



Porsche Air Cooled Throttle Installation Guide

Read thoroughly before installing any AT Power products.

Designed and Manufactured in house

Safety Information



WARNING!

Please read this guide carefully before installation.

Motorsport or driving activities can be dangerous and can result in serious personal injury or death. Please read all fitting instructions thoroughly before proceeding with installation.


AT Power (part of S-CAN 3D Ltd) automotive products are designed for motorsport use only. We accept no responsibility for improper use of our products, and we make no warranty regarding their ability to prevent injury or death. The performance, durability, and safety of this equipment are directly dependent on correct installation, usage, and maintenance. By using this product, the user voluntarily assumes all risks associated with its use.

Installing AT Power products on vehicles subject to manufacturer's warranty may void the manufacturer's warranty and the vehicle's compliance to meet emissions and other transport regulations.

Working on a vehicle involves inherent risks. If you are unsure of what you're doing, please entrust all mechanical and safety-critical tasks to a qualified professional. S-CAN 3D Ltd, accepts no liability for any incorrect installation or misuse of its products.

Please do not dispose of AT Power products in household waste. To help protect the environment and human health from the impact of improper disposal, recycle it responsibly to support the sustainable reuse of materials.

Serial Number(s)



For future access to our product services, please record your serial number(s) here. You can find them on the product label. Distributors, kindly share this information with your customers. Please retain this manual.

We reserve the right to modify this document's content or make technical changes without notice. Copyright Notice © S-CAN 3D Ltd.

Warranty Disclaimer

S-CAN 3D Ltd.
Unit 10b Bunns Bank Ind Est
Attleborough
Norfolk
NR17 1QD
United Kingdom

Dear Customer,

Thank you for choosing an AT Power product. We hope your order has arrived in the same pristine condition it left our facility. If you notice any transport damage or manufacturing faults, please notify S-CAN 3D Ltd within three business days of delivery.

All AT Power products come with a 12-month manufacturer's warranty from the date of delivery, subject to the parts being installed correctly and run within their specification. Please save this installation manual.

Additionally, we also offer refurbishment services to extend the life of your AT Power products. For more information and to get a quote, please contact us via email.

Please note that S-CAN 3D Ltd is not liable for defects caused by normal wear and tear, intentional damage, negligence, improper conditions, misuse, unauthorised alterations, or any actions or omissions by the Customer, their employees, agents, or any third party. Failure to follow AT Power's instructions (whether written or oral) will result in the warranty being voided, without exception.

For full terms and conditions, please visit AT Power's website or contact us directly for assistance.

Sincerely,

James Senior
Managing Director
S-CAN 3D Ltd.

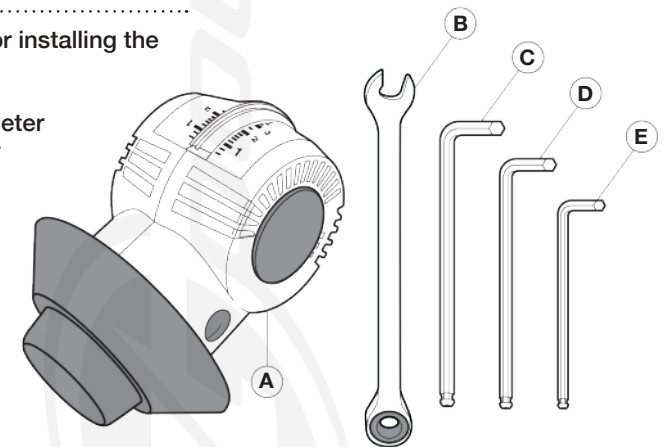
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Tools Required

The tools required for installing the throttles are:

- A. Airflow Synchrometer
- B. 2 x 8mm Spanner
- C. Hex Key 4mm
- D. Hex Key 3mm
- E. Hex Key 2.5mm



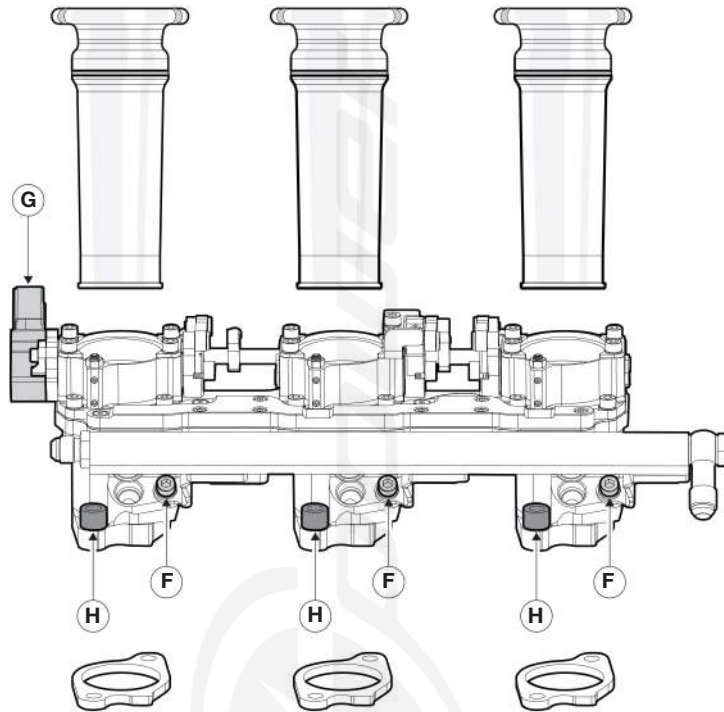
Introduction

This manual provides installation instructions for the Porsche 911 [1969–1977], 911 [1978–1988], and 964/993 models. Since installation details vary slightly, please refer only to the sections relevant to your specific model.

Each of AT Power's Porsche air cooled throttles are designed for a plug-and-play installation. Each throttle is supplied with a thermal gasket for the cylinder head. While minimal pre-assembly is required, fine-tuning and idle adjustment will still be necessary.

Installation

AT Power's throttles are supplied fully assembled with extensions (runners), ram pipes (trumpets), and fuel rails. Each throttle bank is factory-balanced, with the idle set to the minimum position.



Drawings may vary from product

Before installing the throttles, remove the fuel rails by loosening the three M6 bolts (F) securing the fuel rail to the throttle housings, then fit the fuel injectors. The standard fuel rail mounting brackets are designed for Pico Injectors.

If you wish to use alternative injectors, please contact AT Power for compatibility details. AT Power recommends Pico 377cc injectors for applications up to 350HP (more information on Pico fuel injectors is available on p23).

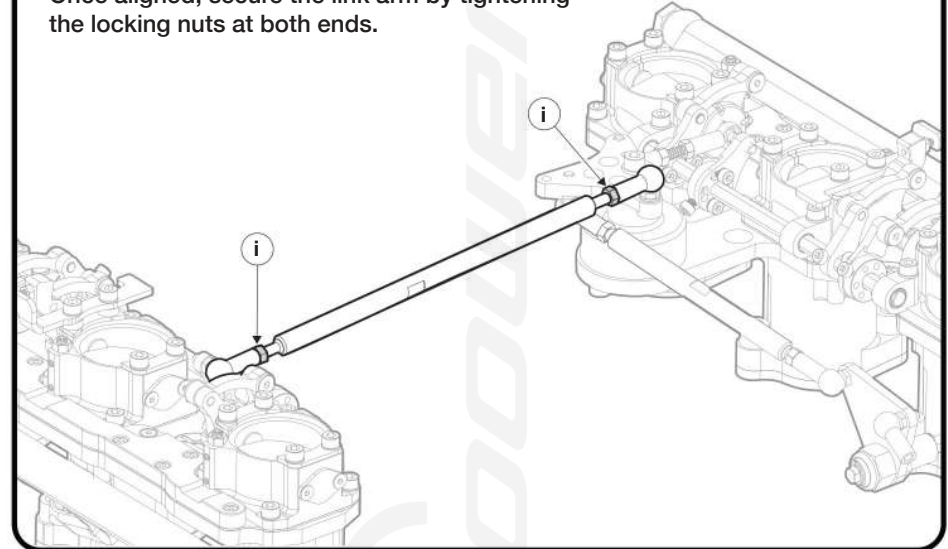
The throttles are fitted with a Novotechnik RSC3200 TPS, installed on the left throttle bank (G).

