



Bulletin No: 08 CB01
Release Date: 30 June 2008
Effective Date: 30 June 2008
Supersedes:
Completion Date: Immediately
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SERVICE BULLETIN

Ride Manufacturer: Zamperla SPA	Affected Production Dates: 1996 and later
Ride Name: Crazy Bus Family	Affected Serial Nos.: Models only with EC 2046 Brevini
Model Number: See Affected Serial Nos.	gearboxes with a vertically mounted motor, non-belt driven.

Abstract Of Issue:

Based on field experience, additional maintenance is required.

Reason For Release:

Based on field experience, additional maintenance is required.

Action To Be Taken:

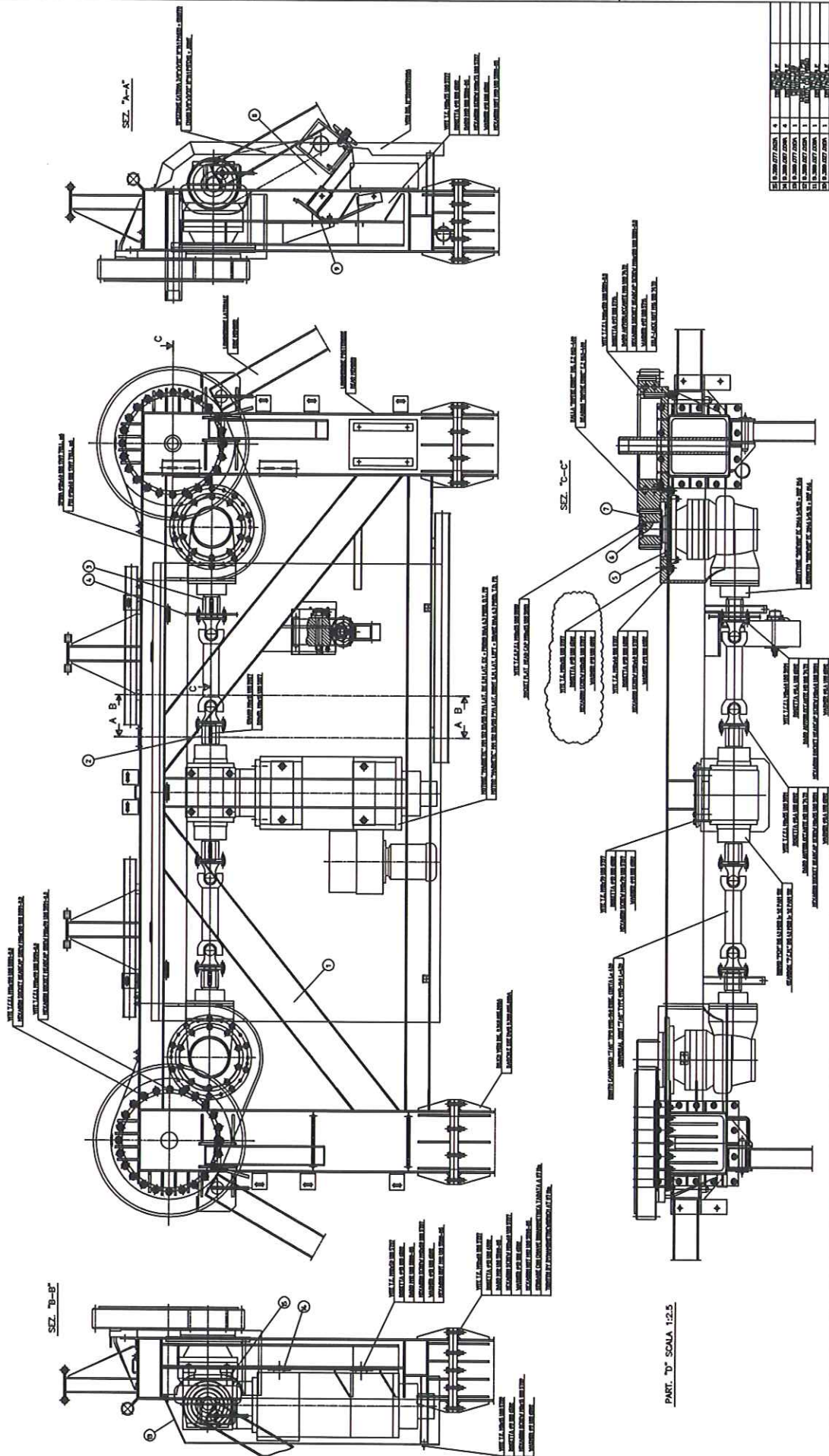
- 1) Position vehicle in upper position as per attached drawing 08 CB01.
- 2) Remove both rear gearboxes as indicated per attached drawing 9369087000B.
- 3) Install new bolts (M10x60 UNI 5737 grade 8.8), one at a time to avoid full disassembly of gearbox, per attached drawing V004600. Verify the 4 guide pins are not damaged and replace if necessary.
- 4) Install safety washer (DIN 93, UNI 6600 or similar) to each bolt as shown in attached picture. If a washer interferes with the gearbox housing, it is acceptable to snip the edge of the washer to fit.
- 5) Torque the M10x60 UNI 5737 grade 8.8 bolts to 50 Nm (37 ft-lbs) with Loctite 243 or higher in a star pattern. Use of a crowfoot wrench will be required due to the limited clearance.
- 6) Bend safety washers as per picture.
- 7) Apply a torque seal to all bolt connections.

