

COMPO-X

DIGITAL COMPONENT GAUGE
STEPPING DRIVE φ60

Thank you for purchasing our PIVOT product.
Please read these instructions carefully before installing or using this device.

FEATURES

- Our Part Component System and Packet Server System provide overwhelming cost performance no matter if you are using single or multiple units.
- The gauge wiring not only brings you direct serial communication but also the ultra thin black cable used for installation enables for a sleek on dash mounting.
- 8 multi-color lamp allows you to choose a color for each situation.
- By setting the lamp to Auto Warning Lamp Mode, you can prevent brightness at night and still have the light shine upon a warning.
- Non-reflective coating on both case and bezel prevents glare.
- Because other gauge sensors can easily be appropriated, our new system makes changing gauges a snap.
- Brightness Adjustment Function. ● Peak Hold. ● Warning System.
- High Precision Stepping Moter System.

CAUTION

- When installing this product, we recommend that if technical knowledge becomes necessary please consult a qualified mechanic.
- Please make sure to install to a safe place that does not interfere with driving nor where there is a possibility of the unit falling while driving.
- When carrying out these operations, make sure to park your car in a safe place. Trying to do these operations while the car is moving, may cause trouble and damage.
- Please be careful that the cable does not get crushed by the seat rail or car door steel plate, nor cut by any sharp steel plate as this may cause a poor connection or an electric short leading to fire or other danger.
- Please carry out the sensor wiring only when the engine is thoroughly cooled down. If done while hot, the oil or coolant may shoot out and cause injury.

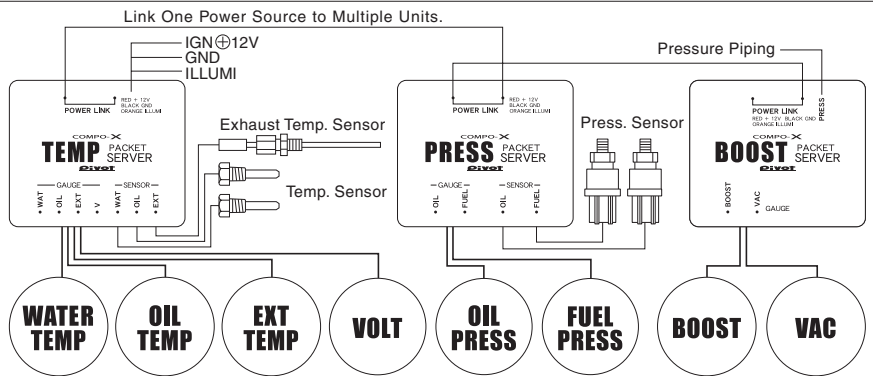
NOTE

- For safety purposes, when working on your car always disconnect the ⊖ battery terminal. (Reconnect to check for power.)
- Please use the provided connectors or soldering to carry out the wiring. Do not use electro taps sold on the market as they may result in improper electrical connections.
- When double-sided tape is used for an installation be warned that when hot the tape temporarily loses adhesiveness so no strong pressure should be applied.
- Please do not lose this user's guide, as you will held liable for the cost of reissuing it.

COMPONENT SYSTEM

The product allows interchangeability of parts when needed and hence brings you incredible cost performance.

Single Meter	Meter Set	Server
¥ 12,800 each	Gauge, Server and Sensor Set	Temp. Server ¥ 6,800
Sensor and Server are not included.	Water Temp. Set ¥ 19,800	Press. Server ¥ 4,800
Water Temp.	Oil Press. Set ¥ 32,800	Sensor
Oil Temp.	Boost Set ¥ 19,800	Temp. Sensor ¥ 2,800
Exhaust Temp.	Boost Set ¥ 19,800	Press. Sensor ¥ 19,800
Oil Press.	Vacuum Set ¥ 19,800	Exhaust Temp. Sensor ¥ 14,800
Voltage		
Fuel Press.		



CONTENTS OF PART'S SET

※ All parts are included in the Set Packages.

