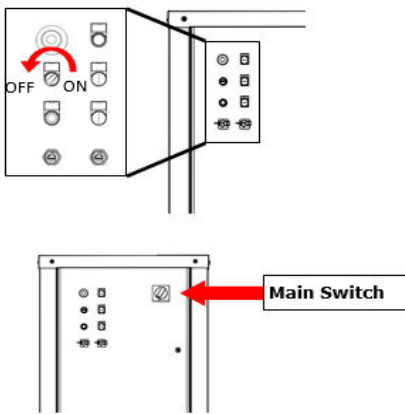
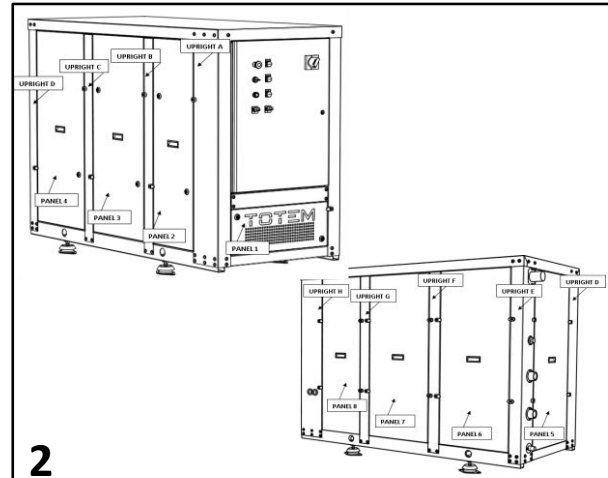
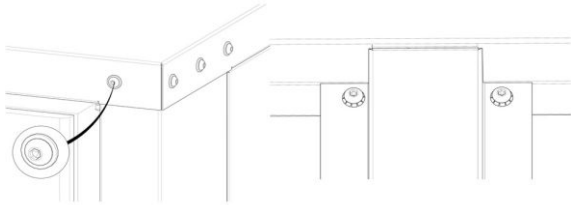
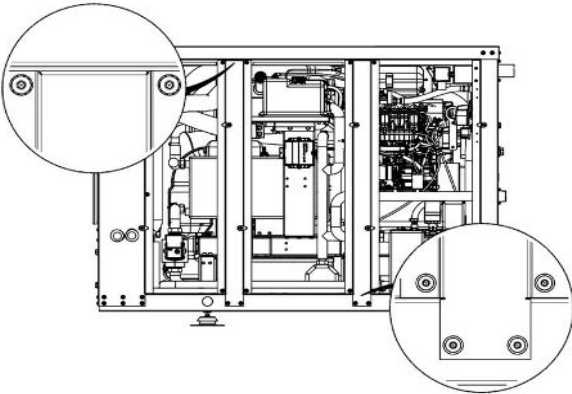


<div>TOTEM osga group</div>		SOP (Standard Operating Procedure)								
Activity/Operation:										
SOP No : 015	Rev.: 02	Exhaust Manifold Replacement (Installation) FIRE engine		Machine	TOTEM FIRE					
Page: 1	of: 9									
Legend: <div>+</div> Safety (S) <div>Q</div> Quality (Q)				<div>→</div> Indication <div>→</div> Important Phase	<div>↺</div> Rotation <div>→</div> Direction					
<div>1</div> <div></div> <div>MATERIAL REQUIRED</div>		<div>PROCEDURE:</div> <div><div>Wear PPE: safety glasses, face shield, gloves, Safety shoes.</div><div>+</div><div>SAFETY:</div><div>SEE CHAPTER 02 OF THE SERVICE MANUAL.</div></div>		<div>2</div> <div></div> <div>MATERIAL REQUIRED</div>		<div>PROCEDURE:</div> <div>Side Panel Removal</div> <div><div>Safety instruction: Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02 of the Service manual.</div><div>+</div><div>SEE CHAPTER 06 OF THE SERVICE MANUAL.</div></div>				
Compiled by:	Date:	Checked by:	Approved by:	NAME	Department Head	Operator	Operator	Operator	Operator	Operator
Marco Piga	29/09/2021	A. Romeo A. Santomauro	Paolo Gecchele A. Santomauro							


