



GARRETT G-SMART MODULE

Installation Instructions

PN	Kit Description	Speed Sensor	Harness	Module
923586-0002	Module Harness Threaded Speed Sensor (GTX Gen II 28,30,35 and Custom Installation)	Threaded	Y	Y
923586-0003	Module Harness Flange Speed Sensor (G-Series GTX Gen II 47 50 55 PowerMax)	Flange	Y	Y
923586-0004	Module Harness	No	Y	Y



We recommend that this Garrett product be installed by a qualified automotive technician. If you have any doubts as to your ability to install this product, consult with a local automotive repair company. Please be sure to carefully read all of the attached instructions prior to starting the installation process. If you have any questions about the enclosed parts or the instructions, call the distributor that you purchased the kit from for clarification.

Prior to the Garrett product installation, be sure that the vehicle is parked on a level surface and the engine is cool. Engine fluids and components can be extremely hot following normal vehicle operation. Avoid direct contact of engine fluids or components with your skin which may cause personal injury.

GARRETT G-SMART MODULE

IMPORTANT INFORMATION - PLEASE READ CAREFULLY

Return Policy

Only unused and complete merchandise will be accepted for return subject to inspection and acceptance by Garrett Advancing Motion. No goods will be accepted without prior return authorization from Garrett Advancing Motion. No returns are accepted after thirty (30) days from original ship date from Garrett. All accepted returns are subject to a 20% restocking charge - NO EXCEPTIONS.

Damaged Shipments

The customer must file a claim with the shipping company if goods arrive in a damaged condition. The customer must also notify the distributor from which the goods were purchased with pertinent information.

Refused Shipments

Sending a shipment back to The Garrett Garage (or Garrett) does not automatically give rise to a complete refund or credit. Garrett Advancing Motion may, at its sole discretion require different payment means for any shipment refused and then reshipped. It is the customer's responsibility to make all arrangements with Garrett Advancing Motion for disposition of refused shipments.

Shortage or Discrepancy Claim

Shortage or Discrepancy claims must be reported within forty-eight (48) hours of receipt of goods to the distributor from which the goods were purchased. The Garrett distributor will determine the best solution on how to address shortages or discrepancies.

Limited Warranty

Garrett Advancing Motion warrants to the original purchaser of its Turbocharger Products that such Turbocharger Products will, for a period of 1 year from date of shipment and subject to the Limitations on Warranty, be free from defects in materials and workmanship. For approved warranty claims Garrett Advancing Motion will, at its sole discretion, either credit the original purchaser in an amount equal to the original purchase price, or replace the applicable Turbocharger Product free of charge, within 60 days of Garrett Advancing Motion' approval. This is purchaser's sole and exclusive remedy and provides the complete financial responsibility of Garrett Advancing Motion for a warranty claim. To be eligible for reimbursement, Customer must (a) submit all warranty claims to Garrett Advancing Motion within 30 days of the discovery of the alleged Turbocharger Product defect; and (b) complete and return a Returned Material Authorization Form. Consumers are required to work through Garrett distributors in order to process any warranty claims.

When Garrett Advancing Motion requires the examination of a failed part, Garrett Advancing Motion will promptly notify Customer and will await receipt of the failed part before further processing the warranty claim. If Garrett Advancing Motion ultimately determines that the failed part is covered under the Limited Warranty, Garrett Advancing Motion will reimburse Customer for the actual cost of ground shipment for any part found to be defective.

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IMPORTANT INFORMATION - PLEASE READ CAREFULLY

Limitations on Warranty

The Limited Warranty does not apply to any parts: (a) not used in accordance with Garrett Advancing Motion' written instructions (b) for which no fault is found; (c) that have been modified in any manner not specifically approved by Garrett Advancing Motion; (d) for which an inspection indicates that reasonable and proper installation and/or preventative care and maintenance has not occurred; (e) that have been subject to damage attributable to or caused by misuse, abuse or vandalism; mishandling, improper shipping or other transit related damage; acts of god or insurrection; foreign object entry; any part not supplied by Garrett Advancing Motion; any repair, maintenance or service by anyone other than Garrett Advancing Motion; or any other acts that are beyond Garrett Advancing Motion' reasonable control; or (f) attributable to parts not supplied by Garrett Advancing Motion expressly disclaims any and all warranties relative to the foregoing circumstances.

Garrett Advancing Motion shall not be liable to Customer under any circumstances for any special, incidental or consequential damages, including without limitation, damage to or loss of property other than for Turbocharger Products; damages incurred in installation, repair or replacement; lost profits, revenue or opportunity; loss of use; losses resulting from or related to downtime of Turbocharger Products; the cost of replacement transportation, power, or compression; the cost of substitute products; or claims of third parties for such damages, howsoever caused, and whether based on warranty, contract, and/or tort (including negligence, strict liability or otherwise).

The Limited Warranty is the only warranty made by Garrett Advancing Motion for any of its turbochargers and related parts and/or services, and is in lieu of and excludes all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. Garrett Advancing Motion hereby disclaims all other warranties not expressly set forth. Some jurisdictions do not allow for the exclusion of implied warranties, so the above exclusions may not apply to you, however if implied warranties do apply they are limited to the original purchaser and for a period of one (1) year from the date of shipment.

Diagnosing Your Vehicle

Do not rely on diagnostic software without seeking the advice of an ASE certified mechanic. Diagnostic software should only be used as a general guideline to help you facilitate the repair of your car. If you experience or suspect any malfunction of vital safety equipment, such as your brakes, exhaust, motor, transmission, fuel delivery system, your car's structural integrity or any other potentially life threatening malfunction, cease driving your vehicle immediately and seek professional help. Always consult your owner's manual.