Single Meter	Server			Sensor		
	Temp. Server 	Press. Server 	Boost Server 	Temp. Sensor (For both water and oil temperature) 	Press. Sensor (For both oil and fuel pressure) 	Exhaust Temp. Sensor

PART NAMES

※ The small hole near the server coupler serves to cool the internal part of the server and should not be blocked off or closed.

Meter	Temp. Server	Press. Server	Boost Server
	1 Water Temp. 5 for Water Temp. 2 Oil Temp. 6 for Oil Temp. 3 Exhaust Temp. 7 for Exhaust Temp. 4 Voltage	1 Oil Press. 2 Fuel Press. 3 for Oil Press. 4 for Fuel Press.	※ The sensor is built into the Boost Server, so there is no need to purchase separately.

CONNECTING THE WIRES

WIRING

■ METER

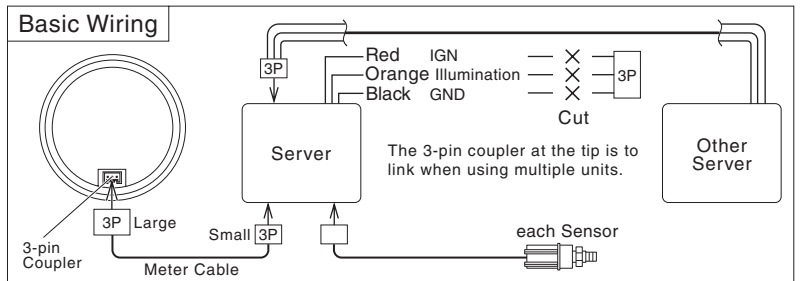
Insert the large 3-pin coupler of the provided cable into the 3-pin coupler at the back of the gauge and insert the small coupler end into the gauge output coupler for each server.

■ SERVER

Insert the coupler at the tip of each sensor cable into the input coupler for each server's sensor.

WIRING (Power)

- Red Wire (IGN) = Position in which with the key switch ON is ⊕12V.
- Orange Wire (Illumination) = Position in which with the parking lights are on is ⊕12V.
- Black Wire (GND) = To a steel plate or somewhere else you are sure to obtain earth.



METER OPERATIONS SETTINGS

※ Even if you make a mistake when manipulating the switches, the normal display will return within 3 to 5 seconds. By repeating the operations you will soon be able to manipulate the switches easily.

Basic Operations		Peak Hold Mode	Warning Mode
<p>1 Key switch ON.</p> <p>2 The display opens after one opening demo.</p> <p>※ During the opening demo the lamp will be on.</p>	<p>1 Key switch OFF.</p> <p>2 Stop Display.</p> <p>※ The needle will stop at the position it was before the key was turned OFF and will not return to zero.</p>	<p>Basic Operation Push and release switch.</p> <p>1 Key switch ON.</p> <p>2 Push and release switch.</p> <p>3 Push and release switch.</p> <p>Normal Display LED lamp off.</p> <p>Peak datar reset.</p> <p>Long 5sec Press switch for a long time</p> <p>※ Peak values are shown for water temp, oil temp, exhaust temp and boost are shown on the ascending side and oil pressure, fuel pressure, vacuum, and voltage are displayed on the descending side.</p>	<p>Basic Operation Press in switch for 3 seconds.</p> <p>1 Key switch ON.</p> <p>2 Long 3sec Press in switch for more than 3 seconds.</p> <p>3 Press Switch.</p> <p>4 Release Switch.</p> <p>Normal Display after 3 seconds (LED lamp off)</p> <p>※ Warnings for water temp, oil temp, exhaust temp and boost are shown on the ascending side and oil pressure, fuel pressure, vacuum, and voltage are set on the descending side. Whenever a setting has been exceeded, the LED will blink.</p>
<p>Explanation of car switch operations.</p> <p>Key switch Headlight switch </p> <p>ACC ON ST OFF Small OFF Light</p>			
<p>Explanation of meter switch operations.</p> <p> Press switch Long 3sec Press in switch for more than 3 seconds.</p> <p> Push and release switch. Long 5sec Press in switch for more than 5 seconds.</p> <p> Release switch.</p>			

