



## - Installation Manual -

965 012 AN  
Water-Oil Engine Cooler



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Thank you for purchasing CUSCO products. Please make certain that this instruction manual and the vehicle's factory service manual is fully read and acknowledged prior to installation. When transferring usage of the product, please make sure the instruction manual is given to the new owner with the product, or to anyone operating the vehicle. When this product or the vehicle equipped with this product is given/let borrow to others, please hand this manual to the person who receive the product or vehicle.



Wear protective eyewear and gloves.



## Please read this first

### Attention

A potential possibility of malfunction and (or) breakage can result to the product and (or) to the vehicle if this indication is ignored, if wrongful usage and (or) operation is performed.

- This instruction manual includes the usage and installation. Read this manual thoroughly before operating. Please keep this instruction in the vehicle at all times.
- This product is for off-road or competition use only. By reading this warning the customer acknowledges that Cusco products are not permitted for use on public highways.
- This product includes all components listed in this instruction manual. If there are any missing or damaged parts, please contact an authorized CUSCO retailer.
- Always disconnect the battery before beginning any type of work on the vehicle.
- CUSCO cannot be responsible for any loss or damage to the product or the vehicle, when used in combination with other product(s) and (or) unauthorized tamperment to this product.
- CUSCO cannot be responsible for any injury or damage caused to the individual or third party as well as malfunction of the vehicle, products and (or) accessories.
- This product and accessories can be changed without prior notice due to production and manufacturing reasons.
- CUSCO cannot be responsible for any factory OEM parts lost during temporary removal process when performing installation.
- Some components such as car audio and clock can lose memory when the battery is disconnected while installing. After completion of the installation process, recover the setting referring to each instruction manual. CUSCO cannot be responsible for lost settings.
- Perform periodical inspection. The durability of this product can vary depending the surrounding conditions and usage.
- CUSCO cannot be responsible for any voided factory warranty due to installation of this product.
- Acknowledge that the installation of CUSCO products will alter vehicle control characteristics. Operate vehicle with extreme caution after product installation.
- Always install products according to the automobile manufacturer factory service manual unless otherwise specified in this installation manual.

### Danger

An immediate possibility of serious injury and (or) even death can be assumed to the individual and (or) to the third party if this indication is ignored and wrongful usage and (or) operation is performed.

- Any service to the car with removal of the parts should be performed by trained professionals at a properly equipped workshop.
- Resting, sleeping in the car, or working in the car or in the closed garage can cause carbon monoxide poisoning, which can be fatal. Must turn the engine off and keep the area well ventilated.
- Always place wheel chock to prevent the vehicle from moving.
- Be careful with wiring when making connections directly in relationship with driving equipment, such as engine, steering, brake, and air-bag.
- Always make sure that the wiring is done properly. Take extra caution when dealing with positive and negative polarity. Make sure that the wires are insulated and there are no loose wires. If any wiring is performed in error, it may cause a fire on this product and/or the vehicle. Please disconnect the battery terminal wires before beginning the installation process. In case if it is not possible to shut off the power supply, it is your own responsibility to protect yourself from any injury as well as avoid electric shock and/or short circuit which can cause damage to the product and/or the vehicle.
- Use and install Cusco products only as directed by the manufacturer. Do not modify product to fit unspecified application. Misuse of product may lead to serious injury or death.

### Warning

An potential possibility of serious injury and (or) even death can be assumed to the individual and (or) to the third party if this indication is ignored and wrongful usage and (or) operation is performed.

- Exhaust manifold, radiator, and engine can be very hot. Please provide sufficient cool down time before starting any installs.
- Exhaust manifold, radiator, engine can be extremely hot while the vehicle is running immediately prior to vehicle usage. There is high possibility of injury when coming in contact with such components.
- Keep clear from infants, small children, and animals. Keep small parts away to avoid accidents. (prevent the parts from being swallowed/inhaled)
- Exhaust pipe can be very hot. Wear proper protective clothing when working in or around this area.
- Avoid installing any product in areas that can interfere with vision of the front windshield, driving equipments, and/ or air-bag system and other safety features..
- Take caution when installing this product near electric wires, water hoses, and air hoses. and avoid inflicting and damages to them. Damaging the electric wires, water hoses, and air hoses can cause shot circuit and/or critical engine damage.

### Caution

An potential possibility of serious injury and (or) even death can be assumed to the individual and (or) to the third party if this indication is ignored and wrongful usage and (or) operation is performed.

- Dropping and/or applying the excessive force to this product before or during installation can cause damage, resulting in malfunction of the product.
- This product is designed to be used in 12V power vehicles only. Do not install this product in different voltage supplied vehicle.
- Make sure to insulate the unused connector and wirings to avoid short circuiting.
- Always use the supplied hardware.
- Installation of components on the passenger side or center section can interfere with safety standards. Please check within local regulations before installing.
- Use a soft cloth to clean the product gently. Using cleaners or abrasive agents can damage the product.

## Notes

### Warning

- Installation by non-professionals and unauthorized shops voids product warranty.
- Always focus on driving first, and never on the gauge displays. This may cause vehicle accidents and can even result in death.
- Perform product setting adjustment and other operation when the vehicle is parked at safe place.
- Do not disassemble or apply any modifications to this product. Such alterations can cause vehicle accidents or product damage. This also voids the product warranty.
- If any problem is found (wet/odor/smoke/erratic movement etc.), stop using the product IMMEDIATELY and contact your local retailer. Prolonged usage with such symptom can lead to accident or vehicle damage.
- CUSCO cannot be responsible for any damages while using this product, or any damages caused by this product usage.

