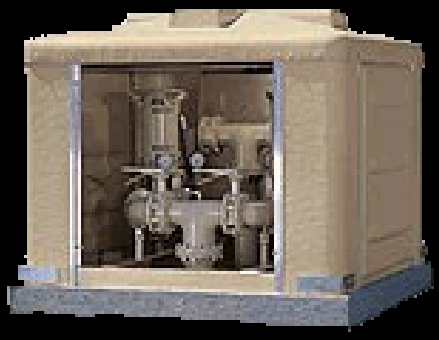
Gravitational Systems Engineering, inc

GSE

Gravitational Systems Engineering:



Fluid Pumps : R-SHP:100, 200, 450

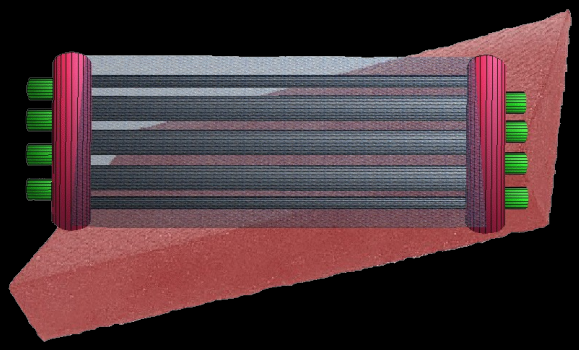
R-series : Fluid Pumps

GSE R-series fluid pumps are industrial grade displacement systems. GSE fluid pumps convert the inertia of heavy vehicles into fluid pressure and elevated fluid temperature. The fluid pressure can be utilized for a a wide variety of water pressure driven applications including;

- Reservoir Storage
- Air Conditioning Systems
- Agricultural Irrigation
- Municipal Water Pressure
- Regional Water Distribution
- Wastewater Agitation
- Emergency Water Pressure

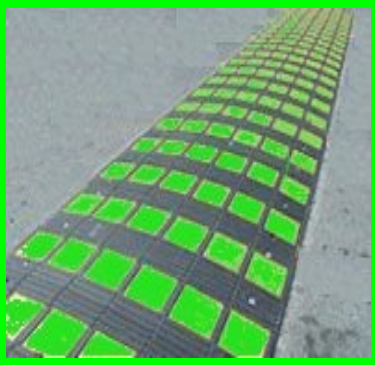
The increased pressure and residual heat generated by inertia driven fluid pressure pumps can be employed in a wide variety of industrial and commercial applications, including;

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



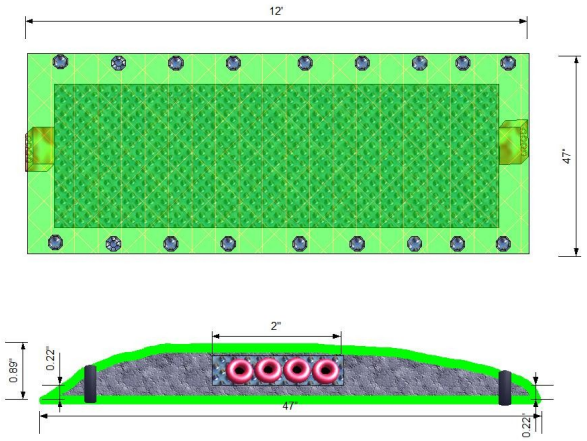
GSE **R-SHP** series fluid pumps provide a number of significant environmental advantages, including;

- Emission free local hydrology optimization
- Traffic generates positive impacts
- Distributes hydro power
- Disaster resistant power
- Increase municipal water pressure
- Traffic speed control
- Reduce the severity of traffic accidents



GSE **R-SHC** fluid pumps are based upon our patent pending PEC technology.

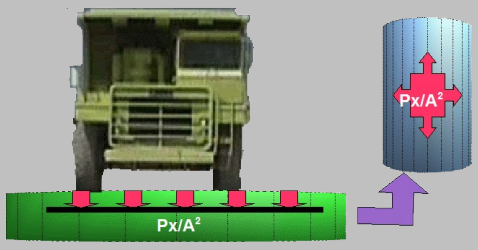
PEC (Pressure Energy Conversion) is a simple, reliable, easily implementable, highly durable, environmentally friendly, clean energy method of converting the inertia of vehicles into steady, reliable energy.

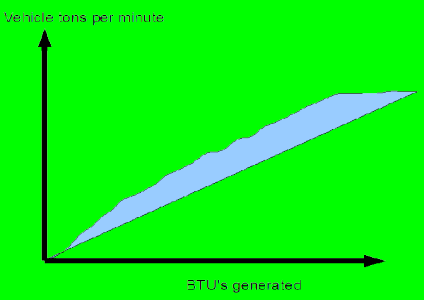


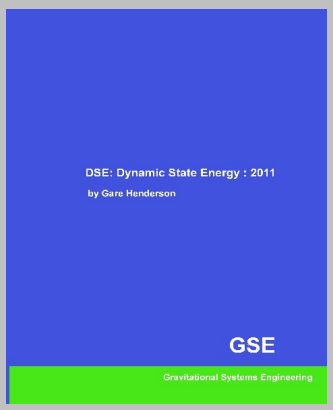
Each vehicle which encounters a R-SHP fluid pump will generate usable energy in the form of water pressure. The heavier, or faster the vehicle the more inertia that will be converted into clean reliable energy.