Each Mode Setting

Lamp Color Mode (Lamp Color Settings)	Lamp Intensity Mode (Brightness Adjustment)	Auto Warning Lamp Mode / Demo Mode
<p>※ You cannot operate the lamp intensity or lamp color modes during Demo Mode or when the Lamp is set to Auto Warning Lamp Mode.</p>		
<p>Basic Operation While holding in the switch, turn the parking lights on.</p> <p>1 Key switch ON.</p> <p>2 Light switch OFF.</p> <p>3 + While holding in the switch, turn the parking lights on.</p> <p>Lamp color mode</p> <p>4 The lamp will change with every press of the switch.</p> <p>5 Release Switch.</p> <p>After about 3 seconds, the setting will be complete, lamp blinks once and the display will return to normal.</p> <p>※ The LED for each gauge has been adjusted to minimize differences in color, but due to special properties of the LED, some colors (white, yellow, etc) may exhibit more noticeable differences.</p>	<p>Basic Operation While holding in the switch, turn the parking lights on, off and on again.</p> <p>1 Key switch ON. 2 Light switch OFF.</p> <p>3 + → → Lamp color mode Lamp intensity mode</p> <p>While holding in the switch, turn the parking lights on, off and on again.</p> <p>4 The LED comes on and shines from bright to dark and the needle displays the steps of brightness intensity.</p> <p>Lamp intensity mode</p> <p> Highest Brightness The needle displays the steps of brightness. The display is broken into 8 steps and the marks on the gauge are of no connection.</p> <p>5 The brightness will change with each press of the switch.</p> <p>6 Release Switch. After about 3 seconds, the setting will be complete, lamp blinks once and the display will return to normal.</p>	<p>Basic Operation Press in switch for 5 seconds.</p> <p>1 Key switch ON.</p> <p>2 Long 5sec Press in switch for 5 seconds.</p> <p>3 LED goes from blinking to ON status (Warning Mode)</p> <p>Auto Warning Lamp / Demo Mode The needle displays each mode</p> <p> Demo Auto2 Auto1 Continuous Illumination</p> <p>Auto Warning Lamp Mode — The Auto Warning Lamp Mode is to prevent brightness at night and other than when a warning occurs the lamp will be off or will be at minimal brightness. The Continuous Illumination Mode is for normal use with the lamp always on when lights are turned to parking position.</p> <p>Explanation of the Lamp Patterns</p> <p>Continuous Illumination = Normal illumination with continuous illumination and light switch on parking lights.</p> <p>Auto 1 = With the light switch on parking and the lamp OFF, when a warning setting has been exceeded the lamp will come ON to the set illumination.</p> <p>Auto 2 = Reduced illumination with light switch on parking lights and when a warning occurs the set illumination for a warning will come on.</p> <p>Demo mode Demo mode is for use in stores for demonstrations only and the movement of the needle and illumination has no connection to the input signal. Normally there is no need to set this.</p> <p>4 The needle position changes with every push of the switch.</p> <p>5 Set the needle to the desired position and release the switch.</p> <p>After about 3 seconds, the setting will be complete and the display will return to normal.</p> <p>Canceling the Demo Operation Long 5sec During the demo, hold in the switch for 5 seconds.</p>

BASICS OF WARNING SETTINGS AND BEST RANGES FOR DISPLAYS

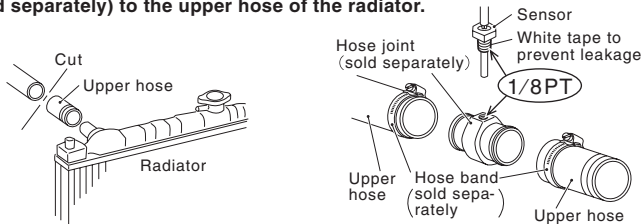
The following are simply examples of popular settings. Depending on the car model and the specifications, the actual settings may vary, so please adjust to fit your particular situation. The diagonal line represents the suitable range.