[ Part Number ]	965 012 AN
[ Application ]	Toyota 86 / Scion FR-S [ZN6] Subaru BRZ [ZC6]
[ Product ]	Water-Oil Engine Cooler
[ Description ]	Engine Oil Cooler (Water Cooled)

[Always follow (FSM) Factory Service Manual as a primary source]

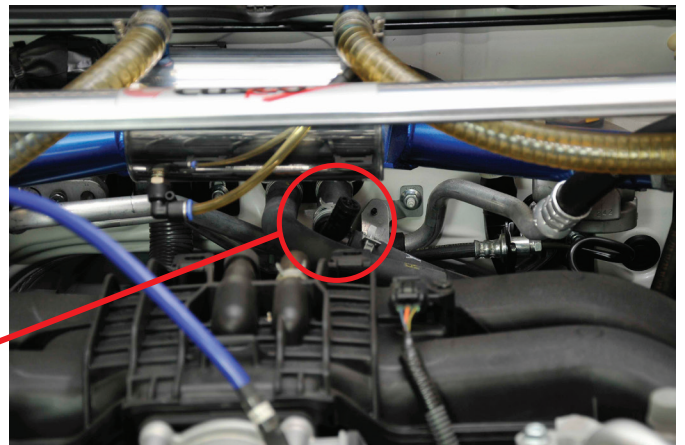
### Draining the Cooling System

1.) Make sure the engine and cooling system has completely cooled down before starting any work. Never remove a pressurized radiator cap when engine is warm or hot. Once engine has cooled down, locate and remove the plastic and metal undertray from below.

2.) Locate radiator drain plug and attach an (ID) 8mm hose to the neck. Loosen the drain cock plug by hand and start drainage.

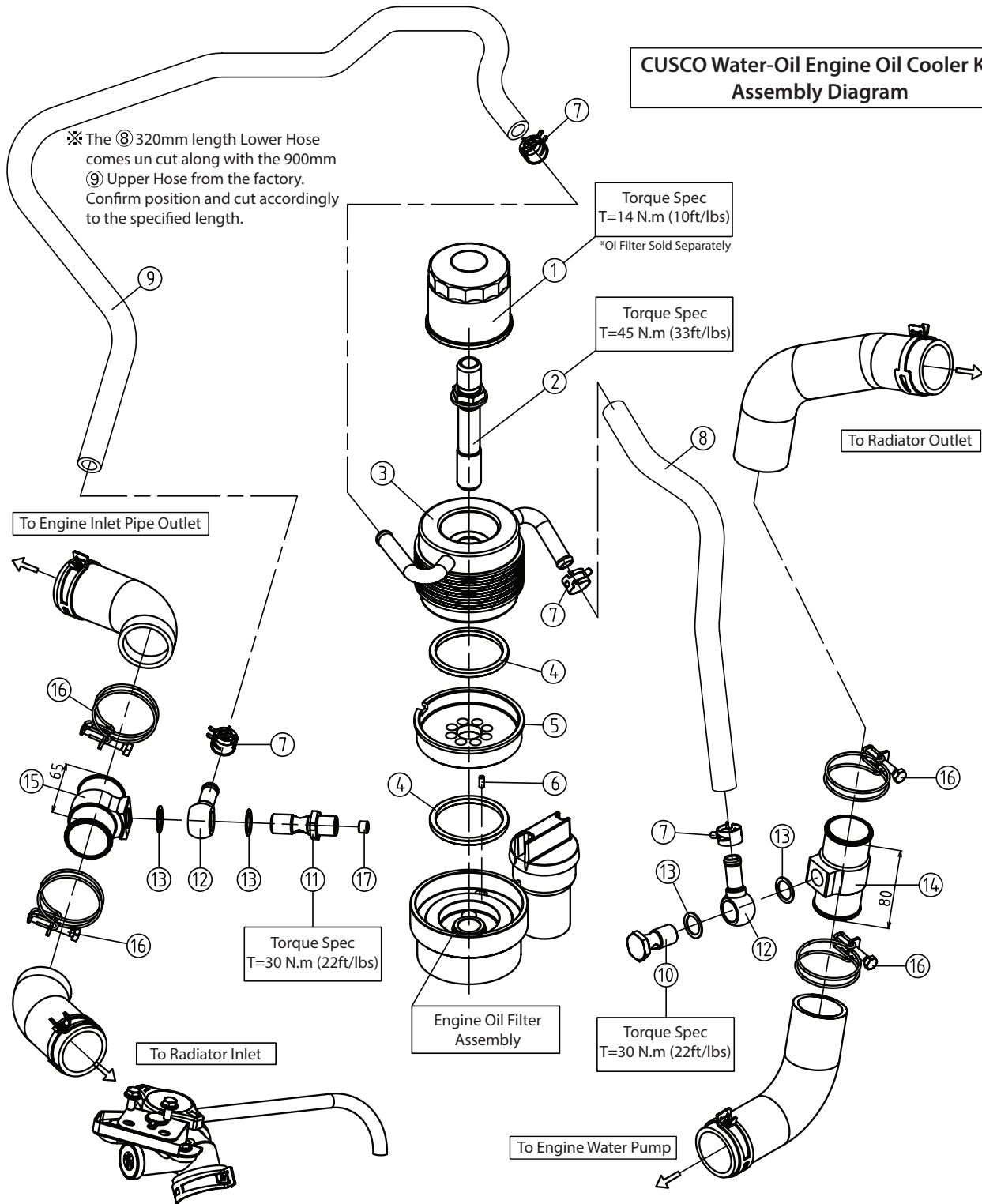


3.) Open the heater hose relief valve located near the firewall. Remove radiator cap and let all the coolant drain from the system.



