

OPPAMA

Insutrcution Manual

PULSE ENGINE TACHOMETER PET-1200

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- Please read this manual carefully before using this product.
- Please keep this manual for future referece.
- The PET-1200 complies with the EU RoHS directive.

A. Product Features

- The PET-1200 is a pulse count type tachometer for detecting pulses generated when a spark plug fires.
- RPM of 2-stroke (1 to 4 cylinders) and 4-stroke (1 to 6 & 8 cylinders) gasoline engines can be measured.
- Compatible with engines using direct ignition (some engines are not compatible)
- Maximum rpm during measurement can be recorded.
- Equipped with Hourmeter function to record total cumulative operating time.
- Sensors included enable measurement without connecting the PET-1200 to as engine.
- For engines with rpm output lines, an optional sensor D can be used to measure rpm.
- ※ Not compatible with diesel engines.

C. Position List

Position	Measurable		Measurable engine r/min
	Stroke	Cylinder	
P : 41	4	1	100~30000
P 21 : 42	2	1	100~30000
	4	2	
P : 43	4	3	100~20000
	2	2	
P 22 : 44	4	4	100~15000
	2	3	
P : 45	4	5	100~12000
	2	4	
P 23 : 46	4	6	100~10000
	2	4	
P 24 : 48	4	8	100~7500

D. Modo Setting

The PET-1200 offers non-measurement and measurement modes. Please set the mode according to its use by referring to Tagle 1 "Switch operation during non-measurement" and Table 2 "Switch operation during measurement".

Table 1 : Switch operation during non-measurement

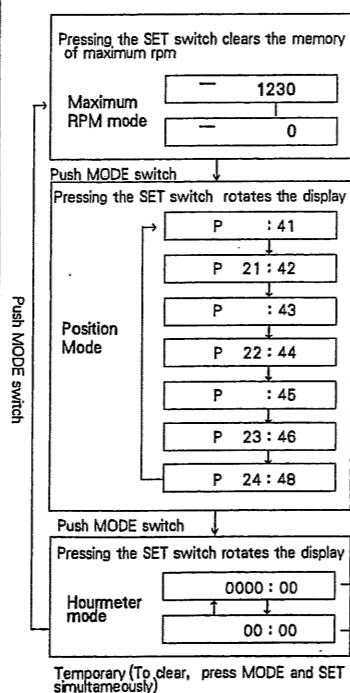
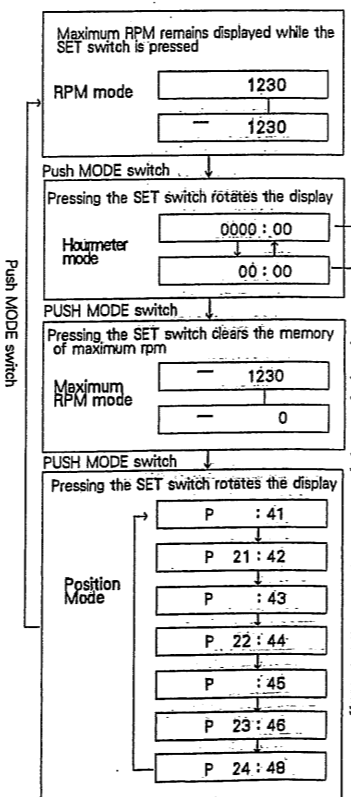
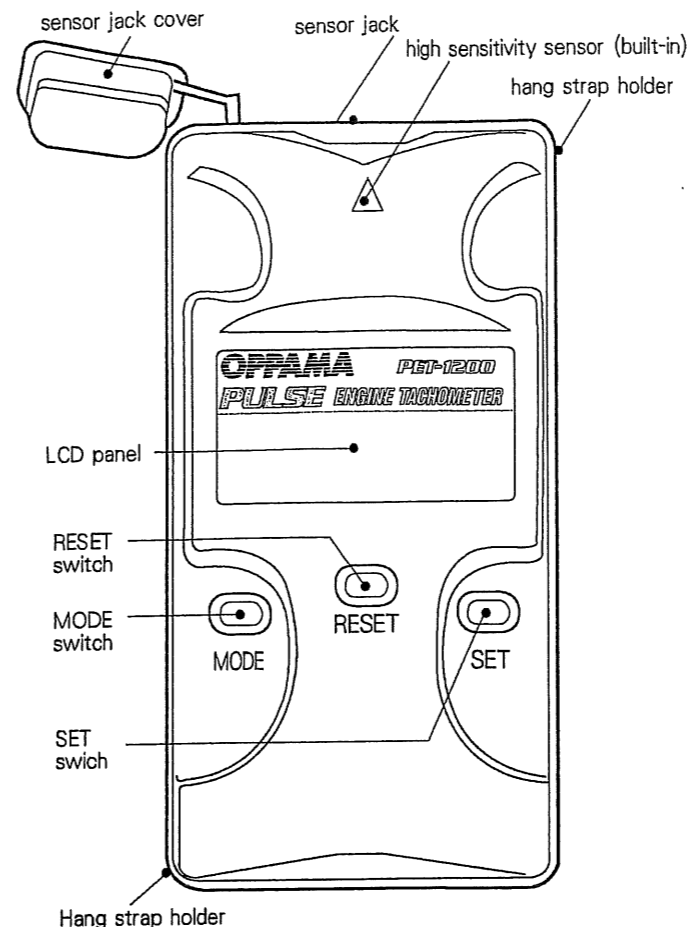


