|  |  |  |  |
| --- | --- | --- | --- |
| Station | | Task | |
| 7 | | 4 | |
| Running 1503 | | | |
|  |  |  |  |

**

# BUDS navigation

## TASK OBJECTIVE

At the completion of this task the technician will be able to properly utilize BUDS to navigate through the various screens and functions available. In addition, he will be able to explain when this procedure would be necessary. He will also be able to explain the importance of having the correct wiring to the correct sensor and how that can be tested.

**INTRODUCCTION**

Understanding the B.U.D.S system and its options is important for the proper entry of information such as, the customer name and the delivery date. The B.U.D.S system is also used for the programming of the DESS (Digital Encoded Security System) lanyards to the vehicle. It can also be used for setting the ignition timing and TPS (Throttle Position Sensors) on some models and reading fuel injection diagnostic information on equipped models.

In overview, the B.U.D.S. system will allow you to read the information stored in the vehicle's MPEM and/or ECM (Sea-Doo 4-Tec), modify the parameters in the B.U.D.S program, save the entire B.U.D.S file to disk or hard drive, print a service report and write the information back into the vehicle's MPEM.

When working with BUDS on a 1503 engine there are several diagnostic functions that can be utilized. Access to fault codes and diagnostic information can be found in the faults screen. In addition there are several items that can be activated by the system. Not only can items be activated, but in some case items can be deactivated.

When the engine is not running, certain items can be activated. Items that can be activated include the fuel pump, buzzer, fuel injectors, ignition coils, RAVE solenoid, injectors and tachometer. This function is useful to determine if the components are operating. By feeling the activated components you can also determine if the correct component is being activated. This eliminates crossed connectors.

When the engine is running certain items can be deactivated. Items that can be deactivated include the ignition coils and injectors. This function is on the monitoring page under cylinder shut down. This is very useful for performing a cylinder contribution test.

**PROCEDURES**

####  Place the switches on the switch box in the following positions.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A | X | X | X | X | X | X | X | X |
| B |  |  |  |  |  |  |  |  |

Follow the steps and answer the questions below:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Connect BUDS to the vessel by connecting to the 6 pin adapter. | | | | | | | | | | | | | |
| 1. Install the DESS cap on the vessel. | | | | | | | | | | | | | |
| 1. Read the ECM data. | | | | | | | | | | | | | |
| 1. Go to the "vehicle" screen. | | | | | | | | | | | | | |
| 1. Record the engine identification number. | | | | | | | | | | | | | |
| 1. Record the date and the hours of the last service. | | | | | | | | | | | | | |
| 1. Go to "keys" screen? | | | | | | | | | | | | | |
| 1. Record the number and the type of keys used? | | | | | | | | | | | | | |
| 1. Go to "setting" screen. | | | | | | | | | | | | | |
| 1. Record degrees of throttle opening: | | | | | | | | | | | | | |
| 1. Air intake temp | | Value | | |  | | | | MIN | |  | MAX |  |
| 1. Engine temp | | Value | | |  | | | | MIN | |  | MAX |  |
| 1. Exhaust temp | | Value | | |  | | | | MIN | |  | MAX |  |
| 1. Air pressure | | Value | | |  | | | | MIN | |  | MAX |  |
| 1. Volts engine off:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | |
| 1. Start the engine. | | | | | | | | | | | | | |
| 1. Volts engine running:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | |
| 1. Shut down the engine using BUDS. | | | | | | | | | | | | | |
| 1. Start the engine and from the "monitoring" screen, perform the shut down cylinder tests in the following steps and record the following: | | | | | | | | | | | | | |
| 1. What is the RPM drop, when the #1 cylinder is shut down? | | | | | | | | | | | | | |
| 1. What is the RPM drop, when the #2 cylinder is shut down? | | | | | | | | | | | | | |
| 1. What is the RPM drop, when the # 3 cylinder is shut down? | | | | | | | | | | | | | |
| 1. Shut the engine off. | | | | | | | | | | | | | |
| 1. Go to the "activation page". | | | | | | | | | | | | | |
| 1. Install a LED into the # 2 cylinder ignition coil primary side. | | | | | | | | | | | | | |
| 1. Activate the # 2 ignition coil. | | | | | | | | | | | | | |
| 1. Does it illuminate? | YES | |  | NO | | |  |  | | | | | |
| 1. If it does not illuminate, reverse the polarity of the LED leads and try again. | | | | | | | | | | | | | |
| 1. Does it illuminate now? | | YES | |  | | NO | | |  |  | | | |

####  Place the switches on the switch box in the following positions.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A | X | X | X | X | X |  | X | X |
| B |  |  |  |  |  | X |  |  |

|  |
| --- |
| 1. Crank the engine for 10 seconds |
| 1. Re-read the BUDS data. |
| 1. Go to the "faults" screen. |
| 1. Record the faults and the descriptions here |
| 1. Is the fault "Active" or "Occurred"? |
| 1. How many times did the fault occur? |
| 1. At how many minutes did the fault occur? |
| 1. What is the total hours on the machine ? |
| 1. Go to "More Details" of first fault. |
| 1. Record the service action here. |

####  Place the switches on the switch box in the following positions.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A | X | X | X | X | X | X | X | X |
| B |  |  |  |  |  |  |  |  |

|  |
| --- |
| 1. Clear occurred faults. |
| 1. Restart the engine. |
| 1. Re-read the faults. |
| 1. Did any faults return? |
| 1. Go to the "history" screen. |
| 1. Enter the total run time. |
| 1. Enter the total run time between 4000 RPM and 6519 RPM. |
| 1. Disconnect BUDS. |

**QUESTIONS**

1. What have you learned from this task?

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**Instructor sign off-- Go \_\_\_\_\_\_\_\_\_\_**