Vehicle Modification Notice

Any modifications to your car are AT YOUR OWN RISK. You should consult the owner's manual and service manual. You should also contact your car's manufacturer to determine what effects modifications may have on your safety, warranty, performance, etc. Please also contact your local authorities to determine whether your intended modifications will make your car illegal to drive on public roads. A vehicle modified by the use of competition parts may not meet the legal requirement for use on public roads. It is your responsibility to comply with federal, state, and local laws prior to driving your vehicle on public roads.

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IMPORTANT INFORMATION - PLEASE READ CAREFULLY

OTHER PRECAUTIONS

Observe all safety precautions and warnings contained in the installation instructions. Wear eye and ear protection and appropriate protective clothing. When working under or around the vehicle support it securely with jack stands. Use only the proper tools. Exercise extreme caution when working with flammable, corrosive, and hazardous liquids and materials.

LEGAL INFORMATION

This product is an aftermarket part that is not legal for street use in California and New York. Use on public roads may also be prohibited in other states adopting California emissions standards under Section 177 of the Clean Air Act. If you do not live in California or New York, you should check with your state authorities to find out whether this product is legal for street use in your state. Federal and state laws also prohibit the tampering with parts or vehicle design elements affecting emissions on vehicles intended for use on public roads. You are responsible for ensuring that the use of this product complies with all applicable federal, state or local laws, regulations and ordinances. This product may be used on racing vehicles that will never be driven on public roads or highways.

Contact Information for Questions

Please contact the Garrett distributor from which the equipment was purchased for any questions regarding this Shipping/Returns/Cancellation Policy, for notifications to Garrett Advancing Motion, and for instructions on processing damaged shipments and authorized returns.

Garrett Advancing Motion ATTN IAM
2525 190th Street B4
Torrance, California 90504
www.GarrettMotion.com

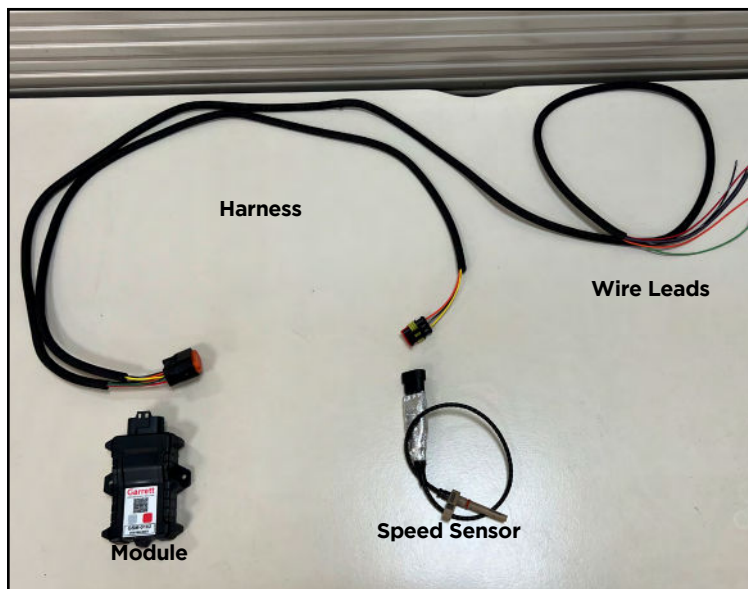
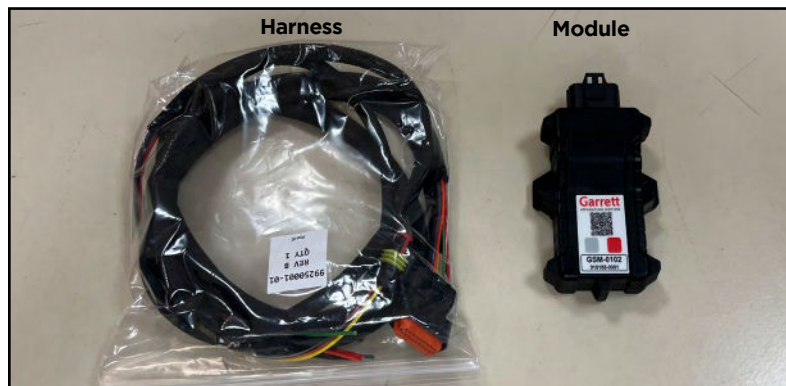
Garrett
ADVANCING MOTION

GARRETT G-SMART MODULE

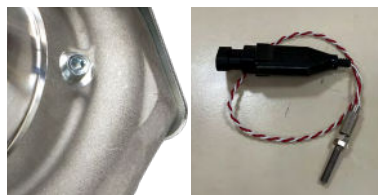
Installation Instructions

Kit Contents:

PN	Kit Description	Speed Sensor	Harness	Module
923586-0002	Module Harness Threaded Speed Sensor (GTX Gen II 28,30,35 and Custom Installation)	Threaded	Y	Y
923586-0003	Module Harness Flange Speed Sensor (G-Series GTX Gen II 47 50 55 PowerMax)	Flange	Y	Y
923586-0004	Module Harness	No	Y	Y



Flange Speed Sensor
(G-Series | GTX Gen II 47 50 55 | PowerMax)