Relief Valve

**CUSCO Water-Oil Engine Oil Cooler Kit Assembly Diagram**

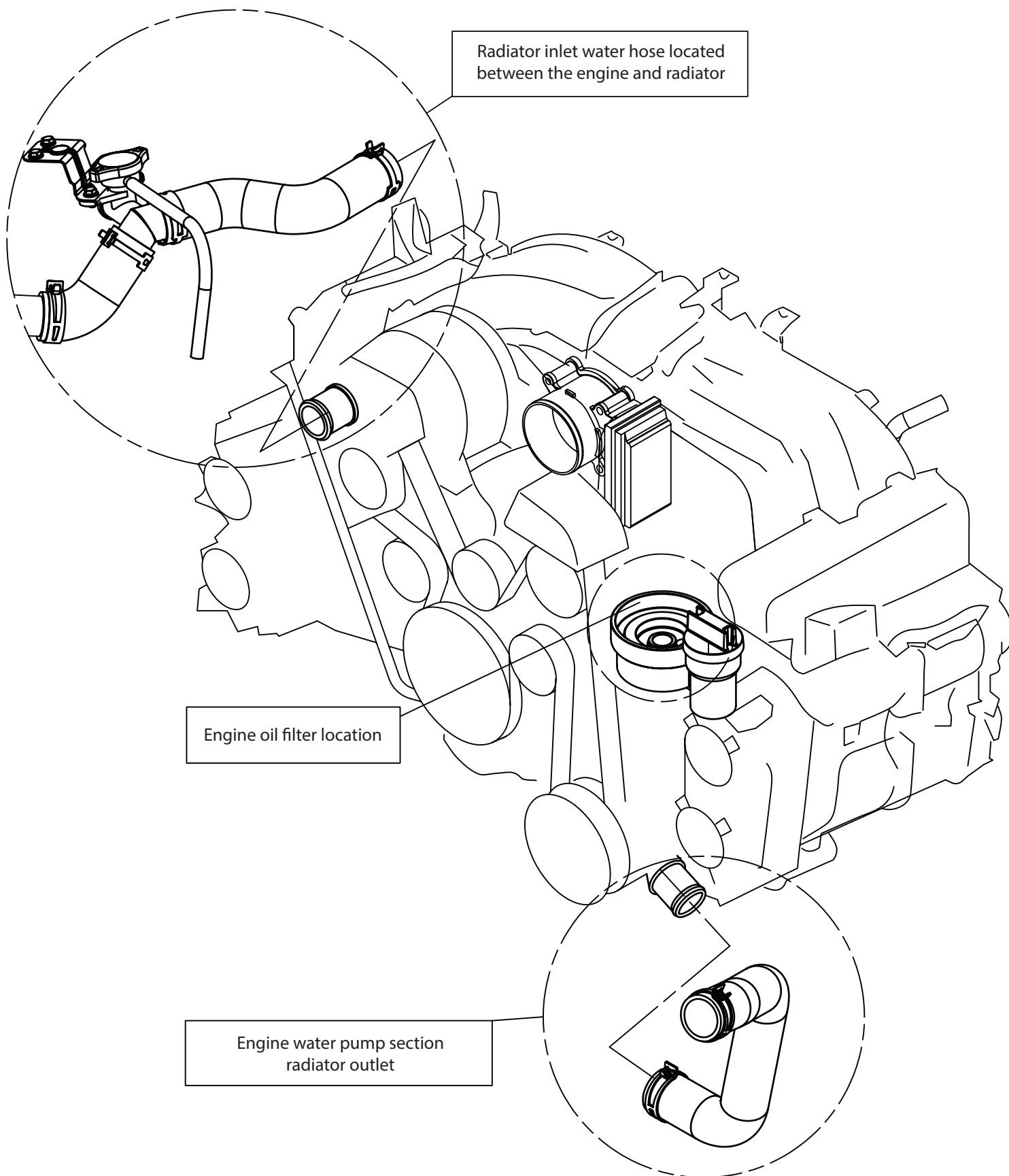


No.	Component	qty
①	Oil Filter *Sold Separately	1
②	Oil Filter Union	1
③	Main Oil Cooler Unit	1
④	O-Ring Gasket	2
⑤	Mounting Block	1
⑥	Knock Pin $\phi 4 \times 10$	1
⑦	Hose Clamp (small)	4
⑧	Lower Hose 12.7x20 (320mm length)	1

No.	Component	qty
⑨	Upper Hose 12.7x20 (900mm length)	1
⑩	Banjo Bolt	1
⑪	Banjo Bolt PT 1/8 threaded	1
⑫	Banjo Neck Fitting	2
⑬	Aluminum Washer 16x22x1	4
⑭	Inlet Junction (80mm length)	1
⑮	Inlet Junction (65mm length)	1
⑯	Hose Clamp (large)	4

