DIGATRON

ENGINE MONITORING SYSTEMS

DT-40K

INSTRUCTION MANUAL

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Digatron's DT-40K Instruction Manual

Introduction

Congratulations on the purchase of your new DT-40K. The DT-40K is Digatron's small, easy to use, multi-function, digital engine monitoring system. This instrument was designed for the customer who wants to know how their engine is functioning without spending a lot of time and money. Depending on which version of this instrument you purchased, it can monitor any combination of the following functions: cylinder head temperature (CHT) or water temperature (WT), exhaust gas temperature (EGT) and tachometer (Tach). It datalogs all of these inputs, along with lap times. Lap times can be stored manually or with a beacon (both optional). All of this information can then be played back on the DT-40K.

Included with your instrument is a simple instruction sheet that allows you to quickly install and use your Digatron DT-40K. The instructions in this booklet are more detailed to help you learn all of the capabilities of your new instrument.

Sensor Installation (General)

These instructions cover all the sensors that can be used with the DT-40K. Some may not pertain to your particular model.

- **Tach Sensor:** Must be hooked up for instrument to work correctly.

- **Temperature Sensors:** If not used, use a shorting plug.

- **Timing Input, White Boot:** Use receiver and beacon or manual switch. It is okay to leave this input open.

Tach and temperature inputs that are left open can cause erratic readings and possible instrument damage.

Sensor cables that run from the engine compartment to the instrument should always be routed as far away from the ignition system components as possible (plug wires, spark plugs, ignition coils, distributor or magneto). Sensor cables too close to these components may pick up radiated electrical interference and cause erratic instrument readings and operation. A distance of at least 6˝ from these components is desirable in all installations.

When routing sensor cables through any panels, be sure to use a rubber grommet to keep the cables from being cut by a sharp edge. It is also good practice to protect all of the sensors with a short piece of fuel line at any point that the cable may rub against a hard surface.

If any of your cables are too long to route back to your instrument fully extended, we recommend sending your sensors back to Digatron to be cut to the appropriate length for your needs. You can also coil them each separately. If you do coil your sensors, keep the coils away from the engine.

For detailed information about installing each sensor, see Appendix A.

Electrical Interference

If the instrument encounters excessive electrical interference it will display ERR on the left side of the display. (see Fig. 8) This indicates that the stored data might be invalid. Press the *Function* button, then turn the instrument off for 30 seconds. After turning the instrument back on, check that it is working properly. If it is not, turn the instrument off and back on again. Immediately after turning the instrument on, press the ← and the *Max/Event* buttons to reset the instrument. When the display flashes PrS PLA, press the *Play/Pause* button. The error should now be cleared and memory is erased.

Fig. 8

An instrument displaying EGT that has encountered electrical interference. Shown by the ERR annunciator

EGT 1268
ERR

The ERR annunciator can also indicate an incorrect instrument or sensor installation. Severe electrical interference can cause the limits and calibration to reprogram themselves. If your instrument is doing strange things, put it in Set Limits and check to see that the limits and calibration are still where you set them. (see Appendix B)

Electrical interference problems can normally be solved by installing a resistance plug boot. We recommend using an NGK boot, # LB05EMH.

To avoid erratic readings:
- Keep your temperature and Tach leads separated by at least 3˝. Do not wrap leads together, this can induce interference into the system.

- Route the leads as far away from the coil as possible.

- Install the Tach lead on the plug wire at least 2˝ back from the plug boot. If you still have a problem, try a different location on the plug wire.

- Running your leads through separate sections of fuel line will protect them from cuts and abrasions, but will *not* shield them from ignition generated interference.

- Be sure that *all sensors* are connected to the instrument, and that all connectors fit together snugly. Any functions not being used must have a plug on the pigtail.

Please contact Digatron if the problem continues.

Power On
There are two ways for your instrument to be powered on:
- The unit will turn on and begin recording automatically when the engine is started.

- The unit can be turned on with the *Exit/Power* button before the engine is started. It will then begin recording when the Lap switch is pressed or it passes a beacon (if you are using a receiver). Also, when the engine is running, the *Exit/Power* button can start and stop recording.

