

# NAFLIC

*National Association For Leisure Industry Certification*

Standards & Related Documents Committee

TECHNICAL BULLETIN — October 2015

## **395. Zamperla service bulletin re Crazy Bus/Crazy Sub/Crazy Plane/Fire Chief**

Zamperla has issued a service bulletin relating to the above mentioned devices regarding the installation of a redundant chain system to prevent the arms going out of sync should the drive mechanisms fail. This issue has been discussed in previous TBs. There are two different systems to install depending on the type of drive installed on the device. The solution for both types appears to be the attachment of an additional sprocket onto the slewing ring and connecting the two sprockets with a chain. This has the potential to introduce an additional hazard, however, that of an unguarded chain. IBs and controllers are reminded that implementation of this modification will require a design review of the safety critical modification to be carried out.

*The information contained within is that of the manufacturer and not NAFLIC. When following the advice from the manufacturer, you are reminded of your duties and responsibilities under HSG175 regarding modifications.*

Committee Members: Mr. D Dadswell (Chairman), Mr. A Mellor (Secretary), Mr. P Smith, Mr. J Green,  
Mr. D Cox, Mr. M Thirkettle, Mr. I Davies, Mr. J Shilling & Mr. D Inman

Ride distributed by:  Zamperla, Inc. 49 Fanny Road Boonton, New Jersey 07005 USA  Phone: 973 334 8133 Fax: 973 334 6880		Bulletin No: 2014 CB01
		Release Date: October 1, 2014
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		Supersedes: n/a
		Completion Date: Prior to 2015 Operation
		Page: 1 of 2

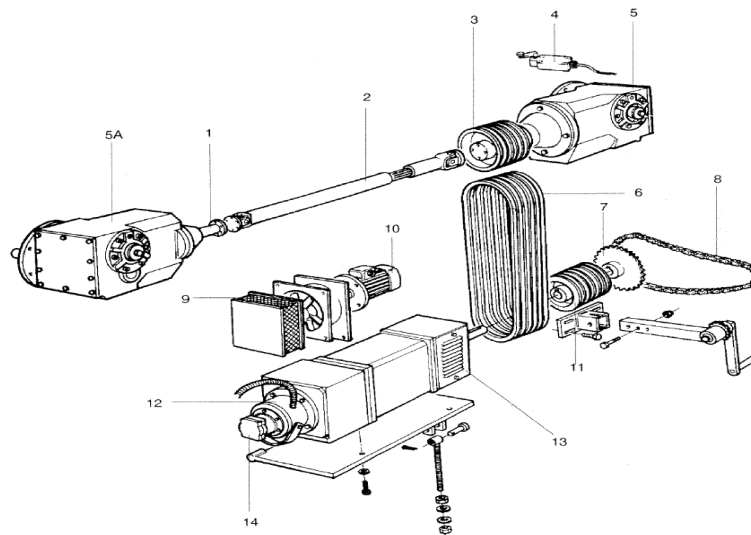
## SERVICE BULLETIN

Ride Manufacturer: A. Zamperla SpA	Affected Production Dates: ALL
Ride Name: Crazy Bus, Crazy Sub, Crazy Plane, Fire Chief	Affected Serial Nos.: ALL
Model Number: Crazy Bus, Crazy Sub, Crazy Plane, Fire Chief	
Abstract Of Issue: Installation of the redundancy kit.	
Reason For Release: To introduce a redundant system to the drivetrain.	
Action To Be Taken: Use the attached page to determine the version of your ride. Contact Zamperla Inc. (973 334 8133) to obtain the correct version redundancy kit (provide serial number). Follow the procedure to install the redundancy kit on your ride. Procedure will be provided with kit.	
Detail Of Issue: Determine the version of ride (refer to page 2 of 2). Follow procedure to install the redundancy kit, which will be provided with the kit when it is delivered.	
Future Action To Be Taken: Daily: <ul style="list-style-type: none"> <li>- Inspect chain is intact and shows no signs of damage or wear.</li> <li>- Visually inspect torque stripes.</li> <li>- Verify tensioner is adjusted properly.</li> </ul> Weekly <ul style="list-style-type: none"> <li>- Grease chain.</li> </ul>	

