

# Trouble-Shooting (if things aren't working properly).

For ALL operating manuals and other technical information see [www.brantz.co.uk](http://www.brantz.co.uk)

INFORMATION about accessories and peripherals (Sensors etc) for Brantz meters available on [www.brantz.co.uk](http://www.brantz.co.uk) Technical support from: Brantz at Right Track Enterprises Ltd UK Tel/Fax No. (0)1625 669366.

## Troubleshooting suspect sensor installations:

Before fitting any type of sensor to a vehicle, connect it up to the Brantz meter and check its' correct operation by rotating the inner of speedometer cable types, or repeated touching of wheel types to a metal object. Use a low calibration figure on the meter, and watch the readouts increment. If the readouts do not increment there is a problem which should be investigated. Make absolutely sure that sensors are correctly connected before turning on the meter as they will be destroyed by reverse current.

If it is suspected that either a wheel or speedometer sensor has been damaged in service (ie tripmeter does not increment on the road) then the output from the sensor can be tested with a voltmeter which has the negative lead connected to ground, (wheel sensor voltage varies as wheel is rotated 2.0 volts to 4 volts approximately) or speedo cable sensor blue connection varies 0v to 5v as internals are rotated.

Alternatively the tripmeter itself can be proven to be OK by the following test which must be carried out strictly in the order described:

- a) Switch off the meter.
- b) Pull off the three push-on connectors from the grey cable to the sensor.
- c) Ease back the insulating sleeves from the Blue and Green wires of the grey cable described in b). Keep these away from contact with anything else. d) Select calibration 001 on the tripmeter.
- e) Switch on the tripmeter.
- f) Press all the zeroing buttons.
- g) Tap the above Blue and Green wire connectors together electrically many times. The tripmeter should increment.

If it does, and there is no increment during normal use on the road with the sensor connected, then the sensor has indeed been damaged and the tripmeter itself is still functional. The other type of mis-operation from which a tripmeter can suffer is self-stepping whilst the vehicle's engine is running, or self zeroing, or readouts going on and off by themselves. Assuming the power supply is reliable (try powering the meter directly from a separate battery placed temporarily in the passenger area) then suspect powerful radio interference from home-made H.T. sparkplug leads. This is particularly common with historic vehicles. Replace them with standard proprietary parts from an accessory shop. Testing for interference is easily demonstrated using a portable radio on the AM band (important). Tune away from the stations into a quiet frequency, turn up the volume, then start up the engine. Listen for loud clicks. That's interference which should be cured, as it is far too powerful to defend against with screening etc. Vehicles with interference will normally fail pre-event scrutineering.

## Fault-Finding Procedures for Brantz Products:

If a tripmeter installation is giving trouble, the recommended way to find faults is by progressively removing areas of the installation so that there is an obvious point at which things are either good or bad. The most important split is to take the customer's car out of the equation by fitting the tripmeter into another car. Often it is not necessary to fit the sensor in the replacement car; simply connect up to the new car's power supply and observe all the tripmeter functions which do not need the distance increments. If the opportunity presents itself, a sensor can be connected to the new car tripmeter installation without the sensor being fitted to the vehicle in a permanent way (i.e. just placed loose inside the car and operated by hand). Only after the above should the following become necessary. Brantz may be able to offer advice about typical car problems, but it is ultimately the car owner's responsibility to have a car with normal trouble-free electrics.

## International 1 / International 2 / International 2'S' / Architect 1 / Architect 2 / Laser3/ Surveymaster

1. The meter is installed in a customer's vehicle. The meter digits light up correctly when the meter's ON/OFF switch is switched ON--GOTO4. The meter digits light up incompletely when the meter's ON/OFF switch is switched ON--GOTO13. The meter digits do not light up when the meter's ON/OFF switch is switched ON--GOTO2.