Display Resolution
When the instrument is powered on, the display is in high resolution.

- To change the display resolution, press the ← and the → buttons at the same time.

High Resolution:
- Highest number displayed is 1:59.9
- After that time, the instrument continues to record, and the 1 on the left of the display toggles every other minute.

Low Resolution:
- Highest number displayed is 19:59
- The instrument continues to record after this amount of time and the 1 on the left of the display toggles every 20 minutes.

Setting Limits and Calibration Number
Before using your DT-40K, be sure to set the operating limits for each input. Limits allow the instrument to give you a visual warning (the display flashes) if any of the inputs exceed their limit.

For detailed information on setting limits see Appendix B.

Monitoring and Recording

When your instrument is powered on, it is monitoring your engine functions and ready to begin recording.

The instrument will visually warn you, by flashing the display, if your engine exceeds any of it's set limits. These limits allow you to avoid engine damage. You can make quick tuning adjustments to your engine that allow you to run safe and fast.

Recording information is very simple and once you have started recording, you can change what function is being displayed. Laps are recorded manually with the Lap switch or automatically when a beacon is passed, if you have a beacon receiver and transmitter.

Note: The memory of this instrument holds 35 minutes of information. After that amount of time, the instrument will keep recording and begin writing over the oldest previously recorded data.

- **Change Function Displayed:** Press the *Function* button to change what is being displayed. It cycles through the functions in this order: CHT/WT, EGT, RPM, Lap # and Lap Time. (Not all instruments have all of these functions.)

- **Stop Recording:** Press the *Exit/Power* button, or turn your engine off, to stop recording and end the current Event.

- **Backlight:** The backlight is used to illuminate your display for use at night. Press the ← button to toggle the backlight on or off. The backlight can only be turned on or off while in Monitor/Record mode.

- **Maximums:** The *Max/Event* button is used to display the maximum reading for each engine function and the Event number in progress.

    1. If the instrument is displaying an engine function and you press the *Max/Event* button, it will display the maximum reading for that function since the instrument was turned on.
    2. If the instrument is displaying Lap # (display shows L and two or three numbers, see Fig. 4a) and you press the *Max/Event* button, it will display the current Event number. (display shows E and two numbers, see Fig. 4b)

Fig. 4a

Display showing lap# 23

L 2 3

Fig. 4b

Display showing event # 6

E 0 6
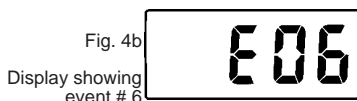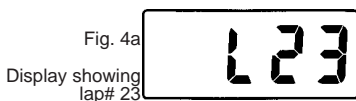
Begin Recording

There are three ways to begin recording data:

1. Starting the engine while the instrument is turned off, automatically starts the instrument and begins recording the Event.

2. Manually turn the instrument on with the *Exit/Power* button before the engine is started. Press the Lap switch or the *Exit/Power* button to begin recording. (The instrument must be receiving a Tach signal to begin recording with the *Exit/Power* button. If it does not have a Tach signal, pressing this button will turn the instrument off.)

3. Manually turn the instrument on with the *Exit/Power* button before the engine is started. When the vehicle passes a beacon, the instrument will begin recording, if you have a beacon receiver on your vehicle.

Information about Recording

When the instrument is recording, it can ignore multiple beacons on the track. After receiving a signal, the instrument will ignore any other beacon signal for the number of seconds entered in Set Limits (see Appendix B). After the number of seconds has passed the instrument will register the next beacon signal it receives and then begin ignoring again.

When you finish a lap, while the instrument is recording, it will display the total time for the last lap for three seconds, before returning to the previously displayed data. If you are displaying Lap Time while recording, the instrument will continuously display the time of the last lap. To show running time for the current lap, press the *Max* button. When the clock is running, a colon will flash in the display.