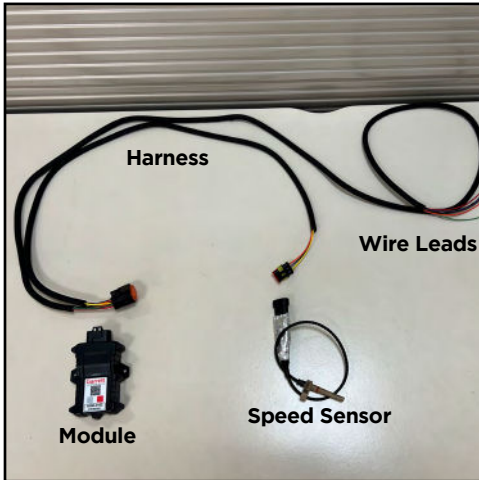
Threaded Speed Sensor
(GTX Gen II 28 30 35 | and Custom Installation)

Important Installation Information:

- The module is rated for a maximum temperature of 176°F (80°C).
- Ensure the power supply to pin ten (red wire) is a 12V switched and fused power source with constant power even while the engine is cranking. The module draws less than 1A.
- If a pressure sensor is connected to the module, ensure the black/white wire (pin 7) is connected to the ground wire of the pressure sensor (usually a black wire), not to a chassis ground.
- Module Bluetooth Proximity: The G-Smart module should be in close proximity to your mobile device for proper data transmission. This may vary per application and location. Please check the bluetooth connection before securing the module.
- Mobile device and mount not included and must be supplied by the user.

GARRETT G-SMART MODULE

Installation Instructions



1. Unravel the harness on a flat surface. Pair the module and speed sensor with the correct harness connector.



2. Attach the G-Smart module and harness connector.



3. The module harness connector should latch and lock onto the module.



4. With the module connected to the harness, take the harness to the car for install.

5. Be sure the vehicle is parked on a level surface and the engine is cool. Place the module and harness in the engine bay, in proximity to the turbo and in a location where the module is protected from excessive heat caused by the engine, exhaust manifold, and turbo.

The module is rated for a maximum temperature of 176°F (80°C).

6. Connect the speed sensor to the turbocharger:

Flange Sensor: Page 14

Threaded Sensor: Page 9-13

7. Attach the speed sensor plug to the harness connector. The speed sensor harness connector should latch and lock onto the speed sensor.

8. Secure the module to a sturdy surface in a way that minimizes vibration and movement when the car is running and in motion.

9. Ensure no wires are near or in front of the turbo inlet, or any other rotating parts of the vehicle, where they can become damaged or destroyed. Use cable ties or tape to secure wires.

10. Using the pin identification chart, connect the appropriate wires for your setup. At a minimum, wires for pin 2, 10, and 17 must be connected to power the module and transmit data from the speed sensor to the app.

Ensure the power supply to pin ten (red wire) is a 12V switched and fused power source. The Module draws less than 1A.

11. Wire leads can be extended using 20-18 gauge wire if needed.

12. **Important info for ground connections:** If a pressure sensor is connected to the module, ensure the black/white wire (pin 7) is connected to the ground wire of the pressure sensor (usually a black wire), not to a chassis ground. Connecting this wire to a chassis ground can cause erratic and incorrect pressure values.

PIN	Label	Description	Wire Color
2	TSS-OUT-GND	Turbo Speed Sensor, Output Ground	Black / Lt Green
7	MAP-GND	Manifold Absolute Pressure, Sensor Ground	Black / White
10	12V VBAT	12V Switched Battery Power	Red
11	TSS1-OUT-SIG	Turbo Speed Sensor #1, 0-5V Analog Output	Green
15	MAP-5V	Manifold Absolute Pressure, 5V Sensor Power	Orange
16	MAP-SIG	Manifold Absolute Pressure, 0-5V Analog Signal Input	Violet
17	12V-GND	Battery Ground	Black

X pin outs are not used

13. Module Bluetooth Proximity:

The module should be in close proximity to your mobile device for proper data transmission. This may vary per application and location. Please check the bluetooth connection before securing the module.

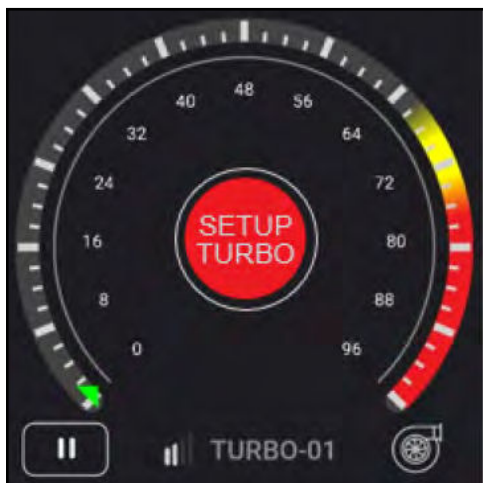
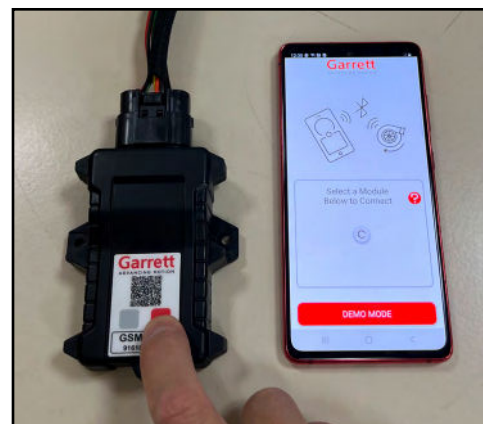
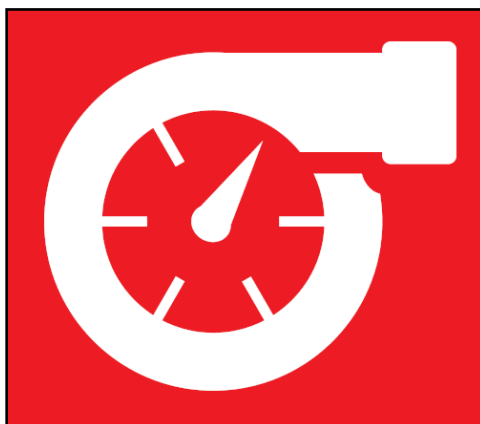
GARRETT G-SMART MODULE

Installation Instructions

14. Download the free Garrett G-Smart app from the App or Google Play store.

15. **Connect To Device:** Open the app on your mobile device, then turn on fused switched 12V power to the car/module. The module should signal a red LED. Hold down the red button on the module until the light flashes blue.

