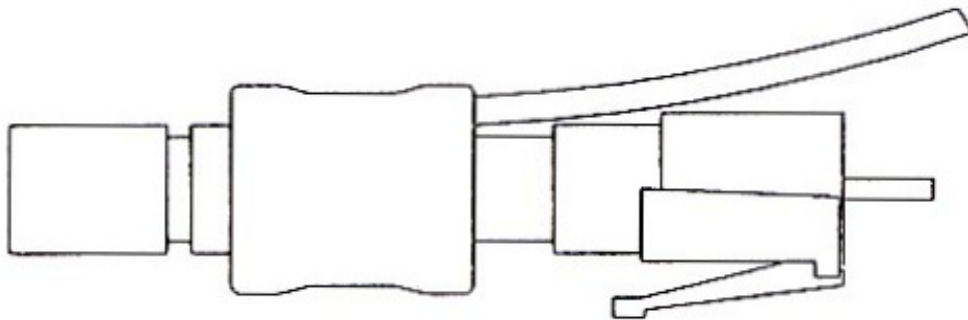
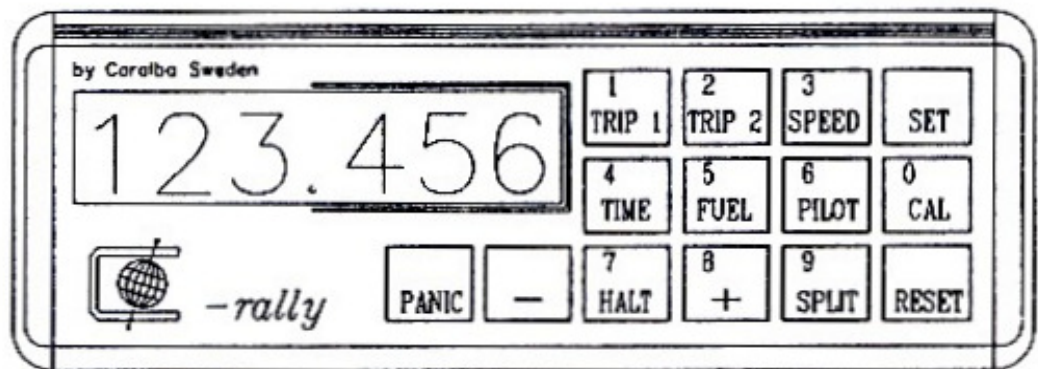



-rally



IMPULSER

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INSTRUCTIONS FOR C-rally

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Edition: 900502-2

1 GENERAL

C-rally is used for measurements during rallies. It is an indispensable instrument for the professional co-driver. The instrument is developed after lots of years of experience of the special needs in his stressed situation. Therefore C-rally has all the functions that will make a co-driver perform his duties **RAPIDLY, SECURE and EFFICIENT**.

It has basically distance- and speedometer for the car. As an option it has an automatic function for measuring special stages (SS-measurement) showing length, time and average speed on SS. Furthermore correct time and delay in respect to the scheduled time is shown. The precision of the instrument is reached by an effective but simple calibrating procedure. After being calibrated C-rally is showing correct values to a tolerance typically better than 0,03%.

As an option C-rally can work as a precision instrument for the fuel by just connecting the instrument to the standard fuel gauge of the car and calibrate it in a simple way.

A complete set of C-rally consists of:

- * instrument
- * cables
- * fastening device
- * impulser with a universal mounting kit
- * documentation

NOTE! In some cases the universal mounting kit is substituted with special adapters for the impulser.

Check before the mounting starts that you have the correct parts for your car.

2 FITTING C-rally

2.1 FITTING THE INSTRUMENT

Fitting the C-rally into the vehicle is extremely simple. First you have to fit the instrument itself. Fitting of C-rally in the vehicle compartment can be done in two different ways:

- C-rally is fastened with its bracket through the pivoting ball.
- The instrument is fastened with double adhesive tape or similar.