<p>Water Temp. Warning · Peak Ascending side</p> <p>Warning 110°C</p> <p>Too High</p> <ul style="list-style-type: none"> Overheat. Loss of Power. Loss of Fuel Efficiency. Knocking Occurs. <p>Too Low</p> <ul style="list-style-type: none"> Loss of Power. Loss of Fuel Efficiency. 	<p>Oil Temp. Warning · Peak Ascending side</p> <p>Warning 110°C</p> <p>Too High</p> <ul style="list-style-type: none"> Engine Trouble from Cut in Oil Film. <p>Too Low</p> <ul style="list-style-type: none"> Loss of Power due to Oil Viscosity Resistance. 	<p>Exhaust Temp. Warning · Peak Ascending side</p> <p>Warning (NA) 800°C Warning (TURBO) 900°C</p> <p>Too High</p> <ul style="list-style-type: none"> Danger of Blowing an Engine due to Thin Air Fuel Consumption. Boost Increased Too High. <p>Too Low</p> <ul style="list-style-type: none"> Bad response and Fuel Efficiency due to Thin Air Fuel Consumption. 	<p>Voltage Warning · Peak Descending side</p> <p>Warning 11.5V</p> <p>Too High</p> <ul style="list-style-type: none"> Shortened Battery Life. Shortened Electrical Equipment Life. Alternator (Regulator) Trouble. <p>Too Low</p> <ul style="list-style-type: none"> Dead Battery or Deficient Charge. Abnormal Operation of Electrical Equipment. Loss of Sound Quality. Loose or Torn Fan Belt. Bad Alternator or Battery. 	<p>Oil Press. Warning · Peak Descending side</p> <p>Warning 100KPa</p> <p>Too High</p> <ul style="list-style-type: none"> Engine Blown due to Lack of Oil or Clogged Filter. <p>Too Low</p> <ul style="list-style-type: none"> Engine Blown due to Insufficient Oil, Broken Pump, Clogged Filter or Poor Viscosity. 	<p>Fuel Press. Warning · Peak Descending side</p> <p>Warning 200KPa</p> <p>Too High</p> <ul style="list-style-type: none"> Shortened Fuel Pump Life. Broken or Clogged Fuel Line. Broken Pressure Valve. <p>Too Low</p> <ul style="list-style-type: none"> Loss of Power, Danger of Blowing Engine due to Thin Fuel. Broken or Clogged Fuel Filter. Damaged Fuel Line. 	<p>Boost Warning · Peak Ascending side</p> <p>Warning is the highest boost value for that car plus 10~20KPa.</p> <p>Too High</p> <ul style="list-style-type: none"> Danger of Blowing Engine due to Broken Actuator or Improper Piping of Boost Controller Sensor. <p>Too Low</p> <ul style="list-style-type: none"> Loss of Power due to Improper Piping. 	<p>Vacuum Warning · Peak Descending side</p> <p>Warning -900KPa</p> <p>Vacuum is 0 at full acceleration and minus when the engine break is on. Rather than being too high or too low, look for changes when idling or when the revolution limiter is on.</p>
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SENSOR INSTALLATION

Water Temperature Sensor

Install the water temp. sensor connecting the hose joint (with 1/8 PT hole = sold separately) to the upper hose of the radiator.

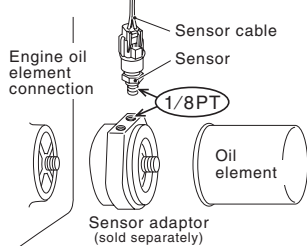


- 1 Cut the upper radiator hose at a suitable spot. (Water coolant will spill out, so prepare replacement coolant.)
- 2 Fit the hose band onto the cut hose and securely connect the cut hose to the hose joint with the hose band, so as no leakage will occur.

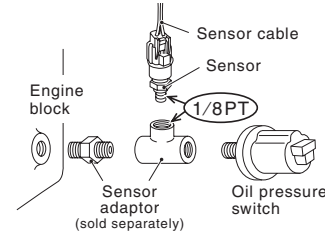
Oil Pressure Sensor

Depending on the installation you may need a sensor adaptor. (Sensor connector 1/8 PT = sold separately.)