2. Disconnect the Black Power Cable coming from the base of the meter from the vehicle's supply and connect it directly to a spare charged 12 volt battery placed in the vehicle next to the meter. Observe that it is the Black cable which connects to power; Brown to +12 volts, Green/Yellow to -12 volts. Battery chargers are not a suitable power supply as they are not smoothed. There is normally a Blue wire in the Black cable. This Blue wire is not normally connected to anything. If the meter digits light up, find the problem with the vehicle's supply. Often the polarities are reversed or of poor quality. Use Screw-type connections and definitely NOT crimps. If the meter does not light up--GOTO3.

3. Check that the cables (Black and Grey) are not fractured or cut-into by bodywork. Disconnect the sensor from the Grey cable. If the meter lights up--GOTO12. If the meter does not light up--GOTO13.

4. The problem is that on the road the meter digits flash on and off--GOTO2 and 3. The problem is that the digits zero themselves from time to time GOTO3 and 7. The problem is that the digits increment themselves even when the vehicle is standing still--GOTO7. The problem is that the digits do not increment when the vehicle is travelling--GOTO5. The problem is that the meter does read distance but not accurately--too low GOTO5, too high GOTO6.

5. The meter is not seeing all of the pulses from the sensor. This could mean that the sensor is not functioning or that the meter's pulse input is damaged. Connect the negative of a voltmeter to the Green/Yellow wire inside the Grey cable (The sensor Cable). Test the Brown of the Grey cable with the other positive voltmeter lead and see that +5 volts is present. If it is not GOTO13. If it is +5 volts then test the Blue lead in the Grey cable. This lead should go up and down in voltage as the sensor is rotated (or if a wheel type sensor its' end is touched repeatedly by a steel object. When the Blue wire is in the Low state its' voltage should be less than 2 volts. When the Blue wire is in the High state, its' voltage should be over 4 volts. Note that the meter requires that either state has to be present for more than 2 milliseconds to recognise it, (this can be a problem if the customer is using a wheel type sensor to sense on a drive shaft which rotates very quickly. The answer here is to use a larger target). If the voltage does go up and down sufficiently--GOTO6. If the voltage does not go up and down--GOTO12.

6. The meter is receiving external pulses of energy from interference sources--GOTO7 or the sensor is not reliably detecting rotation--GOTO5 and if a wheel type sensor check for correct gaps on all detected targets and also check that socket head screws are not being detected. Check wheel sensor operation with a voltmeter whilst it is connected to the tripmeter. Voltages should be about 4.0v when sensor is near to metal and about 2.0 volts when not near metal. Remember that gaps can alter whilst the vehicle is being driven due to vehicle parts bending and flexing.

7. Test for interference. This is particularly common when home-made HT sparkplug leads have been used, but can come from damaged alternators or fuel pumps/horn/wipers etc. If interference is present it is always too powerful to defend against and should be fixed at source by suppressors or new silicon leads etc. Take a portable radio, select the AM band (important) and tune into a quiet spot between stations. Turn up the volume and start the vehicle. Listen for loud clicks. That's interference. Compare the vehicle with a normal road car as a guide to what is acceptable. Try other vehicle accessories to locate intermittent sources of trouble.

8. &12. The sensor is damaged. Replace and install new unit with best chance of survival against heat and shock etc. Use first class connections.

13. The meter's internal circuit is damaged so the meter and sensor must be returned to the factory for service or replacement. Installation tips: On receipt of a tripmeter test it on the bench with a charged battery (NOT a battery charger as the current is not smoothed) and its' sensor connected. Before installing into a vehicle, do the vehicle interference checks as in 7) and operate other car accessories to see if any of them produce interference type clicks etc.. Always derive 12volt power AND the ground lead DIRECTLY from the two battery TERMINALS. Use screw connections (NEVER use crimp connections. These are almost always loose and account for the vast majority of unreliable customer installations). Support cables at terminal entry points to prevent them from pulling on connectors.