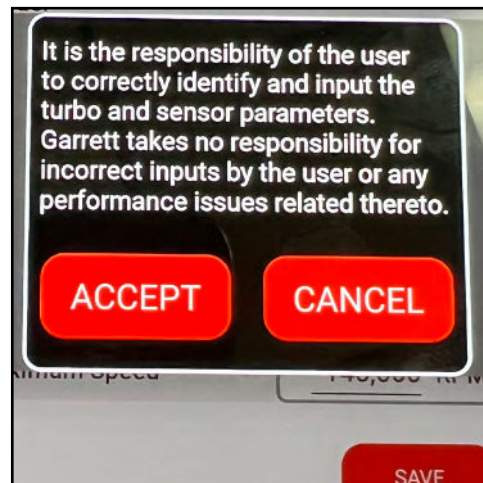
16. The blue flashing light indicates pairing mode. The device name should appear on the "Select a Module" screen of the app. Tap the correct module name (Default is "TURBO-01", which can be changed in "Connection Settings") to pair with the device. Pairing is done once per module and per device.



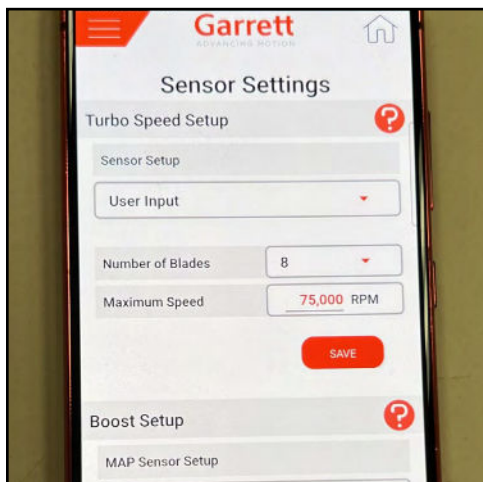
17. If this is your first time pairing with the app, your home screen will display the setup turbo button. Click to proceed to the turbo setup menu.



18. **Turbo Setup for Garrett part numbers:** Select turbo model from the dropdown list. Select and verify the part number. Some models will have multiple part numbers. Once the part number is selected, the maximum turbo speed, blade count, and part number will populate.



19. Verify your turbo model, part number and blade count. Then click save to apply the settings.



20. **Setup for Non-Garrett manufactured part numbers:** Select "user input", then enter the compressor wheel blade count that comes in proximity to the location and placement of the speed sensor. Enter the maximum turbo speed value. Click save to



21. **Boost Sensor Setup:** If connecting a boost pressure sensor, navigate to the sensor settings menu to complete the setup. Select the sensor from the dropdown menu. If the sensor is not in the dropdown list, select "user input" to enter the calibration inputs.

22. Select the pressure unit you want displayed on the gauge screen. (PSI, Bar).

23. Verify the sensor calibration settings for 0.5 Volt and 4.5 Volt.

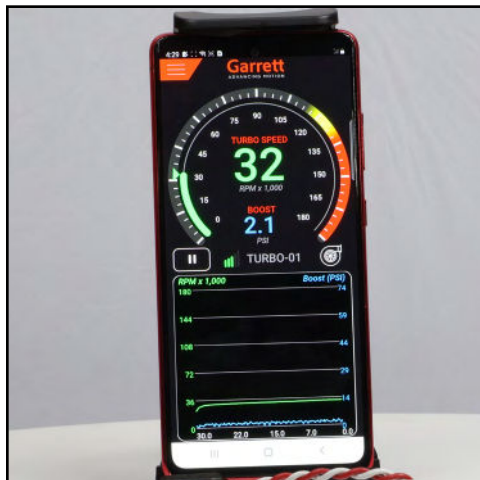
24. **Barometer:** The module can take a sample MAP reading upon startup or you can enter a Constant Value. NOTE: If "Sample MAP at Power-Up" is selected during pressure sensor setup, power the module off and then back on with MAP sensor exposed to atmospheric pressure (engine is not running - no vacuum or boost)" to sample correctly for barometric pressure after the "Save" button is pressed and changes acknowledged.

25. **Sensor Wiring:** refer to step 7 and the pin identification chart when wiring the boost pressure sensor.

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Installation Instructions

26. Test the device: start the vehicle, ensure the mobile device is paired with the module. The pairing process should only need to be performed the first time you connect the module to your device. Check if the app is displaying turbo speed and boost data (if connected). If the app is not displaying data, turn off the vehicle, review the installation steps for any errors made during the installation process. If the problem persists, please contact your retailer/distributor for additional support.