Detail Of Issue:

See attachments.

Future Action To Be Taken:

Weekly, visually inspect the bolts.



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- Notes:
1. Position gondola in the up position.
 2. Disconnect gearboxes from the universal joints.
 3. Remove both gearboxes by removing M12x35 bolts. Location of bolts indicated with bubble.
 4. Install new bolts (M10x60 UNI 5737 grade 8.8) one at a time to avoid full disassembly of the EX 2046 MN Brevini gearboxes. See separate drawing for location.
 5. Torque the M10x60 UNI 5737 bolts to 50 Nm.
 6. Torque the M12x35 UNI 5737 bolts on the gearbox to 50 Nm with Loctite 243 or higher.
 7. Bend safety washers on per picture.
 8. Apply a torque seal to all bolt connections.



Secure all these screws
nr.8 M10x60 UNI5737 8.8
by means of safety washers
UNI 6600 as indicated
Torque 50Nm

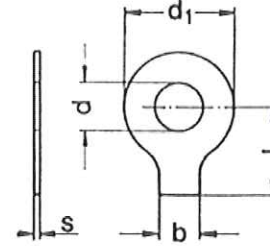
Section 2 Non-Threaded Fasteners, Etc.



TAB WASHERS # 93

Ref: DIN 93 - One Tab

Three materials: Plain Steel, A2 (304) Stainless or A4 (316) Stainless



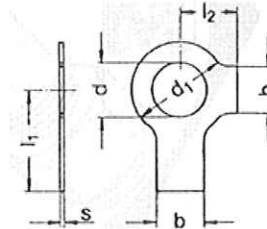
SCREW DIA. mm	# 93 Steel	# 93 A2 Stainless	# 93 A4 Stainless	I.D. mm d	O.D. mm d1	b	l	s
3	x	-	-	3.2	12	4	13	0.38
4	x	x	-	4.3	14	5	14	0.38
5	x	x	x	5.3	17	6	16	0.5
6	x	x	x	6.4	19	7	18	0.5
8	x	x	x	8.4	22	8	20	0.75
10	x	x	x	10.5	26	10	22	0.75
12	x	x	x	13	30	12	28	1
14	x	x	x	15	33	12	28	1
16	x	x	x	17	36	15	32	1
18	x	x	x	19	40	18	36	1
20	x	x	x	21	42	18	36	1
22	x	x	x	23	50	20	42	1
24	x	x	x	25	50	20	42	1
27	x	x	x	28	58	23	48	1.6
30	x	x	x	31	63	26	52	1.6
33	x	-	-	34	68	28	56	1.6
36	x	x	-	37	75	30	60	1.6
39	x	-	-	40	82	32	64	1.6
42	x	-	-	43	88	35	70	1.6