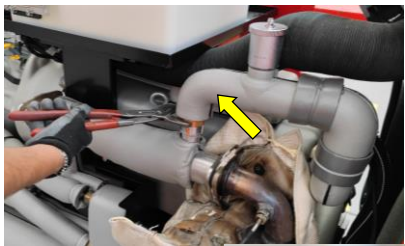

<div>TOTEM ospa group</div>		SOP (Standard Operating Procedure)								
Activity/Operation:		Exhaust Manifold Replacement (Installation) FIRE engine			Machine	TOTEM FIRE				
SOP No : 015	Rev.: 02									
Page: 2	of: 9									
Legend:		<div><div>+</div> Safety (S)</div> <div><div>!</div> Quality (Q)</div>			<div><div>→</div> Indication</div> <div><div>→</div> Important Phase</div> <div><div>↺</div> Totation</div> <div><div>→</div> Direction</div>					
<div><div>3</div><div></div></div>		<div>PROCEDURE:</div> <div>Upper Panel Removal</div> <div>SEE CHAPTER 07 OF THE SERVICE MANUAL.</div>		<div><div>4</div><div></div></div>		<div>PROCEDURA:</div> <div>Casing Upright Removal</div> <div>SEE CHAPTER 08 OF THE SERVICE MANUAL.</div> <div>Remove the uprights pulling them downwards. Position the uprights horizontally on a flat surface without applying weights to prevent bending, scratching, twisting and dents.</div> <div><div>!</div></div>				
<div>MATERIAL REQUIRED</div> <div>Allen wrench 5mm</div>				<div>MATERIAL REQUIRED</div> <div>Allen wrench 5mm</div>						
Compiled by:	Date:	Checked by:	Approved by:	NAME	Department Head	Operator	Operator	Operator	Operator	Operator
Marco Piga	29/09/2021	A. Romeo A. Santomauro	Paolo Gecchele A. Santomauro							


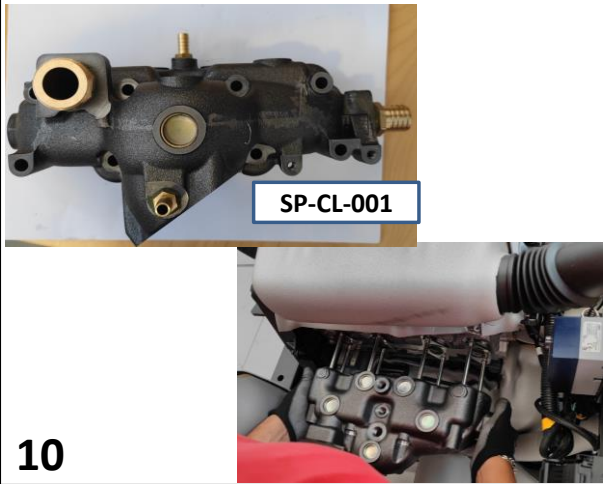
		SOP (Standard Operating Procedure)					
		Activity/Operation: Exhaust Manifold Replacement (Installation) FIRE engine			Machine	TOTEM FIRE	
SOP No : 015 Page: 3		Rev.: 02 of: 9					
Legenda: Sicurezza (S) Qualità (Q) Caratteristica Report (Documentata)				Indication	Important Phase	Rotation	Direction

<div style="font-size: 2em; font-weight: bold; text-align: center;">5</div> <div style="border: 1px solid black; height: 150px; margin-top: 10px;"></div>	<p style="text-align: center; font-weight: bold;">PROCEDURE:</p> <p style="text-align: center; font-weight: bold;">Manual Engine Oil Change (Removal)</p> <p style="text-align: center;"><u>SEE CHAPTER 10 OF THE SERVICE MANUAL.</u></p> <p style="text-align: center; color: red;">Dispose of used oil according to the laws in force in the place of installation of the Totem module.</p> <div style="text-align: center;"> </div>	<div style="font-size: 2em; font-weight: bold; text-align: center;">6</div> <div style="border: 1px solid black; height: 150px; margin-top: 10px;"></div>	<p style="text-align: center; font-weight: bold;">PROCEDURE:</p> <p style="text-align: center; font-weight: bold;">Exhaust Manifold Replacement (Removal)</p> <p style="text-align: center;"><u>SEE CHAPTER 45 OF THE SERVICE MANUAL</u></p> <p style="text-align: center; color: red;">Safety instruction: Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02.</p> <p style="text-align: center; color: red;">Safety instruction: 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 installation" operation and in all cases before refitting all the components, including the panels.</p> <p style="text-align: center; color: red;">Safety instructions: Perform the activity with the engine cold.</p> <div style="text-align: center;"> </div>
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<u>MATERIAL REQUIRED</u>	
Flexible pipe Ø 13mm Small flathead/cross-tip screwdriver Medium-size flathead screwdriver Container	