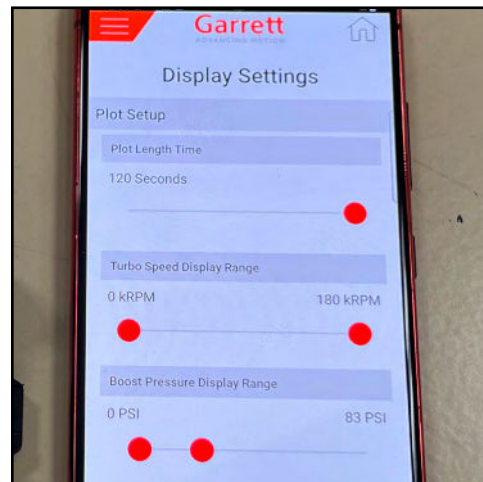
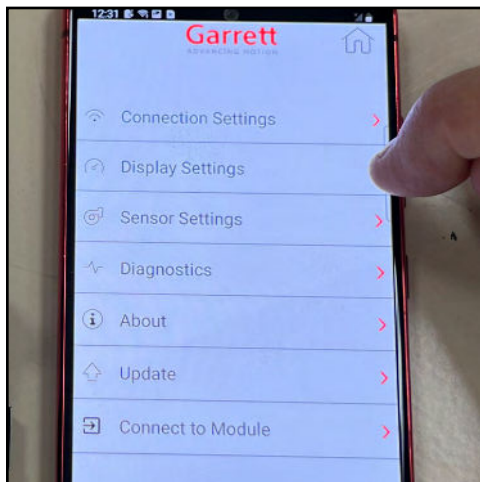
Warning: Do not hold or review your device while driving the car. Always keep both hands on the steering wheel, eyes on the road, and obey local safety and traffic laws.

27. Display settings: This allows you to adjust the Plot Length, Turbo Speed Display Range, and Boost Pressure Display Range.

Plot length refers to the graph on the lower section of the home screen. This section displays turbo speed and boost data. You can pause the live feed to the graph and review the data at any time. This section can be increased up to 120 seconds.

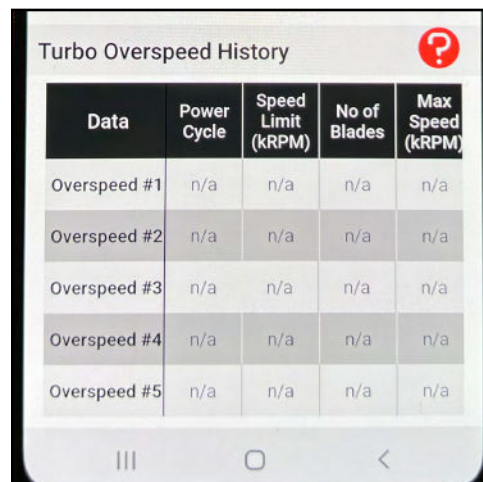
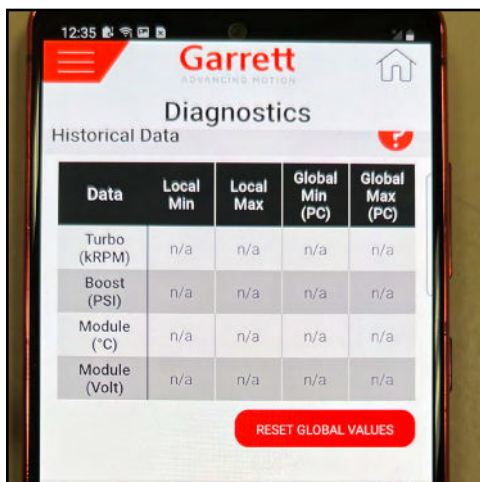
Turbo Speed Display Range refers to the min/max values on the gauge sweep. If you setup the module using a Garrett part number, you do not need to change these values.

Boost pressure display range min/max values can be adjusted for the graph display.



28. Diagnostics: View the min and max historical data for turbo kRPM, Boost Pressure, Module temperature, and Module voltage. You can reset the global values at any time with the reset button.

Turbo Overspeed History will log the top 5 overspeed occurrences. Power cycle, Speed Limit, Max Speed, and Number of blades will be displayed. This data is recorded on the module and cannot be reset.



GARRETT G-SMART MODULE

Threaded Speed Sensor Installation Instructions

GTX Gen II 28, 30, 35 and Custom Installation

1. Remove the compressor housing from your turbocharger. This may necessitate removing the turbo from the vehicle, if it is already installed. Typically the compressor housing is attached to the turbo using a v-band clamp or bolted clamps. Remove all bolts, clamps, and the wastegate actuator – whatever is necessary to separate the compressor housing from the turbo (see fig. 1). Do not loosen the wastegate rod end or lock nut, and do not adjust the actuator; simply unbolt its bracket from the compressor housing.

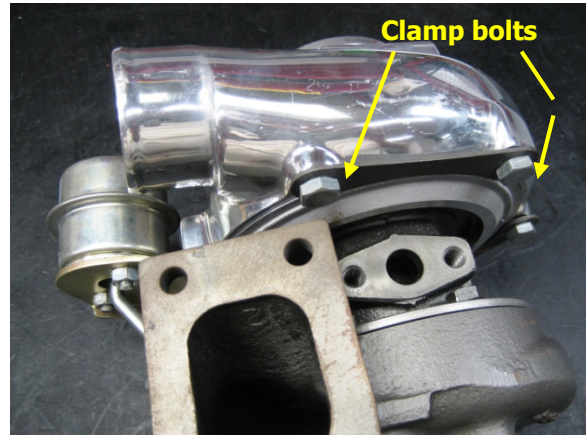


Fig. 1

2. If the compressor housing has a pre-drilled speed sensor port and plug installed from factory(see fig. 2), skip to step 6 for removal instructions.



