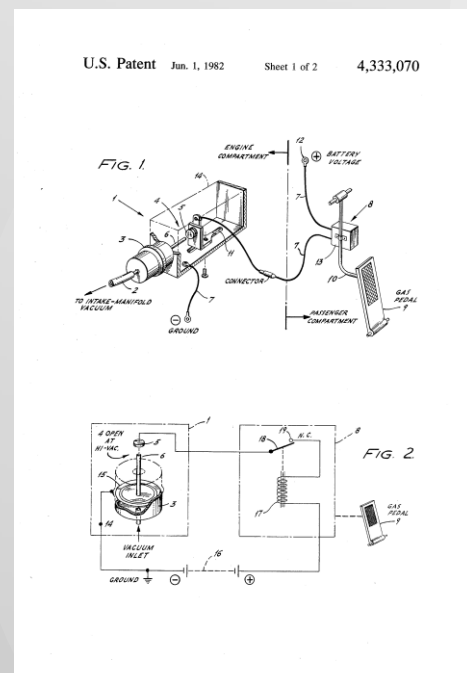
1. Segmentation
2. Extraction, Separation, Removal, Segregation
3. Local Quality
4. Asymmetry
5. Combining, Integration, Merging
6. Universality, Multi-functionality
7. Nesting
8. Counterweight, Levitation
9. Preliminary anti-action, Prior counteraction
10. Prior action
11. Cushion in advance, compensate before
12. Equipotentiality, remove stress
13. Inversion, The other way around
14. Spheroidality, Curvilinearity
15. Dynamicity, Optimization
16. Partial or excessive action
17. Moving to a new dimension
18. Mechanical vibration/oscillation
19. Periodic action
20. Continuity of a useful action
21. Rushing through
22. Convert harm into benefit, "Blessing in disguise"
23. Feedback
24. Mediator, intermediary
25. Self-service, self-organization
26. Copying
27. Cheap, disposable objects
28. Replacement of a mechanical system with 'fields'
29. Pneumatics or hydraulics
30. Flexible membranes or thin film
31. Use of porous materials
32. Changing color or optical properties
33. Homogeneity
34. Rejection and regeneration, Discarding and recovering
35. Transformation of the physical and chemical states of an object, parameter change, changing properties
36. Phase transformation
37. Thermal expansion
38. Use strong oxidizers, enriched atmospheres, accelerated oxidation
39. Inert environment or atmosphere
40. Composite materials

Suggested Lenses Based on Matrix

34 Recycling (rejecting and regenerating) [15]  
23 Feedback [36]  
16 Partial or excessive action [16]  
18 Mechanical vibration [8]

Generate Boolean Google Queries Using Lenses

Example Query for "gas+milage+car+mechanical+vibration"



Motor vehicle fuel-waste indicator  
US 4333070 A  
ABSTRACT  
A method and electro-mechanical device, for use on motor vehicles, which signals the driver to ease up on the gas pedal whenever he is applying excessive pedal pressure which causes fuel waste. The device utilizes a vacuum-operated electric switch that detects any drop in engine intake-manifold-vacuum below a pre-selected level, caused by excess foot-pressure on the gas pedal, and applies voltage to an electric vibrator which is coupled to the gas pedal. On feeling the gas pedal vibrating, the driver reduces his pedal pressure sufficiently to allow engine vacuum to rise above the pre-selected level, thereby causing the vacuum-switch to cut off electric current to the pedal vibrator. This cessation of vibration serves as a feed-back signal to the driver that his pedal pressure, and hence vehicle performance, is restored to an economical level.