# How to determine the version of my ride?

## Horizontal Motor “drive belts”

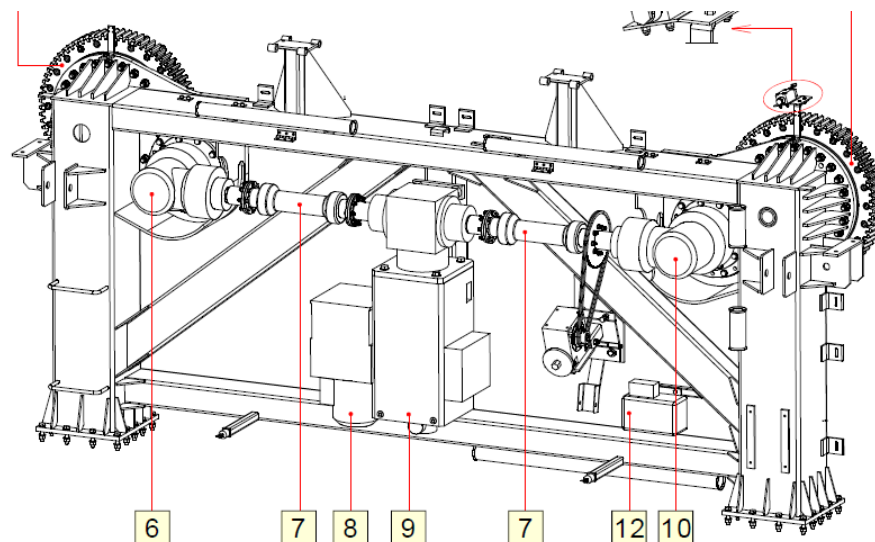
Requires Redundancy Kit 9369232000A



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## Vertical Motor “no drive belts”

Requires Redundancy Kit 9369235000A



Procedure to install the **chain redundancy kit**, part number 9369232000A, on the Crazy Bus ride

## “Horizontal Motor” Version

Note: There may be some slight variations in design from ride to ride. If you encounter a problem installing this kit, please contact Zamperla at 973 334 8133. Please have the serial number of the ride available.

The kit contains all the components required to perform the installation. The kit consists of two half moon sprockets, two half moon reinforcement plates and hardware. The sprockets form a circle against the boom flange that mates to the ring gear. The reinforcement plates form a circle that bridges the joint of the sprockets. The ride must be rotated several times during the installation to allow access to the socket head bolts that secure the ring gear. These bolts are systematically replaced with the new hardware supplied in the kit. Refer to drawing 9369232000A for complete bill of material of kit.

1. Remove the ring gear covers that conceal the two rotary ring gears.
2. Remove six consecutive bolts of the ring gear and replace them with the longer M12x100 bolts, washers and nuts supplied (Fig. 1). Attach the first half moon sprocket (they are in matched sets) to these six bolts. The end of the half moon sprocket must not land concealed behind the steel of the boom. Position it so that the sprocket ends land outside this concealed space. The sprocket must rest flush against the boom flange. If there is some interference, carefully clean or grind the material away to allow a correct mating of the sprocket to the flange (Fig. 2). Tighten these bolts (do not torque to the final value) (Fig. 3).