Fig. 2

3. Refer to the enclosed layout drawing 776243 and find your particular Garrett turbo on sheet 2. Check the turbo nameplate for part number. Otherwise, cross-reference www.GarrettMotion.com or your Garrett catalog to confirm your turbo part number, or call a distributor if you are unsure. Once you have identified the part number, highlight the correct row in the table for future reference. The dimensions in this table refer to the views on sheet 1 of this drawing; these are instructions for the machinist to modify your housing. For example, if you have a Disco Potato turbo (GT2860RS) part number 739548-1, or -5 or -11, highlight row 18. You will only need the dimensions listed in this row (see figure 3).

-	GT2860R	707160-0005	446237-0025	0.60	28
-	GT2860R	707160-0007	446237-0039	0.42	28
-	GT2860RS	739548-0001 739548-0005 739548-0011	446296-0015	0.60	28
-	GT2860RS	739548-0009	467937-0015	0.60	28
-	GT2871R	472560-0015 771847-0001	467937-0013	0.60	11
-	GT2871R	742247-0001	446296-0018	0.60	28

Fig. 3

4. Take your compressor housing and the highlighted layout 776243 (all sheets) to a qualified machine shop. Make sure the machinist is capable of meeting the tolerances on the drawing and knows which row of dimensions to use before agreeing to pay for the work. You may want to supply the machine shop with the spacer, screw and speed sensor so they can test-fit the parts in the housing (see figure 4).

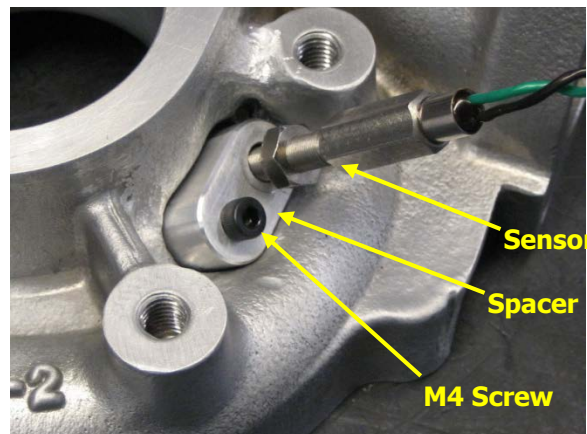


Fig. 4

GARRETT G-SMART MODULE

Threaded Speed Sensor Installation Instructions

GTX Gen II 28, 30, 35 and Custom Installation

NOTE: On the machining Layout (776243 sheet 1), datum A is always the main compressor housing mating surface, which is a machined surface around the perimeter of the housing, and is usually inset by several millimeters.

5. Once the housing is machined, install the spacer with the supplied M4 screw. There are different lengths of screws supplied in the kit; the layout drawing shows which screw to use on each turbo. Do not torque the screw at this point. If your housing has a ported shroud and the machined spacer pocket has broken through to the inside, coat the outside of the spacer with RTV or similar sealant to prevent an air leak past the spacer (see figure 5).

6. If the compressor housing has a pre-drilled speed sensor port and plug installed from factory, follow these instructions(Fig. 6). Using a 5mm Allen wrench(Hex key), remove plug completely from the compressor housing(Fig 7). Keep plug in safe place just in case it is needed in the future. Thread is a unique M6x0.5mm and cannot be purchased from stores. Follow the instructions in the next steps to install speed sensor but do not use M4 screws or spacer block for installation.

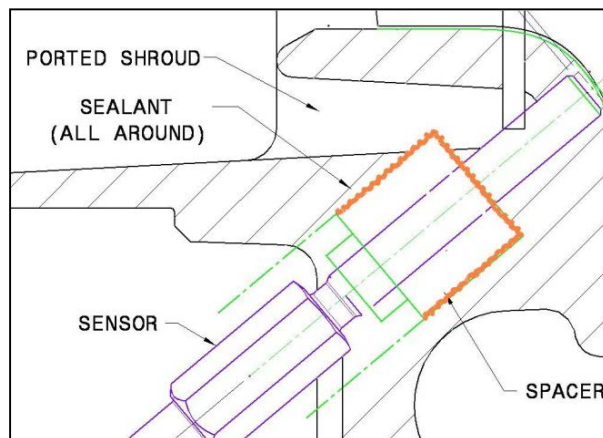


Fig. 5



Fig. 6



Fig. 7

GARRETT G-SMART MODULE

Threaded Speed Sensor Installation Instructions

GTX Gen II 28, 30, 35 and Custom Installation

7. Test fit the speed sensor. If the lock nut is not accessible by wrench once installed, apply a threadlocking compound that will cure slowly enough to allow adjustment and final tightening. Install the speed sensor loosely in the housing – do not tighten the lock nut yet.

IMPORTANT: Make sure the **tip** of the sensor is approximately flush with the inside contour of the housing. (see figure 8). Tighten the M4 spacer screw once the sensor has been installed in the housing.

8. Count the number of blades on your compressor wheel, including small (splitter) blades. Record this number below; you will need it later (see figure 9).

Number of Compressor Wheel Blades: _____

9. Install the housing on the turbocharger with its bolts and clamps. Make sure housing orientation is correct. Reinstall the wastegate actuator with bracket. Tighten and torque the clamping bolts, according to the tabulated columns "Comp. Housing Clamp Bolt Torque" and "Clamp Bolt Thread Type" on the layout (776243) for your turbocharger.