### Laser 3

See the general information for International tripmeters as above document. Additional facilities exist in the Laser 3 which could give the appearance of faults, but are due to mis-operation of the additional facilities:

**A/** Wheel sensor does not work with the Laser3 though other sensors do. There is an internal switch in the centre of the circuit board (Remove the back cover to see it) marked PULL-UP. Switch should normally be ON. (The facility to switch OFF provides for a high impedance input which can connect directly to the digital Electronic speedometer pulse supply of some vehicles without using a Pre-scaling Interface Board.

**B/** The Radio Remote control does not zero readouts. The internal switch adjacent to the one described above disables the Laser's radio receiver in the OFF position.

**C/** Hard-wired remote button lights the -dist button. Menu has set the RR input terminal to -dist (Reversing-light detector) instead of 'TRIP' zeroing. This one connection can be used as either function.

**D/** Fuel gauge does not calibrate. Check the fuel sender on your vehicle is generating a compatible signal. If the tank sender is connected to the vehicle's own level gauge (ie volts-on) check with a voltmeter that when empty the signal wire is reading several volts positive with respect to chassis, and when it is full, the signal wire reads a much lower voltage (probably less than one volt).

If the tank sender is not connected to the rest of the vehicle, check that the sender resistance is more than 60 ohms to chassis when empty, and less than 10 ohms to chassis when full. Parameters outside the above cannot be reliably read by the Laser 3.

**E/** Time of day is lost when Laser3 is disconnected from the power source. Internal backup battery needs to be changed.

### Retrotrip 2 and Retrotrip 3

Carefully read the TROUBLESHOOTING documents to reduce to a minimum the shortcomings of the old technology which is the basis of the retrospective design.

#### **Testing a RetroTrip on the workshop bench:**

Connect the power cable (black sheath) to a 12 volt battery, brown to +12 volts, green/yellow to -12 volts. Note that testing can NOT be done reliably when connected to a battery charger, as the current is not smoothed. If the Retrotrip has customer-installed connectors, especially crimp types, push & pull these gently, then firmly, to check tightness. Solder them in place wherever possible.

**Test (1)** Switch on the Retrotrip. Observe the top lights go on. Switch off.

**Test (2)** (Optional test for dealers with Brantz test equipment. Others go straight to test 3) Put the Retrotrip calibration switches (some may be pen-push types) to 555. Connect the grey cable to a Brantz 'Rolling Road Tester' taking care to connect the right colours. Zero the two readouts. Switch on the Retrotrip. Note the two counters click over together. Change the calibration figures (there is a limit as to how fast the counters can go, so the calibration figure cannot be too low. Switch off the Retrotrip. Remove the 'Rolling Road Tester'.

**Test (3)** Connect a sensor to the grey cable carefully observing the colour codes (see the sensor information sheet). Select a low calibration figure. Switch on the Retrotrip. Rotate the sensor mechanism (or for a wheel sensor touch a steel object onto the tip of the sensor many times). See the counters click over.

#### **Self Test Facility for more recent models of Retro (AUG 2001):**

Connect the Retrotrip to a charged battery supply (sensor is not needed). Put the rotary calibration switches to 000 / 000. Turn on the power. Within eight seconds of turning the power on, change all the calibration switches to 888 / 888. After a few seconds the counters will start to self-step themselves in groups of eight for as long as the power remains connected. This enables the simulation of great distances on the bench. If all the above functions are correct then any problem is likely to be with the car and/or the installation. See the trouble-shooting tips on the sensor sheet and MOST IMPORTANTLY - try the meter on another car. Derive power directly from the battery TERMINALS not the chassis or fuse panel. This is the single most important installation recommendation, and it is the one most resisted by customers as it is frequently inconvenient. Low battery voltage at the trip will cause trouble (see recommended power conditioner below). Popular problems are: Reversed power, loose crimp type connectors, even more loose connectors, battery under voltage, poor quality wiring with still more loose connectors, and earthing derived from chassis instead of