Turning off the engine or pressing the *Exit/Power* button terminates the current lap and the current Event. A new Event is started when the instrument starts recording again. When the unit is turned off, it does not lose it's data. When it begins recording again, it will start a new Event on Lap one, at the end of the last recorded Event. After 35 minutes of total record time, the instrument will begin recording over oldest previously recorded data.

Note: The instrument will not record while the PRS (**PR**eviou**S**ly recorded data) annunciator is visible on the left side of the display. The PRS annunciator shows that the instrument is in Playback. Press the *Exit/Power* button until PRS is not displayed to return to monitoring the engine and recording.

Acknowledging an Overlimit Condition

When one of the functions of your instrument exceeds it's set limit, the instrument will display that function and flash the display. To return the instrument to the function that was displayed before the overlimit condition, press any button. Your engine may still be running over the set limit, but the instrument will not display that condition after you press a button. If the function goes below the set limit and then again exceeds the limit, the instrument will again display and flash the over limit function.

Reset Lap and Event Number and Clear Memory

To reset the lap and event number to zero and clear all recorded data, press the ← and the *Max/Event* buttons at the same time. When the display flashes PrS PLA, press the *Play/Pause* button. Any recorded data is now cleared from your instrument. Limits are not cleared. If you do not press the *Play/Pause* button within 5 seconds the reset will be aborted.

Note: The memory is **not** automatically reset when you turn the instrument off. All data is retained when the instrument is turned off and even when the batteries are removed.

Analyze Data
**There are two ways to look at the recorded information:**
1. **View maximum readings and lap times for each lap.**
2. **Play the selected lap.**

Note: PRS (**PR**eviou**S**ly recorded data) is visible on the left side of the display during both of the above. (see Fig. 5)

Fig. 5

Display in Playback showing RPM
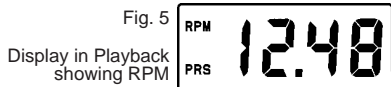
Lap Times and Maximums
To review lap times and maximum readings for each lap:

Fig. 6

Display showing lap 18 selected
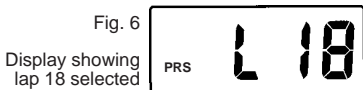
- **Enter Laps:** When in the basic monitoring mode, press the *Play/Pause* button to view lap times and maximums for each lap. Lap numbers are represented by an L on the display. (see Fig. 6)

- **Change Laps:** Press the ← or → button to change the lap number being displayed. If you are viewing the last lap of an Event, the → button moves you to the first lap of the next Event. If you are at the first lap of an Event, the ← button moves you to the last lap of the previous Event.
  Note: If your display shows the word LooP after pressing one of the arrow buttons, this means that it is searching for the beginning of the next lap's information.

- **Max Readings:** Press the *Function* button to cycle through all the functions of the instrument. It will display the maximum readings for that lap.

- **Event Numbers:** When the display is showing Lap number, press the *Max/Event* button to see which Event you are reviewing. (The display will show E and two numbers.)

- **Return to Monitoring:** To return to the basic monitoring mode, press the *Exit/Power* button.

Detailed Review of a Lap

You can review all of the detailed information recorded for the lap that was selected in Laps. The information can be played back, for each function, in real time or stepped through in 0.1 second increments.

- **Enter Playback:** When in Lap/Max, press the ***Play/Pause*** button to begin reviewing the data for the lap. The instrument will play back time for the selected lap. (see Fig.7)

Fig. 7

Display in playback mode showing time **PRS** $1:28.7$
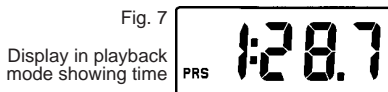
- **Pause:** Press the ***Play/Pause*** button to pause playback and again to resume playback. (The information for this lap will continue to replay until this button is pressed.)

- **Change Direction:** Press the ← or → button to change the direction of playback. If playback is paused, use the arrow buttons to step through the data in 0.1 second intervals.

- **Change Function:** Press the ***Function*** button to view the different functions' readings for this lap.

- **Max Readings:** Press the ***Max/Event*** button to review the maximum readings for each function, the current Event number or the total lap time for the current lap, depending on which function is being displayed.

