LINCOLN®

Capabilities

INFORMATION FROM THE LEADER IN THE LUBRICATION INDUSTRY

Lubrication Solutions for the Rail Industry

Wayside Lubrication for Gauge Face and Top of Rail

The Issues. . . .

- **High Lubricator Maintenance Costs**
- **Uncontrolled and Uneven Grease Placement**
- **Too Many Weather and Temperature Variants**

Other lubrication systems apply large, uncontrolled amounts of grease in short durations to the rail.

These systems flood the rail even when set at their smallest time setting. Any grease that does not attach to the wheel, falls to the ballast resulting in wasted material and uneven distribution at the application site.

Lincoln Wayside lubrication systems effectively apply a consistent volume of grease to the rail and they hold that grease in place allowing the wheels to grab and carry it around the length of the track curve.

The Solution . . . .

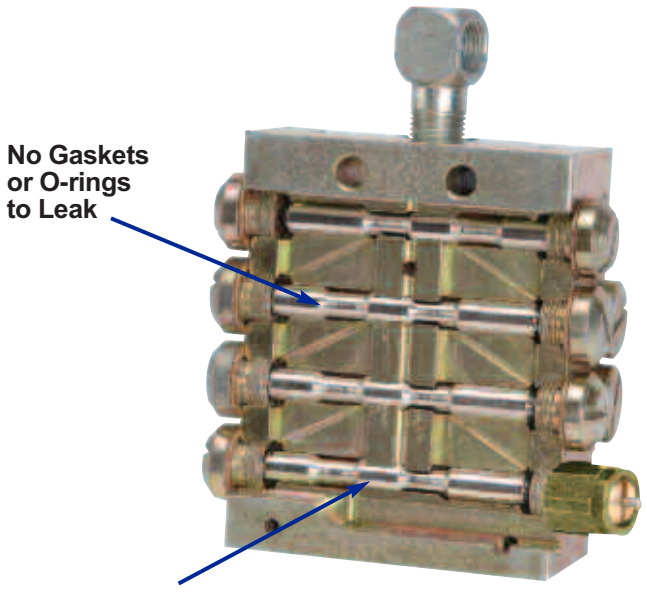
The Lincoln Solution... Pump-to-Port™ Technology

The heart of Lincoln's Pump-to-Port technology is the patented, field-proven SSV® divider block.

The SSV divider block delivers precisely controlled, even grease output to each rail using Lincoln's Gauge Face (GF), Top-of-Rail (TOR) and Restraining Rail lubrication systems.

Lincoln's Pump-to-Port technology applied in Lincoln's Wayside systems has been utilized in other tough application environments including mining, construction and industrial settings.

Lincoln's Patented SSV Divider Block

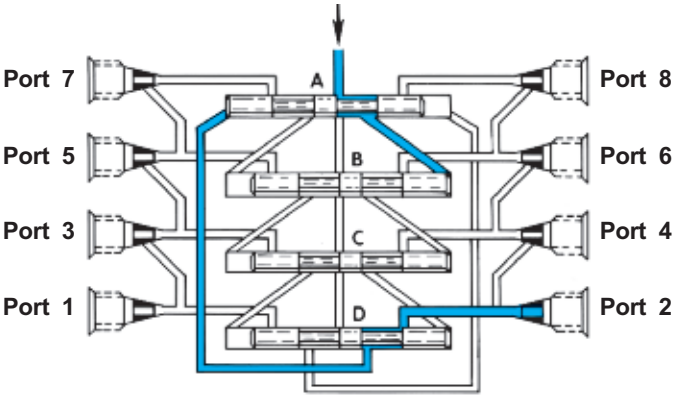


What Sets Lincoln Apart From Others?

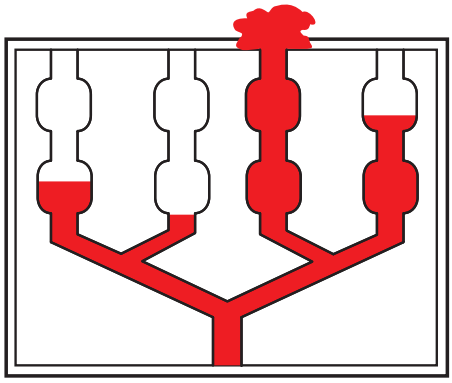
Pump-to-Port Technology

The high-pressure, positive displacement of fluid to a single outlet port.

