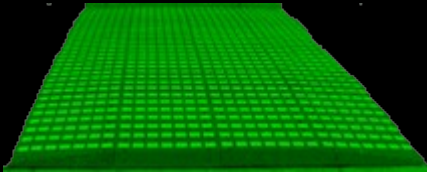




**Gravitational  
Systems  
Engineering, inc**

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E**



## **Gravitational Systems Engineering:**

**Gas Compressors : R-SHC:100, 330, 450, 900**

### **R-series : Gas Compression Devices**

GSE R-series gas compression devices are industrial grade displacement systems. GSE gas compressors convert the inertia of heavy vehicles into high PSI compressed gas and residual heat. The gas created can be stored locally to operate a wide variety of compressed air driven devices including;

- Electric Generators
- Air Conditioning Systems
- Pneumatic Systems
- Compressed Air Driven Systems

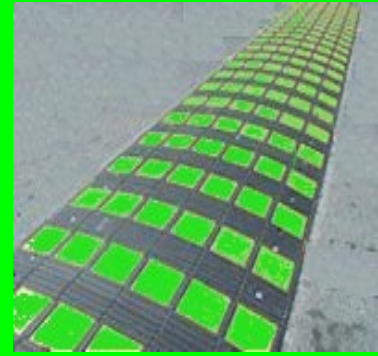
The residual heat generated by inertia driven compressed gas systems can be employed in a wide variety of industrial and commercial applications, including;

- Roadway Deicing
- Facilities Heating
- Materials Fabrication
- Evaporative Desalination

GSE **R-SHC** series gas compressors provide a number of significant environmental advantages, including;

- Demand generated power
- Demand limited power expenditure
- Locally supplied power
- Disaster resistant power
- Emissions reduction
- Traffic speed control
- Normalized roadway surfaces

GSE R-SHC gas compressors are based upon our patent pending PEC technology.



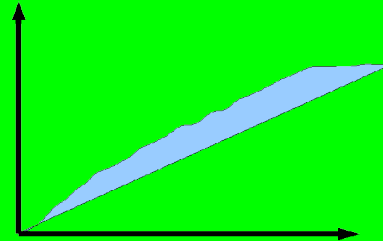
PEC (Pressure Energy Conversion) is a simple, reliable, easily implementable, highly durable, environmentally friendly, clean energy method of converting the inertia of vehicles into steady, reliable power.

Each vehicle which encounters a R-SHC compressor will generate usable energy. The heavier, or faster the vehicle the more inertia that will be converted into clean reliable energy.

R-SHC units are highly reliable because they operate on a simple diaphragm/displacement pump model with involves fewer moving parts that any other pump or compressor design. Most of the operational parts and interfaces are constructed from recycled automobile tires, and they will withstand years of high volume installation. GSE devices are low maintenance and do not require lubrication or fuel.

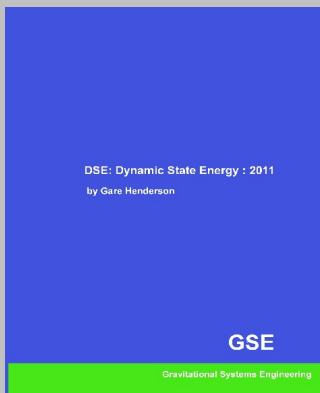
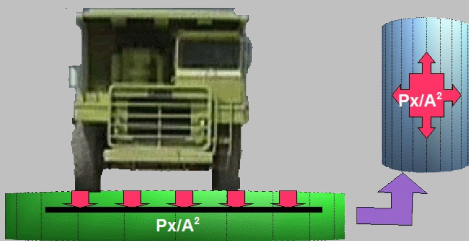
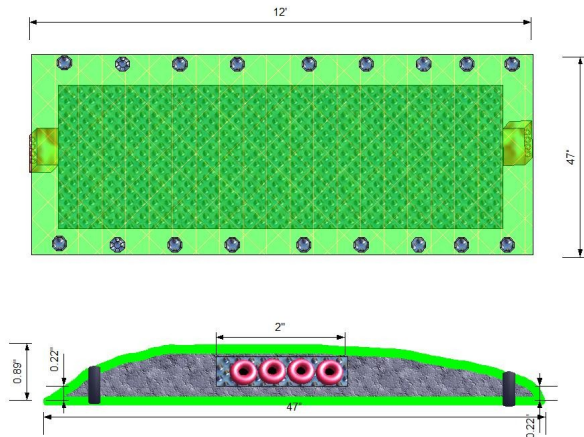
Custom engineering will minimize impacts on targeted traffic while optimizing control and power output objectives.

