



# Service Manual Update

Variant: water-cooled exhaust manifold

**TOTEM**  
by asja

## **Important Notes**

**No tampering and/or changes of any kind to the product are permitted, including replacement of components with non-genuine spare parts and/or any alternation to original product conformity unless expressly approved by TOTEM ENERGY.**

**Any changes to the casing or components inside the product will cause suspension and/or exclusion of the product warranty.**

**By way of non-exhaustive example, the following are not permitted in any manner before or after commissioning the product:**

- **Piercing the casing, the structure or the components inside the product.**
- **Welding or gluing system parts or components to the casing or to the devices inside the product.**
- **Changes to the electrical system and to the devices inside the product.**
- **Transporting and positioning the product in manner different from the transportation instructions illustrated in this manual.**
- **Non-conforming grounding.**
- **Non-conforming product storage.**
- **Alteration or tampering with the software or control parameters.**
- **Electrical powering of the product not conforming with the specifications illustrated in this manual.**

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## 64. Lambda sensor (Variant: water-cooled exhaust manifold)

### Lambda sensor removal

**Safety instructions:** Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.

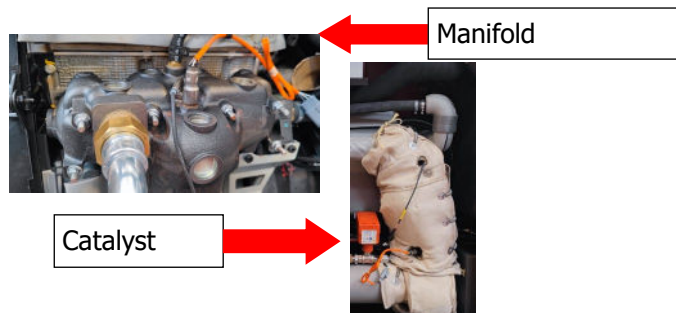
**Safety instructions:** Do not perform the "Restoring Totem for normal operation" procedure and do not attempt to operate or start the Totem module before having completed the "Lambda Sensor replacement" operation and in all cases before refitting all the components, including the panels.

**Safety instructions:** Perform the activity with the engine cold.

#### **Description:**

Remove panels P2, P3 and P4 as described in CHAPTER 06.

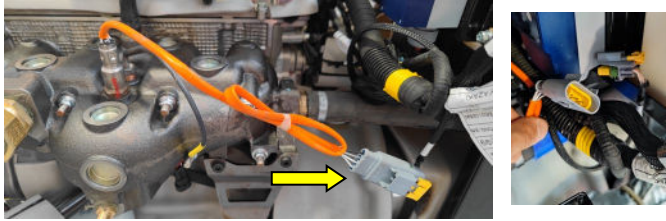
Identify the two lambda sensors in the exhaust manifold and in the catalytic converter.



Remove the lambda probe wire from the plastic clip.

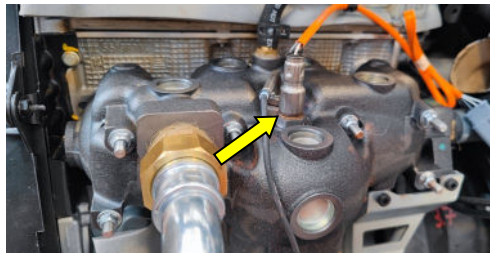


Disconnect the lambda sensor connector.

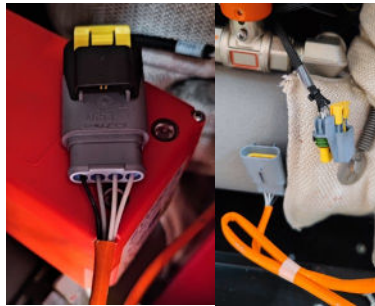


Using a 22 mm wrench, disconnect the lambda sensor from the exhaust manifold.

**WARNING:** PERFORM THIS PROCEDURE WITH THE ENGINE COLD.



Disconnect the lambda sensor connector on the bottom of the catalytic converter.



Using a 22 mm wrench, disconnect the lambda sensor from the catalytic converter.

**WARNING:** PERFORM THIS PROCEDURE WITH THE ENGINE COLD.



## Lambda sensor installation

**Safety instructions:** Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.

**Safety instructions:** Do not perform the "Restoring Totem for normal operation" procedure and do not attempt to operate or start the Totem module before having completed the "Lambda sensor replacement" operation and in all cases before refitting all the components, including the panels.

**Safety instructions:** Perform the activity with the engine cold.

**Safety instructions:** Handle the new lambda sensor carefully and avoid removing the anti-seize grease from the threading.

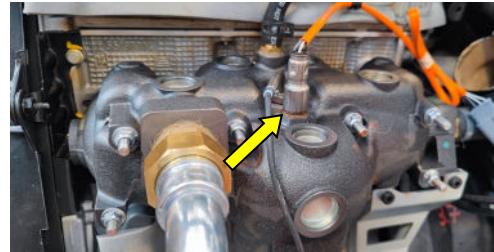
**Safety instructions:** Handle the lambda sensor carefully and avoid shocks which could compromise operation.