Table 2 : Switch operation during measurement

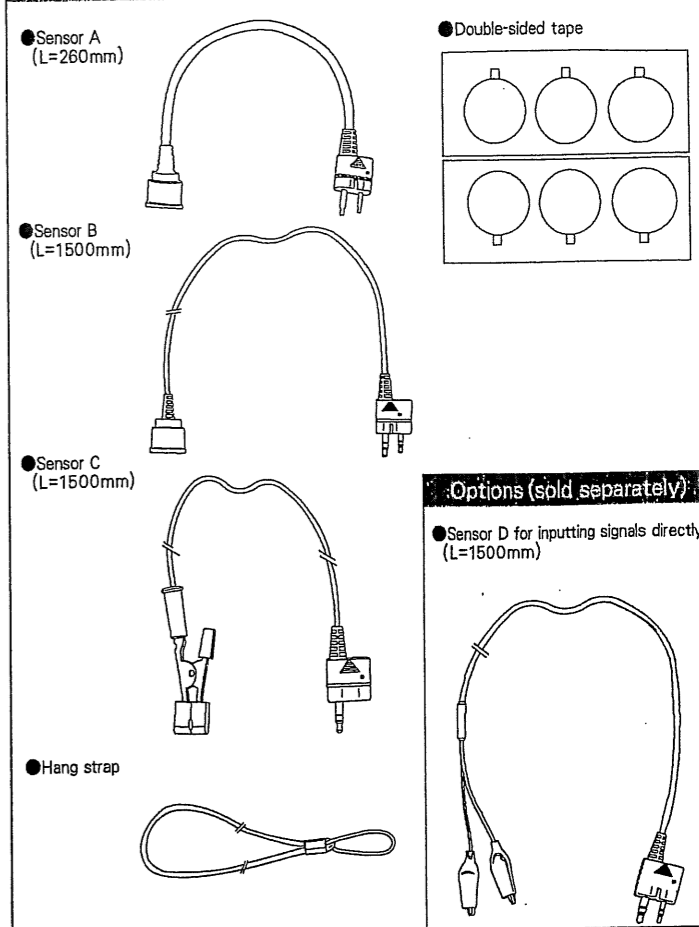


B. Part Name



● This figure is an illustration and may differ from the actual product.