For 911 only, mounting spacers (H) have been provided to allow the use of the existing OEM mounting studs and nuts.

Linkage Mechanism

Porsche 911 [1969-1977]

After both throttle banks have been fitted to the cylinder heads, fit the link arm connecting the throttle banks as shown. With the locking nuts loosened (i), adjust the link arm to ensure both throttle banks open simultaneously. Once aligned, secure the link arm by tightening the locking nuts at both ends.

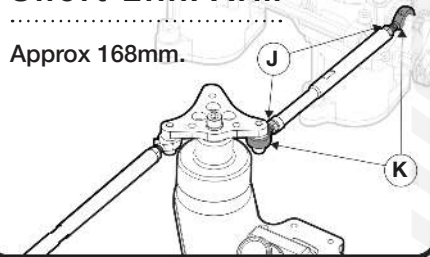


Porsche 911 [1977-1989] & 964/993

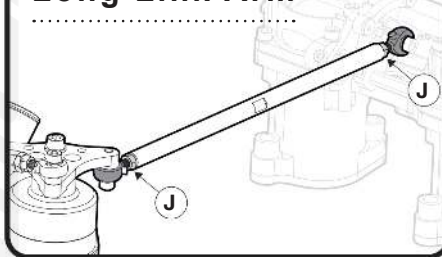
After both throttle banks have been fitted to the cylinder heads, fit the short link arm as shown below first. With the locking nuts (J) loosened, set the centre distance between the two rod eyes (K). This is approximately 168mm. Tighten the locking nuts using two 8mm spanners. After connecting the short link arm, connect the long link arm.

Short Link Arm

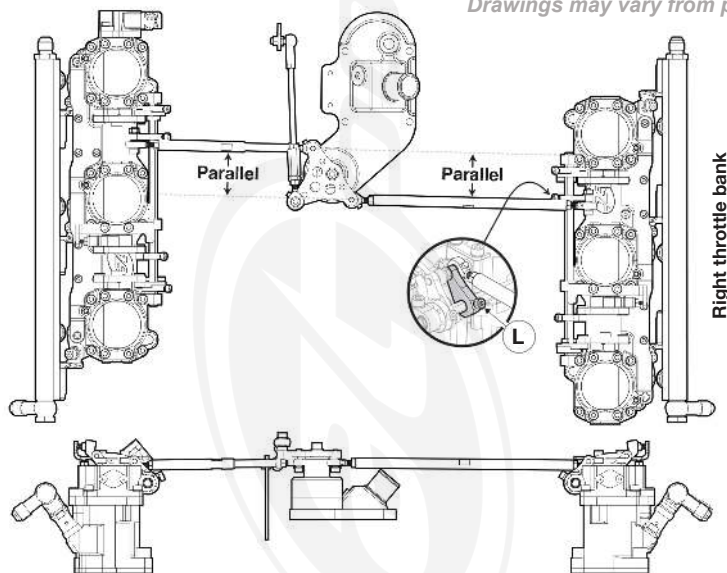
Approx 168mm.



Long Link Arm



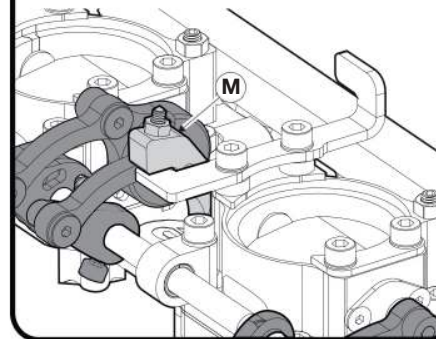
Drawings may vary from product



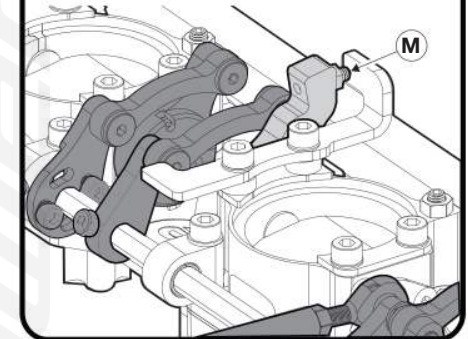
As the two link arms are different lengths, it is crucial to ensure they are horizontal and parallel, as shown above. Adjust the right throttle bank's link arm lever by loosening the screw (L) and slide the link arm along the layshaft until the long link arm is parallel to the short link arm. Retighten screw (L). Then, adjust the long link arm's length to ensure both throttle banks open and close uniformly, reaching full opening. Tighten the nuts (J).

When the throttles are fully open, the idle adjuster arm (M) will contact the idle adjuster bracket. It is not essential for both idle adjusters to contact the bracket, but this helps indicate if the throttle banks open uniformly.

Open Throttles



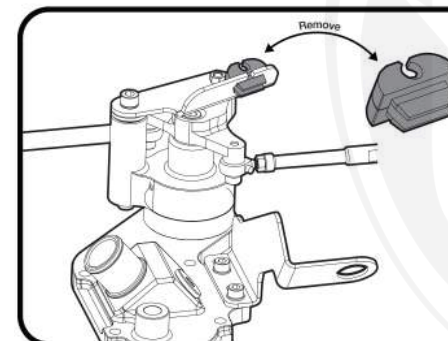
Closed Throttles



Drawings may vary from product

Central Linkage Mechanism

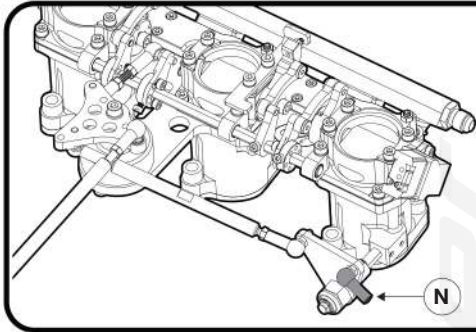
On your Porsche engine, remove the existing OEM engine oil breather cover and install the AT Power central linkage mechanism (OEM gasket not supplied). Do not connect the throttle cable at this stage.



Porsche 964/993

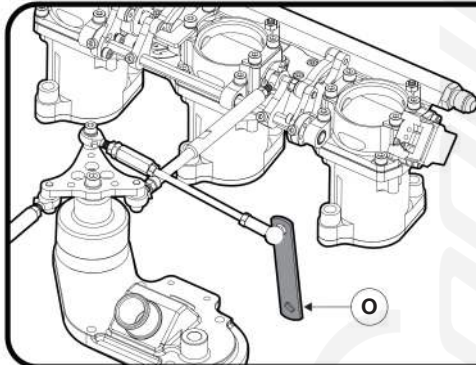
For the OEM single throttle, remove the throttle cable gland and attach it to the AT Power central linkage.

Central Linkage Mechanism - Continued



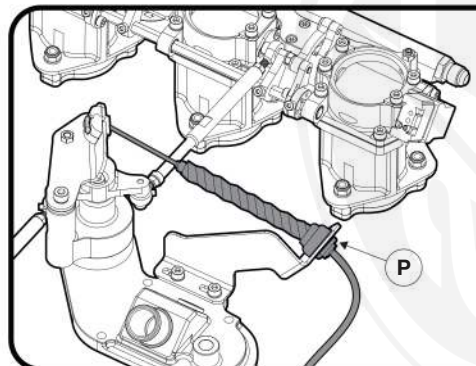
911 [1969-1977]

The OEM throttle cable can now be connected to the throttle linkage (N).