### **Description:**

Screw the lambda sensor into the exhaust manifold as far as possible. Using a 22 mm wrench, finish fastening the lambda sensor.

**TIGHTENING TORQUE:  $44 \pm 2.2$  Nm**

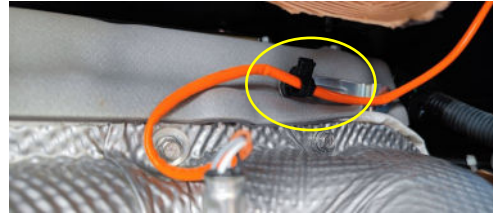
**IMPORTANT:** THE EXHAUST MANIFOLD INSULATION MUST BE DISTANCED FROM THE LAMBDA SENSOR BODY.



Reconnect the lambda sensor connector.



Refit the lambda sensor wire in the plastic clip.



Screw the lambda sensor into the catalytic converter as far as possible. Using a 22 mm wrench, finish fastening the lambda sensor.

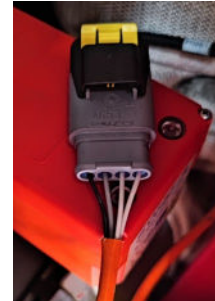
**TIGHTENING TORQUE:  $44 \pm 2.2$  Nm**

**IMPORTANT:** THE EXHAUST MANIFOLD INSULATION MUST BE DISTANCED FROM THE LAMBDA SENSOR BODY.



Reconnect the lambda sensor connector.

**WARNING:** THE EXHAUST MANIFOLD INSULATION MUST BE DISTANCED FROM THE LAMBDA SENSOR CONNECTOR.



Refit panels P2, P3 and P4 as described in CHAPTER 06.

## 65. PT200 sensor (Variant: water-cooled exhaust manifold)

### PT200 sensor removal

**Safety instructions:** Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.

**Safety instructions:** Do not perform the "Restoring Totem for normal operation" procedure and do not attempt to operate or start the Totem module before having completed the "PT200 sensor replacement" operation and in all cases before refitting all the components, including the panels.

**Safety instructions:** Perform the activity with the engine cold.

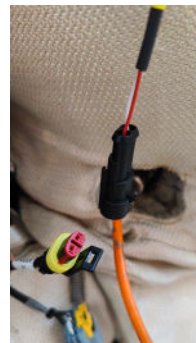
#### **Description:**

Remove panels P2 and P4 as described in CHAPTER 06.

Loosen the insulation from the catalytic converter.



Disconnect the PT200 connector.





Using a 17 mm wrench undo the PT200 sensor from the catalytic converter and the exhaust manifold.



## PT200 sensor installation

**Safety instructions:** Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.

**Safety instructions:** Do not perform the "Restoring Totem for normal operation" procedure and do not attempt to operate or start the Totem module before having completed the "PT200 sensor replacement" operation and in all cases before refitting all the components, including the panels.

**Safety instructions:** Perform the activity with the engine cold.

### **Description**

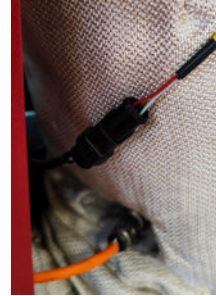
Refasten the PT200 sensor from the catalytic converter and the exhaust manifold.

**TIGHTENING TORQUE:  $25 \pm 1.25$  Nm**



Reassemble the insulation.

Reconnect the PT200 sensor connector.



Refit panel P2 as described in CHAPTER 06

## 66. Exhaust gas line pipe (Variant: water-cooled exhaust manifold)

### Exhaust gas line pipe removal

**Safety instructions:** Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.

**Safety instructions:** Do not perform the "Restoring Totem for normal operation" procedure and do not attempt to operate or start the Totem module before having completed the "Coaxial replacement" operation described in CHAPTER 34 and in all cases before refitting all the components, including the panels.

**Safety instructions:** Perform the activity with the engine cold.

**Safety instructions:** Risk of contact with water and glycol mixture.

#### **Description:**

Remove panels P2 and P3 as described in CHAPTER 06.

Remove upright B as described in CHAPTER 08

Using 12 and 13 mm wrenches, remove the six bolts (as shown in the photo).



Remove the exhaust gas line pipe.

Remove the insulation.



Clean the interface from the silicone paste.

## Exhaust gas line pipe installation

**Safety instructions:** Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.

**Safety instructions:** Do not perform the "Restoring Totem for normal operation" procedure and do not attempt to operate or start the Totem module before having completed the "Coaxial replacement" operation described in CHAPER 34 and in all cases before refitting all the components, including the panels.

**Safety instructions:** Perform the activity with the engine cold.

**Safety instructions:** Risk of contact with water and glycol mixture.

### **Description:**

Apply the silicone paste on both sides of the new metal seals.



Reassemble the insulation.



Place the exhaust gas line pipe and fasten the six bolts.

**TIGHTENING TORQUE:  $16 \pm 0.5$  Nm**



Refit upright B as described in CHAPTER 08.