PET-1200 Accessories



E. Explanation of Each Mode

E-1. During non-measurement (when pulses are not being input ; table 1)

- ① Position mode**
In this mode, the engine type to be measured can be selected according to "C. Position List". (Every time the SET switch is pressed, the position will change.)
※ The position setting will not change even if the mode is switched to a different mode or auto-off is activated
- ② Hourmeter mode**
● The cumulative operating time of an engine is displayed. Every time the SET switch is pressed, the display will switch between temporary ("0 : 00") and total ("0000 : 00") cumulative operating time.
● The temporary display can be cleared by pressing the MODE switch and SET switch at the same time.
※ When the RESET switch is pressed or batteries are replaced, both temporary and total time are cleared.
- ③ Maximum rpm mode**
The maximum rpm measured can be displayed/cleared. Pressing the SET switch will clear the rpm.
※ Also, when the RESET switch is pressed or batteries are replaced, rpm is cleared.

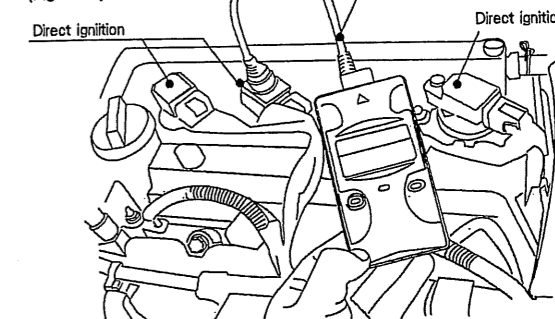
E-2. During measurement (when pulses are being input ; Table 2)

- ① position mode**
In the mode, the position can be changed during measurement. The operation method and reminders are the same as non-measurement position mode.
- ② RPM mode**
In this mode, the rpm being measured position mode.
- ③ Hourmeter mode**
The cumulative operatime time of an engine is displayed during measurement. The operation method and reminders are the same as non-measurement position mode.
※ During measurement, the cumulative time of any mode can be recorded

and mode.

- ④ Maximum rpm mode**
The maximum rpm is displayed during measurement. The maximum rpm is automatically updated during measurement.
- F. How to Measure**
- F-1. Contact type measurement (direct ignition, using sensor A ; Figure 1)**
- ① Remove the engine cover so that the coil heads of direct ignition can be seen.
 - ② Remove the sensor jack cover of the PET-1200 and attach sensor A to the PET-1200 as shown in Figure 1.
 - ③ Press the MODE switch or SET switch to turn the power on.
 - ④ Referring to "D. Mode Setting", switch to the position mode and select position mode and select position "P : 41"

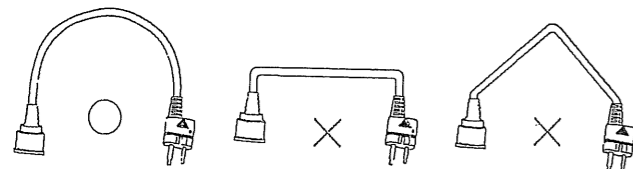
(Figure 1)



- ※ If twice the number of rpm is displayed, switch the position to "P21 : 42".
- ⑤ As shown in Figure 1, bring sensor A into contact with the head of direct ignition of an operating engine. The engine rpm will be displayed.
- ※ When connecting sensor A and the coil head of direct ignition, try to match the flat surface of the ignition head with the flat surface of the sensor. Otherwise, an accurate rpm may not be displayed.
- ※ Sensoe A is flexible. Bend it into a shape that is easy to measure. Be careful not to bend it at a sharp angle, as it may break or cause the sensor to fail.

∇ (continued)

(continued)



- ※ If the number displayed is higher than expected and not stable, try using the measurement method of F-3. Also, if rpm is not shown in the display, please contact us.
- ⑥ If the sensor part is moved farther from the coil head of operating direct ignition, or if the engine stops, the mode will automatically switch to the one set during non-measurement.
- ⑦ After about one minute, the display will automatically disappear.

WARNING

When engine covers and others are removed during measurement, make sure to put them back in place, otherwise a serious accident could occur.