No.	Component	qty
⑰	Plug PT 1/8 (includes sealing tape)	1
⑱	Tie Wrap (Zip Tie)	3

Main areas of the engine that require access for CUSCO Oil Cooler installation



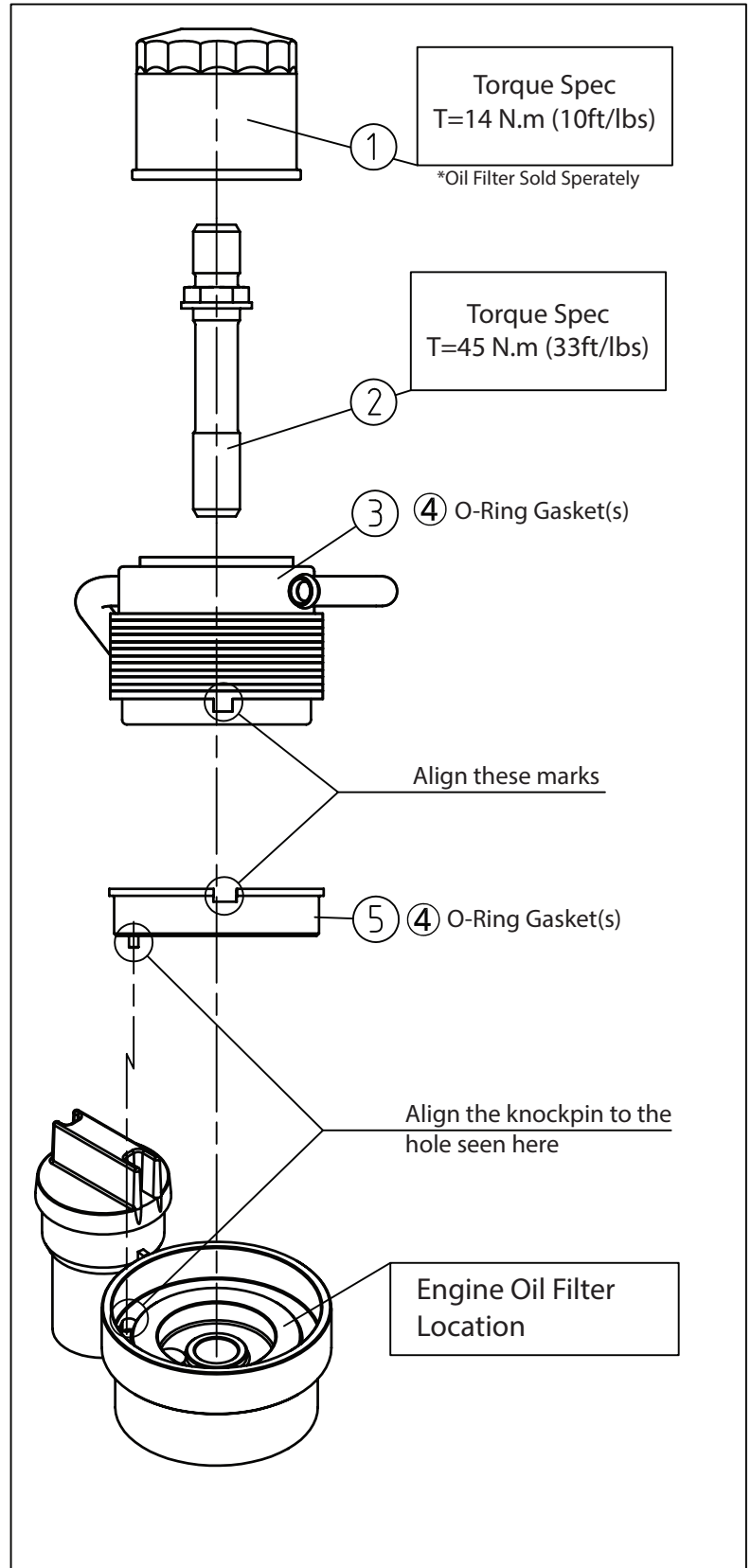
Oil Cooler pre-assembly in before vehicle installation

1.) Remove factory oil filter and union bolt.

✘ Consult with the factory service manual for proper removal of the oil filter, banjo bolt, and motor oil.

2.) Assemble the oil filter to the new Union Bolt included in the kit.

- Lubricate both of the O-Ring Gaskets #4 with motor oil.
- Align and set the Mounting Block #5 knock pin with the factory oil filter location tray.
- Join the Oil Cooler Main Unit #3 with the Mounting Block #5 by aligning the marks.
- Hand tighten the Union Bolt #2 and the oil filter and check to see if the knock pin and the markings are still aligned. Torque down the Union Bolt #2 first, then the oil filter to the specified torque figures.
- Do not forget to lubricate the o-ring of the oil filter with motor oil before installing. Always use a brand new oil filter.

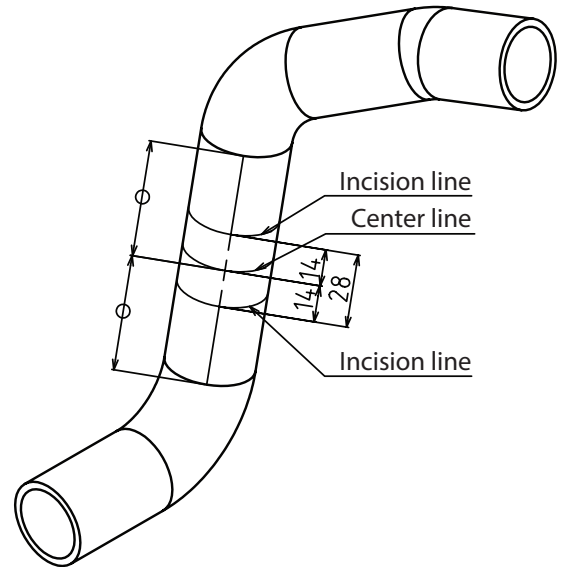


### Engine to radiator bottom hose modifications

#### 3.) Remove factory radiator outlet hose

✂ Consult with the factory service manual instructions for proper removal of the radiator hose.