911 [1978-1989]

The link arm can now be attached to the throttle linkage plate (O) as shown. Depending on the engine's year and model, the threaded rod between the ball joint and hexagonal turnbuckle may need to be shortened before fitting.



964/993

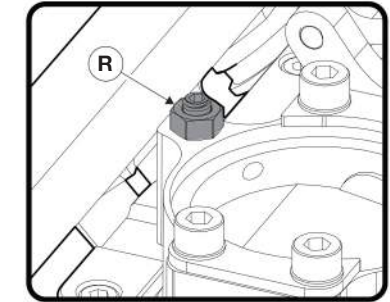
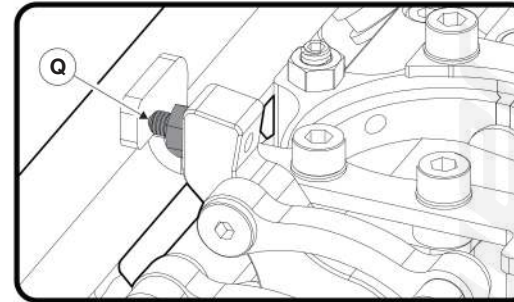
Now the OEM throttle cable gland is attached, the throttle cable can now be installed. First, fit the cable nipple into the gland, then fit the cable sleeve grommet to the bracket (P). Adjust the bracket to eliminate any slack in the cable.

Drawings may vary from product

The throttle pedal should operate so that the throttles begin to open as soon as the pedal is pressed. The throttles should be fully open when the pedal is fully depressed.

Balancing & Idle Adjustment

Each throttle bank is factory-balanced with the idle set at the minimum position. For initial start up, it may be necessary to slightly open the throttles to achieve sufficient RPM (revolutions per minute). If this is required, ensure both idle adjusters are set evenly.

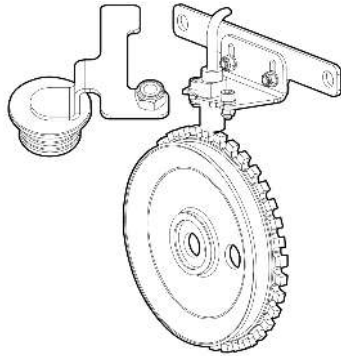


Once the idle adjustment screw (Q) has been adjusted, the engine can be started. Although the throttles are factory-balanced, AT Power recommends using an Airflow Syncrometer (p5) to fine-tune the balance of each inlet. Adjust the idle speed to ensure the engine runs between 1000 and 1200 RPM.

Each throttle housing is fitted with a balancing bleed valve (R). Using the Airflow Syncrometer on the inlet port, check each inlet and adjust the bleed valve as needed. Note that any adjustments may affect the engine's RPM.

Once all inlets are balanced, adjust the idle speed to the desired setting.

Porsche 911 [1969-77] & 911 3.0L SC [1978-83] Trigger Wheel & Sensor

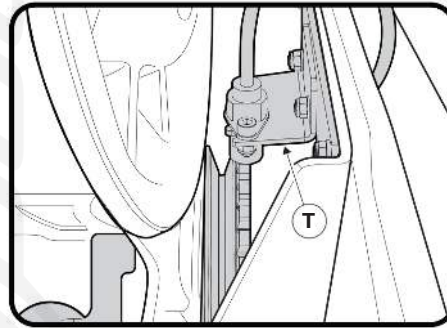
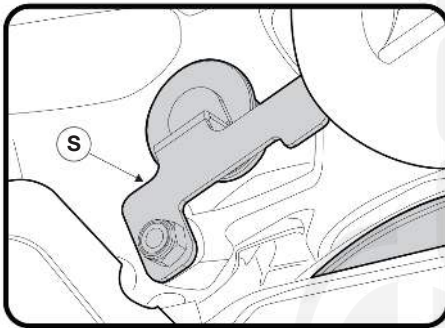


For Porsche 911 [1969-77] engines and the 911 3.0L SC [1978-83], the ECU kit includes a replacement fan belt pulley with an integrated trigger wheel and sensor.

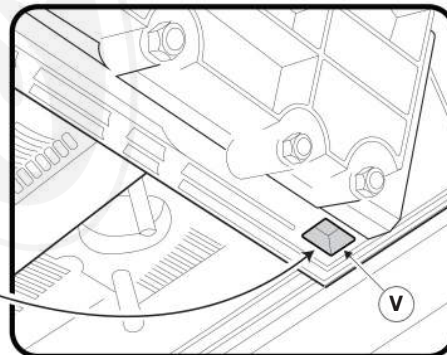
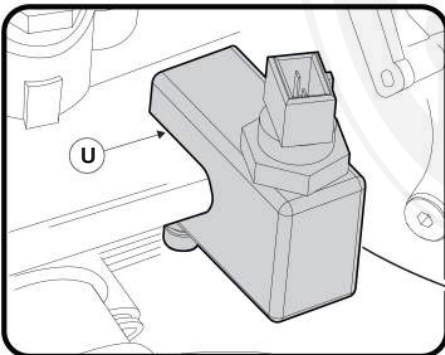
Remove the distributor and fit the supplied distributor plug (S).

Remove the OEM fan belt pulley and replace it with the new pulley featuring the built-in trigger wheel.

Mount the sensor bracket to the inside of the engine mounting bracket cradle (T). Adjust the sensor to achieve a gap of 0.8mm–1.0mm.

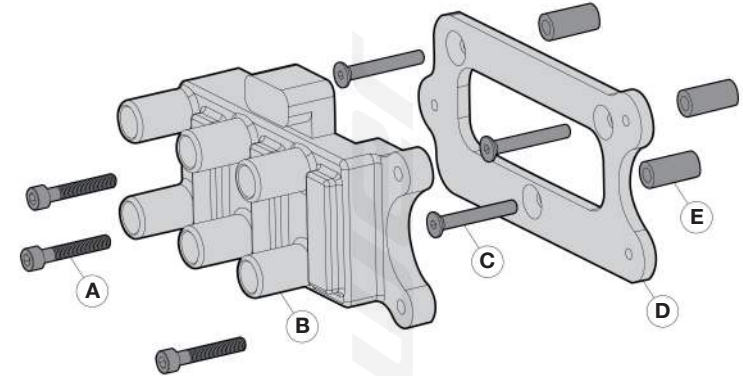


Additionally, the kit includes an engine temperature sensor with a mounting bracket (U). Fit this sensor to the fin underneath the left-hand cylinder head (V) nearest to the rear of the car.



Porsche 911 [1969-1977] Coil Pack

As part of the full installation kit for the 911 [1969-1977], a coil pack and set of HT leads are also provided with a mounting bracket for optional bulkhead installation. To secure the bracket to the bulkhead, find a configuration example below.



