

***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

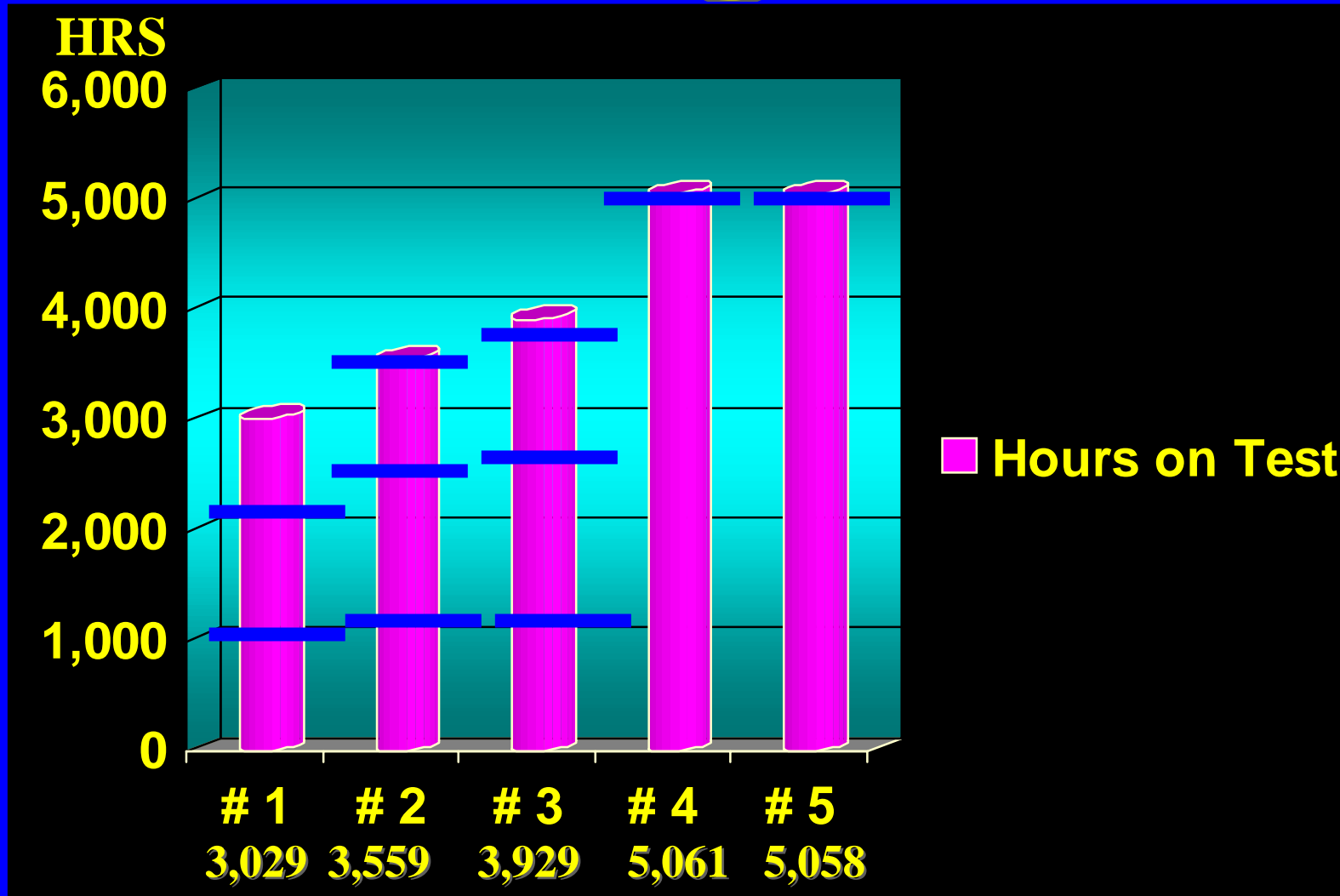
# ***Results as of September 21, 1999***