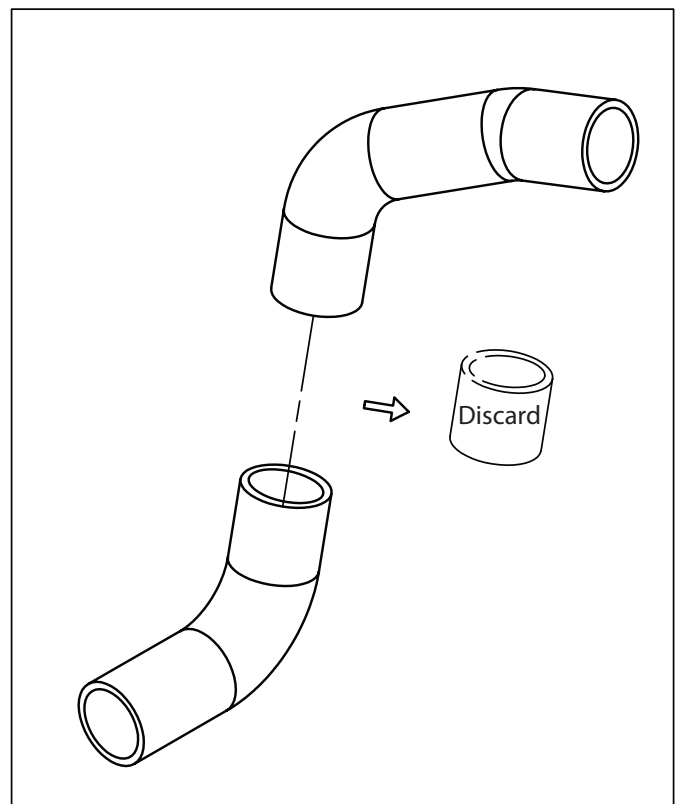
(Note: Although the factory service manual recommends complete removal of the radiator hose, this step can still be performed with the hose attached to the radiator side. Simply remove the clamp on the engine side, measure & cut according to the illustration shown to the right and install the 80mm #14 Inlet Junction.)



#### 4.) Modification to the factory radiator outlet hose

- Cut the hose as indicated in the illustration. Mark a line 14mm from the center line in both directions. Two incisions will cut off 28mm of hose material.

There will be three pieces of hose left at the end. (discard center piece)