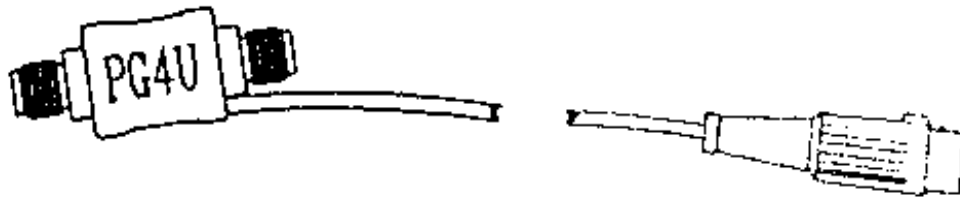
2.2 FITTING THE IMPULSER

The impulser may be of different types:

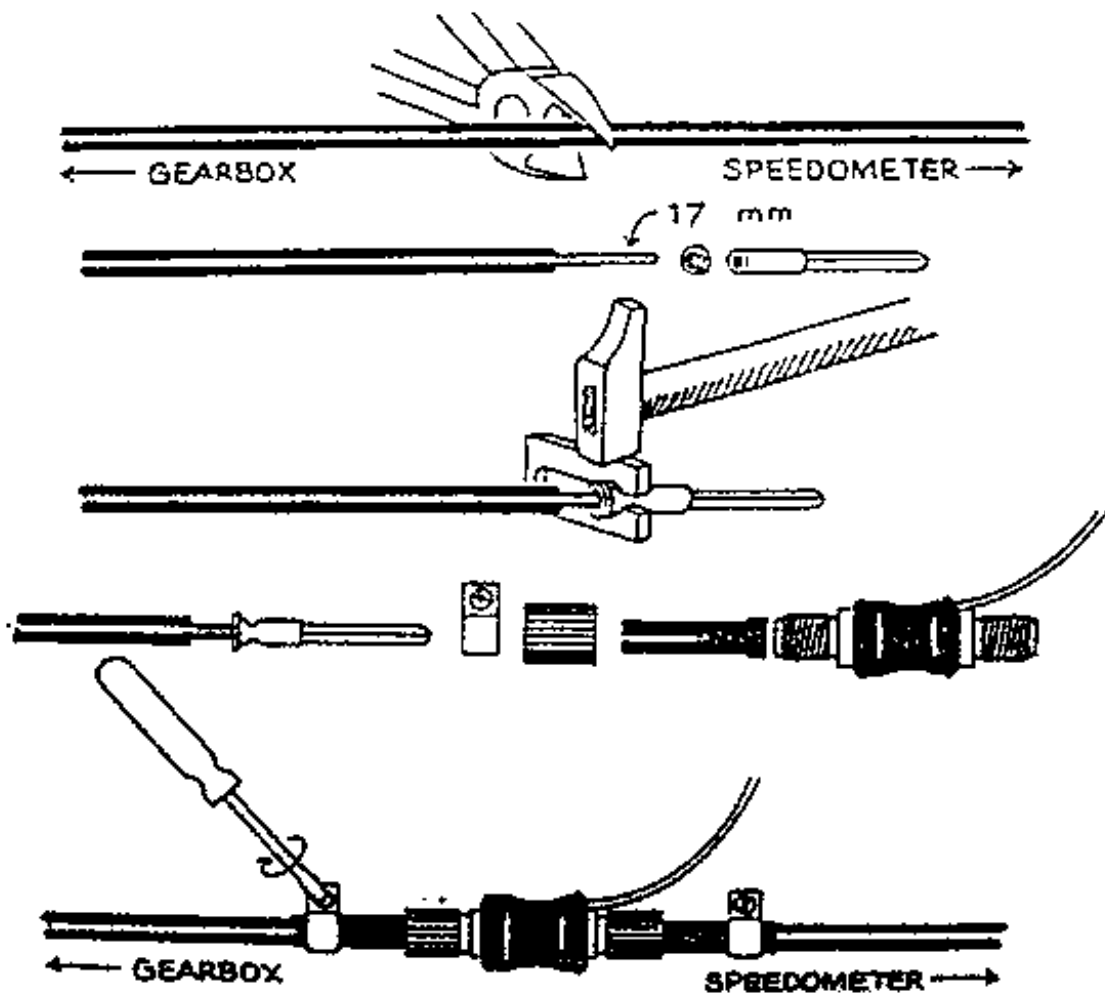
- Rotating impulser with universal mounting kit (PG4U)
- Rotating impulser with special fittings (PG4S..)
- Interface for a car with electronic speedometer (PGE-..)
- Proximity switch impulser (PGI)

Depending of what type is required for your car it is fitted in different ways.