- **Change Lap:** To review a different lap's data, press the ***Exit/Power*** button. Use the arrow buttons to select a different lap. Then press the ***Play/Pause*** button to begin reviewing data for the newly selected lap.

- **Exit Laps:** Press the ***Exit/Power*** button to return to Laps and press it again to return to the basic monitoring mode.

Power Off

The unit can be turned off by pressing the ***Exit/Power*** button while it is in Monitor/Record mode (if there is no Tach signal and it is not recording). The instrument will turn itself off automatically after ten minutes if no keys have been pressed and there has been no tach signal.

Note: All data is saved when the instrument is turned off.

APPENDIX A: Sensor Installation (detailed)

Tach Sensor Installation

Our standard Tach sensor can be installed on both two and four cycle engines. For best results, keep the Tach sensor cable separated as much as possible from all other cables running to your instrument.

Use a cable tie on the shrink tube, at the end of the colored wire, to attach the sensor to the plug wire, keeping the end at least 2" from the plug boot. Keep the sensor electronics (colored band of plastic) away from any ignition component. Attach the end of the black ground wire to bare metal on the engine block. Route the sensor cable from the motor to your instrument, securing with cable ties. Plug the sensor connector into the tach connector on the back of the instrument.

Four cycle engines: The Tach sensor is a small antennae that picks up the energy radiated by the spark plug wire. Four cycle engines produce weaker signals than other engines. To receive a strong signal with a four cycle engine, ty-wrap the colored wire down the spark plug wire of the sensor. This creates the antennae.

Two cycle engines: These engines usually produce a strong signal. Attaching the end of the Tach sensor to the spark plug wire should be sufficient to get a strong reading. If it is not, ty-wrap the colored wire down the spark plug wire.

For best results, keep the Tach sensor cable separated as much as possible from any other cables running to your instrument.

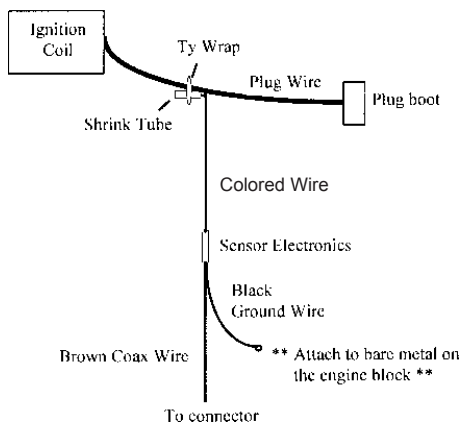## Standard
Inductive Tach Sensor Installation

Ignition Coil

Ty Wrap

Plug Wire

Plug boot

Shrink Tube

Colored Wire

Sensor Electronics

Black Ground Wire

Brown Coax Wire

** Attach to bare metal on the engine block **

To connector

Fig. 1a

Example of standard installation

Low Energy Ignition
Inductive Tach Sensor
Installation
(Briggs)

Ignition Coil

Ty Wraps

Plug Wire

Plug boot

Shrink Tube

Colored Wire

Sensor Electronics

Black Ground Wire

Brown Coax Wire

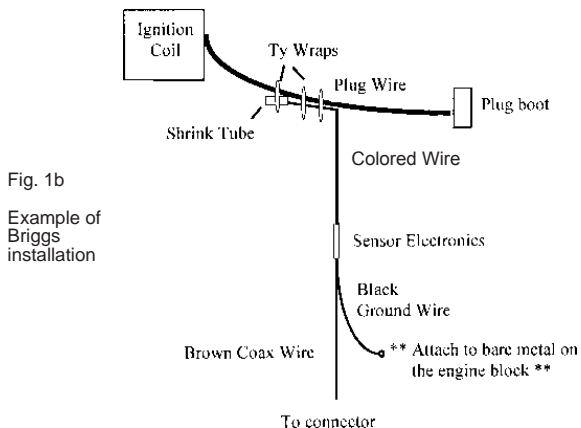** Attach to bare metal on the engine block **

To connector

Fig. 1b

Example of Briggs installation

CHT Sensor Installation
Our standard CHT sensor is for air cooled engines only.