R-SHP 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.

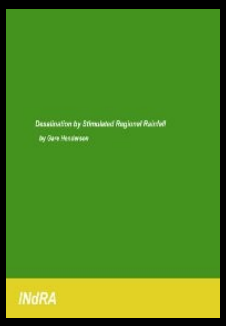
Custom engineering will minimize impacts on targeted traffic while optimizing control and power output objectives.

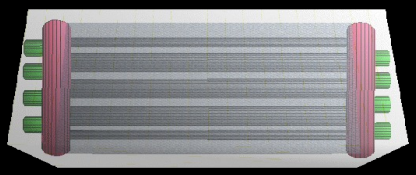






The key to the operational success of an GSE R-SHP installation is traffic flow. The correct placement of our devices is key. Sufficient traffic must be directed to encounter the devices to meet operational objectives. Stationary vehicles do not have sufficient inertia to generate usable power.





Cost Benefit Analysis:

GSE R-SHP devices when compared to other sources of fluid pressure or pumping provide **a number of significant benefits:**

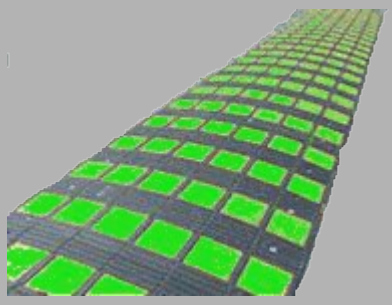
1. Lower or **zero fuel costs**
2. No dependence on fuel delivery
3. No dependence on the power grids
4. No exposure to stored fuel hazards
5. Lowered maintenance costs
6. Low up-front costs
7. Pollution free

The limitations of a GSE installation are limited to;

1. Fluid 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. (manage impacts on local or regional hydrology)
2. Increases disaster preparedness ratings of municipal projects. (grid independent)
3. Enables projects before supporting infrastructure. (grid alternative)
4. Minimizes weather related maintenance costs. (positive drainage & de-icing)
5. Reduces the cost of the construction of operator facilities. (air-conditioning & water supplies)
6. Increased reliability versus other clean energy technologies. (cloudy days, windless days)



Installations:

R-SHP series fluid pumps 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 10-12% cost increases, which will be offset by 20-40% 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-SHP100, R-SH200

Designed for rapid deployment by work crews for emergency drainage, and pressure generation.

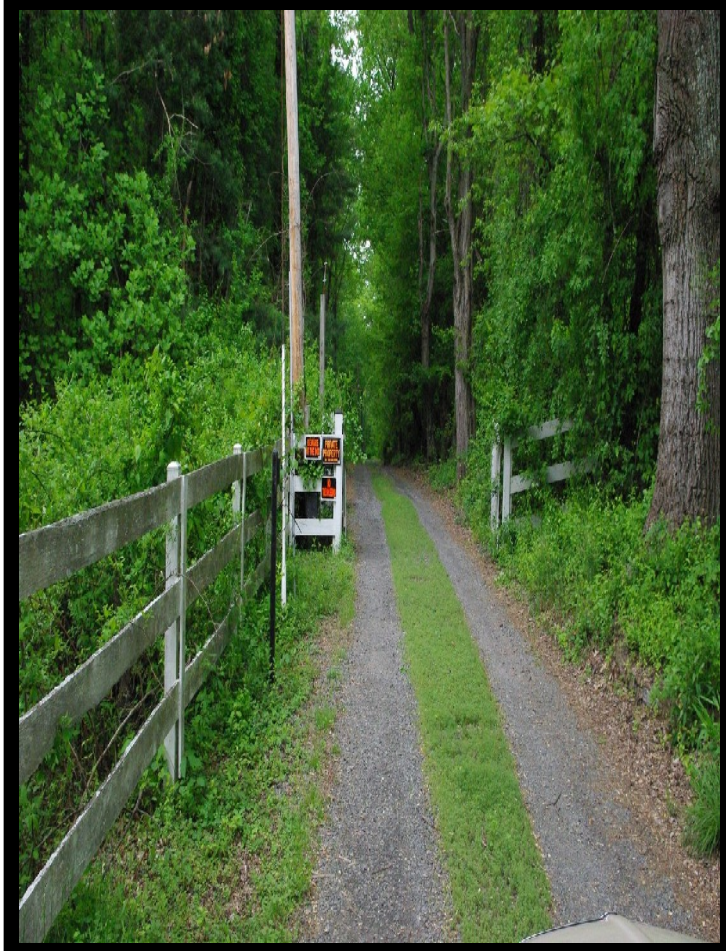
- 1-9 gallons per vehicle
- 500-800 vehicles per hour
- 100,000 vehicles life span

Longer term : R-SHP450, R-SHP950

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

- 1-50 gallons per vehicle
- 500-800 vehicles per hour
- 100,000 vehicles life span

Please contact our engineering department for other models.



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