Parts Supplied

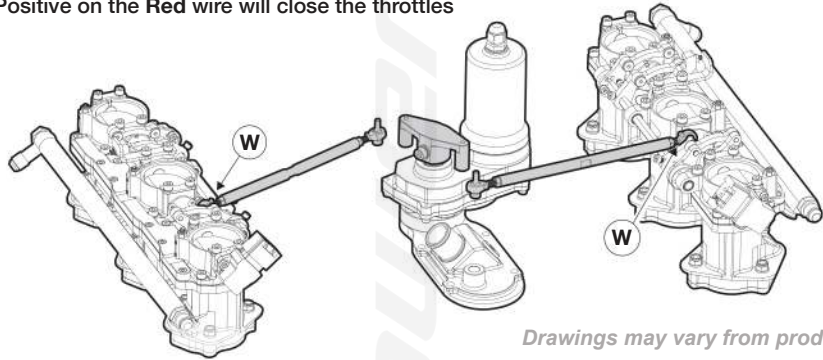
- A. 3 x Socket Head Screws
- B. Coil Pack Bracket
- C. 3 x M5 Countersunk Screws
- D. Bracket
- E. 3 x Spacers
- F. 6 x HT Leads (not pictured)

Throttle DBW Single Actuated Installation

Remove the existing OEM engine oil breather cover and install the AT Power central linkage mechanism (OEM gasket not supplied). Next, connect the two link arms to the lever arms on the throttle banks only (W).

DBW Motor Wiring

- + Positive on the **Black** wire will open the throttles
- + Positive on the **Red** wire will close the throttles

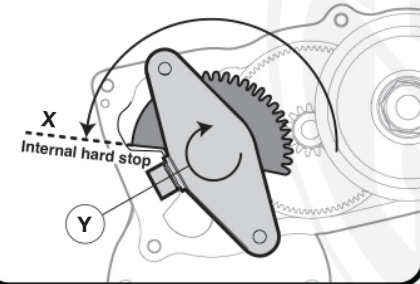


Drawings may vary from product

Rotate the DBW (drive-by-wire) actuator spigot to the fully closed position (X), then slightly rotate the spigot away from the internal stop in the actuator (Y).

Attach one link arm to the DBW actuator, making sure the gear is free from the hard stop. Then, connect the second link arm as below.

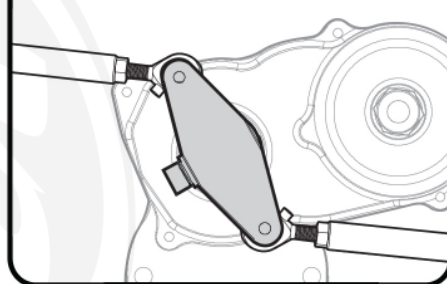
DBW Actuator Spigot



Ensure both link arms are of equal length. If necessary, adjust the lengths until they match. Check that the spigot is not contacting the internal hard stop in the actuator.

Verify that both throttle banks open and close simultaneously. Use two 8mm spanners to adjust the link arm length as needed. Then, lock the nuts.

Connect Link Arms



Brake Boost and/or Cold Idle Control

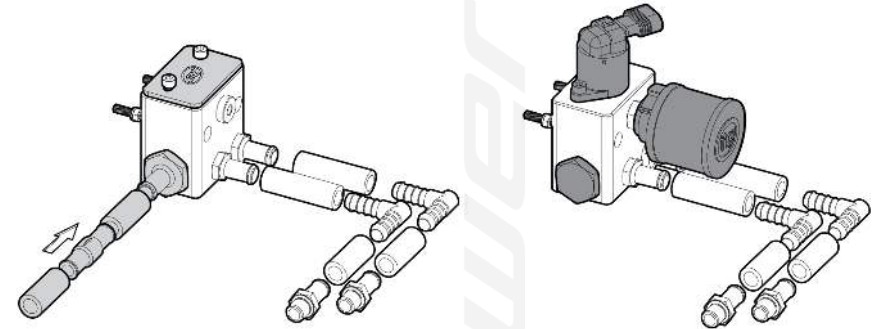
The idle air control (IAC) and brake boost offer three setup options:

1. Brake boost only

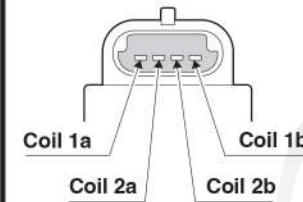
Brake boost for hydraulic-assisted brakes.

2. Idle air control (IAC) only

IAC is required for cold idle management with certain ECU kits.

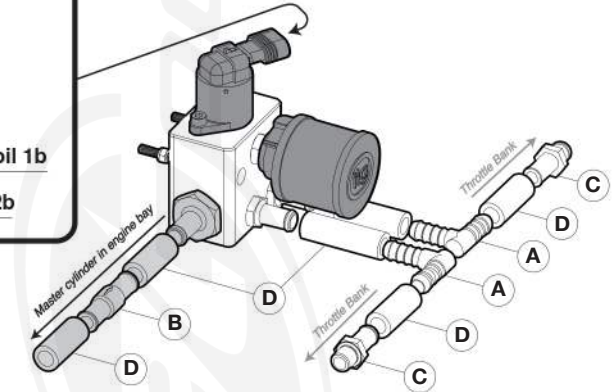


IAC Valve Pin Out



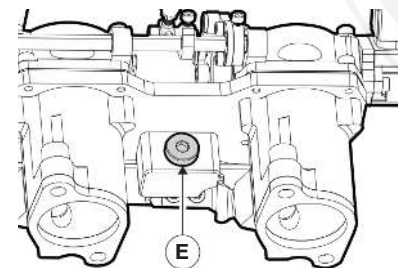
3. IAC and brake boost

- A. 90° Elbow
- B. Non Return Valve
- C. Hose Tale Fitting
- D. 3m Silicon Hose (Cut to Length)



On each throttle bank, remove the vacuum take-off plug (E) and install the supplied hose fittings (C).

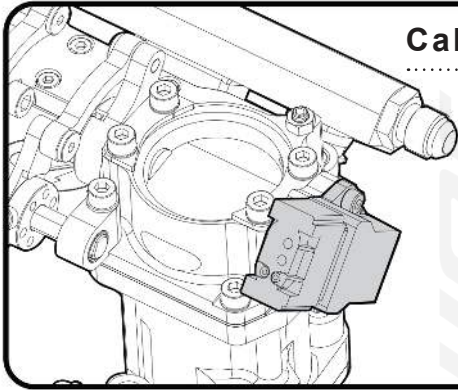
The vacuum take-off manifold can be mounted to the bulkhead, and the supplied hose can be cut to the required length.



TPS Installation

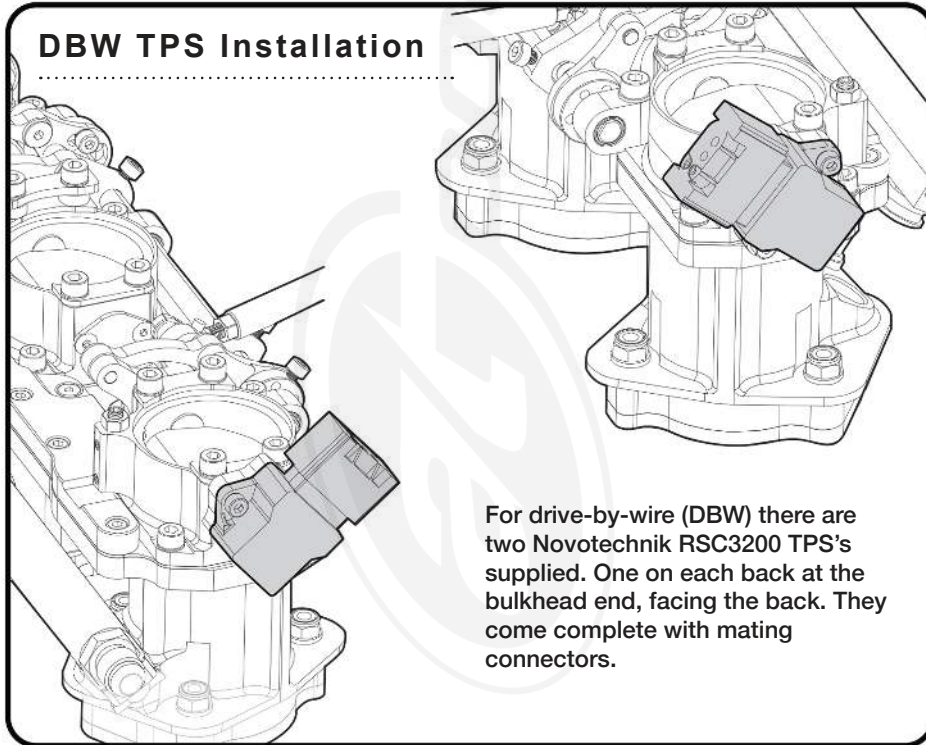
Once the throttles have been fitted, connect the throttle position sensor (TPS). The TPS should be connected to the wiring harness ready for tuning.