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<div>TOTEM ospa group</div>		SOP (Standard Operating Procedure)								
Activity/Operation:		Exhaust Manifold Replacement (Installation) FIRE engine		Machine	TOTEM FIRE					
SOP No : 015	Rev.: 02									
Page: 4	of: 9									
Legenda:		<div><div>+</div> Sicurezza (S)</div> <div><div>Q</div> Qualità (Q)</div> <div><div>D</div> Caratteristica Report (Documentata)</div>		<div>→</div> Indication	<div>→</div> Important Phase	<div>↺</div> Rotation	<div>→</div> Direction			
<div><div>7</div><div></div></div>		<div>PROCEDURE:</div> <div>1) Remove the pipe between generator and air/water heat exchanger.</div> <div>SEE CHAPTER 52 OF THE SERVICE MANUAL.</div>		<div><div>8</div><div></div></div>			<div>PROCEDURE:</div> <div>Exhaust Manifold Replacement (Installation)</div> <div>Safety instruction: Carry out the "TOTEM module securing" operation or make sure that it was previously performed in correct manner as described in CHAPTER 02 of the Service Manual.</div> <div>Safety instruction: 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 installation" operation and in all cases before refitting all the components, including the panels.</div> <div>Safety instructions: Perform the activity with the engine cold. <div>+</div></div> <div>2) Clean the area of any residue with a clean rag and alcohol.</div> <div>3) Insert the eight screws and tighten by hand</div>			
<div>MATERIAL REQUIRED</div> <div>Monkey wrench</div>				<div>MATERIAL REQUIRED</div> <div>N.8 screws P/N MI0001</div>						
Compiled by:	Date:	Checked by:	Approved by:	NAME	Department Head	Operator	Operator	Operator	Operator	Operator
Marco Piga	29/09/2021	A. Romeo A. Santomauro	Paolo Gecchele A. Santomauro							

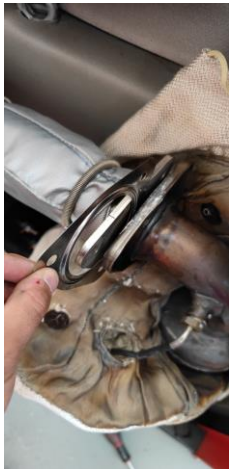

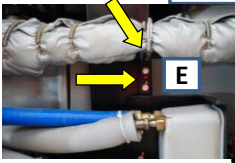
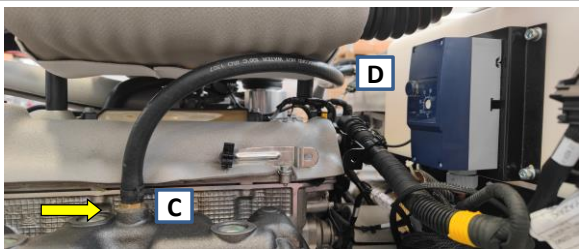

<div>TOTEM osja group</div>		SOP (Standard Operating Procedure)								
SOP No : 015 Page: 5		Rev.: 02 of: 9		Machine		TOTEM FIRE				
Activity/Operation: Exhaust Manifold Replacement (Installation) FIRE engine										
Legenda: <div><div>+</div> Safety (S)</div> <div><div>!</div> Quality (Q)</div>				<div><div>→</div> Indication</div> <div><div>○</div> Important Phase</div> <div><div>↺</div> Rotation</div> <div><div>→</div> Direction</div>						
<div>9</div> <div></div> <div><div>MATERIAL REQUIRED</div><div>Wrench torque</div></div>		<div>PROCEDURE:</div> <div>4) Tighten the screws in the sequence shown in the figure.</div> <div>Tightening torque: 10 Nm</div> <div><div>!</div></div>		<div>10</div> <div></div> <div><div>MATERIAL REQUIRED</div><div>N.8 nuts P/N MI-RA-218 N.8 conical washer P/N MI-MV-211 N.1 Metal seal P/N 1808GS60008 N.1 Exhaust Manifold SP-CL-001 Wrench torque</div></div>		<div>PROCEDURE:</div> <div>5) Arrange the 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.</div> <div>IMPORTANT Remember to proceed by tightening the nuts from the center outwards.</div> <div>TIGHTENING TORQUE: 16 Nm + 30° ± 3°</div> <div><div>!</div></div>				
Compiled by:	Date:	Checked by:	Approved by:	NAME	Department Head	Operator	Operator	Operator	Operator	Operator
Marco Piga	29/09/2021	A. Romeo A. Santomauro	Paolo Gecchele A. Santomauro							