Remove the spark plug from the cylinder you wish to monitor and discard the plug washer. (see Fig. 2) Check the surface of the head around the spark plug hole for a smooth, flat finish to assure a good seal when the sensor is installed. Position the sensor over the spark plug hole and check that you have sufficient clearance around the outside of the sensor body to avoid damage when the plug is installed and tightened. This may require some minor machining on some installations.

Fig. 2

Spark plug with washer removed & sensor in its proper position

Install the spark plug finger tight to hold the sensor in position. Finish tightening with a plug wrench to the same torque as normally recommended. **Do not allow the sensor to turn as you tighten the plug.** The sensor is easily damaged if forced into a cooling fin.

Route the sensor cable from the motor to the instrument. Secure the cable to the frame of the kart with cable ties. Connect to the instrument and twist to lock in place.

EGT Sensor Installation
Our standard EGT sensor is a type K thermocouple temperature sensor. Install the sensor clamp assembly, or weld on, to the exhaust header. Position the clamp so that the sensor will be in the center of the header and approximately 2˝ from the head side of the exhaust flange. Using the fitting on the clamp assembly as a drill bushing, drill a 3/16˝ hole through the header. Remove the clamp assembly from the header and redrill the hole to 13/64˝. Reinstall the clamp assembly and align it with the hole just drilled.

Insert the sensor into the fitting so that the tip of the sensor extends 1/4˝ past the center of the header. Tighten the compression nut to lock it in place. (see Fig. 3) Connect the black wire to any clean, unpainted metal surface on the engine (it is important that this is a good electrical connection).

Fig. 3

Proper installation of EGT sensor

Route the sensor cable from the motor to the back of the instrument, connect and twist to lock. Secure the cable with cable ties to prevent excessive **The thermocouple cable is brittle and will break at the flex points if not properly tied down. It is also good practice to protect the cable with fuel line.**

Beacon Receiver Placement (Optional)
The Digatron beacon receiver is used in conjunction with the Digatron transmitter. The beacon receiver needs to be mounted on your vehicle with an unobstructed view of the transmitter. Mount it with the red lens facing where the transmitter is located, with the longest part of the case protecting the red lens from the sun. Other racers will rarely interfere with the beacon signal, but mounting the receiver as high as practical will help to avoid that situation.

Attach the receiver to your vehicle with cable ties or hook and loop material (such as Velcro). Route the sensor cable to the back of the instrument, connect and twist to lock.

Using A Beacon Transmitter (Optional)
When using Digatron SMART beacons, multiple beacons can be on the track at once. Each SMART beacon can transmit one of 16 different signals. Your instrument treats all of these signals as lap signals. When the instrument encounters a beacon signal, it starts recording the race or it stops recording the current lap and begins a new one. The instrument does allow you to ignore beacon signals for a set amount of time after receiving a signal.

For more information about ignoring multiple beacons see Appendix B.

Here is a list of items to be aware of when using a beacon transmitter:
• Make sure the beacon receiver is mounted on the vehicle so that the signal has a clear path to the receiver.

• Direct sunlight into the receiver can cause a lap to not register. Install the receiver with the overhang on top. If the rising or setting sun is pointed directly into the receiver, set the transmitter on high power.

• Have the beacon transmitter on standard power if it is within 10' to 25' of the receiving instrument. Set the beacon on high power if it is over 25' from the receiving instrument.

• Beacons transmit their signal in a cone shape. If you are too close to the beacon you may miss the signal or intermittently pick it up. The faster the kart, the farther from the beacon transmitter signal it should be.

Manual Lap Switch Placement (Optional)
The Lap switch is used in place of the infrared beacon receiver. It should be mounted to the steering wheel within thumbs reach of the driver. This switch requires a 15/32" mounting hole for installation. Mount the switch in a position that will provide easy access while driving. Tie the coil cord to the steering column where needed to prevent it from interfering with the driver.

Route the sensor cable to the back of the instrument, connect and twist to lock.

If the Lap switch is not used, leave it's input connector open. Do not use a shorting plug.