Cable Pull TPS Installation



For cable pull, the TPS is installed on left bank at the bulkhead end, facing the back. The TPS supplied is a Novotechnik RSC3200 and comes complete with a mating connector.

DBW TPS Installation

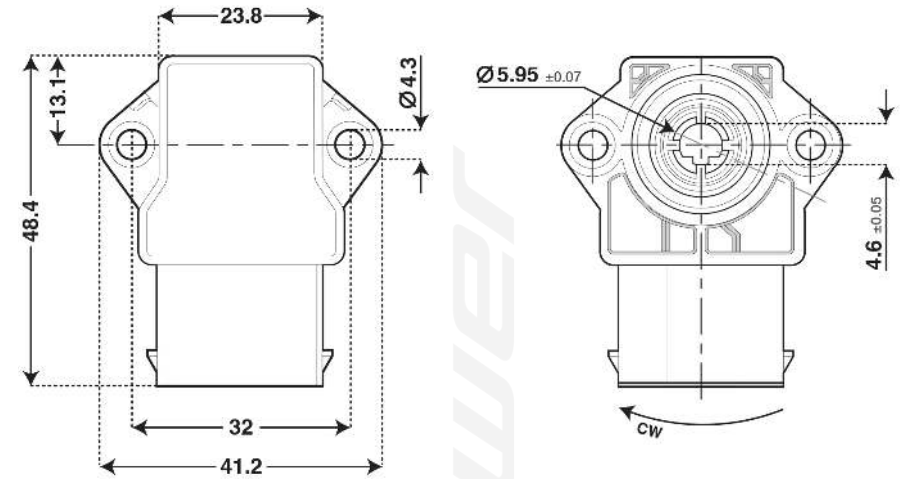


For drive-by-wire (DBW) there are two Novotechnik RSC3200 TPS's supplied. One on each back at the bulkhead end, facing the back. They come complete with mating connectors.

Drawings may vary from product

TPS: Novotechnik TPS Novohall Angle Sensor

Series RSC3200



Mechanical Specification

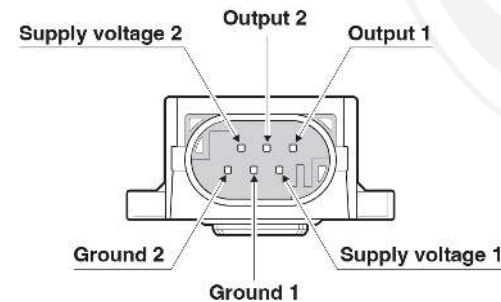
Mounting	with 2 M4 screws
Starting Torque of Mounting Screws at Housing Flange	200 ... 300Ncm
Mechanical Travel	360° Continuous
Maximum Operational Speed	Mechanical Unlimited
Weight	Approx 25g

Environmental Data

Temperature Range	-40° up to +125°C
Vibration (IEC 60068-2-6)	5...2000Hz Amax = 0.75mm Amax = 20g
Shock (IEC 60068-2-27)	50g (11 ms)
MTTF (DIN EN ISO 13849, Parts Count Method, w/o Load)	285 years (per channel)
Protection class (ISO 20653)	IP6k7 / IP6k9k (mounted with O-ring)

Electrical Specification

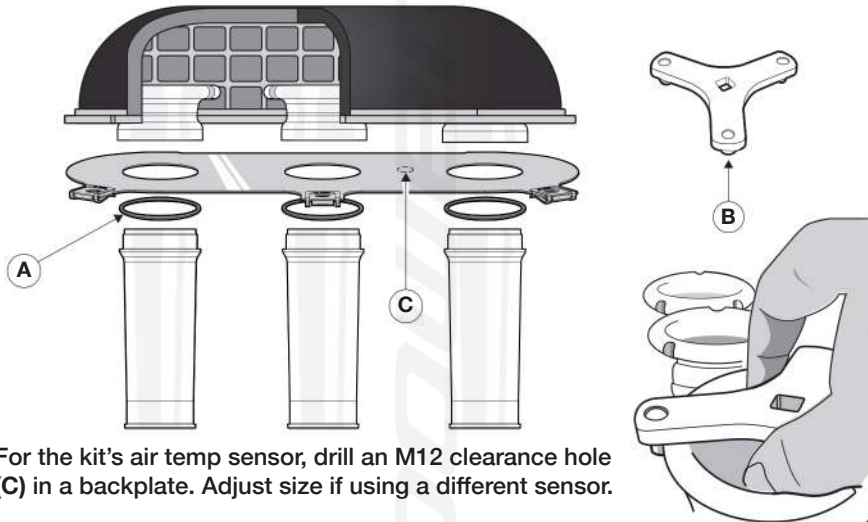
Maximum Permissible Applied Voltage	5 (4.5 ... 5.5)VDC
Current Consumption Without Load	typ. 15 (typ 8 on request) per channel mA
Reverse Polarity Protection	yes, supply lines
Short-circuit Protection	yes (vs. GND and Ub)
Measuring Range	0...60° up to 0...360 in 5 angles available (s.ordering code)
Number of Channels	2
Update rate	2.5 kHz
Resolution	12 bit
Repeatability	0.5°
Absolute Linearity At Measuring Angle	60° <1.1 ± % FS 120-180° 1.5 ± % FS 240-360° 1.0 ± % FS (additional ±0.3 % at FS at electrical code 229 for channel 2)
Interlinearity	3 ± % FS
Output signal	rationometric to Ub 0.25...4.75 VDC 0.5...4.5 VDC (load resistance > 1 kΩ)
Temperature Error At Measuring Angle	60° <1.1 ± % FS 120-180° <0.7 ± % FS 240-360° typ. 0.5 ± % FS (additional ±0.3 % at FS at electrical code 229 for channel 2)



Throttle Ram Pipe (Trumpet) Fitment

Megaflow Air Filters

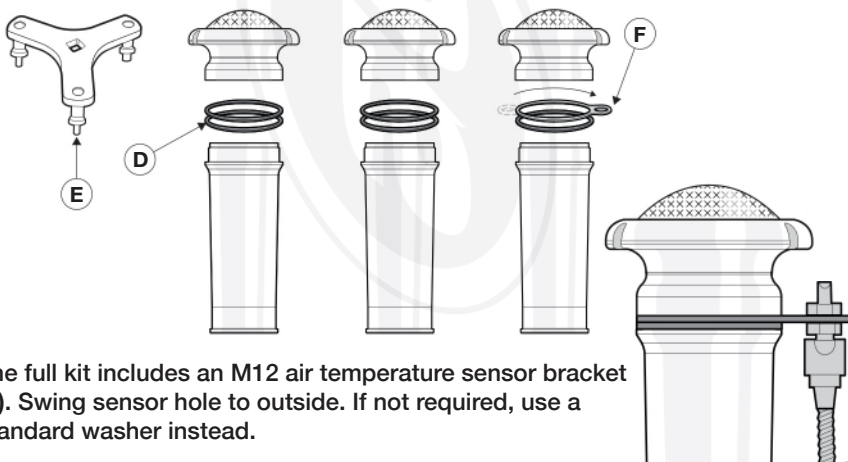
If Megaflow air filters have been purchased, they are now ready for installation. Place one ram pipe washer beneath the Megaflow backplate (A). Using the AT Power ram pipe torque tool (B), secure the ram pipes at 8-10Nm.