2.2.1 Fitting PG4U



This impulser is fitted on the original speedometer cable by cutting it into two pieces and connecting the two parts together with the impulser. Select a place on the speedometer cable where it is fairly straight and cut away a part from it about as long as the length of the impulser. The cutting is preferably done after having unfitted the speedometer cable from the car. The position of the cut should preferably be at a place so that the impulser is mounted on a place where it isn't exposed to water or oil.

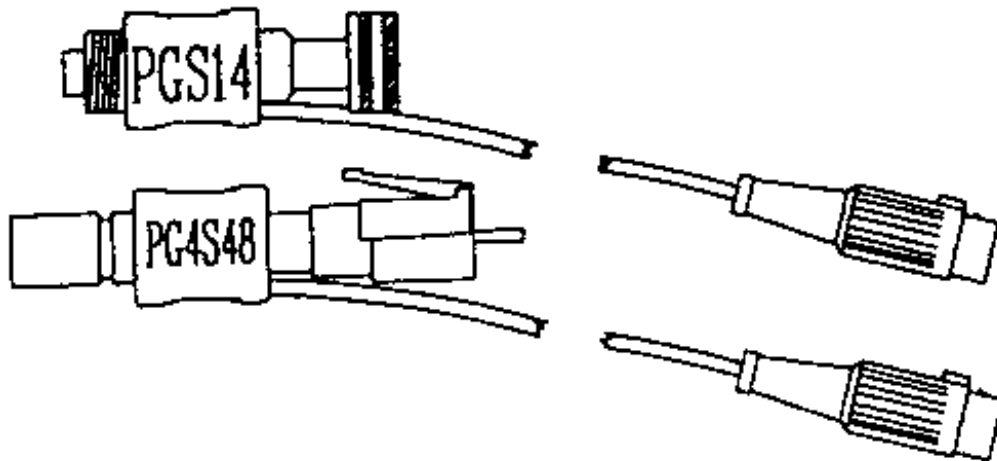


NOTE that the cable coming out from the impulser must be facing against the speedometer.

When removing the impulser from the vehicle you may replace it with a cable repair kit instead of changing the speedometer cable. The cable repair kit may be ordered from Coralba.

2.2.2 Fitting PG4S..

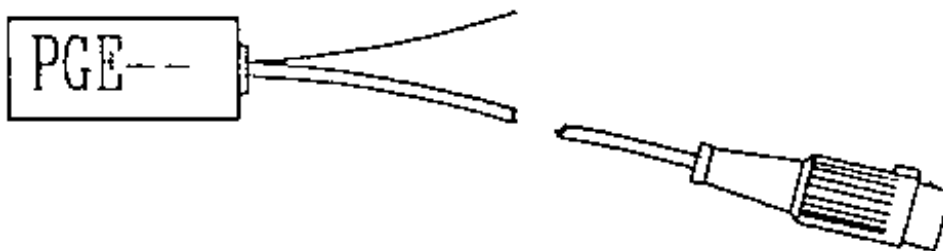
This impulser is equipped with special adapters to fit directly on the speedometer of your car. Just remove the speedometer cable from the speedometer and adjust the length of the connecting pin so that the impulser will fit directly against the speedometer. Connect the speedometer cable to the other end of the impulser. In some cases there is so little space left behind the speedometer that an extension cable is needed between the speedometer and the impulser. If not delivered it may be ordered from Coralba.



NOTE!! There must not be any grease or whater in the impulser.

