



PROVING PERFORMANCE

HAMR™

WELDED FROGS

THE BACKGROUND

Over the last five years, Holland has repaired over 350 frogs via automated welding on multiple Class 1 and Short Line railroads. When a selection of repairs on a Class 1 was evaluated over three years later, the HAMR welded frogs demonstrated superior performance to traditionally repaired frogs and are continuing to exceed expectations.

Patent Pending 63345331
Patent 10,767,318

THE STATS

- 15 frogs were inspected in late 2022
- All the frogs inspected have surpassed two to three years of traffic
- Minor maintenance grinding will allow them to continue to perform at this level
- The estimated tonnage on the inspected frogs range from 180 MGT to over 250 MGT at time of inspection for half of the inspected frogs
- As of December 2022, the life of the repairs range from over 2 to 3 years
- Full refurb service includes Holland HAMR™ weld warranty



Example Frogs Inspected:

Date of repair	Serial #	Frog Type	Subdivision	Location	Track	Switch	Original Grade	Material Used lbs	Service Date	Time in Service	MGT Rate per day	Est. MGT
5/3/2019	1502	RBM	GENEVA	CPY048	1	East	7	16.7	11/8/2022	1285.00	0.21	269.85

Condition: Fair. Some grinding on frog; Vertical crack; Riding good & even wear



Date of repair	Serial #	Frog Type	Subdivision	Location	Track	Switch	Original Grade	Material Used lbs	Service Date	Time in Service	MGT Rate per day	Est. MGT
6/24/2019	1748	RBM	GENEVA	CPY055	2	West	5	19.88	11/8/2022	1233.00	0.15	184.95

Condition: Fair/Good. Cracking 10" back w/ flow; Riding good; Missing fasteners & broken tie plate.



Date of repair	Serial #	Frog Type	Subdivision	Location	Track	Switch	Original Grade	Material Used lbs	Service Date	Time in Service	MGT Rate per day	Est. MGT
7/3/2019	C1110107	RBM	GENEVA	CPY063	2	West	6	17.2	11/8/2022	1224.00	0.15	183.6

Condition: Fair/Good. Low points; Chipping; Riding good; Uniform wear



Date of repair	Serial #	Frog Type	Subdivision	Location	Track	Switch	Original Grade	Material Used lbs	Service Date	Time in Service	MGT Rate per day	Est. MGT
7/17/2019	1110/1270	RBM	GENEVA	CPY063	1	West	8	20.89	11/8/2022	1210.00	0.21	254.10

Condition: Very good. Slight cracking; Riding good



Date of repair	Serial #	Frog Type	Subdivision	Location	Track	Switch	Original Grade	Material Used lbs	Service Date	Time in Service	MGT Rate per day	Est. MGT
7/10/2019	300	RBM	GENEVA	CPY076	2		4	18.08	11/8/2022	1217.00	0.15	182.55

Condition: Good. Metal flow present, riding good.



Date of repair	Serial #	Frog Type	Subdivision	Location	Track	Switch	Original Grade	Material Used lbs	Service Date	Time in Service	MGT Rate per day	Est. MGT
7/19/2019	1110291	Spring	GENEVA	CPY078	1	West	2	6.11	11/8/2022	1208.00	0.21	253.68

Condition: Excellent. Riding good; Even wear



Date of repair	Serial #	Frog Type	Subdivision	Location	Track	Switch	Original Grade	Material Used lbs	Service Date	Time in Service	MGT Rate per day	Est. MGT
7/31/2019	464	RBM	GENEVA	CPY080	2		4	13.2	11/8/2022	1196.00	0.15	179.40

Condition: Good. Chip on mainline wing; Riding good.



Date of repair	Serial #	Frog Type	Subdivision	Location	Track	Switch	Original Grade	Material Used lbs	Service Date	Time in Service	MGT Rate per day	Est. MGT
7/29/2019	1867	RBM	GENEVA	CPY093	1	West	5	20.9	11/8/2022	1198.00	0.21	179.55

Condition: Fair. Flow; chipping; Even wear; Riding Good