battery, radio interference from HT sparkplugs / pumps / horn / wipers / dynamo / alternator etc. See the sensor sheet for a very simple interference test. N.B. PREVENT VIBRATION! - Excessive vibration can cause one counter to disagree with the other as can poor power supplies. Remember that the counter technology of the Retrotrip is necessarily over fifty years old and today's expectation of perfect performance is a little harder to achieve. Older cars with 6 volt electrics or poorly performing or less reliably performing 12 volts charger systems should use a BRANTZ POWER CONDITIONER which will always produce a correct voltage source for the Retrotrip. If any of the above recommendations have been followed, please make a list of them with your observations, and have that list to hand before calling a technical helpline. Detailed operating and installation information is available on [www.brantz.co.uk](http://www.brantz.co.uk) or [www.retrotrip.net](http://www.retrotrip.net)

**If you are experiencing difficulties with your Retrotrip installation:**

In order that we can help you, please complete the following tests and indicate every item as 'good' or explain the observation if not good. Fax back to us on 0044 (0) 1625 669366 or Email: [sales@brantz.co.uk](mailto:sales@brantz.co.uk) and we will respond.

Test 1) Check to see if battery is 12volt or 6volt. If 12 volt go to test 2. If 6 volt test the Retrotrip from a temporary 12 volt battery connected only to the Retrotrip. Observation:

Test 2) Check to see that Power is derived directly from the TWO battery terminals not fuse panel etc or chassis.

Indicate 'Good' or observation:

Test 3) If the Retrotrip has customer-installed connectors, especially crimp types, push & pull these gently, then firmly, to check tightness. Solder them in place wherever possible or use screw-type connectors.

Indicate 'Good' if not crimp type or observation:

Test 4) Test for interference. This is particularly common when home-made HT sparkplug leads have been used, but can come from damaged alternators or fuel pumps/horn/wipers etc. If interference is present it is always too powerful to defend against and should be fixed at source by suppressors or new silicon leads etc. Take a portable radio, select the AM band (important) and tune into a quiet spot between stations. Turn up the volume and start the vehicle. Listen for loud clicks. That's interference. Compare the vehicle with a normal road car as a guide to what is acceptable. Try other vehicle accessories to locate intermittent sources of trouble. Indicate 'Good' or observation:

Test 5) SELF TEST FACILITY FOR MORE RECENT MODELS (May 1999 onwards): Connect the Retrotrip to a charged battery supply (sensor is not needed). Put the rotary calibration switches to 000. Turn on the power. Within eight seconds of turning the power on (Important / less than 8 seconds is not a very long time!!!), change all the calibration switches to 888. After a few seconds the counters will start to self-step themselves in groups of eight for as long as the power remains connected. This enables the simulation of great distances on the bench. If all the above functions are correct then any problem is likely to be with the car and/or the installation. Indicate 'Good' or observation:

Test 6) If test 5 fails, connect the Retrotrip power wires directly to a spare 12volt battery which is not connected to your car. Repeat test 5. Indicate 'Good' on spare or observation:

Test 7) Connect a sensor to the grey cable carefully observing the colour codes (see the sensor information sheet). Select calibration figure(s) 009. Switch on the Retrotrip. Rotate the sensor mechanism (or for a wheel sensor touch a steel object onto the tip of the sensor many times). See the counters click over. Indicate 'Good' or observation:

Test 8) If all the above tests are 'Good' Try the meter on another car. Indicate 'Good' on the other car, or observation:

Note that testing can not be done reliably when connected to a battery charger, as the current is not smoothed.