For the kit's air temp sensor, drill an M12 clearance hole (C) in a backplate. Adjust size if using a different sensor.

Mesh-Filtered Ram Pipes

Use two ram pipe washers (D) for mesh-filtered ram pipe installation. Using the AT Power ram pipe torque tool (E), secure the ram pipes at 8-10Nm.

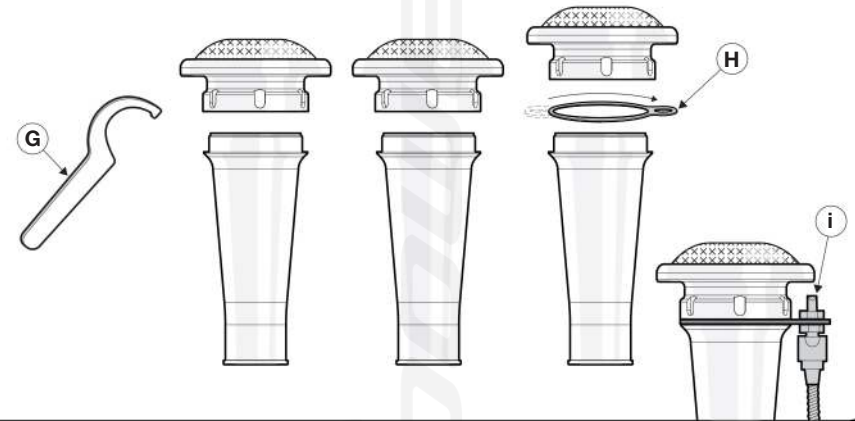


The full kit includes an M12 air temperature sensor bracket (F). Swing sensor hole to outside. If not required, use a standard washer instead.

Large Bore Ram Pipes

For large bore ram pipes, no washers are needed. Tighten them using a C-spanner (G) with a maximum torque of 8-10Nm.

The full kit includes an M12 air temperature sensor bracket (H) mounted on the left throttle body at the bulkhead end. Swing the sensor washer to the outside. The M12 air temperature sensor will be installed here (i). If not required, remove washer (H).



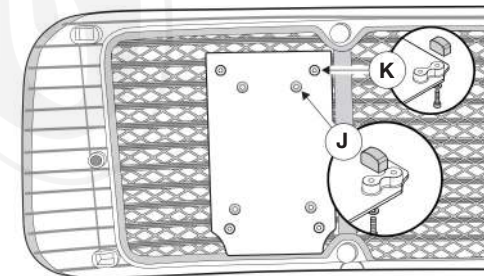
911 [1969-1989] Rain Guards

Warning: Failure to fit these rain guards may result in engine damage.

For 911's only, full EFI throttle kits include rain guards for use with Megaflow or mesh filters. Fit the guards beneath the Porsche grille, positioning them over the throttle intakes to prevent rain ingress when stationary. Two bolt patterns are provided to suit the 911 vehicle models and year.

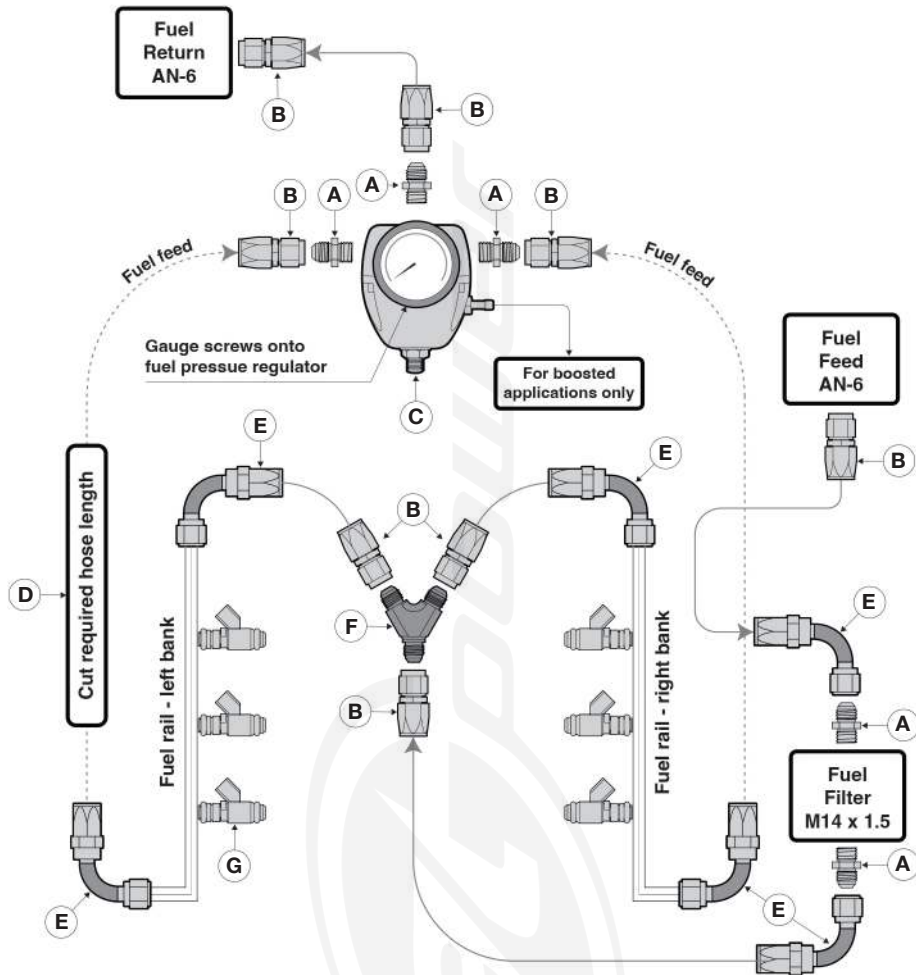
For 1969-1977, bolt inside holes (J)

For 1978-1988, bolt outside holes (K)



Fuel System Assembly: Porsche 911 [1969-77] & 911 3.0L SC [1978-83]

