

TROUBLESHOOTING SCENARIOS	
FORM NO	CRO006. Rev. 2
SCENARIO NAME	Main Engine – Fuel Injection Pump No. 4 sticking
SYSTEM NAME	Main Engine
Max Time	10 minutes
SYSTEM DESCRIPTION	<p>Main Engine onboard simulated ship is a crosshead engine of two-stroke type. The engine is equipped with scavenging ports and exhaust valve. Fuel injection pump is operated mechanically by means of camshaft. Fuel injection pump is of helix type with two control levers; one for fuel index and another for VIT index adjustment. Fuel index lever is designed to control (adjust) amount of fuel to be injected into cylinder while VIT level control injection point – beginning of injection. Both levers are control by engine pneumatic system by means of pneumatic cylinders. During more excessive movement in case one of the control levers stuck it will cause deviations in exhaust gas temperature, significant changes in injection timing and differences in injected fuel quantity between cylinders.</p>
Describe the problem	<p>While increasing speed ME control rack of fuel injection pump no 4 stuck causing that smaller amount of fuel is injected into the cylinder for corresponding engine speed. The fuel rack must be manually moved in order to rectify the problem.</p>
Preparation	<ul style="list-style-type: none"> <li>• Check levers on fuel injection pumps</li> <li>• Check safety measure</li> </ul>
SCENARIO ALGORITHM	<p>Scenario chronology:</p> <ol style="list-style-type: none"> <li>1. Heavy Alarm sound and Signal light column for machinery alarm is illuminated</li> <li>2. Message on ECR computer panel will appear: “ME CYL 4 EXHAUST GAS TEMP. DEVIATION LOW”</li> <li>3. Student will have to press ACKNOWLEDGE BUTTON in ECR computer panel</li> <li>4. The alarm horn will SILENT and light on signal column will go OFF</li> <li>5. The letters on message on ECR computer panel “ME CYL 4 EXHAUST GAS TEMP. DEVIATION LOW” will change color to yellow</li> <li>6. Student will physically have to go to the fuel injection pump no 4 and inspect fuel pump index position and compare it to the adjacent cylinder (found difference Cyl.4. – 35, Cyl. 5. – 45)</li> <li>7. Student will have to manually push fuel rack on cylinder no. 4</li> <li>8. Message on ECR computer panel: “ME CYL 4 EXHAUST GAS TEMP. DEVIATION LOW” will disappear</li> </ol> <p>FINISHED SCENARIO</p>

QUESTIONS	<ol style="list-style-type: none"><li>1. What is cylinder exhaust gas temperature?</li><li>2. What is the consequence of one cylinder not working?</li><li>3. What is exact alarm message?</li></ol>
LEARNING OUTCOME	<p>To understand possible malfunction of single cylinder.</p> <p>To understand possible malfunction of fuel injection pump for one cylinder.</p>