

## **INVESTIGATION REPORT IR-1773**

To: Minh Le Manager – Bus Engineering and Quality Assurance

From: Michael Battiston Equipment Engineering Officer, Ontario Canada

Date: April 12, 2019

Subject: Stone Guard Issue – GO Bus Fleet

The GO bus fleet has experienced a number of problems with the current Crystal Clear 2K stone guard such as discoloration, peeling and chipping. To combat this, Engineering trialed a new stone guard called Nano-Clear NCI. This was installed on 2 DDS buses which entered revenue service at the same time as 3 new DDS buses. The results of the trial showed that the Nano-Clear NCI stone guard significantly reduced the number of stone chips to the front bumper compared to the Crystal Clear 2K stone guard. All results from the stone guard trial can be found in SER 1903.

## **Background**

The stone guard evaluation trial ran from May 1, 2018 until February 13, 2019 and used 5 DDS buses. Three of the DDS buses were new bus deliveries, 8397, 8398 and 8399, that entered into service near the beginning of May and had the original Crystal Clear 2K stone guard installed. The other 2 DDS buses, 8305 and 8308 were sent to MTB to have the Nano-Clear NCI stone guard applied near the end of April 2018 and entered into service on May 1, 2018.

**Table 1: Tabulated Results** 

Bus Number	Downtime (Days)	Mileage (KM)	Number of Stone Chips	Type of Stone Guard
8305	27	84,907	56	Nano-Clear NCI
8308	37	89,986	40	Nano-Clear NCI
8397	32	111,263	>100	Crystal Clear 2K
8398	36	118,062	>218	Crystal Clear 2K
8399	28	118,062	>180	Crystal Clear 2K



Figure 1: Stone Chip, Bus 8308



Figure 2: Stone Chip, Bus 8399

As can be seen in Table 1, the buses with the Nano-Clear stone guard significantly reduce the amount of stone chips along the front bumper. Furthermore, the Crystal Clear stone guard did not prevent the small chipping from occurring (Figure 2) whereas the Nano-Clear NCI stone guard did prevent this issue (Figure 1). It is important to know that only 2 layers of the Nano-Clear stone guard were applied to the front of the bus, whereas 6 layers of the Crystal Clear stone guard were applied to the front of the bus. Stone chips can be further reduced with the addition of another layer of Nano-Clear stone guard. All test results and further information can be found in SER 1903.

## Conclusion

As the Nano-Clear NCI stone guard has proven to be a more resilient stone guard, Engineering recommends that future bus deliveries and buses that go out for refurbishment have the Nano-Clear NCI stone guard applied in lieu of the Crystal Clear 2K stone Guard.

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Status: RELEASED