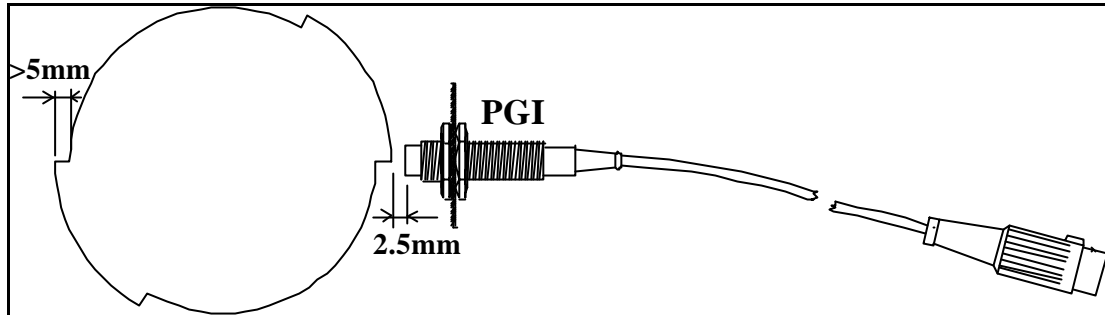
2.2.3 Fitting PGE..

This interface is connected to the original impulser of your car according to a separate instruction.



2.2.4 Fitting PGI

The proximity switch impulser is sensitive to metal at its end. Fit the impulser so that it senses the flags when the car is running. It is to be mounted so that it will sense between 1 and 100 flags per 10 m. At least one flag per meter is preferable. Flags made of iron will give maximum sensing distance (typical value: 10 mm). The optimal ratio between size of flag and window is to have the window twice as big as the flag. Don't tighten the impulser too hard as the material is rather thin at the end.



Check the indicating light at the impulser to measure the maximum sensing distance. Adjust the impulser to half of this space. Check that it senses all your flags by watching the indicator while turning the wheel.

