

New Joules Engineering North America Inc.

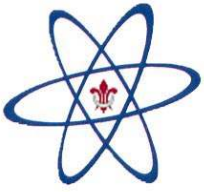
An Argent Industrial Ltd. Company

***JOULE SPEED CONTROL
SYSTEMS FOR
MARSHALLING YARDS***



Balmer Yard, Seattle WA

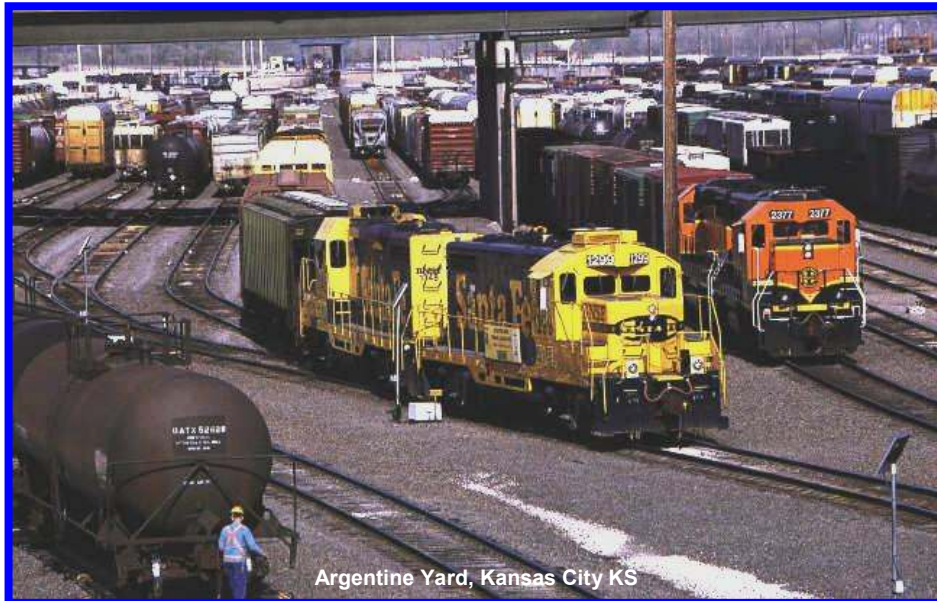
4401 Clary Blvd., Kansas City, MO 64130
(816) 921-7441, newjoules@aol.com Fax: (816) 921-7443



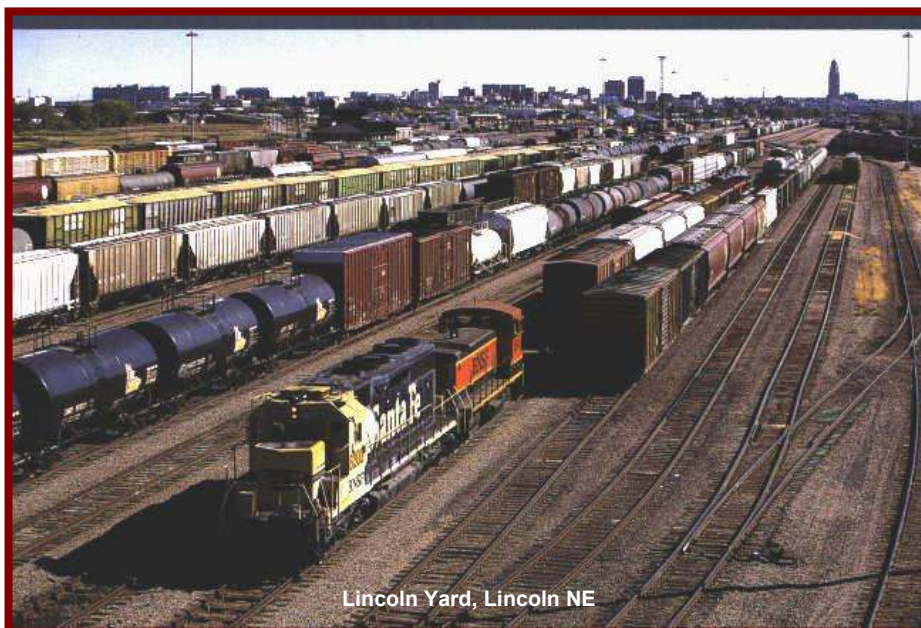
New Joules Engineering North America Inc.

An Argent Industrial Ltd. Company

During the passage of wagons through marshalling yards accurate speed control is essential for high throughput and zero damage to rolling stock and freight. Speed control is the only means by which optimum operation can be achieved.



With this in mind New Joules Engineering North America Inc. has over the past decade, designed, developed and implemented a variety of products to achieve the efficiency needed to cope with modern day demands of high- speed marshalling yards. The result of which is the ***JOULE RETARDER***.