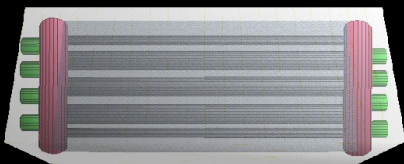
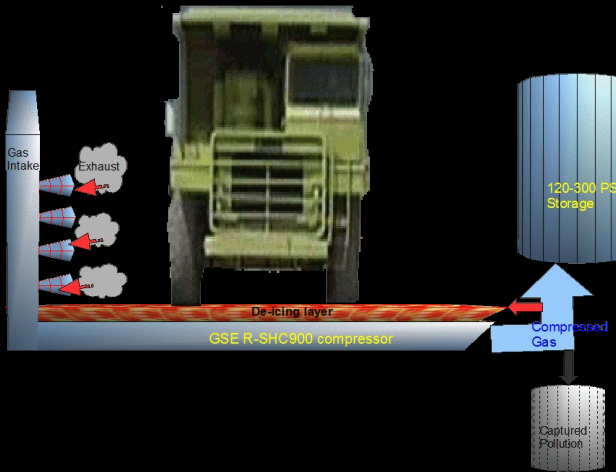
Vehicle tons per minute



BTU's generated

The key to the operational success of an GSE R-SHC installation is traffic flow. The correct placement of our devices is key. Sufficient traffic must be directed to encounter the devices to meet operational objectives. Stationary vehicles do not have sufficient inertia to generate usable power.





## Cost Benefit Analysis:

GSE R-SHC devices when compared to other sources of gas compression provides a **number of significant benefits:**

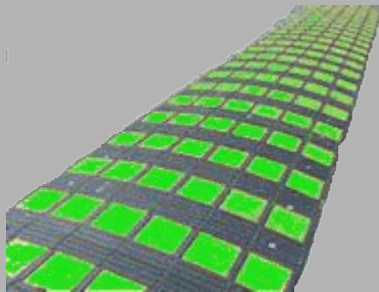
1. Lower or **zero fuel costs**
2. No dependence on fuel delivery
3. No dependence on the power grids
4. No exposure to stored fuel hazards
5. Lowered maintenance costs
6. Low up-front costs
7. Positive emission impacts

The limitations of a GSE installation are limited to;

1. Compression power depends on traffic flows
2. Traffic flows must be engineered
3. Controlled impacts on traffic flow
4. Increased noise levels

## Direct Stakeholder Benefits:

1. Reduces environmental impacts of new roadway construction projects. (exhaust filtering & demand sensitive usage)
2. Increases disaster preparedness ratings of municipal projects. (grid independent)
3. Enables projects before supporting infrastructure. (grid alternative)
4. Minimizes weather related maintenance costs. (de-icing)
5. Reduces the cost of the construction of operator facilities. (air-conditioning & heating)
6. Increased reliability versus other clean energy technologies. (cloudy days, windless days)



## Installations:

**R-SHC** series compressors are engineered for the entire range of installations, including;

- Permanent in-roadway
- Temporary surface applications
- High traffic parking lots
- Indoor parking garages
- Warehouse or factory floor

Temporary roadway surface units can be deployed with a 3 man crew on an active roadway within 30-90 minutes in an emergency situation.

Permanent applications do require trenching for the units and supporting pipes and channels. The design and implementation phases of new construction will see approximately 10-15% cost increases, which will be offset by 50-70% reductions in operational costs.

GSE will work with your engineering departments to supply our devices with optimum scale, dimension and implementation characteristics. We will also bring our extensive corporate engineering experience in rigging and metal fabrication to make the implementation, operation and maintenance of your installations extremely cost effective.

## Retail Models:

Temporary or short term : R-SHC100, R-SHC330

Designed for rapid deployment by work crews to operate pneumatic tools, and emergency signage.

- Equivalence: 13 Hp
- 1-2 CF per vehicle
- 500-800 vehicles per hour
- 100,000 vehicles life span

Longer term : R-SHC450, R-SHC900

Engineered for many years of usage in long term installations. Appropriate for supplying compressed gas for factories, and ideal for adding pressure to municipal drinking water and fire suppression systems.

- Equivalence: 250 Hp
- 1-35 CF per vehicle
- 500-800 vehicles per hour
- 100,000 vehicles life span

**Please contact our engineering department for other models.**



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