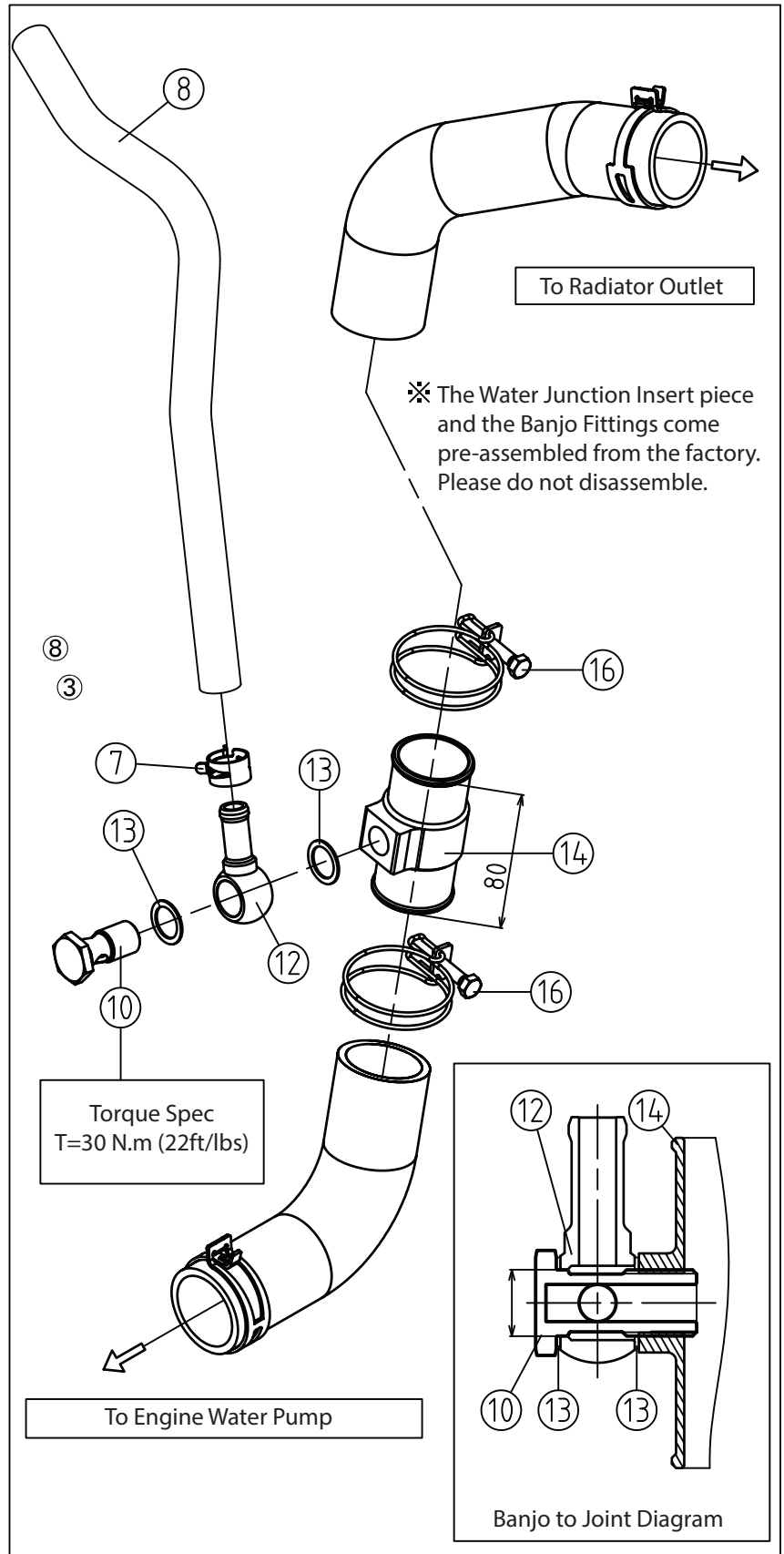




### Engine water pump to radiator bottom hose installation

#### 5.) Assembly of radiator hose with junction piece

- Position the components as shown in the illustration to the right. Insert #14 Inlet Junction between the cut hose and secure with the included #16 Hose Clamps.
- Assemble the Banjo Fittings #10 Banjo Bolt, #12 Banjo Neck Fitting, #13 Aluminum Washers like shown on the illustration diagram and hand-tighten. Position the proper angle of the banjo neck.
- Measure and cut #8 Lower Hose to the length indicated and route to #3 Main Oil Cooler Unit and #12 Banjo Neck Fitting. Secure with #7 Hose Clamps. Check for any kinks or obstructions of the #8 Lower Hose.
- Reinstall air cleaner box and check for clearance. If #8 Lower Hose is making contact, either re-cut the hose or use Tie Wraps (Zip Ties) to enable room.
- Tighten the air cleaner box and all Hose Clamps to the torque specs according to the factory service manual. Torque #10 Banjo Bolt to 30Nm (22ft/lbs)





### Engine to radiator top hose modifications

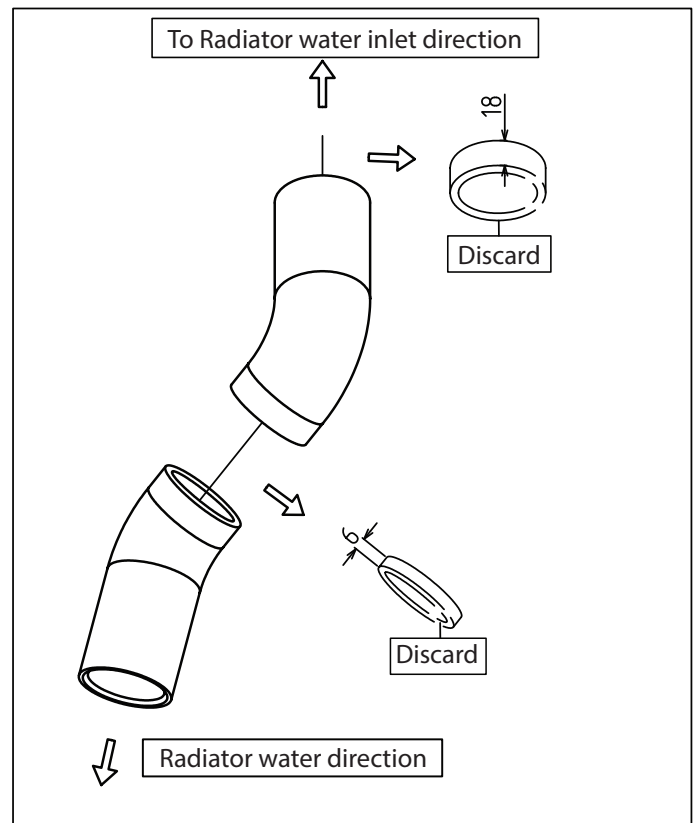
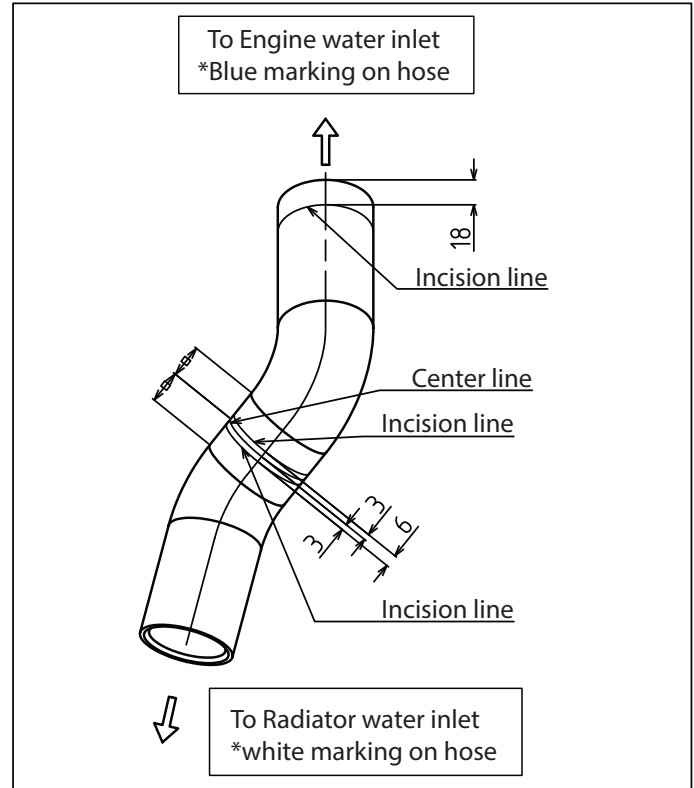
#### 6.) Remove factory top radiator inlet hose

✘ Consult with the factory service manual instructions for proper removal of the radiator hose.

#### 7.) Modification to the factory radiator inlet hose

- Cut the hose as indicated in the illustration. First, mark a line 3mm from the center line in both directions. Two incisions will cut off 6mm of hose material. Also mark 18mm from the edge of the hose on the engine side. Cut this piece off.