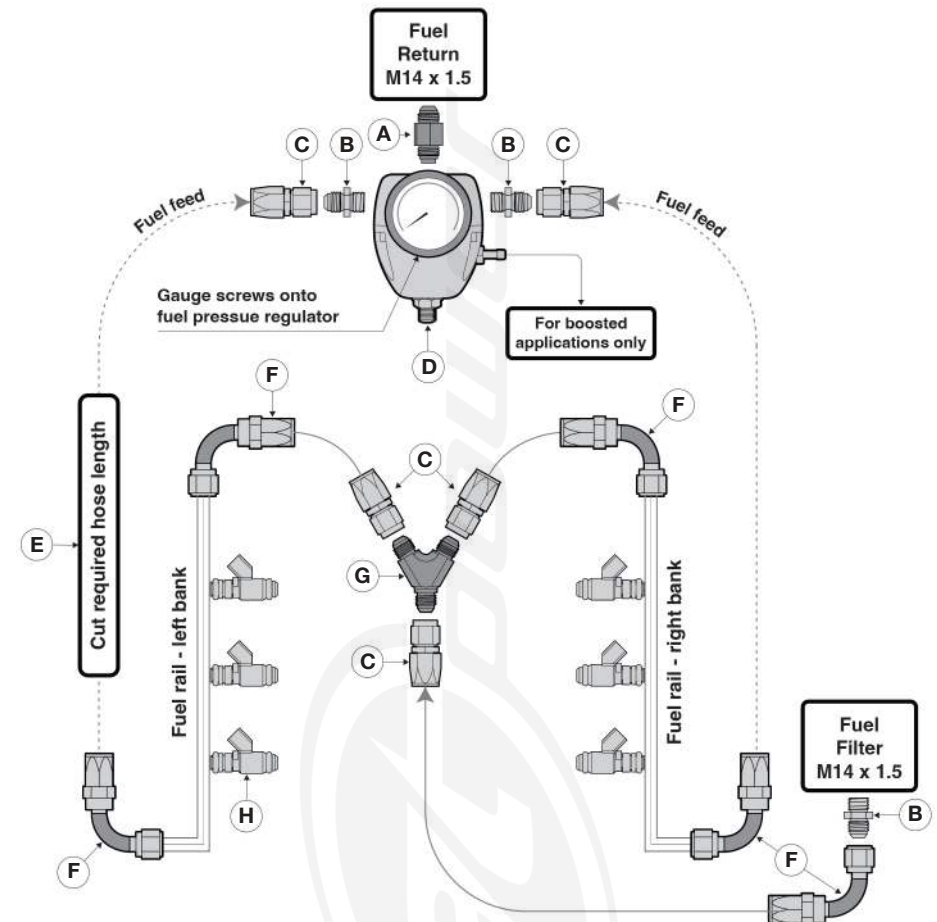
Drawing No: 102-134-00006 Date: 11/05/23



Items	Total	SKU
A. Fitting - M14 to JIC-6 Male to Male	5	509-102-00006
B. Fitting - straight hose AN6	8	509-102-00002
C. Fuel pressure regulator and gauge	1	509-103-00001
D. Nylon braided hose (cut to required length)	1	102-212-00020
E. Fitting - 90° hose AN6	6	509-102-00003
F. Fitting - 'Y' piece adaptor AN6	1	509-102-00001
G. Injector	6	101-129-00010

Fuel System Assembly: Porsche 911 [1978-89] & Carrera / G50

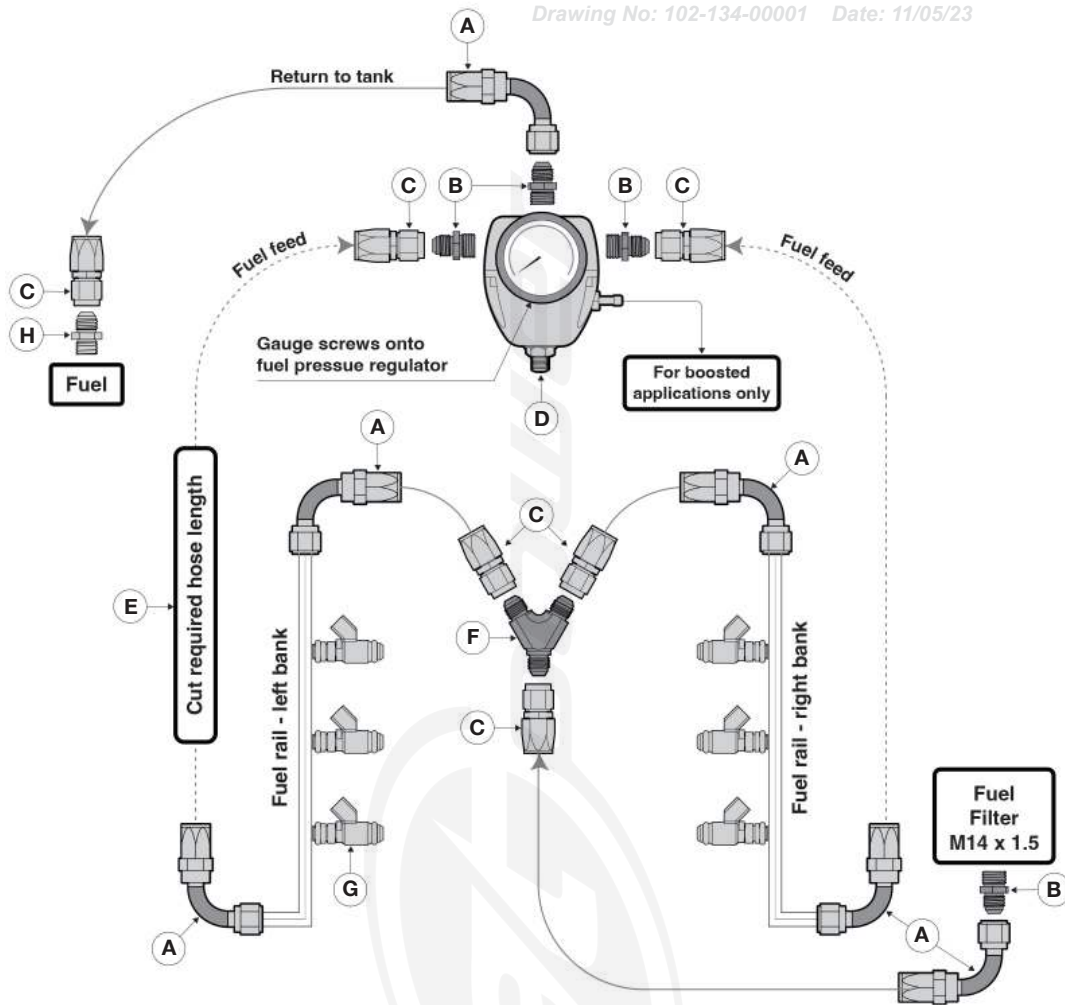
Drawing No: 102-134-00002 Date: 11/05/23



Items	Total	SKU
A. Fitting - M14 x 1.5 male to M14 x 1.5 male	1	102-216-00234
B. Fitting - M14 to JIC-6 male to male	3	509-102-00006
C. Fitting - straight hose AN6	5	509-102-00002
D. Fuel pressure regulator and gauge	1	509-103-00001
E. Nylon braided hose (cut to required length)	1	102-212-00020
F. Fitting - 90° hose AN6	5	509-102-00003
G. Fitting - 'Y' piece adaptor AN6	1	509-102-00001
H. Injector	6	101-129-00010

Fuel System Assembly: Porsche 964/993

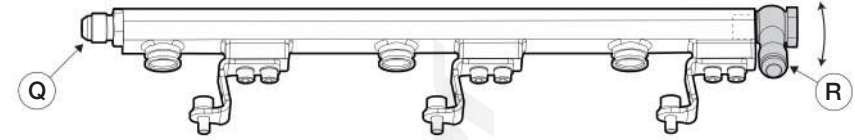
Drawing No: 102-134-00001 Date: 11/05/23



Items	Total	SKU
A. Fitting - 90° hose AN6	6	509-102-00003
B. Fitting - M14 to JIC-6 male to male	4	509-102-00006
C. Fitting - Straight hose AN6	6	509-102-00002
D. Fuel pressure regulator and gauge	1	509-103-00001
E. Nylon braided hose (cut to required length)	1	102-212-00020
F. Fitting - 'Y' piece adaptor AN6	1	509-102-00001
G. Injector	6	101-129-00010
H. Fitting - M16 to JIC-6 Male to Male	1	509-102-00005

Fuel Rail

IMPORTANT: Do not remove the fuel rail end fitting (Q), as this may cause damage. To change the fitting please contact us with your serial number so we can advise you. The banjo fitting (R) is loosely installed to allow for proper orientation.