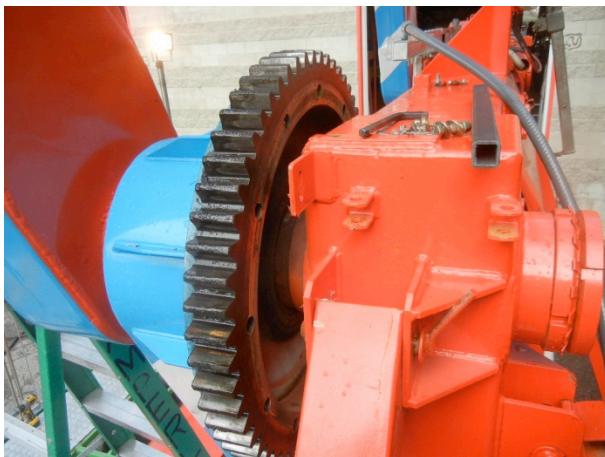


Fig. 1



Fig. 2



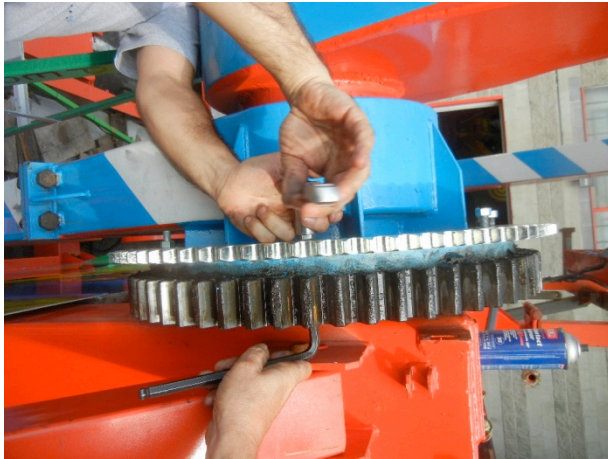


Fig. 3



Fig. 4

3. Remove the remaining six original bolts from the ring gear and replace them with the longer M12x100 bolts, washers and nuts supplied. Attach the second half moon sprocket (they are in matched sets) to these six bolts (Fig. 5, 6). The two sprockets should now form a 360 degree circle (Fig. 7). Tighten these bolts (do not torque to the final value).

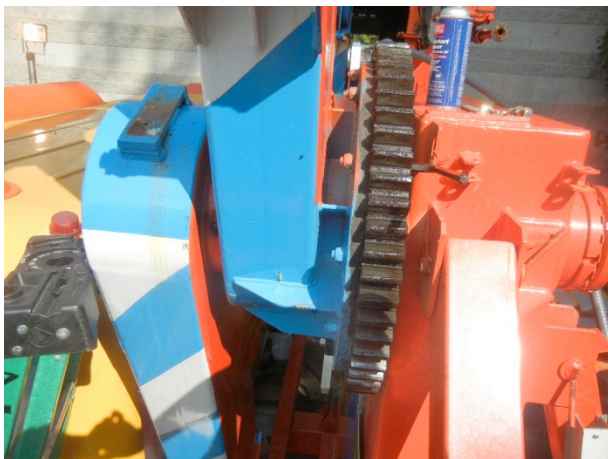


Fig. 5

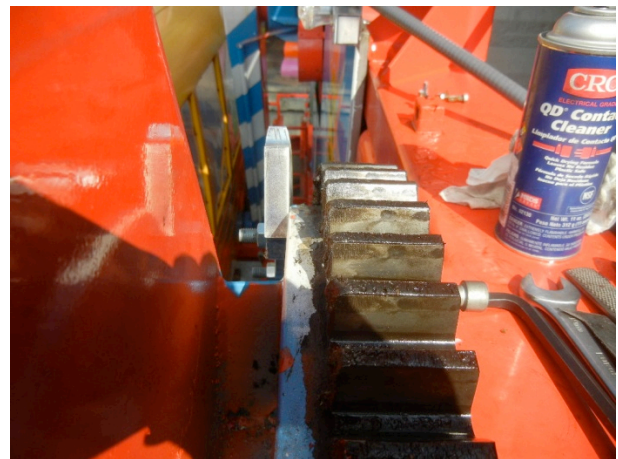


Fig. 6

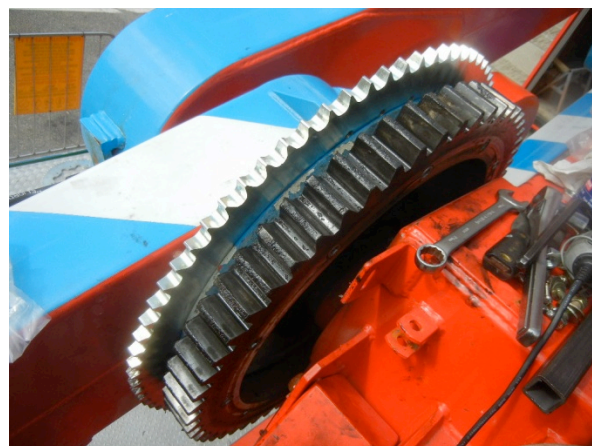


Fig. 7

4. Remove three nuts from the first half moon sprocket and three nuts from the second half moon sprocket. Install the first half moon reinforcement plate to span across the two sprocket halves (Fig. 8). Install the supplied hardware (M12x25 bolts with washers) through the holes in the reinforcement plate and into the threaded holes of the sprockets (Fig. 9). Tighten all hardware.