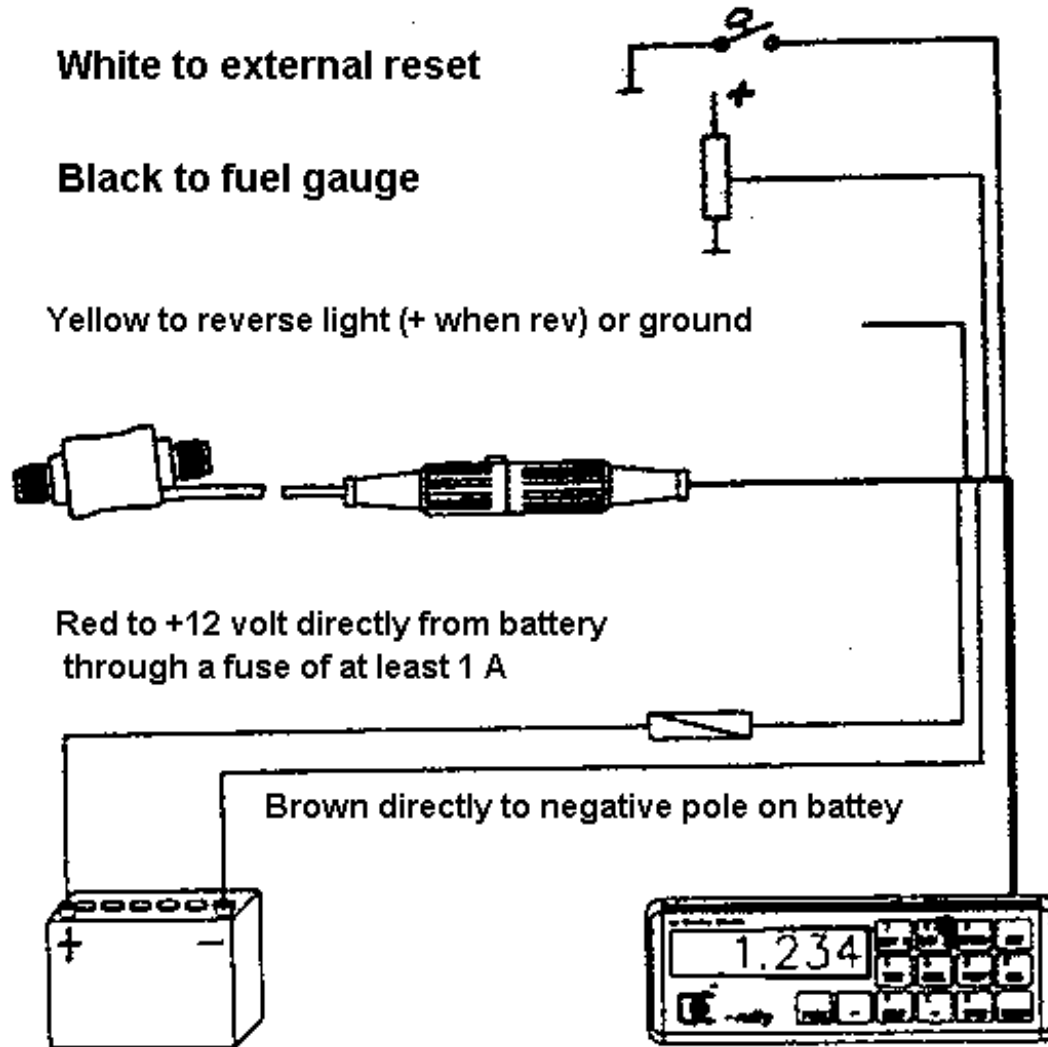
2.3 ELECTRICAL CONNECTIONS

Make sure great care is taken in connecting C-rally as damage may occur to the unit if it is connected incorrectly. The system should have negative ground.

- Red cable (power) is connected to +12 volt directly from battery through a fuse of at least 1 A.
- Brown cable is connected to negative pole directly on battery.
- Yellow cable is connected to a reverse light so that the trip will be supplied with +12 volt when the car is driven reverse. If this is not possible the yellow cable must be connected to ground.
- White cable may be connected to a reset button. TRIP1 is resetted to zero when the cable is connected to ground even if its value is not shown in the display. No other register is influenced by this.
- Black cable is connected to the fuel gauge if the instrument has the fuel option.

Make sure all connections are done professionally. The cables should be fastened to avoid damages. Most disturbances in function that occur depend on improper connection of the power supply.

After having carried out these functions simply connect each part together and you will be ready to use C-rally.



When the trip meter is connected it must be calibrated. See section 5.8 CALIBRATE C-rally, DISTANCE (CAL).

3 SAFETY ASPECTS

Safety aspects concerning fitting of accessories inside a car must be taken in to account when fitting C-rally. The instrument must be fitted in a way that follow applicable laws and regulations and so that the risk of damages in case of an accident is minimized.

4 FUNCTION

A basic philosophy for C-rally is that you do not influence any other register in the instrument than the one that you see in the display by pressing any of the keys. The register in the display is called the current register. While pressing a key to select a new register the display shows a flash text telling what the current register will show next. When the instrument is not in use it is automatically switching itself into an idling mode where the display and the keyboard are totally unlit. When operating the instrument or running the car it is automatically turned on again.

C-rally has the following functions:

- * Two trip meters, TRIP 1 and TRIP 2. The trip meters have a resolution of 1 meter and individual:
 - Positive counting direction (+).
 - Negative counting direction (-).
 - HALT stop of counting.
 - SPLIT will freeze all registers.
 - SET for the preset and correction arithmetic.
 - RESET will reset the register to zero.
 - Automatic reverse function makes the trips counting in contrary direction when reversing the car.

- * SPEED is a digital speedometer.
- * TIME is a time measuring register that may be used as a stop watch or as a ordinary watch.
- * PILOT indicates time delay or time ahead of scheduled time.
- * CAL is a calibrating function to make the instrument show correct values.
- * Remotely controlled RESET will reset TRIP1 to zero.
- * TRIP 2 has automatic SS-measurement (option).
- * FUEL may indicate fuel left in tank (option).

A short description is given for every key on the key board. A more detailed description will follow. Those keys that have both text and a figure have double function. They switch over automatically when a number is to be fed into the instrument.

TRIP 1, TRIP 2

Registers with a resolution of 1 meter. Press appropriate key to select and see value and to change its function.

Flash text

(...1...) and a led indicator

shows that the function is selected. TRIP 2 has as an option also a function for automatic SS-measurement. See section 5.2.

Selectable keys: SET, CAL, -, HALT, +, SPLIT, RESET.

SPEED

SPEED shows the speed of the vehicle. Flash text (.SPEED.) and led indicator show that the function is selected.

Selectable keys: SET, SPLIT.

SET

SET is used to start an input of a value to the register that is shown in the display.

SET may be used together with TRIP 1, TRIP 2, SPEED (for pilot),

TIME, PILOT, CAL (for trip, time and fuel)

SET is also used for the correction arithmetic, that is if you want to change a register with a certain value. This function may be used together with TRIP 1, TRIP 2, TIME and PILOT.