Pico Fuel Injectors

IWP048 Fuel Injector
5 Hole | Cone Spray, Fuel Injector

Max Fuel Pressure	500 kPa
Flow (Fully Open at 3 Bar)	215 cc/min - 2.45g/s

IWP023 Fuel Injector
1 Hole | Cone Spray, Fuel Injector

Max Fuel Pressure	500 kPa
Flow (At 3 Bar)	158 cc/min - 1.8 g/s

IWP043 Fuel Injector
4 Hole | Cone Spray, Fuel Injector

Max Fuel Pressure	500 kPa
Flow (At 3 Bar)	329 cc/min - 3.75 g/s
Flow (At 4 Bar)	377 cc/min - 4.30 g/s
Flow (At 5 Bar)	421 cc/min - 4.80 g/s

IWP069 Fuel Injector
1 Hole | Cone Spray, Fuel Injector

Max Fuel Pressure	500 kPa
Flow (At 3 Bar)	491 cc/min - 5.60 g/s
Flow (At 4 Bar)	563 cc/min - 6.42 g/s
Flow (At 5 Bar)	629 cc/min - 7.17 g/s

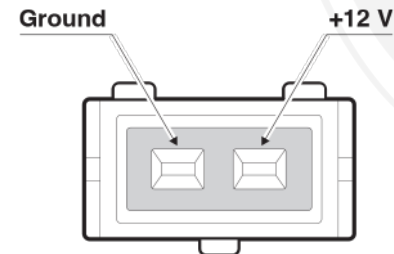
IWP189 Fuel Injector
12 Hole | Cone Spray, Shower Injector

Max Fuel Pressure	500 kPa
Flow (Fully Open at 3 Bar)	510 cc/min - 5.8 g/s

IWP006 Fuel Injector
4 Hole | Twin Spray, Fuel Injector

Max Fuel Pressure	500 kPa
Flow (At 3 Bar)	26 cc/min - 2.58 g/s

Pin Information



For AT Porsche kits, we supply:

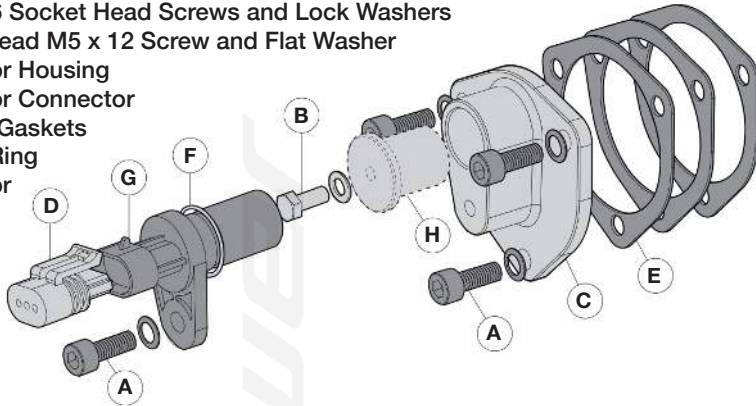
IWP162 Fuel Injector
5 Hole | Cone Spray, Fuel Injector

Max Fuel Pressure	500 kPa
Flow (At 3 Bar)	377 cc/min - 4.30 g/s
Performance	350HP

Porsche CAM Sync Adaptor Instructions

Parts Supplied

- A. 4 x M6 x 16 Socket Head Screws and Lock Washers
- B. Hexagon Head M5 x 12 Screw and Flat Washer
- C. Cam Sensor Housing
- D. Cam Sensor Connector
- E. 3 x Flange Gaskets
- F. Sensor O-Ring
- G. Cam Sensor
- H. Drill Bush



1. Remove the plug from the end of the cam housing (see figure 1).
2. Rotate the engine through a full cycle, stopping 90 degrees before Z1 on the compression stroke.
3. Attach the cam sensor housing (C) to the cam housing on the engine. No gasket is required at this stage. Install the housing with the sensor hole positioned at the top, and we recommend marking the position once in place.
4. Insert the supplied drill bush (H) and drill a 4.2mm hole, 13-16mm deep into the end of the camshaft on the engine (see Figure 2). After drilling, remove the drill bush, chamfer the hole, and hand tap it with an M5-0.8 thread (see Figure 3).

Figure 1
.....
Plug removal

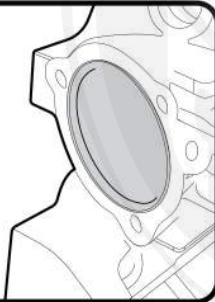
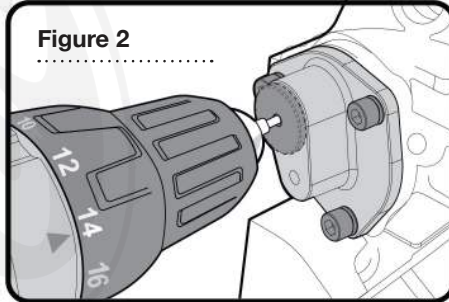


Figure 2
.....



5. Thoroughly clean any drill and tapping debris from the camshaft and cam housing. Use a magnet to remove metal chips, and flush with solvent to clean any remaining debris. **Do not use compressed air.** Ensure the M5 thread in the cam and the M5 bolt are free of oil.

6. Adjust the sensor gap: Install the M5 screw (B) finger-tight (see Figure 4), ensuring the bolt head seats on the cam. Fit the adaptor with one gasket (E). Measure the distance from the cam sensor mounting surface to the top of the M5 screw (B) (should be 33-33.5mm). If necessary, add additional gaskets (E) to reduce the gap or a washer under the M5 bolt if the gap is too large.

Figure 3
.....

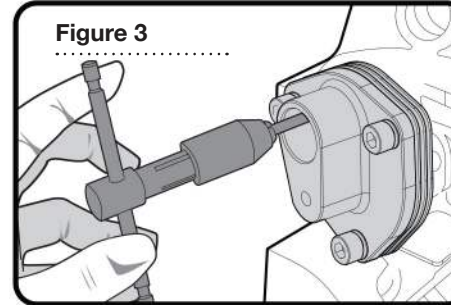
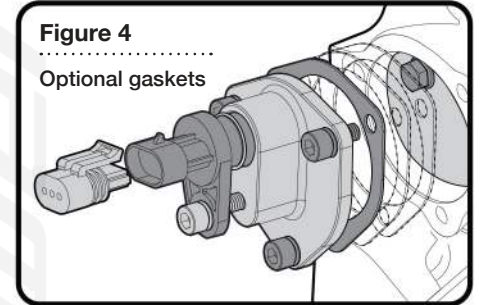


Figure 4
.....

Optional gaskets

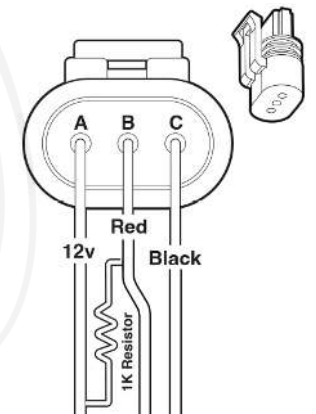


7. Final assembly: Remove the M5 screw (B), apply Loctite 271 (red) to the threads, and reinstall the bolt into the camshaft, tightening securely. Reinstall the adaptor with the gasket(s) in the correct orientation and tighten.
8. Apply a small amount of oil to the sensor O-ring (F) and inside the sensor bore, then insert the sensor. Secure the sensor with the M6 x 16 screw (A) and tighten.

911 CAM Sensor Wiring

Connect 12v switched power to terminal A of the sensor connector. From the engine wire harness cam sensor cable, attach the red signal wire to terminal B and the black ground wire to terminal C. Terminate the shield at the end of the cable jacket.

If required by your ECU, install a 1K, 1/2-watt pull-up resistor between terminal A (12v) and terminal B (red signal wire).



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