Lincoln Systems with PTP Divider Block



Other Systems



Pump to Port

- **Fluid pressure from the pump pushes each piston to displace fluid to one port**
- **Cavity displacement is the same at varying temperature and pressure resistance**
- **Each rail receives an equal amount of grease**

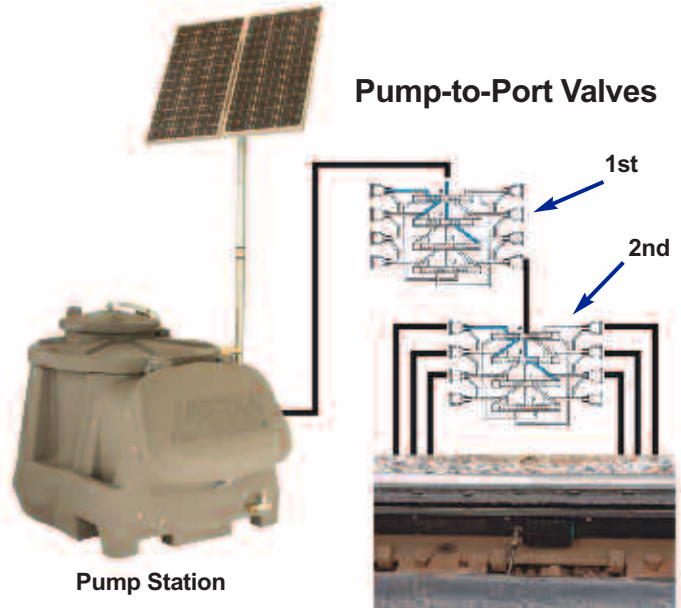
Path of Least Resistance

- **Fluid follows path with least pressure resistance**
- **Higher volume needed to achieve constant flow**
- **Grease is not evenly distributed to the rails**

Pump-to-Port System

Conceptual Layout

- **Pump Station**
  - – Reservoir
  - – High-pressure pump
  - – DC or AC power
- **Pump-To-Port Divider Blocks**
  - – 1st block to divide the flow
  - – 2nd block for PTP gauge face or TOR bar to dispense the material
- **Pump-To-Port Dispensing bar**
  - – Measured placement of material onto the rail



LINCOLN 100 YEARS
Celebrating Our First Century In Business

Gauge Face Lubrication

Features, Benefits and Advantages

Bar design

- Tucked under the rail to eliminate wheel strikes.
- Tip Spreaders and fold-down-brackets for easy installation.
- Brush holds excess grease to be picked up by the next train—minimizes grease waste and contamination.
- Places grease high on the gauge face to be carried by passing wheel flanges avoiding grease migration to the top of rail.
- Universal mounting brackets to adjust the wiper bar placement on 90lb to 140lb standard rail.

High-Pressure System

- Automatically keeps ports open and free of debris without personnel maintenance
- Ensures grease delivery in cold temperatures
- Capable of pumping long distances and high-viscosity lubricants. This feature allows the reservoir to be placed in serviceable locations away from or even below track level reducing required track time.

Variable Output Pump

- Adjustable output (0.7 in^3/min – 7 in^3/min). Reduces lubricant consumption while maintaining the proper grease coverage.
- Lubricant usage savings anticipated to be 25-50% based on conditions of service.
- Adjustable to maximize grease efficiency.

Common to GF & TOR Systems

Reservoir

- 800 # High-density, polyethylene material that is non-reactive to oxidation and material additives.
- 175W Solar Panel modules engineered for 20 years of life without significant degradation.
- Sized to perform in extreme temperatures and low-light conditions maximizing up time.

Top-of-Rail Lubrication

Features, Benefits and Advantages

Bar design

- Field-side mounted.
- Metal-to-metal seal – no wearable items needing periodic replacement.
- Spring mounted – capable of withstanding false-flange wheel strikes.
- Mounting brackets allow bars to be folded out of the way for routine track maintenance.
- Pump-to-Port technology dispenses precise volume of product in exactly the correct location.

High Pressure System

- Non-clogging design eliminates manual cleaning of ports.
- High pressure facilitates cold temperature product dispensing.
- Capable of pumping long distances and highly viscous products.
- High pressure allows reservoir to be placed in serviceable locations away from or even below track level.