Selectable keys: numeric keys, -, RESET.

TIME

TIME may act as a stop watch or an ordinary watch. It can count forwards and backwards. Flash text (.Hr..) and led indicator show that the function is selected.

Selectable keys: SET, CAL, -, HALT, +, SPLIT, RESET.

FUEL

FUEL shows amount of fuel left in the tank. It may be calibrated to the standard fuel gauge of your car. Flash text (.FUEL.) and led indicator show that the function is selected. This function is an option.

Selectable keys: CAL.

PILOT

PILOT shows your time ahead or delayed in respect to the scheduled average speed. Flash text (.PILO.) and led indicator show that the function is selected.

Selectable keys: SET, -, HALT, +, SPLIT, RESET.

CAL

CAL may be used when TRIP 1, or TRIP 2 is selected to show current CALIBRATING CONSTANT. Flash text (.CALdiS) and led indicator show that the function is selected. The constant may be changed with the SET function.

Selectable keys: SET.

The CAL function can also be used when TIME is selected. Then it will calibrate the time counting. Flash text (.CAL-Hr) and led indicator show that the function is selected.

Selectable keys: SET, -, +, RESET.

If CAL is used when FUEL is selected a sequence is started that will calibrate the FUEL function. Flash text (.CALFUE) and led indicator show that the function is selected.

Selectable keys: SET, numeric keys, RESET.

PANIC

PANIC will reset the instrument to a defined status. This function must not be used as a normal resume function but as an emergency action if you must abort a started sequence.

NEGATIVE (-)

NEGATIVE counting direction (-). Press the button to activate. Led indicator shows that the function is selected.

NOTE! ! This function influences only the register that is currently shown in the display. This function may be used together with TRIP 1, TRIP 2, SET, TIME, PILOT.

HALT

HALT will stop the current register from counting. This function is also used to add several intervals. Other is like (-) above.

POSITIVE (+)

POSITIVE counting direction (+), Other is like (-) above.

SPLIT

SPLIT will freeze all registers values simultaneously permitting later inspection. Press the button. Led indicator show that the function is selected. This function may be used together with TRIP 1, TRIP 2, SPEED, TIME, FUEL, PILOT, SS-time, SS-speed.

RESET

RESET will set current register to zero. This function may be used together with TRIP 1, TRIP 2, SET, TIME, PILOT.

5 OPERATION

5.1 DISTANCES MEASUREMENT (TRIP 1 AND TRIP 2)

When measuring DISTANCES C-rally has got two registers for this purpose, TRIP 1 and TRIP 2. They may be used individually with separate counting directions plus (+) or minus (-) and even HALT that stops current register. SPLIT freezes values of all registers. If the measurement is to be done in the negative direction you just press the (-)-button. The reverse function makes the trip meters automatically switch counting direction when going reverse with the vehicle.

Preset.

If you want to start measuring from a point at a known distance it is easy to set that value into a trip register. Select the trip to be used (TRIP 1 or TRIP 2), press the SET button and feed the value with the numeric keys 0 - 9. The input is terminated with the SET key. If you change your mind it is possible to get the original value by pressing RESET in stead of SET. Now your measuring starts from the set distance. If the measurement shall start from a negative value the figures must be preceded by a minus sign.

Align trip to road book

The registers may also be adjusted with an arbitrary value. See section SET. If a junction is passed at km 43.67 according to the road book but the trip shows a different value then it is easy to adjust the trip very accurate without stopping the car. Reset the trip at the junction. Carry on driving and press SET and input the desired value (43670) with the numeric keys. Finish the input with (-). When you terminate the input with the (-) key that means that the current value is to be adjusted with the input value. The result is that the measurement takes place from the junction with the correct value.

5.2 AUTOMATIC SS MEASUREMENT (OPTION)

This option is a great relief for the co-driver at the start and finish of special stages. By just resetting TRIP 2 the automatic measurement of the length, time and average speed of a special stage is initiated. The measurement will start automatically when the car is driven the first meter. That is when TRIP 2 shows its first meter a watch is started and from elapsed time and traveled distance the average speed is calculated continuously. At the finish of the stage you just press SPLIT and can then read the different values by pressing TRIP 2 repeatedly.