There will be four pieces of hose left at the end.  
(discard center piece)



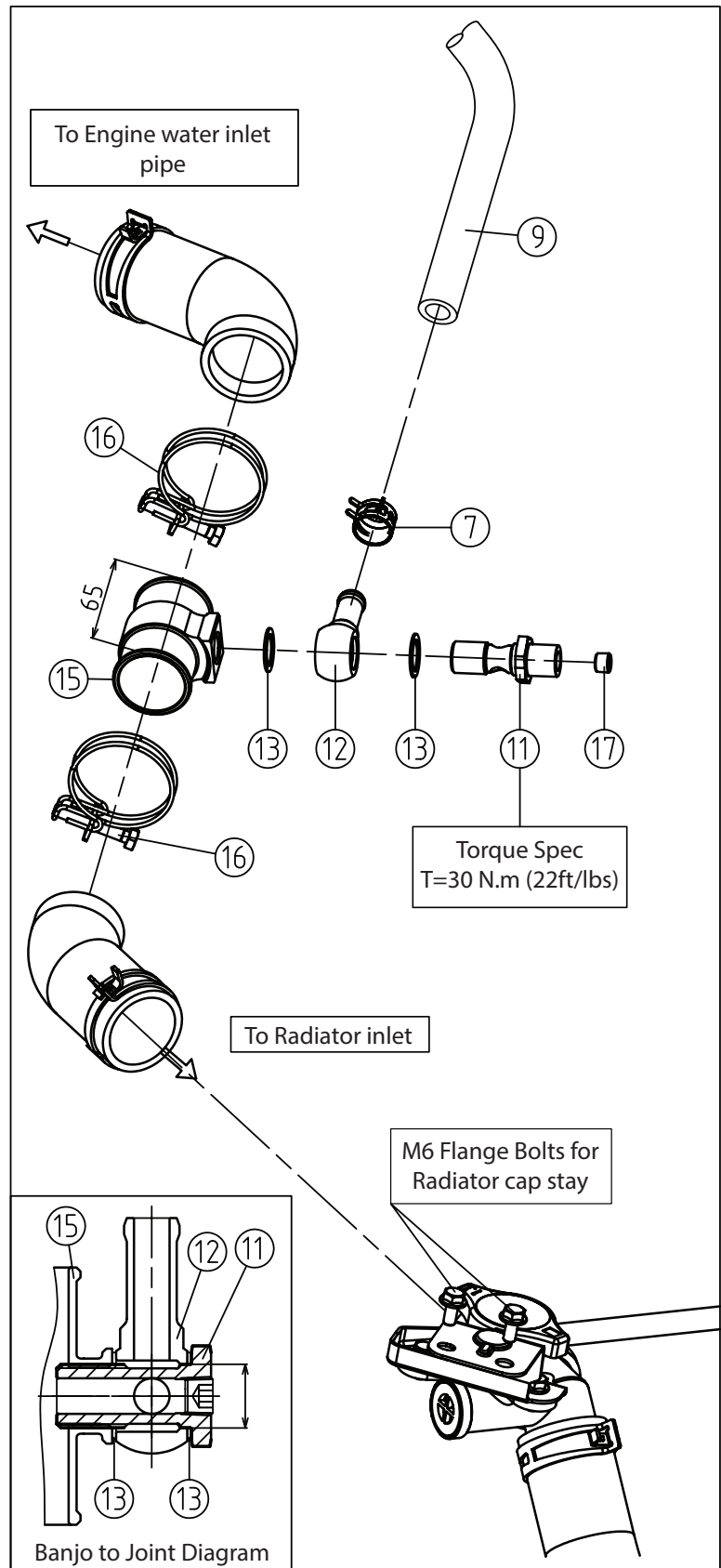
### Engine to radiator top hose installation