The DT-40K uses One AAA Battery (not included)
The DT-40K can run, without a backlight, for 200 hours on one AAA battery. When using the backlight, one battery will power the instrument for 50 hours. With the front of the instrument facing you, remove the left end cap. Remove the battery from the holder. Observe polarity when replacing the battery. Replace the end cap.

Steering Wheel Mount
Attach the three slotted holes on the large side of the mount to the bolts on the center of your steering wheel. Place the nuts on the back of the instrument through the two holes on the other side of the mount. Slide the instrument firmly to the side to lock it in place. Adjust the nuts on the instrument for a tight fit.

APPENDIX B: Setting Limits

Limits should be set at levels that allow you to react to the visual warning before engine damage occurs.

- **Enter Set Limits:** To enter Set Limits press → . The display should now be flashing.

- **Change Number:** To change the number being displayed press the ← or the → button. Hold either of these buttons down and the number will change faster.

- **Next Limit:** When you are finished setting the first limit, press the *Function* button to set the next limit. Repeat the above procedure to set the remaining limits, Tach calibration number and minimum lap time.

- **Save Limits:** To save the current limits and return to Monitor/Record mode, press the *Exit/Power* button.

Note: Set limits at levels high enough for normal operation, but not so high that engine damage can occur before you can respond to a problem.

Limits can only be set for the functions your gauge is designed to monitor. If your gauge monitors all three possible functions, the limits are set in the following order: CHT/WT, EGT, Tach and Tach calibration number and minimum lap time. If you do not have all of these functions, it will also set limits in this order, minus the function(s) you are missing.

Tach

Tach requires two separate parameters. The first is the maximum revolutions per minute (RPM) for safe engine operation. The second number is for Tach calibration. In order to display the correct RPM for different engine types, the instrument divides the Tach input signal by the Tach calibration number. This number can be between .5 and 31.

The most frequently used Tach calibration numbers are:
1 - for single cylinder 2 cycle and most 4 cycle motors
2 - for 2 cylinder 2 cycle and 4 cylinder 4 cycle motors

If you are unsure of the exact Tach calibration number for your engine, experiment. If your calibration number is currently set at 1 and the RPM displayed is double what it should be, set the calibration number to 2. Alternately, if the RPM displayed is half of the correct value, decrease the calibration number to half the current number.

The Tach displays RPM in thousands of RPM. For example, if your display shows 9.50, your RPM is 9500.

Cylinder Head Temperature

Cylinder head temperatures (CHT) usually run in the 300˚F to 475˚F range. The best way to determine the correct temperature for your particular motor is to tune for proper plug or piston color and then observe what the head temperature is for various throttle settings and atmospheric conditions.

Exhaust Gas Temperature

Exhaust gas temperature (EGT) is used primarily for adjusting the air/fuel ratio. Because of its quick response, the effects of carburetor adjustments are seen immediately. Fuel system and carburetor problems can often be spotted quickly enough to prevent engine damage.

Exhaust gas temperatures typically run between 1100˚F and 1350˚F. The EGT on a properly tuned engine will increase rapidly as the throttle is opened and as the load on the engine is increased. At full throttle and full load the EGT will stabilize at a temperature dependent on the air/fuel ratio. Both a "too lean" or a "too rich" condition will be indicated by a lower than peak temperature. The "too lean" condition can damage your engine. An increase in coolant temperature or cylinder head temperature is usually an indication of this. The best way to determine what temperature is normal for your motor is to tune for good plug or piston color and then observe the temperature at various throttle settings.

## Ignoring Multiple Beacons (Minimum Lap Time)

Setting a minimum lap time allows the instrument to ignore multiple beacons on a track. After the minimum lap time has passed, the next beacon signal received will trigger a new lap in the memory of the instrument. Minimum lap time is the last number set in Set Limits. This is the time, in seconds, that the instrument will ignore beacon signals after receiving a signal. Make sure this number is less time than it takes to complete a lap, otherwise your instrument will record inaccurate lap times.

