



**Highway Factors Attachment – Henderson LAS X liquid application sprayer located at the
NTEMP S3 maintenance facility**

Fort Worth, TX

HWY21FH005

(6 pages)



LIQUID ANTI-ICING SYSTEM

OPERATION

Henderson Products Inc. Introduction

The Liquid Anti-Icing System (LAS) from Henderson Products Inc. utilizes a hydraulically driven 210 GPM centrifugal pump, a corrosion resistant liquid storage tank, system control plumbing, and a spraying boom system to distribute the product. When equipped with a closed loop, ground speed, micro processor control console, the application rate of the liquid is automatically regulated using the vehicle ground speed and operator inputted application rate...

Standard practice in these types of systems is to control the pumps' output by controlling the pumps' speed. The output of liquid will therefore increase and decrease as the vehicle speeds up or slows down, respectively. Therefore, the operator only needs to select the desired application rate and enable the desired lane(s) for the proper application at different speeds.

This unit is capable of self-loading, unloading, and agitation of the liquid in the tank by using the on-board pump. The plumbing is also configured to allow the unit to be filled using an off-board pump.

This unit is available with optional legs that are designed for easy, one person loading and un-loading of an empty unit. The legs allow the unit to be free standing. This allows the unit to be removed from the truck in just a matter of minutes putting the dump body back on the road for hauling quickly and effectively.

The HENDERSON PRODUCTS, INC. Three Lane Single Tier Anti-Ice System.

The design of this anti-icing unit optimizes higher rate/higher speed applications while utilizing a single tier, three spray boom arrangement. This system of using higher capacity nozzles allows the use of higher application rates though fewer nozzles at lower pressure, resulting in less atomization and over spray. This translates into better application on dry pavement. Smaller nozzles can be used for high pressure snow penetration.



1 1/2" Standard Boom

System Capacity:

The plumbing components (e.g. boom assemblies and plumbing kits: of an ant-ice system are specified according to the system capacity). Table 1 shows the system capacity required for a single lane operating at different application rates and ground speeds. Each lane of a multiple lane system must have the same capacity in order for the system to apply accurately. **For this reason it is important, to replace nozzles with the same GPM capacity as the others on that spray bar.**

By referring to Table 1, it is possible to determine the maximum vehicle speed and application rate for your system. When calculating the maximum operating parameters of your system, it is necessary to use the component of the system with the **smallest** capacity. This will typically be the boom assembly in the system.

For example, if the boom assembly provided with your system is rated at 32 GPM/lane and the plumbing kit is rated at 150 GPM total, the operating parameters should be calculated for the 32 GPM/lane maximum.

For example, if the operator wants to apply 30 gal/lane mile at 40 MPH, to all three lanes at once, we can see in Table 1 that the boom assemblies must have at least a 20 GPM/lane capacity. Therefore, the plumbing kit must have a capacity of 60 GPM (20 GPM x 3 lanes) or greater if all lanes are going to be operating at the same time. These parameters are well within the 150 GPM capacity of the plumbing kit.

An Example where the plumbing kit is the limiting component would be when applying to all three lanes using a 50+ GPM/lane, three lane boom assembly on a dual tier system. In this example, the plumbing kit with 150 GPM total would be supplying 50 GPM/lane. Therefore, the maximum operating parameters for this system should be calculated for 50 GPM/lane.

By looking at Table 1, we can see that the maximum parameters calculated at 50 GPM/lane are: 60 gal/lane mile at 50 MPH or 50 gal/lane mile at 60 MPH.

System capacity required (GPM) for single lane application at various rates and speeds.														
Gallons per lane mile →	60	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	Typical application range.
	55	4.6	9.2	13.8	18.3	22.9	27.5	32.1	36.7	41.3	45.8	50.4	55.0	
	50	4.2	8.3	12.5	16.7	20.8	25.0	29.2	33.3	37.5	41.7	45.8	50.0	
	45	3.8	7.5	11.3	15.0	18.8	22.5	26.3	30.0	33.8	37.5	41.3	45.0	
	40	3.3	6.7	10.0	13.3	16.7	20.0	23.3	26.7	30.0	33.3	36.7	40.0	
	35	2.9	5.8	8.8	11.7	14.6	17.5	20.4	23.3	26.3	29.2	32.1	35.0	
	30	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	
	25	2.1	4.2	6.3	8.3	10.4	12.5	14.6	16.7	18.8	20.8	22.9	25.0	
	20	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	16.7	18.3	20.0	
	15	1.3	2.5	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0	
	10	0.8	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0	
	5	0.42	0.83	1.25	1.67	2.08	2.50	2.92	3.33	3.75	4.17	4.58	5.00	
		5	10	15	20	25	30	35	40	45	50	55	60	
Ground speed in MPH →														

Table 1

For multiple lane system capacities, multiply the single lane capacity by the total number of lanes required.

NOTE: Brass and stainless steel fixed orifice nozzles perform the best when selecting nozzles that are close to the desired gallon per lane mile. The 24, 32, and 48 gallon per lane mile options are available. See Page #42 for the nozzle part numbers.

OPERATING INSTRUCTIONS

Regardless of the boom configuration, the system operation procedures and the control plumbing (see chart on next page) remain the same.

- Check chart on next page and ensure that all valves are in their normal operating positions.
- Ensure that the control console has been programmed with the desired application rates. (See manual for information on programming.)
- Enable the hydraulics to the anti-ice unit.
- Before reaching the area of application, select the desired application rate using the "RATE" knob.
- Consult control console operating manual for procedure to turn liquid application on and off.

PLUMBING TANK 1065/1235/1635 GALLON

PARTS LIST			
ITEM	PART NO	QTY	DESCRIPTION
5	316001	1	ELBO □ ,32MP/32FP,90
6	324403	7 □	HOSE,POLY,RIBBED,EPDM,2"
7	324403	7 □	HOSE,POLY,RIBBED,EPDM,2"

PARTS LIST			
ITEM	PART NO	QTY	DESCRIPTION
1	113507	1	FITTING □2" FP □4 □BOLT DRAIN
2	80875	2	ELBO □ ,32MP/32HB,POLY
3	107798	4	CLAMP,HOSE,T □BOLT,2.0
4	79027	1	2" BULKHEAD TANK FITTING

