

# **PREPRODUCTION INITIATIVE-NELP OIL RECYCLER (KUBOTA TRACTOR) TEST PLAN**

## **SITE: NS MAYPORT**

### **1.0 OBJECTIVE**

This test plan describes the data collection procedures that will be used to gather performance data on the TF Purifiner ultra-high bypass filter for diesel engine oil.

### **2.0 BACKGROUND**

Currently, NS Mayport generates more than 50,000 pounds of waste engine oil per year. The costs associated with oil usage (such as material, labor, storage, and waste disposal) make usage reduction a primary consideration. At this time, oil changes in government equipment are determined by one of two ways—either the oil is contaminated or the time interval maintenance cycle has been reached. Although this maintenance concept ensures that the equipment is well-maintained, it does not help reduce oil consumption and waste. Studies on oil degradation, contamination, and engine wear have shown that if the oil is filtered to remove contaminants greater than 1 micron, the oil does not have to be changed. In fact, some data have shown that in-service, highly-filtered oil improves with age. To better assess this technology and its viability for government equipment, an ultra-high batch filtration system was selected for evaluation. The filtration system selected is manufactured by TF Purifiner, Inc. The filtration system will be evaluated for 1 year on a Kubota tractor used to maintain the lawns at NS Mayport. The equipment will be maintained by the vehicle maintenance shop, Building 349.

### **3.0 TEST PLAN**

This test plan describes the test, procedures for performing the test, and directions for collecting and recording the test data.

#### **3.1 Test Description**

This section describes the test plan for a Kubota tractor. These procedures shall incorporate the manufacturer's recommended maintenance schedule for filter change and oil sampling.

##### **3.1.1 Installation Procedures**

At the time of installation, oil samples of the old oil were taken and tested by a laboratory to provide baseline data on the condition of the engine. The oil and full flow filters were changed. Also, oil samples of the new oil were taken and tested by a laboratory to provide baseline information on new oil.

- Take an oil sample of the old oil for laboratory testing.

- Drain the old oil, and change the full flow oil filter.
- Install the TF Purifiner filtration system.
- Take an oil sample of the new oil for laboratory testing.
- Fill the engine with the new oil.
- The following information was determined during installation.

- Tractor manufacturer: Kubota
- Tractor part number: M4030SU
- Tractor serial number: 2217
- Engine manufacturer: Kubota
- Engine model number: F2402-D1-A
- Engine serial number:
- Crankcase capacity: 13.4 qts.
- Oil specification:
- TF Purifiner model no.: TF-24P
- TF Purifiner serial no.:
- Date Installed:
- Hours on engine:
- Purifiner filter no.: TF-24F

### **3.1.2 Normal Operating Procedures**

- Take an oil sample every 30 days and send to the laboratory for testing
- Change the full flow filter and TF Purifiner filter in 12 weeks. Only add oil. Do not change the oil.
- Continue taking an oil sample every 30 days and send to the laboratory for testing
- Change the full flow filter and TF Purifiner filter in 24 weeks. Only add oil. Do not change the oil.

### **3.2 Oil Sampling**

The site has been provided with an oil analysis test kits to simplify the testing and analysis of the oil being filtered by the TF Purifiner filter systems. Oil samples will be taken every 30 days and when the filter is changed.

Follow these procedures when taking oil samples.

1. Always take an oil sample when oil is hot.
2. Remove the dustcap from the TF Purifiner oil sample valve at the bottom of the unit.
3. With the engine running, open the sample valve and flush the sample bottle twice with oil before taking the final sample. After flushing, fill up the oil sample bottle provided. Label the samples.
4. Make sure the sample valve is closed tightly and replace the dust cap.
5. Complete the laboratory submission data sheet provided in Table 1. Provide the following information:
  - Sample Number
  - Date Taken
  - Miles/hours on oil
  - Miles/hours on unit
  - Oil added (quarts)
  - Full flow filter change (yes/no)
  - Purifiner filter change (yes/no)
6. Place the completed sheet in the shipping container with the oil sample and place in the mail.

#### **4.0 REPORTING**

Each month, the test site shall forward copies of the data logged in Table 1 to the Naval Air Warfare Center, Aircraft Division, Lakehurst (NAWCADLKE). The data entry form is a concise method of data collection. Data will be collected for 1 year. During this time, periodic status reports on the testing will be submitted to NAWCADLKE. The final report will include detailed results and observations, assess the efficiency and cost-effectiveness of the unit, and evaluate its ability to interface with site operations.

**Table 1  
Laboratory Submission Data Sheet**

|                                 |            |           |
|---------------------------------|------------|-----------|
| <b>Sample number:</b>           |            |           |
| <b>Date taken:</b>              |            |           |
| <b>Mile/hours on oil:</b>       |            |           |
| <b>Mile/hours on unit:</b>      |            |           |
| <b>Oil added (quarts):</b>      |            |           |
| <b>Full flow filter change:</b> | <b>Yes</b> | <b>No</b> |
| <b>Purifier filter change:</b>  | <b>Yes</b> | <b>No</b> |

**Qualitative Assessment\*:**

Please comment on the effectiveness and efficiency of the unit.

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\*Attach extra sheet if required