Application

The speed control offered by the JOULE RETARDER in marshalling yards allows railroad organizations to hump all types of freight inclusive of automobiles, petrochemicals, livestock and hazardous materials, at the same time virtually eliminating freight and car damage. Speeds offered, ranges from 0mph through 8mph. Typical coupling speeds of 4mph is used in most yards.



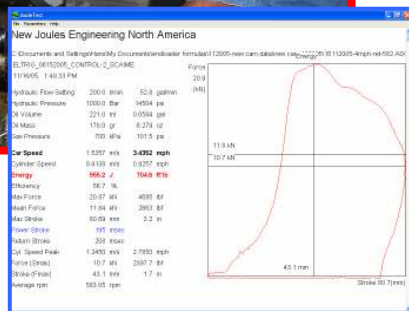
Retarder Simulator

The distribution and density of retarders is determined by a variety of factors such as, gradient, rolling resistance, curves, space for installation, etc. All of which is used by our engineers during the design stage.

Speed control is achieved by the principle of extracting energy from the railcar as it rolls over the retarders, hence the name *JOULE*, which is a Metric unit of measure for Energy.



Hydraulic Test Bench



Test Certificate



Principle of Operation

The JOULE PISTON RETARDER is a self contained hydraulically operated device, that requires no external power source.

The unit is calibrated on a hydraulic test bench to pre-determined flows and pressures, as calculated on a *Retarder Simulator*, to ensure accuracy. All calibration is done under strict quality control. The simulator ensures that the efficiency of all setting parameters are maintained at all times during the final assembly and calibration of the retarder.



As with all piston type retarders, energy extraction is speed related. Thus, higher railcar speed equals higher energy extraction. When a retarder setting is given as, for example, 4mph – 1180J, this means that at 4mph this retarder will extract 1180 Joules of energy from the railcar. As energy cannot be destroyed, but transferred from one form to another, and from one body to another, the extracted energy is transformed into different energy forms, such as heat, sound, vibration, etc.

The retarder has a speed sensitive valve, which is activated at predetermined speeds only. Thus when the railcar travels at speeds lower than the set speed, the valve will not activate, and the retarder “idles”. During idling no significant energy is exchanged, and energy of below 40 Joules is expected. This is extremely important for light cars traveling through.

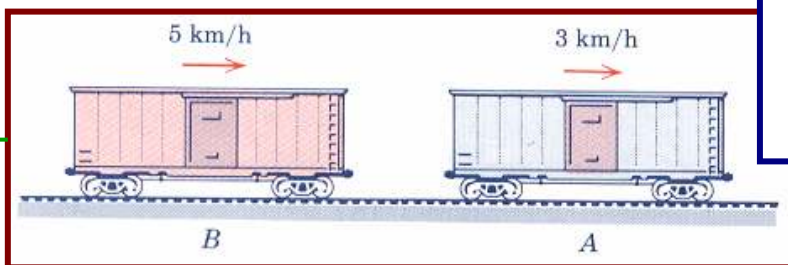
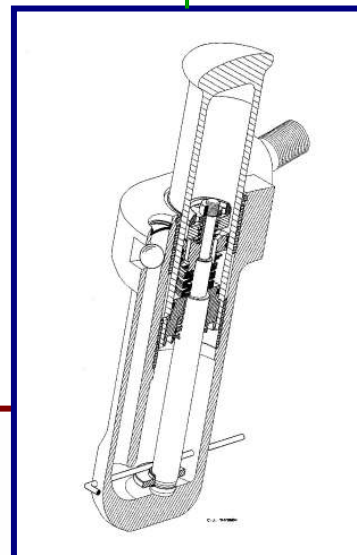
In the event of the rail car traveling at a speed higher than the set speed the valve will activate and resultantly the retarder will extract energy from the car.

Design

Yard design relies on a variety of parameters such as gradients, rolling resistance, car weight, etc. as well as the capabilities of the retarder. Therefore close contact exist between engineers from both, the client, and New Joules Engineering North America Inc. in order to strike the perfect balance for each yard.

New Joules Engineering North America also provides yard design and consultancy services.

The Joule Retarder is designed and manufactured completely by New Joules Engineering North America Inc.

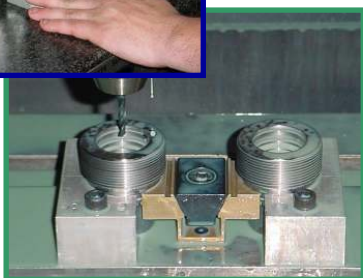


Manufacturing

Value engineering during the design phase coupled with in house production to specified quality standards and prints has resulted in a rugged high quality product.

The company’s manufacturing facilities are equipped with carefully selected machine tools to permit consistent production to the exacting standards required by high performance hydraulic equipment.