Variable Output Pump

- Adjustable output pump (0.7 in^3/min – 7 in^3/min) puts user in control of product consumption.
- User precisely controls product output for conditions of service.

24-VDC System

- Two batteries provide a more efficient system and less current draw.
- Less affected by the power consumption of the load components.
- Low voltage-level cutoff to prevent battery freezing reduces replacement frequency.

The Benefit – Take Control of Your Application

Reduce Lubricant Cost

- Grease output is delivered in small, precise amounts in frequent intervals for the most efficient lubricant usage.
- Even distribution to every lubrication outlet.
- Pump speed adjustable to further fine-tune the lubricant output.

Minimize Maintenance Costs & Time

- Lincoln's RemoteLinc™ technology allows maintenance personnel to monitor systems for system fault or low lubricant levels via telematics satellite communication.
- High-pressure system prevents clogged outlets.
- Performs in all weather and seasons.
- 24 VDC system with low current draw to maximize storage capacity and power.
- Oversized solar panel delivers more power to the batteries keeping them charged during long periods of cloudiness.

System Components

- **Pump-to-Port Divider Valve**—Patented, field-proven divider valves deliver an equal volume of lubricant to each port.
- **FlowMaster® Pump**—High-pressure, 24 VDC two-stage pump proven in harsh industrial applications.
- **Grease Output Controller**—Updated digital design with easy programming functions provides system status via LCD and LED indicators.
- **Wheel Sensor**—Robust design with a cover to protect against damage from debris or ice.
- **Reservoir**—Relocated lid opening provides easy access with bulk or manual pail-fill methods. Increased number of pallet access points for ease of installation and transfer. Environmentally safe, double-wall design capable of containing and entire reservoir leak. Custom reservoirs are available upon request.

Specifications/Design Information

General System Specifications

Operating temperature	-40°F to 120°F (-4°C to 49°C)
Operating voltage* solar-powered unit	24-VDC
Operating voltage*, AC units	90 to 264 VAC
Maximum current draw @ 24 VDC	8 amps max
Pump output/revolution	0.07 in^3 (1.5 cm^3)**
Max unit outlet pressure	4000 psi (276 bar)
Reservoir capacity	800 lbs (348 kg)

* All pumps and controllers operate on 24 VDC. The AC units are equipped with an AC to DC power supply to drop the AC input voltage to 24 VDC

** .036 oz. assuming grease with a density of 7.5 lb/gal

System Design Questions to Consider

1.	What is your primary reason for needing rail lubrication?	a) Noise	b) Rail Wear	c) Wheel Wear	d) Other
2.	What power is available?	a) 110VAC	b) 230VAC	c) Solar	d) Other
3.	Is it single or double track?	a) Single	b) Double	c) Other	
4.	What is the condition of the ballast?	a) Poor	b) Average	c) Good	
5.	What is the primary traffic?	a) Metro	b) Freight		
6.	Is the rail embedded?	a) Yes	b) No		
7.	Do you have restraining rail?	a) Yes	b) No		
8.	Is directional control required?	a) Yes	b) No		
9.	Is rail subject to very heavily loaded trains?	a) Yes	b) No		
10.	What is the rail size?				
11.	How far will the reservoir be located from the track?				

LINCOLN 100 YEARS®

Celebrating Our First Century In Business

Celebrating 100 Years of Innovative Solutions

Continually satisfying our customers with the world's best lubrication equipment and pumping systems has made Lincoln the largest and most successful company in our field.

Our commitment to innovation is illustrated by us having been awarded more U.S. patents for lubrication equipment than all other competitors combined.

Lincoln's Total Capabilities Help to Extend the Life of the Rail

For a century, companies have relied on our technical and quality leadership; our world-class manufacturing and customer service, and our vast network of distributors and support facilities.

From assessment and installation to monitoring and support, we provide the best, most cost-effective and innovative solutions to extend the life of the rail.

LINCOLN 100 YEARS®

Celebrating Our First Century In Business

Lincoln Industrial Corp.
One Lincoln Way
St. Louis, MO 63120-1578

Phone (314) 679-4200
Fax (314) 679-4359
www.lincolnindustrial.com

Form 442998 (5/10)

Printed in U.S,A.