A Oil Element Installation



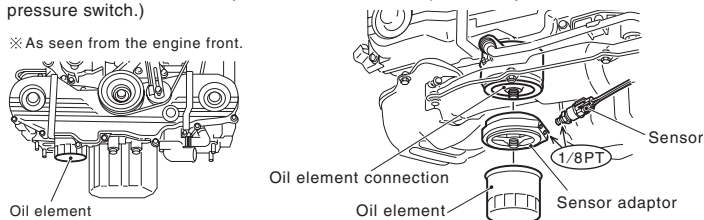
B Oil Pressure Switch Installation



NOTE : About [SUBARU Horizontally-opposed Engine.]

If you install in a car with a SUBARU horizontally-opposed engine, and use the screw hole in the oil pump to install the oil pressure sensor, the vibration from the oil pressure may be so great that it momentarily exceeds 3 times the full scale. This may cause damage to the sensor. If you plan to install in such a model car, please use the oil element installation adaptor as shown below. (It is also possible to use the oil pressure switch.)

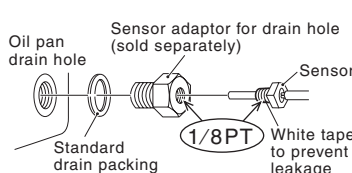
※ As seen from the engine front.



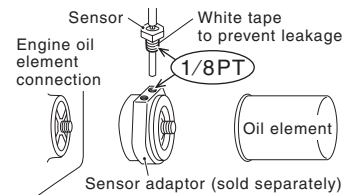
Oil Temperature Sensor

Depending on the installation you may need a sensor adaptor. (Sensor connector 1/8 PT = sold separately.)

A Oil Pan Drain Hole Installation



B Oil Element Installation



NOTE Please be careful not to install the sensor so as it may fall out in any direction and strike the ground causing it to break.

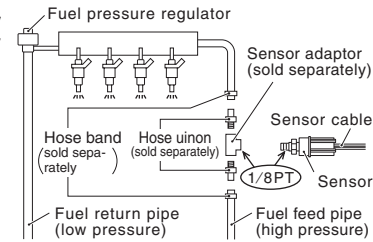
Fuel Pressure Sensor

WARNING The place where the sensor is installed is an area prone to high gasoline pressure. If a leak should occur, it may cause fire and is very dangerous, so please do not use on public roads.

Depending on the installation you may need a sensor adaptor. (Sensor connector 1/8 PT = sold separately.)

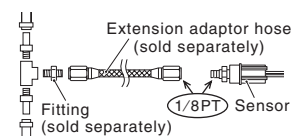
Depending on the installation you may need a sensor adaptor. (Sensor connector 1/8 PT = sold separately. Commercial product may be used.)

- Sensor adaptor**
Sensor connector ; 1/8 PT
- Hose union × 2**
Make sure it corresponds to the diameter of the fit pipe and the sensor adaptor.
- Hose band × 2**
For the prevention of the hose union coming off.



◆ If you are using an extension adaptor hose

If you are using an adaptor hose that utilizes copper piping, make sure to try to reduce vibration by wrapping the piping in a spiral shape. We further suggest that you use an extension adaptor hose that utilizes stainless mesh hose so as to lessen the influence of vibration.

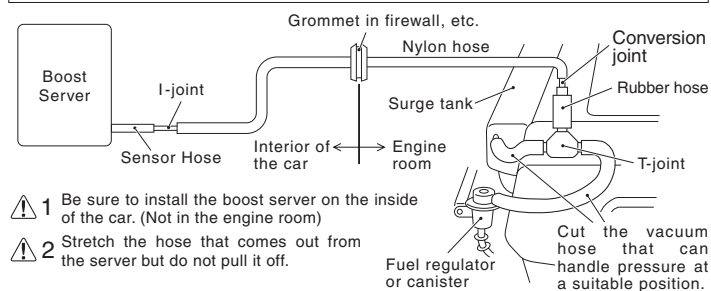


INSTALLATION PROCEDURE

NOTE While working on your car's fuel line, please make sure to follow all proper procedures outlined in your car's maintenance guidelines to ensure no unwanted discharge of fuel.