"x" denotes stock availability

TWO TAB WASHERS # 463

Ref: DIN 463 - Two Tabs

Two materials: Plain Steel or A4 (316) Stainless



SCREW DIA. mm	# 463 Steel	# 463 A4 Stainless	I.D. mm	O.D. mm	b	l1	l2	S
4	x	-	4.3	9	5	14	6.5	0.38
5	x	x	5.3	10	6	16	8	0.5
6	x	x	6.4	12.5	7	18	9	0.5
8	x	x	8.4	17	8	20	11	0.75
10	x	x	10.5	21	10	22	13	0.75
12	x	x	13	24	12	28	15	1
14	x	x	15	28	12	28	16	1
16	x	x	17	30	15	32	18	1
18	x	x	19	34	18	36	20	1
20	x	x	21	37	18	36	21	1
22	x	x	23	39	20	42	23	1
24	x	x	25	44	20	42	25	1
27	x	x	28	50	23	48	29	1.6
30	x	x	31	56	26	52	32	1.6
33	x	-	34	60	28	56	34	1.6
36	x	-	37	66	30	60	38	1.6
39	x	-	40	72	32	64	41	1.6
42	x	-	43	78	35	70	44	1.6

"x" denotes stock availability

How to Order
 Item #: 93 A2
 Size: 20
 Quantity: 300
 Tel: 1-888-966-MMCC

Vibration Meters & Tachometers

Tamper and Vibration Detection Paint



Apply this paint directly to equipment for easy and economical detection. Squeeze on correctly positioned fittings, studs, nuts, parts, and assemblies. When paint dries it becomes brittle and cracks from any movement caused by tampering or vibration. It's noncorrosive and adheres to most surfaces, including all types of metals. Temperature range is -10° to +450° F.

General-purpose paint is excellent for use on small parts.
Aircraft industry paint resists aircraft hydraulic fluid.
Fast-drying paint is for large jobs such as machinery bolts.

Color	Size	Each
General Purpose		
Black	1/2 oz.	1476T55 \$2.87
Blue	1/2 oz.	1476T115 2.87
Brown	1/2 oz.	1476T33 2.87
Gray	1/2 oz.	1476T44 2.87
Green	1/2 oz.	1476T114 2.87
Orange	1/2 oz.	1476T112 2.87
Purple	1/2 oz.	1476T113 2.87
Red	1/2 oz.	1476T111 2.87
White	1/2 oz.	1476T11 2.87
Yellow	1/2 oz.	1476T22 2.87
Aircraft Industry		
Pink	1/2 oz.	1476T122 4.38
Yellow	1/2 oz.	1476T12 4.38
Fast Drying		
Blue	1 oz.	1476T21 5.68

Digital Vibration Meter

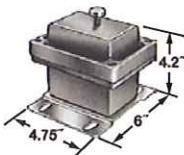


- Acceleration Range: 0.02 to 199.9 g
- Frequency Range: 3 to 1000 Hz
- Velocity Range: 0.02 to 199.9 in./sec.
- Displacement Range: 0.1 to 199.9 mils
- Accuracy: ±2.5% of full scale

In addition to vibration, this meter measures acceleration, velocity, and displacement. Ideal for monitoring the performance of rotating machines such as fans and pumps. Meter has an LCD display that holds the reading for one minute, a polystyrene housing, and comes with a 1 1/2" probe. Size is 6" Lg. x 3" Wd. x 1" Dp. Operating temperature range is 32° to 122° F. Meter operates on a 9-volt battery (included) and comes with a vinyl carrying case and a certificate of calibration traceable to NIST (National Institute of Standards and Technology).