		SOP (Standard Operating Procedure)				
		Activity/Operation:				
SOP No : 015 Page: 6	Rev.: 02 of: 9	Exhaust Manifold Replacement (Installation) FIRE engine			Machine	TOTEM FIRE
Legenda: Sicurezza (S) Qualità (Q) Caratteristica Report (Documentata) 				<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> Indication </div> <div style="text-align: center;"> Important Phase </div> <div style="text-align: center;"> Rotation </div> <div style="text-align: center;"> Direction </div> </div>		

<div style="display: flex;"> </div> <div style="display: flex;"> </div> <div style="text-align: center; font-size: 24px; font-weight: bold; margin-top: 10px;">11</div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center; margin: 0;"><u>MATERIAL REQUIRED</u></p> <p>N.3 pipe clamps 25-40 mm P/N MI-FA-237</p> <p>Steel pipe Di28 0,10 m P/N RA0020</p> <p>Rubber hose Di28 0,70 m P/N PA0014</p> </div>	<p style="text-align: center; font-weight: bold; margin: 0;">PROCEDURE:</p> <p>6) Insert the steel pipe into the water inlet pipe of the generator.</p> <p>7) Connect the rubber hose at the exhaust manifold water outlet pipe to the generator unit water inlet pipe.</p> <p>8) Tighten the pipe clamps.</p>	<div style="display: flex;"> </div> <div style="text-align: center; font-size: 24px; font-weight: bold; margin-top: 10px;">12</div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center; margin: 0;"><u>MATERIAL REQUIRED</u></p> <p>Rubber hose (A) 0,41 m Di28 P/N PA0014</p> <p>N.3 Pipe clamps 25-40 mm P/N MI-FA-237</p> <p>N.3 Pipe clamps 18-12 mm P/N MI-FA-101</p> <p>Rubber hose Di10 (B) 0,18 m P/N 090810WA036</p> <p>N.1 Pipe P/N SP-PA-001</p> <p>N.1 Seal P/N 18120W50220</p> <p>N.1 Seal P/N 18120W50218</p> </div>	<p style="text-align: center; font-weight: bold; margin: 0;">PROCEDURE:</p> <p>9) Connect the pipe union to the exchangers water output.</p> <p>10) Connect the rubber hose (A) at the pipe union of the exchanger water output.</p> <p>11) Connect the hose at the pipe union of the exhaust manifold and to the rubber hose.</p> <p>12) Tighten the pipe clamps.</p> <p>13) Connect the rubber hose (B) at the pipe union PT1 and at the pipe union PT2</p>
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Marco Piga	29/09/2021	A. Romeo A. Santomauro	Paolo Gecchele A. Santomauro	NAME							

<div>TOTEM osjo group</div>		SOP (Standard Operating Procedure)								
SOP No : 015 Page: 7		Rev.: 02 of: 9		Machine		TOTEM FIRE				
Activity/Operation: Exhaust Manifold Replacement (Installation) FIRE engine										
Legenda: <div><div>+</div> Sicurezza (S)</div> <div><div>Q</div> Qualità (Q)</div> <div><div>D</div> Caratteristica Report (Documentata)</div>				<div><div>→</div> Indication</div> <div><div>→</div> Important Phase</div> <div><div>↻</div> Rotation</div> <div><div>→</div> Direction</div>						
<div><div></div><div></div><div></div><div>13</div></div> <div><div>MATERIAL REQUIRED</div><div>Fume exhaust line piping P/N 19FR0603325</div><div>N. 1 Insulation P/N CO0002</div></div>		<div><div>PROCEDURE:</div><div>Fume exhaust line piping (Installation)</div><div>14) Insulate the fume exhaust line piping with insulation.</div></div>		<div><div></div><div></div><div></div><div></div><div>14</div><div><div>MATERIAL REQUIRED</div><div>N. 3 Bolts P/N MI-RA-244</div><div>N. 1 Metal seals P/N 1808GS70009</div><div>N. 1 Insulation P/N CB0002</div><div>Wrench torque</div></div></div>			<div><div>PROCEDURE:</div><div>15) Apply the silicone paste on both sides of the new metal seals.</div><div>16) Position the fume exhaust line piping and fasten the three bolts. Insulate the fume exhaust line piping with insulation</div><div><div>TIGHTENING TORQUE: 16 ± 0.5 Nm</div></div></div>			
Compiled by:	Date:	Checked by:	Approved by:	NAME	Department Head	Operator	Operator	Operator	Operator	Operator
Marco Piga	29/09/2021	A. Romeo A. Santomauro	Paolo Gecchele A. Santomauro							