- 1 Cut the fuel feed pipe.
- 2 Properly connect the sensor adaptor and hose union to the pipe, which you have cut.
- 3 Make sure that no leakage of fuel occurs at each connection by properly carrying out leakage prevention procedures.
- 3 Properly connect the sensor adaptor to the pressure sensor.

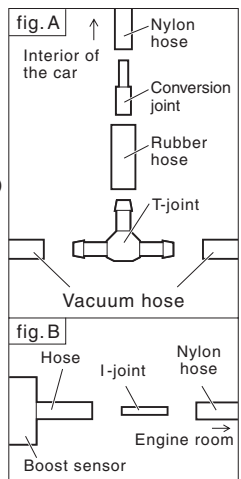
Boost Pressure Sensor



- 1 Be sure to install the boost server on the inside of the car. (Not in the engine room)
- 2 Stretch the hose that comes out from the server but do not pull it off.

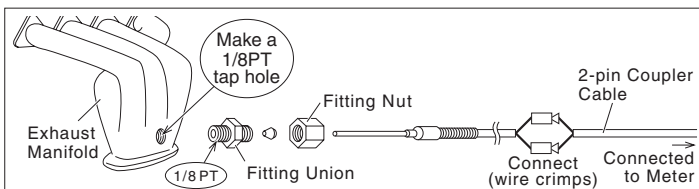
INSTALLATION PROCEDURE

- 1 In the engine room, locate a vacuum hose that can handle pressure directly coming out from the intake manifold or the surge tank. (Ex: A hose that connects to the fuel regulator or canister.)
- 2 Cut the above hose at a suitable place and connect to the T-joint as in fig. A.
- 3 Connect one end of the rubber hose to the T-joint and connect the other end of the hose to the wide end of the conversion joint.
- 4 Connect one end of the nylon hose to the narrow end of the conversion joint and pull the other end of the hose through a harness grommet into the car interior.
- 5 Using the I-joint, connect the end of the nylon hose you pulled into the car to the hose of the boost sensor. (fig. B)



NOTE Make sure that all hose and joint connections are securely fastened so as not to disconnect or cause pressure loss. (Depending on the conditions, it may be necessary to take some action to prevent loosening and disconnection of the various connection points.)

Exhaust Temperature Sensor

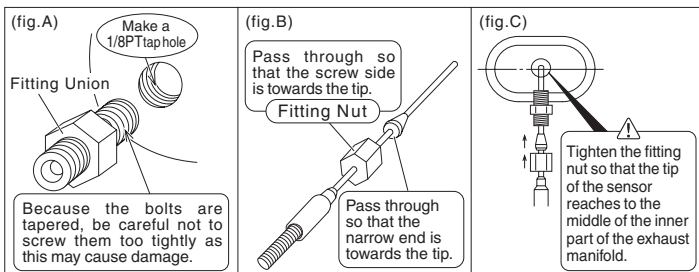


INSTALLATION PROCEDURE

INSTALLATION WARNING

1. When removing and installing the exhaust manifold, please follow directions for your type of model car.
2. Make sure to remove or install the manifold only after allowing it to have become fully cooled down; not doing so may cause burns or injury.