APPENDIX C: Button Functions
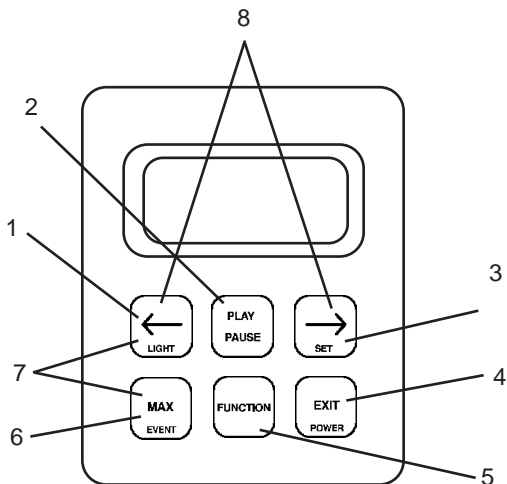
1.
Set Limits: Decreases the value of the limit being set. Hold this button down for the number to change faster. Pg. 15
Monitor/Record: Toggles the backlight on and off. Pg. 5
Laps: Finds previous lap's data. Pg. 8
Playback: Causes the data to be played in reverse direction, while data is being played back. If playback is paused, this button will step through data in 0.1 second intervals, in reverse direction. Pg. 9

2.
Set Limits: Button not used.
Monitor/Record: Instrument enters Lap/Max and displays Lap #. Pg. 8
Laps: Instrument enters Playback and begins reviewing data for the selected lap. Pg. 9
Playback: Pauses and resumes playback. Pg. 9

3.
Set Limits: Increases the value of the limit being set. Hold this button down for the number to change faster. Pg. 5
Monitor/Record: Instrument enters Set Limits. Pg. 15
Laps: Finds next lap's data. Pg. 8
Playback: Causes the data to be played in forward direction, while data is being played back. If playback is paused, this button will step through data in 0.1 second intervals, in forward direction. Pg. 9

4. **EXIT POWER** Powers on the instrument. Pg. 4
Set Limits: Press this button to exit Set Limits and return to Monitor/Record. Pg. 15
Monitor/Record: Powers off the instrument or stops recording data. It will only turn off the instrument if it is not recording and not receiving a Tach signal. Pg. 5, 9
Laps: Exits Lap/Max and returns the instrument to Monitor/Record mode. Pg. 8
Playback: Exits Playback and returns the instrument to Lap/Max. Pg. 9

5. **FUNCTION** Set Limits: Changes the function being displayed in this order: CHT/WT, EGT, Tach, Tach calibration number and minimum Lap time. Pg. 15
Monitor/Record: Changes the function being displayed in this order: CHT/WT, EGT, Tach, Lap # and Lap Time. Pg. 5
Laps: Displays the maximum value of each function, lap number or total lap time for the currently selected lap. Displayed in this order: CHT/WT, EGT, Tach, Lap # and Lap Time. Pg. 8
Playback: Changes the function playing back in this order: CHT/WT, EGT, Tach, Lap #, and Lap Time. Pg. 9

6. **MAX EVENT** Set Limits: Button not used.
Monitor/Record: Displays the maximum value for each engine function since the instrument was turned on. If the instrument is displaying Lap # and you press the *Max/Event* button, it will display the current Event number. Pg. 5
Laps: Displays Event number if Lap # is being displayed. (The display will show E and two numbers.) pg. 15
Playback: Displays the maximum reading for each function for the current lap, the current Event number or the total Lap Time for the current lap. Pg. 9

7. ⬅ & **MAX EVENT** Press this button combination to clear memory, Lap # and Event #. Press them until the display shows PrS PLA, then press the *Play/Pause* button Pg. 7

8. ⬅ & ➡ Toggles between high and low resolution of time display.
High = 1:59.9 max. time displayed for this resolution. (minutes : seconds . tenths of seconds)
Low = 19:59 max. time displayed for this resolution. (minutes : seconds) Pg. 7

9. **Lap Switch** Monitor/Record: Starts and stops the recording of a lap. Pg 14

Troubleshooting
The following are explanations to some commonly asked questions.