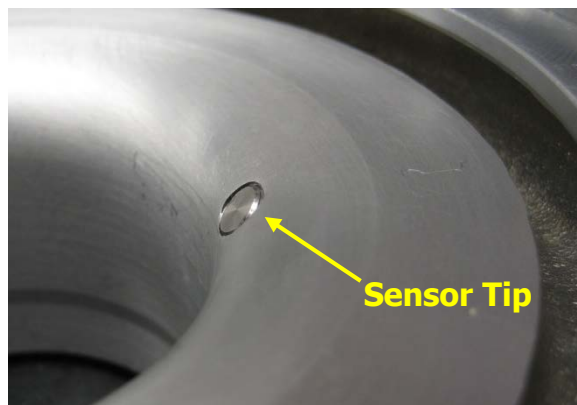


Fig. 8

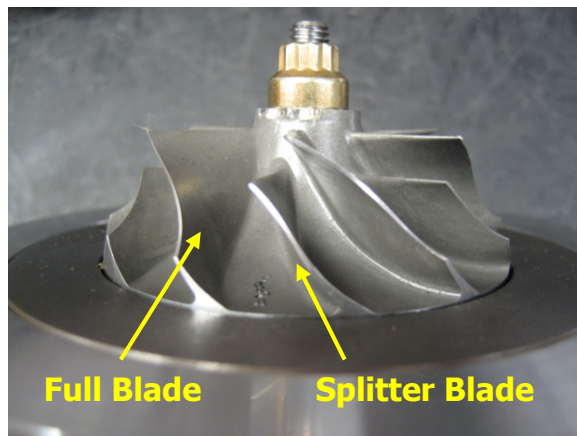


Fig. 9

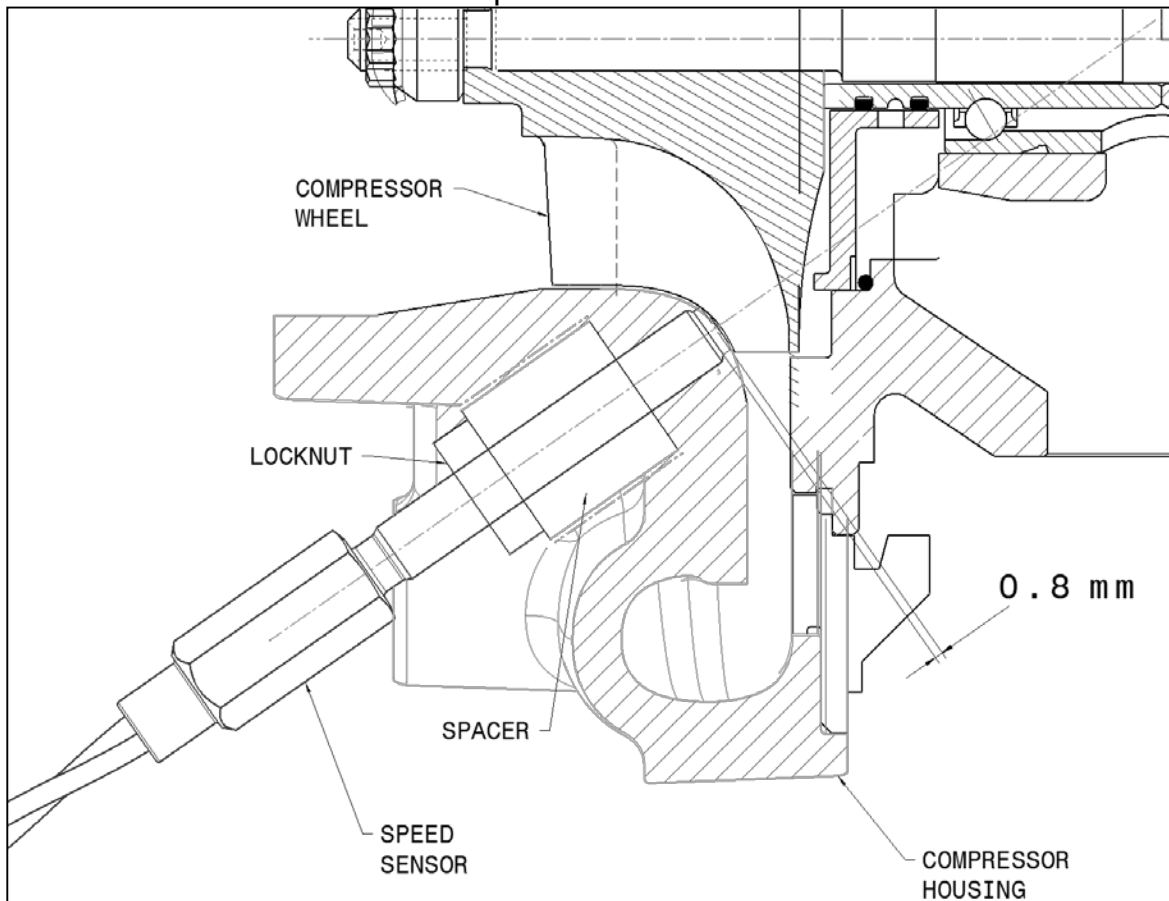
GARRETT G-SMART MODULE

Threaded Speed Sensor Installation Instructions

GTX Gen II 28, 30, 35 and Custom Installation

10. Setting the sensor depth: if the turbocharger is still in the vehicle, ensure that there is enough space to adjust the sensor by turning it in and out. Also ensure there is sufficient space to turn the compressor wheel by hand. If not, remove the turbocharger from the vehicle. Slowly turn the sensor clockwise, while simultaneously spinning the wheel very slowly. Turn the sensor inwards, just until the tip contacts the edge of a compressor wheel blade (see figure 10). Be extremely careful not to jam the wheel into the sensor – the blades or sensor could be damaged. You should be able to feel a SLIGHT resistance and noise while gently turning the wheel as it contacts the sensor. Then turn the sensor back counterclockwise, approximately **1.6** full turns. This sets the sensor depth correctly. The nominal distance from the blade edge is 0.8mm. The sensor thread pitch is 0.5mm/thread (0.5mm/thread × 1.6 threads = 0.8mm).