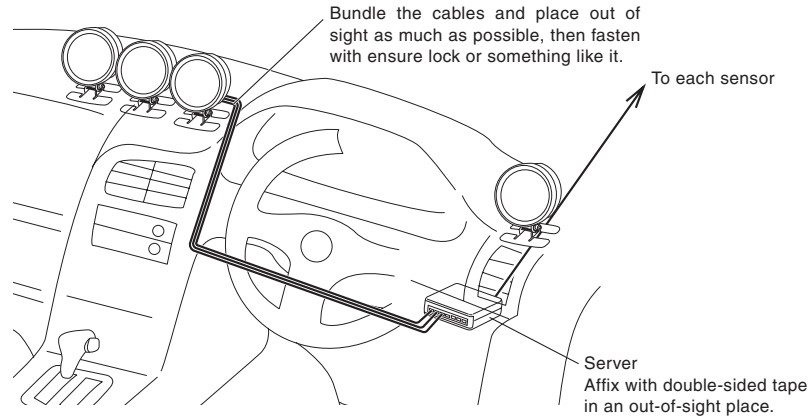
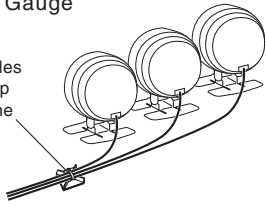
- 1 Detach the exhaust manifold.
- 2 After having decided the position from which to measure the exhaust temperature, make a 1/8 PT tap hole.
- 3 Fasten a fitting union to the middle of the bolt. (fig. A)
- 4 Insert the tip of the exhaust sensor through the fitting nut. (fig. B)
- 5 Tighten the fitting nut on to the bolt so that the tip of the sensor reaches to the middle of the inner part of the exhaust manifold. (fig. C)
- 6 Replace the exhaust manifold.
- 7 After laying out the sensor cable, fasten the connectors by colors to the cable connectors of the 2-pin coupler cable.



AN EXAMPLE OF A DASHBOARD INSTALLATION

Backside of Gauge

Bundle the cables with the tie wrap and fasten to the tie wrap stand.



HOW TO USE THE WIRE CONNECTORS

※If soldering is possible, please do so.

Method 1 Connecting a new wire to the middle of another wire.		Method 2 Connecting two wires at their ends.		※Use a crushing tool to press the wire connector. If you do not have such a tool, use pliers or such to fold and crush the connector together for a secure contact. ※Be sure to insulate and secure with vinyl electrical tape.
1	Peel off about 10mm of the vinyl cover at connection point.	1	Peel off about 10mm of the vinyl covers at the end of the wires to be connected.	
2	Twist the uncovered wires.	2	Twist the uncovered wires.	
3	Close tightly with wire connector.	3	Close tightly with wire connector.	

METER INSTALLATION

A Installation with the Adjustable Stand			When using the provided Band Holder to install on the dashboard.		B Installation with the Cushion Tape	
Fasten using the double-sided tape. (On top of the steering column cover or dashboard.)	1. Installing the Adjustable Stand ① Place the stand's holder band around the back of the meter. NOTE : If you cannot get the band around the meter, loosen the hexagonal bolt and expand the band. ② After getting the band in place, tighten the hexagonal bolt to secure the band.	2. Installing to the Car ① Carefully decide installation place. ② Bend the stand to securely fit the place of installation. ③ Clean the surface; removing all oil or dust. ④ Fasten using the double-sided tape. ⚠ Please be sure about where you wish to install the meter, as it is not advisable to reuse double-sided tape.	⑤ After deciding the position and angle of the meter face, fasten the hexagonal bolts on both sides to secure.	Wrap the cushion tape around the base of the meter and forcibly insert into the 60mm hole in the panel.		

PART DIMENSION (unit : mm)

Meter	Meter Cable	Server (For both temp. and press.)	Boost Server
Temp. Sensor		Press. Sensor	Exhaust Temp. Sensor

TROUBLESHOOTING

※Please make the following checks before seeking repair.

Trouble	Possible Causes	Possible Solutions
The opening demo does not work with the key switch ON.	Poor connection of Server's red wire or black wire.	Check the wire connections or conditions.
	Poor connection of wire between Gauge and Server.	Check the meter and server connections or conditions.
When the display does not change or the display does not change after the opening demo.	Poor Server connection.	Check the sensor connections or conditions.
Even with the small lamps ON, the meter light does not come on.	Poor connection of Server's 3-pin coupler.	Check the ORANGE wire connections or conditions.
	The Illumination Setting is on Auto 1.	The Illumination Setting will be set as Continuous Illumination Mode.
The needle stops at the key OFF position.	This is a characteristic of the stepping motor and is not a failure or breakdown. If after the opening demo with the key ON, the display reads correctly the meter is working properly.	