**RETROTRIP : TEST DE BON FONCTIONNEMENT** Test 1 : Regardez si la batterie est en 12V ou en 6V. Si elle est en 12V, passez au test 2. Si elle est en 6V, testez le Rétrotrip avec une batterie d'appoint de 12V connectée SEULEMENT au Rétrotrip. Test 2 : Vérifiez que l'alimentation du Rétrotrip soit bien directement amenée depuis les DEUX bornes de la batterie, sans passer par le tableau à fusibles (positif) ou le châssis (masse). Test 3 : Si le Rétrotrip est muni de connecteurs installés par l'utilisateur, en particulier des connecteurs sertis, poussez et tirez doucement puis plus fermement sur ces derniers afin de vérifier leur maintien. Soudez-les quand cela est possible, ou utilisez des connecteurs vissés. Test 4 : Test d'interférence : ce problème est relativement fréquent lorsqu'un faisceau d'allumage fait maison a été monté, mais cela peut aussi venir d'un alternateur ou d'appareil électrique défectueux (pompe à essence, klaxon, essuie-glace, ...). Prenez une radio portable, sélectionnez la bande AM (et exques secondes, les compteurs vont s'incrémenter d'eux-mêmes, simulant ainsi une longue distance parcourue, aussi longtemps que le contact sera laissé. Si le fonctionnement est correct lors de ce test, le problème vient très certainement de la voiture ou de l'installation. Test 5 : Raccordez le Retrotrip 2 à une batterie chargée (pas besoin du capteur). Placez les commutateurs rotatifs de calibrage sur 000. Mettez sous tension. Notez que l'affichage avance d'un demi pas. Au moins de huit secondes, mettez les commutateurs rotatifs de calibrage sur 888. Après quelques secondes les chiffres commencent à défiler d'eux-mêmes en groupes de huit, temps que l'on est sous tension. Cela permet de simuler de grandes distances sur le banc d'essai. Test 6 : Si le Rétrotrip ne fonctionne pas normalement durant le test 5, connectez directement l'alimentation du Rétrotrip à une batterie 12V autre que celle de la voiture, puis répétez le test 5. Test 7 : Connectez un capteur au câble gris en observant le code couleur (voir feuille d'information sur les capteurs). Sélectionnez le chiffre de calibrage 009, puis allumez le Rétrotrip. Faites tourner le mécanisme du capteur (ou, pour un capteur sur roue, touchez un objet métallique sur l'extrémité du capteur plusieurs fois) : les compteurs doivent s'incrémenter normalement. Test 8 : Si tous les tests ci-dessus sont bons, testez l'appareil sur une autre voiture. Si l'appareil ne marche toujours pas, le problème se situe dans l'appareil. NOTE : Ces tests ne doivent pas être faits avec un chargeur de batterie, car le courant n'est pas assez régulier. Si on suspecte que le fonctionnement, soit de la roue, soit du capteur du tachymètre est défectueux (par ex. le Tripmeter n'augmente pas pendant les déplacements, on peut tester la sortie du capteur avec un voltmètre (la tension varie avec la rotation de la roue ou du capteur. Autrement, on peut vérifier que le Tripmeter marche bien avec le test suivant qui doit respecter scrupuleusement l'ordre que voici: a) Eteignez le compteur. b) Débranchez les trois connecteurs poussoirs du câble gris vers le capteur. c) Dégagez les manchons d'isolation des fils bleu et vert du câble gris cité sous b). Mettez-les à l'abri de tout contact avec quoi que ce soit. d) Calibrez le Tripmeter à 001. e) Allumez le Tripmeter. f) Remettez tous les boutons à zéro. g) Tapez les connecteurs des fils vert et bleu plusieurs fois l'un contre l'autre. Le Tripmeter doit augmenter. S'il augmente mais qu'il ne le fait pas pendant les déplacements normaux alors que le capteur est raccordé, c'est que le capteur a en effet été endommagé et que le Tripmeter est toujours opérationnel. Le Tripmeter peut aussi être victime d'une autre fausse manoeuvre s'il piétine alors que le moteur tourne, s'il se remet à zéro tout seul, si l'affichage s'allume et s'éteint de lui-même. En supposant que l'alimentation électrique est fiable (essayez d'alimenter le compteur directement à partir d'une batterie indépendante posée provisoirement du côté passager), il faut suspecter de fortes interférences radio provenant du raccordement H.T. des bougies installé artisanalement. Ceci arrive souvent sur les véhicules de collection. Remplacez ces câbles par des pièces standard que vous trouverez dans un magasin d'accessoires. Il est facile de détecter les interférences avec une radio sur le canal de modulation d'amplitude AM (important). Quittez les stations pour une fréquence tranquille, montez le volume puis démarrez le moteur. Ecoutez si vous entendez des claquements. Ce sont des interférences auxquelles il faut remédier car elles sont beaucoup trop fortes pour être protégées par un blindage quelconque, etc. Habituellement, les véhicules provoquant des interférences ne passent pas à travers le crible de l'inspection préventive.