Refit panel P2 and P3 as described in CHAPTER 06.

## 67. Water-cooled exhaust manifold (Variant)

### Water-cooled exhaust manifold removal

**Safety instructions:** Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.

**Safety instructions:** Do not perform the "Restoring Totem for normal operation" procedure and do not attempt to operate or start the Totem module before having completed the "Exhaust manifold replacement" operation and in all cases before refitting all the components, including the panels.

**Safety instructions:** Perform the activity with the engine cold.

**Description:**

Remove panel P3, P4 and P5 as described in CHAPTER 06.

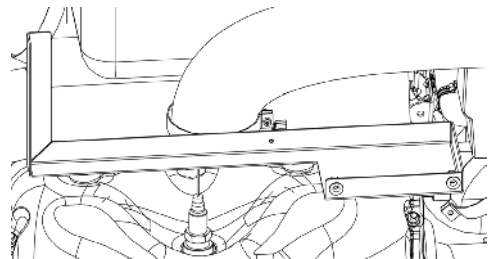
Remove upright C as described in CHAPTER 08.

Remove the air cleaner as described in CHAPTER 31.

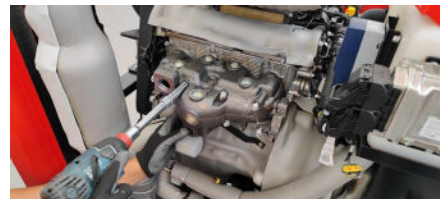
Release the cooling pipe from the lambda sensor.

Disconnect the lambda sensor as described in CHAPTER 64.

Disconnect PT200 sensor as described in CHAPTER 65.



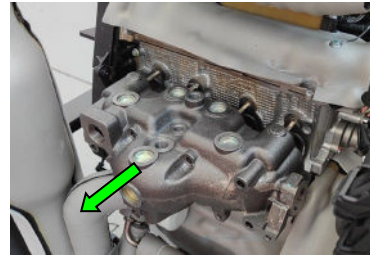
Using a 12 mm wrench undo the nuts, total of eight.



Using a 12 mm and a 13 mm wrench undo the three nuts fixing the water-cooled exhaust manifold/exhaust gas line pipe.



Remove the exhaust manifold.



Remove the metal seal from the water-cooled exhaust manifold.

Remove the metal seal from the water-cooled exhaust manifold/exhaust gas line pipe.

## Water-cooled exhaust manifold installation

**Safety instructions:** Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.

**Safety instructions:** Do not perform the "Restoring Totem for normal operation" procedure and do not attempt to operate or start the Totem module before having completed the "Exhaust manifold replacement" operation and in all cases before refitting all the components, including the panels.

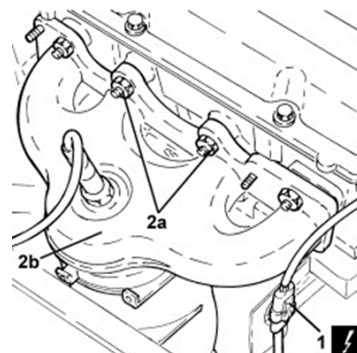
**Safety instructions:** Perform the activity with the engine cold.

### **Description:**

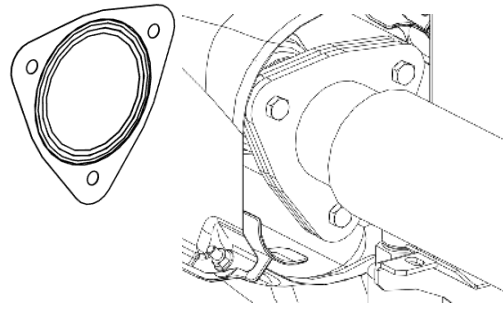
Place the water-cooled exhaust manifold with the respective new metal seal in its housing. Use anti-seize paste to tighten the nuts (to be replaced each time) to the required torque.

IMPORTANT Remember to proceed by tightening the nuts from the center outwards.

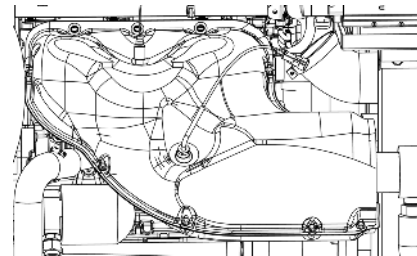
**TIGHTENING TORQUE: 16 Nm + 30° ± 3°**



Reconnect the three new nuts fixing the exhaust manifold/coax jointed terminal with the respective new seal on which silicone paste must be applied to both sides.



Refit the insulating protections covering the exhaust manifold.



Refit the three bolts under the insulation of the tappet cover as described in CHAPTER 42.

Refit the upper protection bolt as described in CHAPTER 39.

Reconnect the lambda sensor as described in CHAPTER 64.

Reconnect the PT200 sensor as described in CHAPTER 65.

Reconnect the cooling pipe from the lambda sensor.

Refit the air cleaner unit as described in CHAPTER 31.

Reconnect upright C as described in CHAPTER 08.

Refit panels P3, P4 and P5 as described in CHAPTER 06.