F-2. Contact type measurement (direct ignition, using sensor B ; Figure 2)

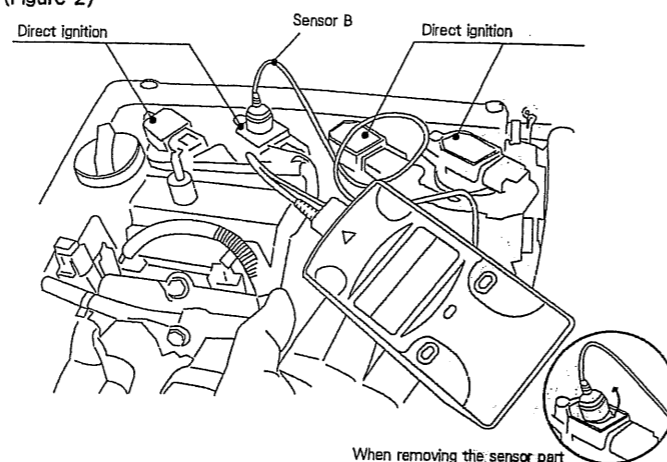
- Remove the engine cover so that the coil heads of direct ignition can be seen.
 - Remove the sensor jack cover of the PET-1200 and attach sensor B to the PET-1200 as shown in Figure 2.
 - Press the MODE switch or SET switch to turn the power on.
 - Referring to "D. MODE Setting", switch to position mode and select position "P : 41".
- ※ If twice the number of rpm is displayed, switch the position to "P21:42".
 - ⑤ As shown in Figure 2, use double-sided tape to attach the sensor part of sensor B to the head of a direct ignition of an operating engine. The engine rpm will be displayed.
 - ※ When connecting the sensor part of sensor B and the coil head of direct ignition, try to match the flat surface of the ignition head with the flat surface of the sensor. Otherwise, an accurate rpm may not be displayed

- ※ When applying double-sided tape, remove oil and dirt from the surfaces beforehand with alcohol, etc.
- ※ If the number displayed is higher than expected and not stable, try using the measurement method of F-3. Also, if rpm is not shown in the display, please contact us.
- ⑥ If the sensor part is moved farther from the coil head of operating direct ignition, or if the engine stops, the mode will automatically switch to the one set during non-measurement.
- ※ To remove the sensor part, gently pull the tab of the double-sided tape upward as shown in Figure 2 and remove it. Do not forcibly attempt to pull the sensor part, as this may damage it.
- ⑦ After about one minute, the display will automatically disappear.

WARNING

When engine covers and others are removed during measurement, make sure to put them back in place, otherwise a serious accident could occur.

(Figure 2)



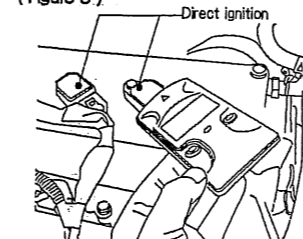
F-3. Non-contact type measurement (direct ignition ; Figure 3)

- Remove the engine cover so that coil head of direct ignition can be seen.
 - Press the MODE switch or SET switch to turn the power on.
 - Referring to "D. Mode Setting", switch to position mode and select position "P : 41".
- ※ If twice the number of rpm is displayed, switch the position to "P21:42".
 - ④ As shown in Figure 3, bring the sensor part (indicated by Δ) closer to the coil head of direct ignition of an operating engine. The engine rpm will be displayed.
 - ※ If the number displayed is higher than expected and not stable, it is possible that pulses from other cylinders are being detected. In this case, use sensor C and wire it as shown in Figure 4 to detect pulses of all cylinders. The position will be for the number of cylinders to be measured of 4 cycles (in case of 4 cycles) (In Figure 4, the position will be "P22 : 44" for 4 cylinders.)
 - ⑤ If the PET-1200 is moved farther from the coil head of operating direct ignition, or if the engine stops, the mode will automatically switch to the one set during non-measurement.
 - ⑥ After about one minute, the display will automatically disappear.