Action	Flash text	C-rally shows	Showed format
TRIP 2	...2...	Value of Trip 2	xxx.xxx
TRIP 2	.SS-Hr.	Time of SS	xx.xx.xx
TRIP 2	A.SPEEd	Average speed	xxx.x

This watch is not possible to control any other way than by the reset of TRIP 2.

5.3 SPEED MEASUREMENT (SPEED)

If you want to see your current speed, simply press SPEED. The speed can be read in km/h or mph depending how you have calibrated the unit. The value of the speed is frozen by SPLIT in the same way as for all other registers in the instrument. SPEED is also used to feed desired speed for the PILOT to work with. See section MONITORING AVERAGE SPEED (PILOT).

5.4 SET

As mentioned previously SET is used to set any register to a desired value. The register to be set is selected by pressing appropriate key and thus make it visible in the display. To set the value simply press SET and you will see the figures in the display flash. This indicates that by using the numeric keys you may enter a new value. A negative value may entered by preceding the value with (-). The input is finished by pressing SET again. The value is visible in the display.

NOTE! if for any reason you wish to retrieve the original value - say if you made a mistake simply press RESET instead of the SET-key.

Adjust value (correction arithmetic).

The correction arithmetic will adjust the current value of a register with an input value. This is done as if the value was to be set but the input is ended with a minus sign (-) in stead of ending with the SET button. Then the fed value is added (including a preceding minus sign if so is) to the current register. If the register is to be decreased a minus sign (-) is fed in as a first sign in the value.

Align trip to road book

Example: You pass a junction at km 34.98 and you want to align C-rally to that value. In the junction you press RESET and carry on without any stop. Then you press SET, 34980, - and your input is added to the current value of the trip whatever the distance you have traveled in the meantime. So the trip is aligned to the road book in the junction at km 34.98.

5.5 TIME MEASURING (TIME)

The watch may be used as an ordinary watch or a stop watch. It may stop (HALT), count up (+), down (-), freeze value (SPLIT), set or adjust value (SET) in the same way as for TRIP above.

Set time:

Action	C-rally shows
Press TIME (select TIME register)	Current time
Press SET (start input of value)	Current time flashes
Set time with numeric keys 0 to 9	New time
Press SET (store with SET-key)	New time

If the watch is running too fast or slowly it is possible to calibrate it. See section CALIBRATE C-rally (TIME).

5.6 FUEL GAUGE (FUEL), OPTION

If the instrument is equipped with the option for fuel measuring this function will give information about the amount of fuel left in the tank. In about one minute after the power is switched on it will show correct value. It must be calibrated before it is used. See section CALIBRATE C-rally (FUEL).

5.7 MONITORING AVERAGE SPEED (PILOT)

The Pilot is a useful tool to monitor your actual position in respect to the scheduled time. This is important when the road sections are long or some service is required on the car. By storing the required average speed into the SPEED register the time gained or time delayed is read in the PILOT register. The sequence is:

Store required average speed:

Action	C-rally shows
Press SPEED (select SPEED register)	Speed of vehicle
Press SET (start input of value)	Current PILOT-speed flashes
Set average speed with numeric keys	New PILOT-speed
Press SET (store with SET-key)	Speed of vehicle

Set PILOT register to its start value with:

	Action	C-rally shows
Press PILOT (select PILOT register)		Time gained or delayed
Press SET (start input of value)		Current time gained or delayed flashes
Set start value with numeric keys 0 to 9 (RESET will give zero)		Start value
Press SET (store with SET-key)		Current time gained or delayed

Set the counting direction of the PILOT register to desired counting direction with (+), (-) or HALT. NOTE!! These three keys only have an impact on the measuring of distance in the PILOT, not on time.

The PILOT calculates continuously the time gained or time delayed in respect to the stored average speed. If you are delayed the result is shown with a "-" in front of the time value. The format of the result is hour.min.sec.

5.8 CALIBRATE C-rally, DISTANCE (CAL)

To enable the C-rally to measure accurately it must be calibrated. The dimensions of tires and transmission ratio influences the performance. Therefore it is important to calibrate C-rally if tires or transmission ratio is changed.