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

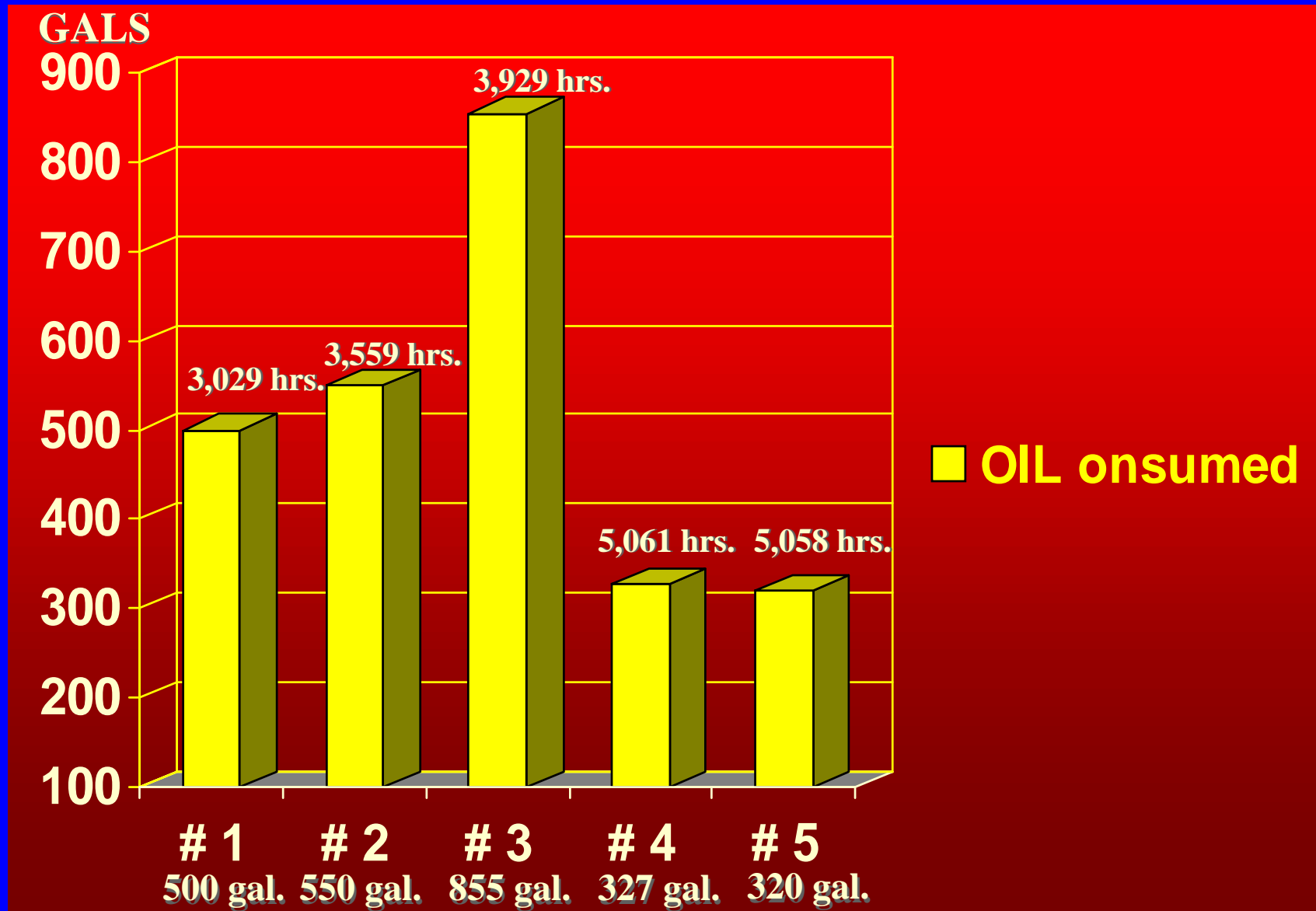
**\*Using Mineral oil**

**\*Using Royal