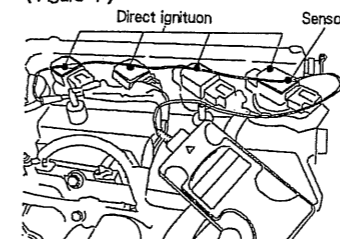
WARNING

When engine covers and others are removed during measurement, make sure to put them back in place, otherwise a serious accident could occur.

(Figure 3)



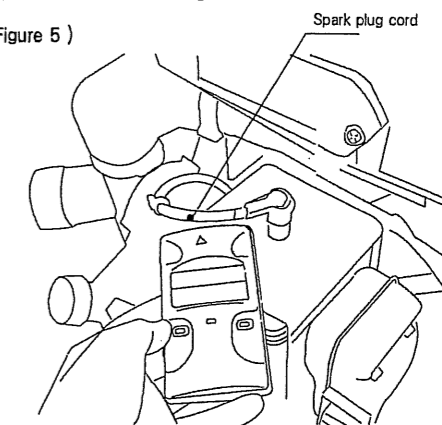
(Figure 4)



F-4 Non-contact type measurement (with spark plug cord ; Figure 5)

- Press the MODE switch or SET switch to turn the power.
 - Referring to "D. Mode Setting", switch to a position mode and select a position appropriate for the engine type to be measured according to "C. Position List".
 - As shown in Figure 5, bring the sensor part (indicated by Δ) closer to the spark plug cord of an operating engine (between 1 and 20 cm where the number displayed becomes stable). The engine rpm will be displayed as long as an appropriate distance is maintained.
 - If the PET-1200 is moved farther from the spark plug cord of an operating engine, or if the engine stops, the mode will automatically switch to the one set during non-measurement.
 - After about one minute, the display will automatically disappear.
- ※ How close the PET-1200 should be brought depends on the engine, so try to find an appropriate distance where the engine rpm becomes stable. Be careful not to bring the sensor too close, as touching the spark plug cord could damage the product.
 - ※ For multi-cylinder engines, bring the PET-1200 closer to where all the spark ignition cords are gathered.

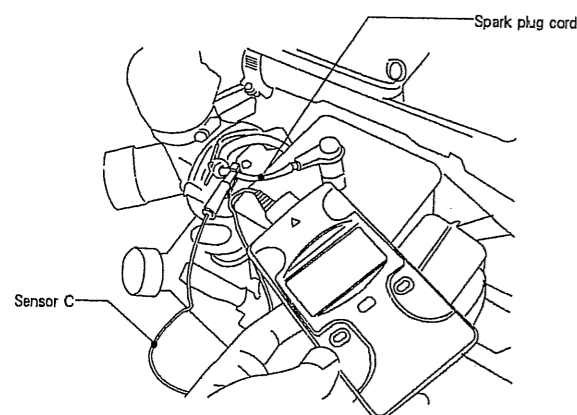
(Figure 5)



F-5. Contact type measurement (with spark plug cord using sensor C ; Figure 6)

- Press the MODE switch or SET switch to turn the power on.
 - Referring to "D. Mode Setting", switch to position mode and select a position appropriate for the engine type to be measured.
 - Remove the sensor jack cover of the PET-1200 and attach sensor C to the PET-1200 as shown in Figure 6.
 - Connect the sensor C clip to the spark plug cord as shown in Figure 6.
 - When spark pulses are received, the rpm will be displayed.
 - Removing the clip or stopping the engine will automatically switch the mode to the one set during non-measurement.
 - After about one minute, the display will automatically disappear.
- ※ For multi-cylinder engines, choose one cord from where all the spark ignition cords are gathered and connect the clip. Also, it is more effective to bring the lead of sensor C closer to each spark plug cord.
 - ※ Do not use sensor A or B when there is a spark plug cord, as it may cause malfunction or damage

(Figure 6)