What are those letters on the side of my display?
There are five annunciators that may be displayed on the left side of your display.
(see Fig. 9) The most common ones represent the engine function being displayed
at that time:
CHT stands for Cylinder Head Temperature
EGT stands for Exhaust Gas Temperature
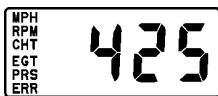**RPM** stands for Revolutions per Minute, also called Tach

Fig. 9

Display showing possible annunciators

There are a couple other annunciators that do not stand for engine functions.
PRS stands for **PR**eviou**S**ly recorded data and signifies that the instrument is in
either Laps or Playback mode.
ERR stands for Error and could mean that your instrument has encountered
extreme electrical interference. This can ruin the recorded information and possibly
cause the instrument to reprogram it's limits and calibration values.

Why am I getting no lap times or intermittent lap times?
1. Tach Signal: Make sure your Tach sensor is properly installed and picking up
   a strong signal. If it is not, spiral the colored wire down the spark plug wire.
2. Short or no lap times are often caused by beacon transmitter problems. Make
   sure the beacon transmitter is turned on and that the batteries are not low.
• Make sure the beacon transmitter is still on the track.
• If these do not resolve your problem, read the section about transmitters on
   pages 13-14.
3. Check that the last number set in Set Limits (Appendix B) is an appropriate
   number for this track. This number is the minimum time (in seconds) for you
   to complete a lap. During this time, the instrument will ignore multiple beacon
   signals. After the number of seconds has passed the instrument will register
   the next beacon signal it receives and then begins ignoring again. The instrument
   will record inaccurate lap times if this number is set higher than the lap time
   for the current track.
• Make sure the instrument's batteries are not low.
• Review page 6 for information about how the instrument begins recording.

Why does my instrument only record for 2 minutes?

Your instrument will record for longer than 2 minutes, but your display has a limit to what it can show. The instrument has two resolution levels, high and low.

- To change the resolution of your display, press the ← and the → buttons at the same time, while in Monitor/Record mode.
- High resolution can display up to 1:59.9. The 1 on the left of the display toggles every other minute.
- Low resolution can display up to 19:59. The 1 on the left of the display toggles every 20 minutes.

Why does my display keep saying LooP?

This means that your instrument is searching for data, usually the beginning of a lap during Playback.

Why does my lap number have a 1 in front of the L?

If your display shows 1L and two other numbers, it means that you have recorded over 100 laps during the current Event.

Why is the colon (:) flashing?

This signifies that the clock is running, either during record or playback.

Why is the Display Flashing?

This signifies that you are either in Set Limits or that your engine exceeded a set limit.

Why won't my instrument record?

The instrument will not record if it is in Laps or Playback. (PRS is displayed on the left side of the display). Press the *Exit/Power* button until PRS is no longer displayed and then you can begin recording.

Why won't my instrument respond when I press a button?

The computer in your instrument needs to be reset. It should still respond to the *Function* button. Press this button, then turn the instrument off for 30 seconds. Turn the instrument back on and check to see if it is working properly. If it is not, turn it off and on again. Immediately after turning it back on, press the ← and the *Max/Event* buttons to reset the instrument. When the display flashes PrS PLA, press the *Play/Pause* button. If you had to reset the instrument, all of your previously recorded data was erased, but it should now be working properly.

Repairs

If you have any questions about the operation of your instrument, please call. One of our technicians will be happy to help you. Please have your instrument nearby to help while troubleshooting with the technician.

Your instrument is warranted to be free from factory defects and electronic failure for two years from the date of purchase. Physical damage during normal usage is not covered under the warranty. Be sure to fill out and return your warranty card for our records. If we do not have a card on file for your instrument, you will be charged for repairs unless you can provide us with proof of purchase date.

When returning an instrument for repair, please use the repair form found on our website or enclose a note indicating your return address, phone number and a detailed description of the problem. Send your instrument and sensors so that we can check the complete system.

Send repairs to:

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Phone: (509) 467-3128   Fax: (509) 467-2952