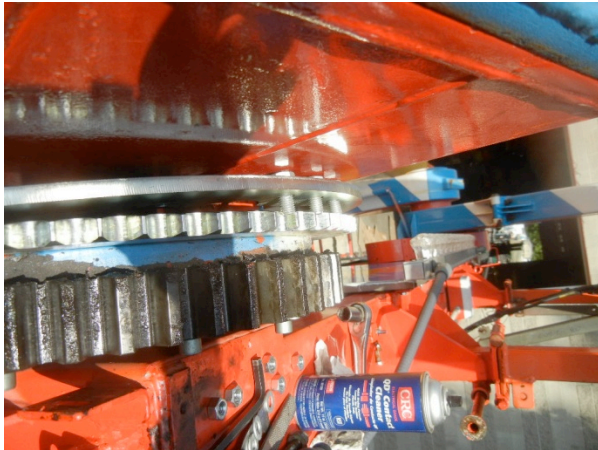


Fig. 8

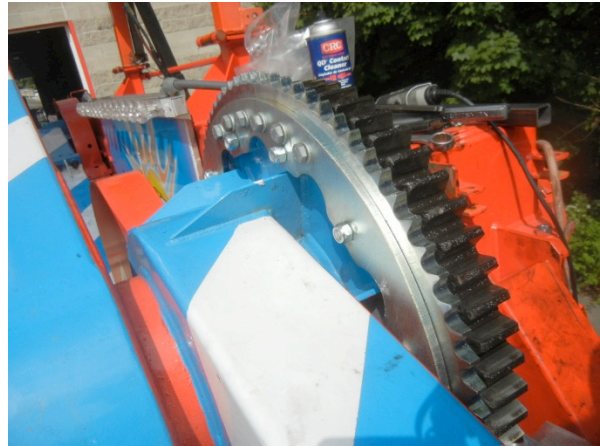


Fig. 9

5. Remove the remaining nuts and install the second half moon reinforcement plate. The two reinforcement plates should now form a 360 degree circle (Fig. 10). Tighten these bolts and nuts.

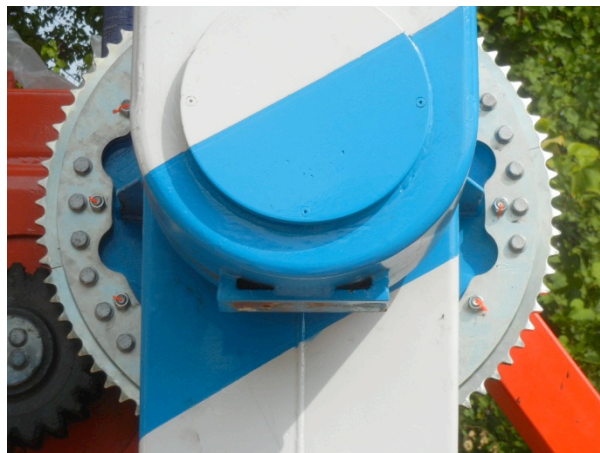


Fig. 10

6. Inspect the sprocket joints. If the joint does not meet correctly (Fig. 11), use a punch to mate the joint so that the chain will rest correctly in the teeth of the sprocket (Fig. 12, 13).