The manufacturing facility is based in **Kansas City, MO** and the retarders are completely manufactured and serviced from this location.



Products & Services

New Joules Engineering North America's product range consists of our **Standard Piston Retarder**, and a variant thereof known as the **Joule Controllable Retarder**. These retarders were designed and developed for the US market and are manufactured and serviced from our Kansas City facility.



Joule Controllable Retarder

The **JOULE CONTROLLABLE RETARDER** offers an affordable solution to increase throughput in modern day marshalling yards without sacrificing speed control.

This system enhances the function of the crest gradient by letting the empty railcars run through with no resistance and ultimately gain enough momentum to carry them to their destinations without premature stalling.

The system also speeds up trimming operations as higher pullout speeds can be accommodated without unnecessary capsule damage.

All this is achieved by retracting the retarder to a position where activation of the internal mechanisms, which are responsible for energy extraction, cannot be activated. In this operational mode the retarder is doing no work and the life expectancy is increased dramatically.



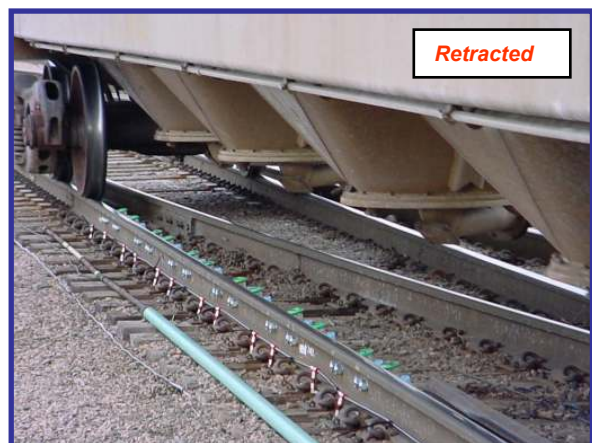
Standard Piston Retarder

As a proven design these retarders are used throughout the US and available in speed settings ranging from 0 mph to 9 mph.

These units can be used all the way from the crest to the bowl tracks, providing speed control from humping operations at the crest, to "soft" coupling in the bowl tracks.

The retarder is sealed to prevent unnecessary water and debris to enter the housing. It is also beneficial to have a sealed unit in areas of high spillage and where icing is a problem.

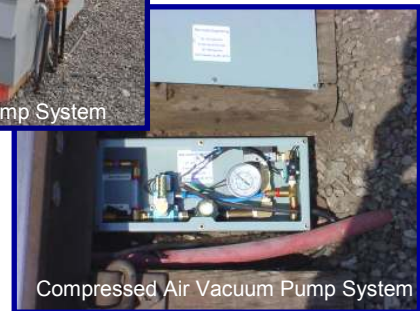
These units are designed for ease of installation and maintenance. Operating in ambient temperatures ranging from -40 to 150 F, including rain, snow and ice.



The hold down is achieved via a vacuum system that creates a suction on the retarder capsule hence causing it not to return to the normal extended (up) position. The vacuum is generated by either an air driven vacuum pump system or by an electrical motor driven vacuum pump.



Electrical Vacuum Pump System



Compressed Air Vacuum Pump System

Controllable Retarder - Principle of Operation

In order for the retarder to extract energy, a series of valves needs to be activated. The valve of interest is the speed valve which shuts off at predetermined oil flow settings, hence the speed setting of the retarder.

Oil flow is generated by the stroking movement of the capsule. When the desired oil flow is reached the speed valve will activate. The series of events following the activation of the speed valve will cause the retarder to extract energy causing the railcar to slow down.

By shortening the stroke length of the capsule, the ability to generate sufficient oil flow to shut the speed valve is eliminated and the retarder cannot extract energy as the internal dynamics needed for energy extraction cannot be activated.



The reduction in stroke is achieved by partially holding down the capsule, effectively reducing stroke length. This is achieved by applying a vacuum to the retarder housing causing an opposing downward force on the capsule. The downward force counteracts the force exerted by the nitrogen gas inside the capsule that exerts a force pushing the capsule upward to its normal extended (up) position.

Service

We offer **On Site Maintenance Service** as well as **Retarder Installation**. Maintenance and Installation are carried out at any location within the US by our highly skilled maintenance crews.



Kansas City Factory (22,500 sq. ft.)

For further information please contact us at:

New Joules Engineering North America Inc.

4401 Clary Blvd.

Kansas City

MO 64130

Tel. : 816-921-7441, 921-7442

Fax no.: 816-921-7443

E-mail : newjoules@aol.com

Web Site: www.argent.co.za

The information, figures, dimensions, illustrations and drawings contained in this document is the exclusive property of New Joules Engineering North America Inc. and may not be reproduced, copied nor issued to Third Parties for Technical or Commercial use without the written permission of New Joules Engineering North America Inc..