Buenos días, Yo entiendo que usted ha tenido dificultades con la instalación de su Retrotrip. Para que nosotros podamos ayudarle, por favor realice las siguientes pruebas e indique en cada una de ellas como "OK" o explique la observación si no funciona. Remítalo por Fax al +44 1625 669366 y nosotros le responderemos. Test 1) Compruebe si la batería es de 12 voltios o 6 voltios. Si es de 12 voltios vaya al Test 2. Si es de 6 voltios compruebe el Retrotrip conectando temporalmente una batería de 12 voltios sólo al Retrotrip. Observaciones: Test 2) Compruebe que la electricidad deriva directamente desde los terminales de la batería, no del panel de fusibles, etc. o masa, etc. Indica "OK" u observaciones: Test 3) Si al Retrotrip se le han instalado conectores, especialmente fichas macho-hembra, compruebe bien esas conexiones volviéndolas a enchufar firmemente. Donde sea posible, suelde esas conexiones o utilice conexiones de atornillar. Indica "OK" u observaciones: Test 4) Test para interferencias. Este es particularmente común cuando se han utilizado cables HT de bujías, pero pueden venir de alternadores dañados, o bombas de gasolina/bocina/limpiaparabrisas, etc. Si la interferencia está presente se debería utilizar algún aislante o conductos de silicona nuevos. Tome una radio portátil, seleccione la banda AM (importante) y gire el dial entre dos emisoras. Suba el volumen y encienda el vehículo. Escuche los clicks. Eso es interferencia. Compare el vehículo con un coche normal como guía para lo que es aceptable. Intente con otros accesorios del vehículo localizar intermitentes señales del problema. Indique "OK" u observaciones: Test 5) TEST PARA LOS MODELOS MAS RECIENTES (posteriores a Mayo 1999): Conecte el Retrotrip a una batería con carga (sensor no es necesario). Ponga los dígitos de calibración en 000. Enciéndalo. Tome nota que las pantallas de lectura pueden girar media vuelta. Dentro de 8 segundos de haberlo encendido (Importante: 8 segundos no es un tiempo muy largo!!!), cambie todos los dígitos de calibración a 888. Después de unos pocos segundos, los contadores empezarán a girar en grupos de 8 mientras esté conectado. Esto permite la simulación de grandes distancias como prueba. Si todas las funciones anteriores son correctas, entonces ningún problema debería ser con el coche y/o con la instalación. Indique "OK" u observaciones: Test 6) Si falla el Test 5, conecte los cables del Retrotrip directamente a una batería de 12 voltios que no esté conectada a su coche. Repita el test 5. Indica "OK" u observaciones: Test 7) Conecte un sensor al cable gris cuidadosamente observando los códigos de colores (ver la hoja de información del sensor). Seleccione los dígitos de calibración en 009. Encienda el retrotrip. Gire el mecanismo del sensor (o para un sensor de rueda toque con un objeto metálico en el extremo del sensor varias veces). Los contadores debe avanzar. Indique "OK" u observaciones. Test 8) Si todos los test anteriores son "OK" intente probar el retrotrip en otro coche. Indique "OK" en el otro coche u observaciones: Tenga en cuenta que estos test pueden no ser fiables cuando están conectados a un cargador de batería.