

Spinner II
Centrifugal Oil
Filtering System
In Conjunction
with
Royal Purple Oil

Objectives for Using Spinner II Filters & Royal Purple Oil

- **Reduce Rig Expenses**
- **Extend Oil Change Intervals**
- **Reduce Engine Overhaul Cost**
- **Reduce Waste Oil**

Controlled Test Data

- **Installed on all D-399's (5) engines:**
 - **Fuel metering gauges**
 - **DeBug fuel filters**

Controlled Test Data

- **Installed Spinner II Centrifuging**
- **Oil Filters on Engines:**
 - # 2**
 - # 3**
 - # 4**
 - # 5**

Controlled Test Data

- **Mineral Oil Used in Engines:**
 - # 1**
 - # 2**
 - # 3**
- **Royal Purple Oil Used in Engines:**
 - # 4**
 - # 5**

Controlled Test Data

- **Controlled Test Started January 6, 1998**
- **Engine Hours at Start of Test:**
 - # 1 Engine 18,798
 - # 2 Engine 18,865
 - # 3 Engine 15,838
 - # 4 Engine 15,621
 - # 5 Engine 9,615

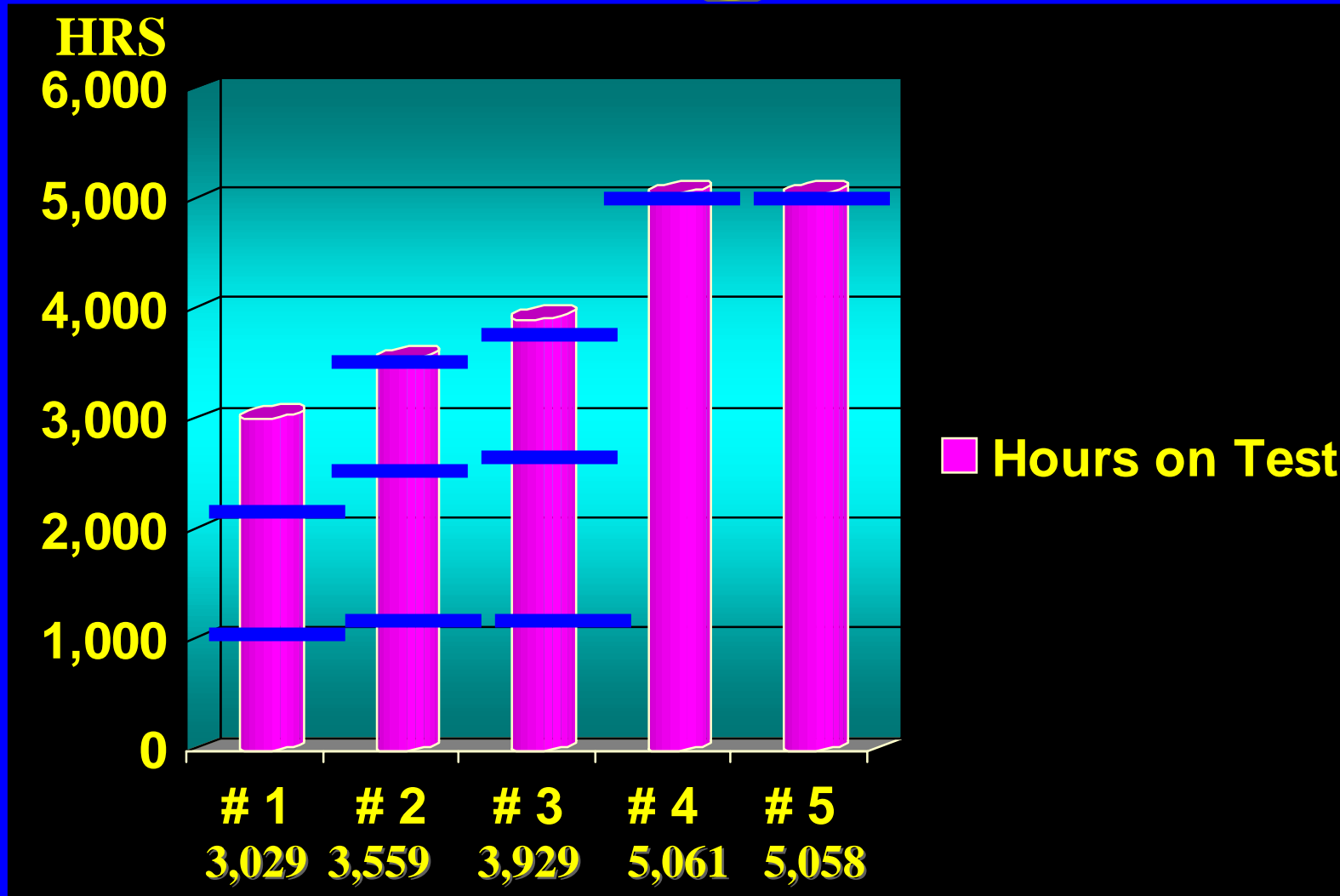
Results as of September 21, 1999

- **Oil & Filter Changes**
 - **# 1 Engine 2 times***
 - **# 2 Engine 3 times***
 - **# 3 Engine 3 times***
 - **# 4 Engine 1 time***
 - **# 5 Engine 1 time***