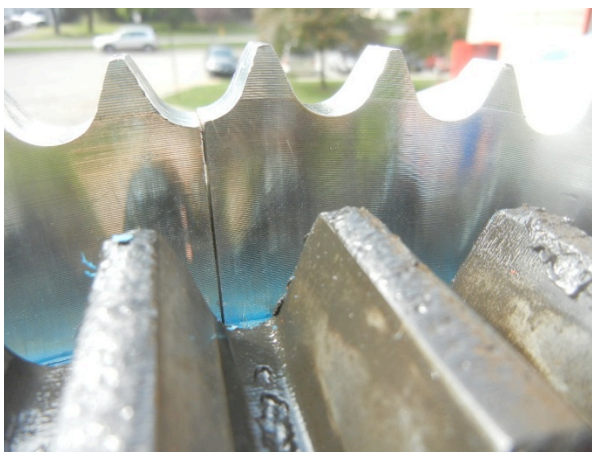


Fig. 11



Fig. 12



Fig. 13

7. Use a torque wrench to apply 84 NM of torque to the nuts of the sprocket (Fig. 14) and torque stripe. Snug tight the small bolts of the reinforcement plates (Fig. 15, 16).

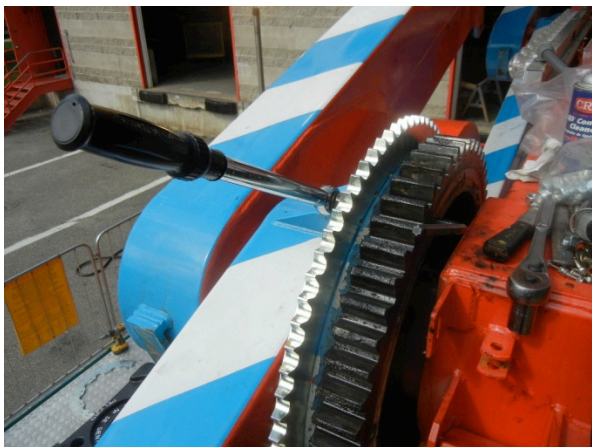


Fig. 14



Fig. 15



Fig. 16



Fig. 17

8. After performing the sprocket / reinforcement plate installation on the other boom, the chain can be installed.
9. Lay the chain over one sprocket. Push and/or pull the arms of the ride to allow a tight slack free chain tension. The chain may be joined with the full or half master link supplied with the chain. A link of the chain may be removed if necessary (Fig. 17).
10. The upper and lower chain should be aligned with little or no slack (Fig. 18, 19). Refer to View X on drawing 9369232000A for tolerance.



Fig. 18



Fig. 19

11. Install the chain tensioner. Refer to [Chain Tensioner Installation Procedure](#) to properly install the chain tensioner.
12. Inspect the counterweight hinge pin to ensure that it will clear the chain when the boom is rotated (Fig. 20). If required, cut, grind or re-drill the arc clip hole to provide adequate clearance between the hinge pin and chain (Fig. 21, 22, 23).



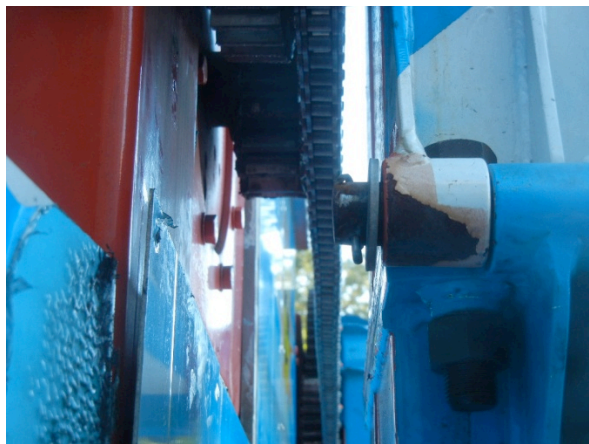


Fig. 20



Fig. 21



Fig. 22



Fig. 23

13. Apply good quality chain grease to the chain.

14. The ring gear covers may be discarded or modified to be reinstalled. You will need to custom cut and fit them for remounting.

15. Test the ride slowly at first increasing speed to normal operating speed (Fig24).



Fig. 24

**NOTE: THE ABOVE PHOTOS ARE FOR GENERAL REFERENCE ONLY. DEPENDING ON YOUR MODEL, THE INSTALLATION MAY VARY FROM THE ABOVE PHOTOS.**