<div>TOTEM osjo group</div>		SOP (Standard Operating Procedure)								
SOP No : 015 Page: 8		Rev.: 02 of: 9		Activity/Operation:						
Exhaust Manifold Replacement (Installation) FIRE engine				Machine	TOTEM FIRE					
Legenda: <div><div><div></div><div>Sicurezza (S)</div></div><div><div></div><div>Qualità (Q)</div></div><div><div></div><div>Caratteristica Report (Documentata)</div></div></div>				<div><div></div><div>Indication</div></div> <div><div></div><div>Important Phase</div></div>	<div><div></div><div>Rotations</div></div> <div><div></div><div>Direction</div></div>					
<div><div><div></div><div></div><div></div></div><div>Catalytic converter</div><div>E</div><div>15</div></div> <div><div><div>PROCEDURE:</div><div>17) Apply the silicone paste on both sides of the new metal seals.</div><div>18) Position the fume exhaust line piping and fasten the three bolts</div><div>19) Reassemble the support bracket of the Fume exhaust line piping. Insert the clamp. (E)</div><div>TIGHTENING TORQUE: 16 ± 0.5 Nm</div></div></div> <div><div><div>MATERIAL REQUIRED</div><div>N. 3 Bolts P/N MI-RA-244</div><div>N. 1 Metal seals P/N 1808GS70009</div><div>Wrench torque</div></div></div>				<div><div><div></div><div></div></div><div>D</div><div>C</div><div>16</div></div> <div><div><div>PROCEDURE:</div><div>20) Connect the rubber hose at the pipe union of the Exhaust Manifold (C)</div><div>21) Connect the rubber hose at the pipe union of the tank (D).</div><div>22) Tighten the pipe clamps.</div></div></div> <div><div><div>MATERIAL REQUIRED</div><div>Rubber hose Di10 0,68 m P/N 090810WA036</div><div>N.3 Pipe clamps 18-12 mm P/N MI-FA-101</div></div></div>						
Compiled by:	Date:	Checked by:	Approved by:	NAME	Department Head	Operator	Operator	Operator	Operator	Operator
Marco Piga	29/09/2021	A. Romeo A. Santomauro	Paolo Gecchele A. Santomauro							

		SOP (Standard Operating Procedure)				
		Activity/Operation:				
SOP No : 015 Page: 9	Rev.: 02 of: 9	Exhaust Manifold Replacement (Installation) FIRE engine		Machine	TOTEM FIRE	
Legenda: Sicurezza (S) Qualità (Q) Caratteristica Report (Documentata)				Indication Important Phase	Rotations Direction	

17

PROCEDURE:

23) Unscrew the screw (E).

24) Position the bracket (F).

25) Tighten the screws M8 L16 by hand (F)

26) Tighten the screws M12x1,25 L80 (G)

27) Tighten the screws M8 (F)

18

PROCEDURE:

PT200/Lambda Sensor Replacement (Installation)

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

TIGHTENING TORQUE: 25 ± 1.25 Nm

29) Reconnect the PT200 sensor connector..

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

30) Reconnect the lambda sensor connector.

TIGHTENING TORQUE: 44 ± 2.2 Nm

MATERIAL REQUIRED

N. 1 bracket P/N SP-CR-001

N. 2 screws MI-MV-330

N. 1 screw P/N MI0002

N. 1 nut P/N MI0003

Hexagonal wrench 5 mm

MATERIAL REQUIRED

PT200 Sensor P/N 21002001023

Lambda Sensor P/N 210010010001

22 mm wrench

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