First you need to know the exact distance of your calibrating distance (this may be any value but for best results it should be in excess of 0.999 km or 0.999 mile). If you do not have access to an exact distance the local police force are usually quite prepared to advise you a number of sites.

Procedure	C-rally shows
Press TRIP1 or TRIP2	Selected TRIP meter
Press CAL (ignore on first occasion)	Current calibrating constant
Press SET (start input of value)	Display flashes
Enter known length (xxxx)	The calibrating distance (xxxx)
Press SET (store with SET-key)	The calibrating distance (XXXX)
Press TRIP1 or TRIP2	Selected TRIP meter
Press RESET (reset TRIP register)	0

Note.

You must select the (+) mode and should not press the 'SPLIT' button.

Drive the calibrating distance.

Stop at the end of it and read your new calibrating constant in the display.

Note it down on a piece of paper. The new calibrating constant

You can now store the calibrating constant by carrying out these instructions:

Procedure	C-rally shows
Press TRIP1 or TRIP2	Selected TRIP register
Press CAL	Calibrating constant for trip
Press SET (start input of value)	Flashing calibrating constant for trip
Enter calibrating constant you have noted down	New calibrating constant
Press SET to store	New calibrating constant.

You have now calibrated your C-rally. The speed shown will be in the same mode as the C-rally was calibrated i. e. km or miles.

If the calibrating sequence has been carried out correctly and the distance used for this calibration was correct you will usually be able to measure to an accuracy better than 0.03% (30 cm/km).

Check the accuracy by traveling over your calibrating distance whilst measuring its length. If all factors are correct the length should correlate exactly.

PLEASE NOTE.

The calibrating constant is usually a four figure number.

Even if C-rally is disconnected from the power supply it will keep its calibrating constant in memory. Note the calibrating constant on a piece of paper together with information about current transmission ratio and tires. Then you don't need to drive to get the instrument calibrated next time you use the same configuration.

5.9 CALIBRATE C-rally (TIME)

It is possible to calibrate the time measuring in C-rally by selecting TIME and then CAL. Use (+) and (-) to set the number of seconds you want to change the time over every period of 24 hours. When correct number is set you must store value with SET. To resume without changing - use RESET before SET.

Now C-rally is calibrated. Even if C-rally is disconnected from the power supply it will keep its calibrating constant in memory.

5.10 CALIBRATE C-rally (FUEL)

To calibrate the fuel gauge you must first of all select FUEL and check if its uncalibrated value is different when the engine is running compared to when it is stopped. If the values are different C-rally should be calibrated with the engine running. Start with the fuel tank almost empty. Then the amount of fuel in the tank must be stored in C-rally at the same time as it is filled up. This is done five times when filling up. Note that a lot of gauges give a constant signal from empty tank to about five liters. It depends on the fact that the floater needs a certain lever to float. This causes the C-rally to give a constant value.

Select FUEL and then CAL. To the left in the display is shown the figure "1" flashing (the first value is to be fed) and to the right in the display is an other flashing number. Now you must feed the present amount of fuel in the tank. As it is almost empty you input "0". Confirm with SET. Then the figure "1" changes to a flashing "2" (second point to calibrate). Fill about 10 litres and feed in "10". Press SET. A "3" is flashing (third point). Fill about another 15 litres and feed "25". Press SET. This is repeated until the tank is full and the fifth point is stored.

Action	C-rally shows
Press FUEL	uncalibrated amount of fuel
Press CAL	1 xx flashes
Input current amount of fuel in the tank. As the tank is almost empty you feed a "0"	0
Press SET	2 xx flashes
Fill about ten litres. Feed the current amount of fuel in the tank (10)	10
Press SET	3 xx flashes
Fill about another fifteen litres. Feed the current amount of fuel in the tank (25)	25
Repeat until the tank is filled up and all five values are stored.	

Now the fuel gauge is calibrated. Even if C-rally is disconnected from the power supply it keeps it calibrating constant in its memory.

5.11 SPLIT

This function is used when measuring to a point whilst driving without stopping the counting. SPLIT freezes all registers in the instrument so that they may be selected afterwards to be read. Next press on SPLIT will unsplit the instrument and actual values may be read. SPLIT works in the same way for distance, time, pilot and speed.