#### 8.) Assembly of top radiator hose

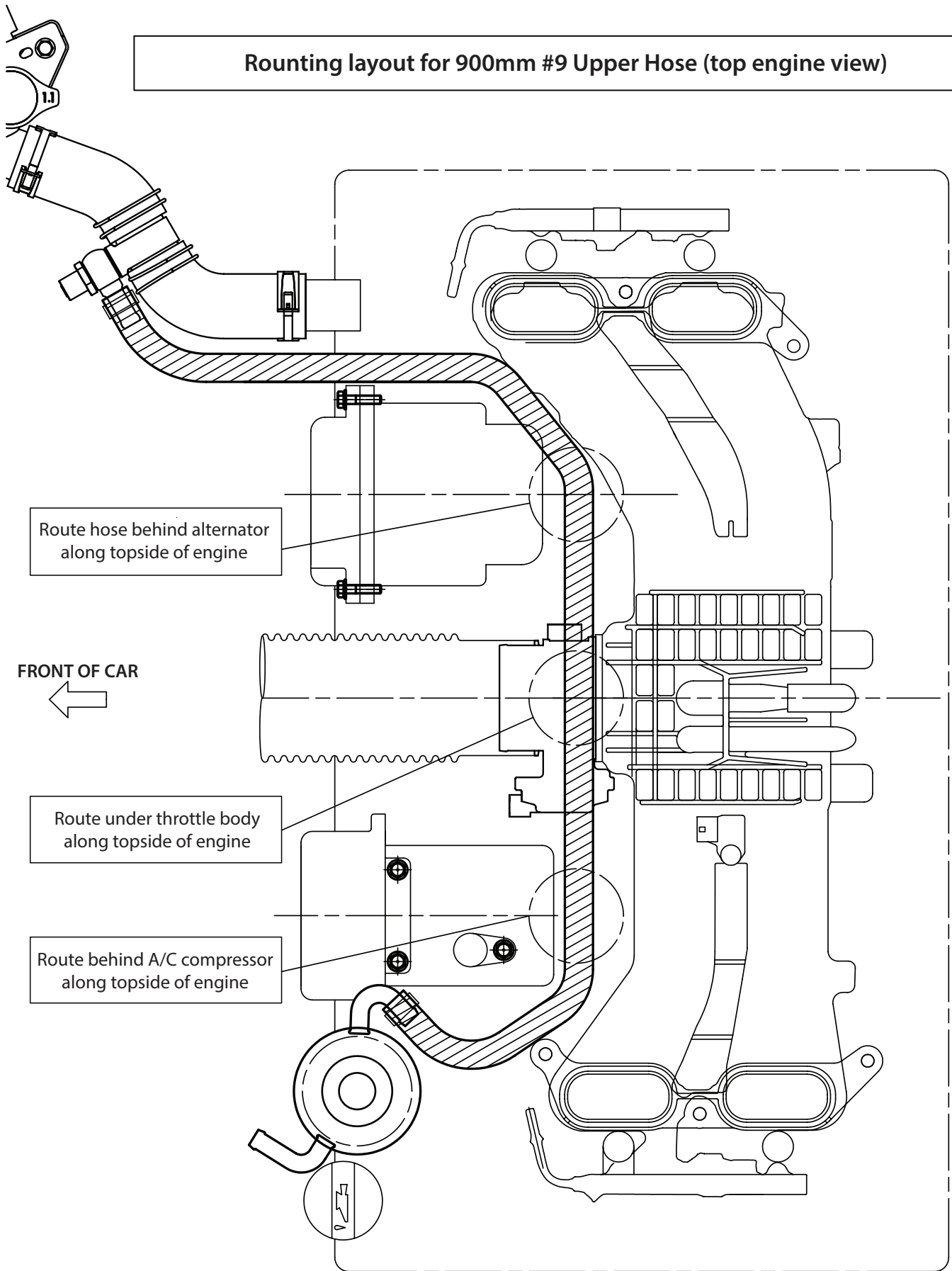
- Position the components as shown in the illustration to the right. Insert #15 Inlet Junction between the cut hose and secure with the included #16 Hose Clamps.
- Assemble #11 Banjo Bolt (PT 1/8 threaded) with #12 Banjo and #13 Aluminum Washers (16x22x1) according to the diagram and hand tighten. Insert #17 Plug into the #11 Banjo Bolt (PT 1/8). Adjust the angle of the Banjo neck by mocking up the position of the radiator hoses and hand tightening the hose clamps.  
\*This step is easier when the two radiator cap stay M6 flange bolts are temporarily removed.
- Position the Banjo neck pointing towards the center of the vehicle.
- Route the 900mm length #9 Upper Hose (12x20) from the #15 Inlet Junction (65mm) to the #3 Main Oil Cooler Unit according to the illustration diagrams.
- After the #9 Upper Hose has been cut and routed, install the #7 Hose Clamps (small) to secure. Confirm that nothing is making contact with this hose such as the factory "Sound Creator" hose. Adjust if necessary.
- Torque all hose clamps to the appropriate factory service manual specs. Torque #11 Banjo Bolt to 30Nm (22 ft/lbs).

#### 9.) Refill engine oil and coolant to factory specification.

\*Consult Factory Service Manual for refilling engine oil, bleeding the coolant system, and any other general repair operation. Make certain the hoses are not making contact with and rotating components such as belts in pulleys. Use Tie Wraps (Zip Ties) to secure any loose ends.



Routing layout for 900mm #9 Upper Hose (top engine view)



**Optional components (sold separately)**

■ **Water-Oil Engine Oil Cooler + Racing Meter (water temp)**

#11 Banjo Bolt PT 1/8 thread is designed exclusively to fit the Cusco Racing Meter temperature sensor.

(Utilizing an alternate aftermarket sensor may hinder efficiency & performance of the Cusco Water-Oil Engine Cooler)

Concurrent usage of Cusco products is highly recommended.

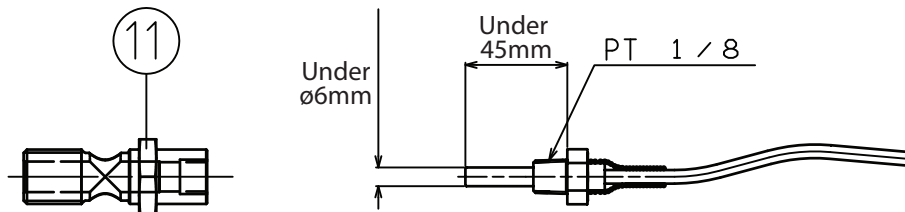
**Cusco Racing Meter (water / oil temp)**

Step motor type, warning function

Part No: 00B 700T

MSRP: \$245.00 (USD)

Installing the water temp sensor on the #11 Banjo Bolt (PT 1/8 thread)



■ **Cusco Racing Meter: Engine Oil Temperature / Oil Pressure**

An optional attachment for oil related sensors are available exclusively for the Cusco 86 & BRZ Water-Air Oil Cooler. This attachment can be used both for the oil temperature and pressure gauge sensor.

**Engine Oil Temp Attachment (PT 1/8 sensor)**

Part No: 00B 700 A234

MSRP: \$67.00

**Cusco Racing Meter: Engine Water/Oil Temp**

Φ 60mm Stepping Motor, Warning Function

Part No: 00B 700T

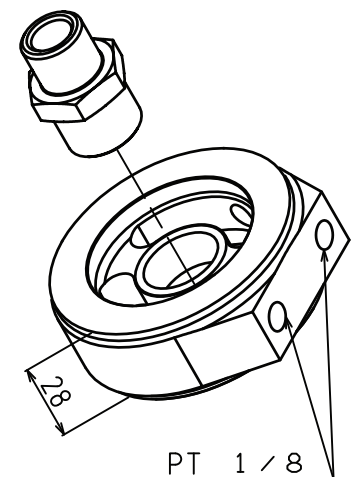
MSRP: \$250.00

**Cusco Racing Meter: Engine Oil Pressure**

Φ 60mm Stepping Motor, Warning Function

Part No: 00B 700P

MSRP: \$300.00



Optional Part  
Cusco Oil Sensor Attachment