G. Notes on Use

G-1. How to select a position—non-direct ignition

- The positions are set based on the ignition number of basic engines. When measuring multi-cylinder engines with multiple cylinders igniting simultaneously, the position needs to be changed.
For example, to display one-half of the normal rpm with the "P22 : 44" position, try measuring with the "P21 : 42" position.
- Some engines have dummy spark cycles (twice the normal ignition). If the rpm displayed is twice the number of normal rpm, try measuring with the position for twice the number of cylinders.
For example, to display twice the normal rpm with the "P21 : 42" position, try measuring with the "P22 : 44" position.
- Since many 4-stroke 1-cylinder engines with magneto ignition, just like 2-stroke 1-cylinder, fire once every revolution, try measuring with the "P21 : 42" position.
- Combinations of 1 through 3 are also possible.

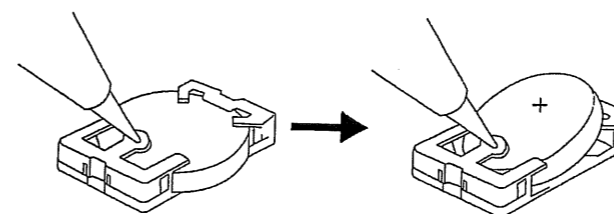
G-2. Notes on wiring—non-direct ignition

- For engines with a distributor such as automobile engines, accurate rpm will not be displayed if the location for detecting pulses is close to the distributor or ignition coil. In this case, move the detection location farther away where no effect can be observed.
- Do not bring the sensor part in contact with water or metal parts, as this may cause the display to indicate inaccurate rpm.
- Accurate rpm may not be displayed if the spark plug cord has deteriorated. In the case, replace the spark plug cord.

G-3. Notes on handling of the PET-1200

- Due to noise or other factors, the display may continue to show inaccurate information which does not go off, or the display may suddenly go off. In such cases, press the RESET button. After about 2 seconds the display will show "—0" (maximum rpm mode) and will be reset. Please note that after resetting, accumulated time and maximum rpm will also be reset.

- Do not drop or give strong shocks to the PET-1200.
 - To replace a battery, remove the eight screws on the back of the PET-1200, remove the back cover, and replace with a new lithium CR2032 battery. To remove the battery, push the plastic part with the tip of a pen or other object as shown in the figure below. Insert the new battery with the side labeled "+" facing up and snap the battery into place.
- ※ When data displayed on the LCD is no longer clear, it is time to replace the battery.



- Do not touch the battery or internal circuits as this may damage the product.
 - The PET-1200 is not water resistant. Do not get it wet or touch it with wet hands.
 - To clean the PET-1200, use a dry soft cloth or a cloth slightly dampened with a neutral detergent. Do not use volatile liquids such as thinner or benzene.
 - If you think there is a problem with the PET-1200, read this manual again and check the operation procedure.
- ※ The batteries shipped with the product are for test use and may not last as long as the battery life indicated in this manual.
 - ※ The specifications of the PET-1200 and the contents of this manual may be changed without prior notice.

H. Specifications

Measurable engine	Stroke	Cylinder
	2	1~4
	4	1~6 & 8
RPM display interval	0.5 sec	
Accuracy	±10r/min (4 stroke 1 cylinder ±20r/min)	
Display of cumulative operating time	Temporary	
	→ 0 : 00 → 999 : 59 Hr Min	
Total	Total	
	→ 0000 : 00 → 9999 : 59 Hr Min	
Maximum RPM	Measure / Record	
Auto-off	When no ignition pulses are received for one minute	
Manual-on	By pressing the MODE button or SET button	
Auto-on	When engine ignition pulses are received	
Battery used	One lithium battery CR2032	
Battery life	Approx. 20,000 hours (with non-contact measurement)	
operating temperature range	-10°C to +50°C	
Storage temperature range	-10°C to +50°C	
Main body dimensions	115 × 62 × 15 (mm)	
Main body weight	About 60g	
Accessories	Hang strap, sensor A, sensor B, sensor C, double-sided tape (3 pieces × 2), Instruction Manual, Warranty	