NOTE: If the Garrett Turbo Speed Sensor Kit is being used with an older Garrett (T-Series) turbo, or with a non-Garrett unit, refer to figure 10 below for general placement of the sensor. It should always be installed at 0.8mm clearance from the wheel. The sensor hole should be drilled at an angle, placing the sensor near the base of the wheel below the level of the splitter blades, in order to accurately measure the speed. On custom applications the sensor can be used with or without the spacer block.



GARRETT G-SMART MODULE

Threaded Speed Sensor Installation Instructions

GTX Gen II 28, 30, 35 and Custom Installation

11. Tighten the speed sensor lock nut firmly with a 10mm wrench. If there is not enough clearance to use a wrench, use needle-nose or similar pliers in conjunction with threadlocking compound to tighten the nut as securely as possible. (see figures 11 and 12).

12. Reinstall your turbocharger if it is not already in the vehicle.

13. Return to page 6, Step 7, to resume the G-Smart installation process.

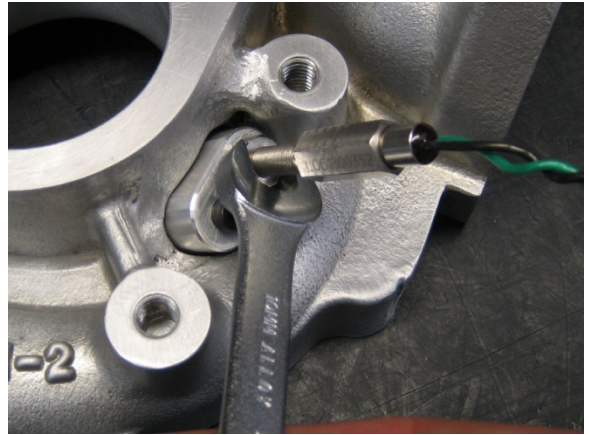


Fig. 11

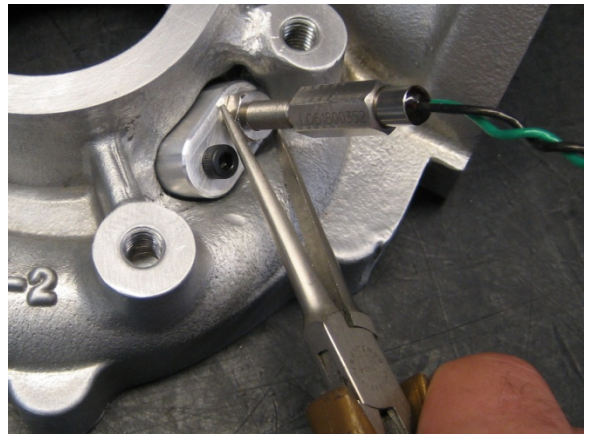


Fig. 12

GARRETT G-SMART MODULE

Threaded Speed Sensor Installation Instructions

G-Series | GTX Gen II 47, 50, 55 | PowerMax

14. Remove bolt from speed sensor port plug located on inlet side of compressor housing using a 7mm socket or wrench(Fig. 14). Remove speed sensor port plug from compressor housing by pulling on it gently and rotating if necessary. Put bolt aside to be used when installing speed sensor. Note: Compressor Housing does not need to be removed from Turbocharger and Turbocharger does not need to be removed from engine if there is adequate space to access the speed sensor plug.

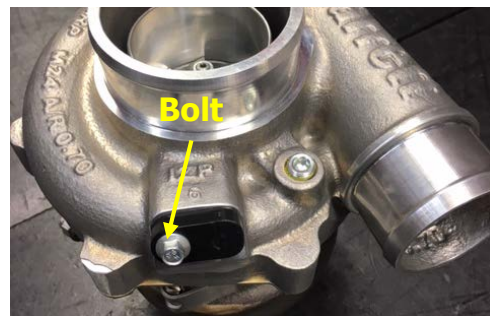


Fig. 14

15. Locate your new G-series speed sensor 873148-0010 from G-Series Speed Sensor Kit. Apply a light coat of oil on O-ring located on the speed sensor body. (Fig. 15)

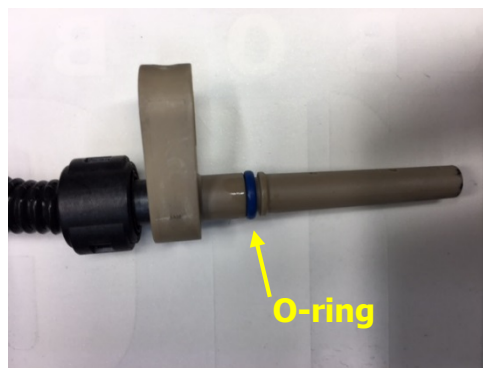


Fig. 15

16. Push speed sensor into speed sensor port on the compressor housing until firmly seated. Re-use bolt from speed sensor plug from step 14 and torque to 5-6Nm(44-53inlbs) Using 7mm socket and torque wrench. (Fig. 16)



Fig. 16

17. Return to page 6, Step 7, to resume the G-Smart installation process.