Purple Oil**

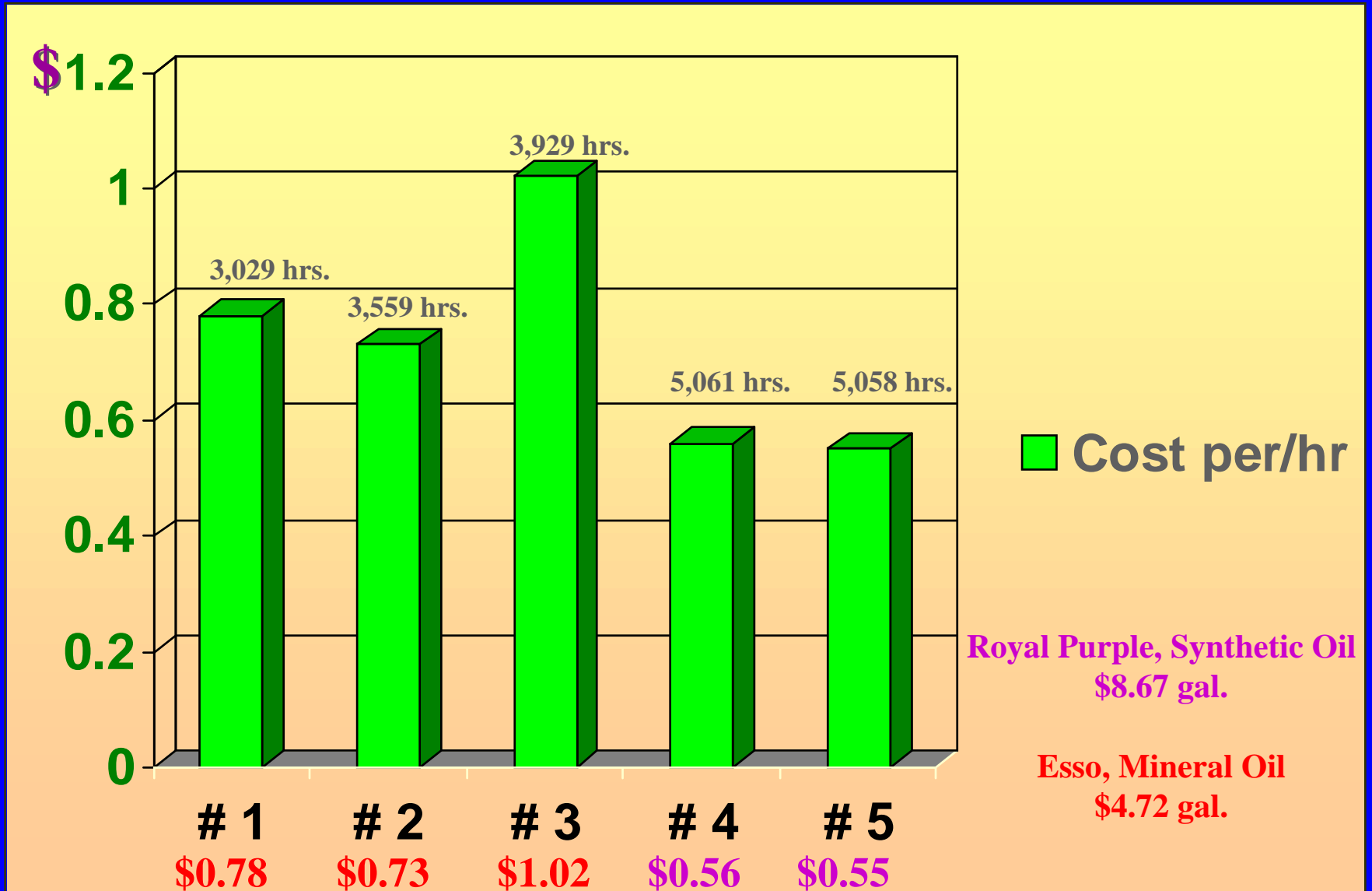
# Oil Change Chart



# 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