	Each
Meter.....	8721T1 \$637.31
Replacement 9-Volt Battery (1/Pkg.).....	71455K56 Per Pkg. \$2.57

Vibration-Monitoring Switch

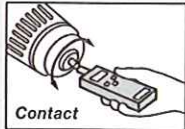


Protect your machinery from damage and downtime with this switch. If vibration or shock exceeds a set point, the contacts actuate to either shut down your machine or activate an alarm. Reset switch with the push of a button. The activation point is adjustable between 0-5 gravity units (g's) at 0-60 Hz. Switches are SPDT and rated 15 amps @ 125 or 480 VAC. Conduit connection is 3/4" NPT female.

Switch has four 0.375" dia. mounting slots (mounting hardware not included). Housing is cast aluminum and rated for hazardous locations for Class I, Groups C and D, Div. 1; Class II, Groups E, F, and G, Div. 1. Meets NEMA 4 and IP65 for dirt and water protection. UL and C-UL listed. CE approved.

1188T31	Each \$446.67
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About Tachometers



Tachometers measure the speed of rotating parts on machines such as shafts, gears, and belts.

Contact tachometers come in direct contact with an object and are an excellent choice for dirty and dusty environments. *Cone tips* are for shafts with a center hole. *Concave tips* are for shafts, pulleys, saws, and other items with a flat end surface.

Noncontact tachometers have a beam of light or laser that reflects off a piece of reflective tape attached to the rotating point.

Analog Contact Tachometer



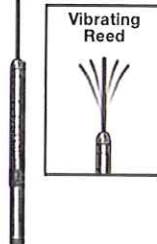
- Range: 0 to 4000 rpm
- Accuracy: ±3% of full scale

Housed in steel for durability, this reversible tachometer can measure in both directions (clockwise and counterclockwise). It has a 2 3/4" dia. dial face with a glass cover and includes one cone and one concave tip.

Optional 12" extension shaft enables access to hard-to-reach areas.

O'all Size, Dia. x Lg.	Each
Tachometer.....3" x 4".....	1416T1 \$74.69
Optional 12" Extension Shaft.....	1416T2 24.00
Per Set	
Replacement Tips (One Cone, One Concave).....	1416T3 \$5.33

Pocket-Size Vibration Meters



Quickly detect and measure machine vibration with these pen-size tools. A flexible steel wire reed detects vibration while the scale on the side of the meter indicates the machine vibration in cycles per minute (cpm). A simple calculation determines motor speed in rpm for engines with multiple cycles. Housing is made of aluminum and is 6 1/2" long. Come with a vinyl carrying case.

Combination set contains one of each meter in a vinyl carrying case.

Vibration Range	Accuracy of Reading	Each
200-2,000 cpm	±5-10%	1353T15 \$49.94
2,000-21,000 cpm.....	±10-15%	1353T11 36.19
Combination Set.....	1353T13 Per Set	\$82.44

Data-Logging Vibration Meter and Stethoscope



- Acceleration Range: 0.01 to 19.99 g
- Frequency Range: 10 to 10,000 Hz
- Velocity Range: 0.01 to 19.99 in./sec.

Listen to, monitor, and record machine performance. In addition to vibration, this meter measures acceleration and velocity. It also has an easy-to-read chart that lets you determine the severity of the vibration based on the size of your machine.

Meter has an LCD display, padded headphones, and a 4 1/2" long sensor probe for locating problem areas. The magnetic base allows you to mount the probe on a machine for constant readings. Recorded data can be entered into the monitoring software (included) so you can predict when machine maintenance is required. Software is compatible with Windows 95/98, XP, and NT 4.0; minimum system requirements are 166 MHz, 32 MB of RAM, and 100 MB of hard-drive space. Size is 6" Lg. x 3" Wd. x 1" Dp. Operating temperature is -14° to +122° F. Operates on two AA batteries (included) and comes with a nylon carrying case.

	Each
Meter.....	8738T1 \$1230.36
Replacement AA Batteries (4/Pkg.).....	71455K53 Per Pkg. \$3.10