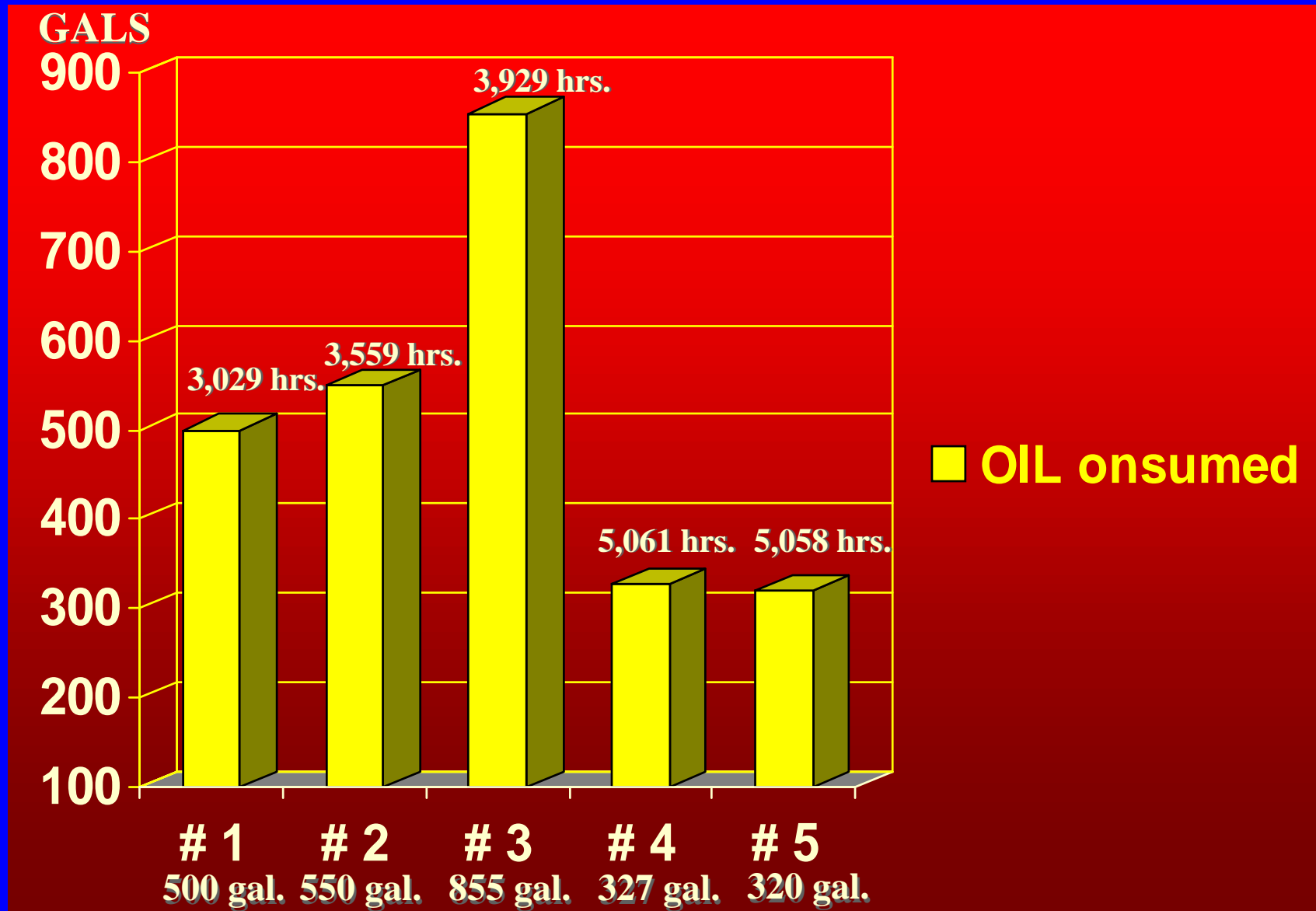
***Using Mineral oil**

***Using Royal Purple Oil**

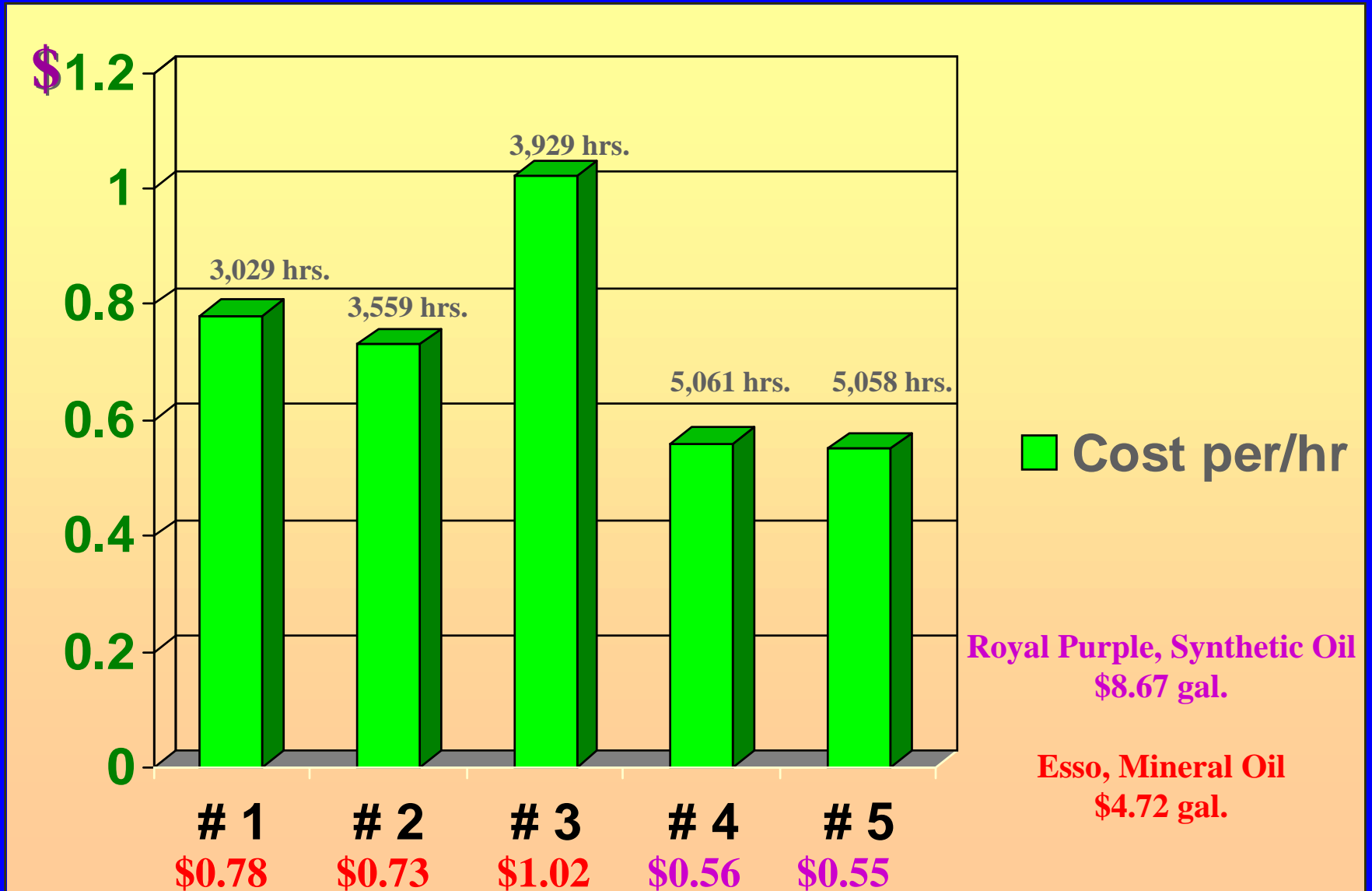
Oil Change Chart



Oil Consumed Chart



Oil Cost Chart



Summary:

Spinner II Filters

- ✓ **Improved oil change intervals by 50%.**
 - **Increased from 1,000 hours to 1,500 hours between oil changes.**
 - **Expected to increase to 2,000 hours when everyone becomes comfortable with increased hours.**
- ✓ **Will reduce waste oil disposal by as much as 550 gals / per engine per year.**

Summary:

Spinner II Filters

- ✓ Expect to extend the hours between engine overhauls because of reduced fines in the oil.
- ✓ Expect to reduce rig engine overhaul cost.
 - * Fewer overhauls for same time period

Summary:

Royal Purple Oil

- ✓ **Extended the hours between engine oil changes.**
 - * **800% improvement over mineral oil**
 - * **Oil change intervals are expected to be above 8,000 hours with Spinner II Filters.**

- ✓ **Reduced rig engine operating cost.**
 - * **Fewer oil & filter changes**
 - * **Improved oil consumption (30%)**
 - * **Fewer overhauls for same time period because of the reduced friction and better film strength.**

Summary: Royal Purple Oil

✓ Improved fuel economy by 5%.

* Benefits Contractor and the Operator,
regardless of who furnishes the fuel.

Cost Vs Benefit

Using Spinner II Filters Only

(OIL)

- ✓ **Per unit cost = \$1,407**
- ✓ **First year savings per engine = \$1,191**
- ✓ **Second year & every year thereafter savings per engine = \$2,598**

Cost Vs Benefit

Using Spinner II Filters and Royal Purple Oil

(OIL)

- ✓ Per unit cost = \$1,407
- ✓ First year savings per engine = \$2,312
- ✓ Second year & every year thereafter savings per engine = \$3,719

Cost Vs Benefit
Using Spinner II Filters
and Royal Purple Oil
(FUEL)

✓ Fuel savings per engine per year = \$4,737