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# EDUCATION CAMPAIGN ON REDUCED LUBRICATION FOR RICKSHAWS IN PAKISTAN



**PRESENTED**

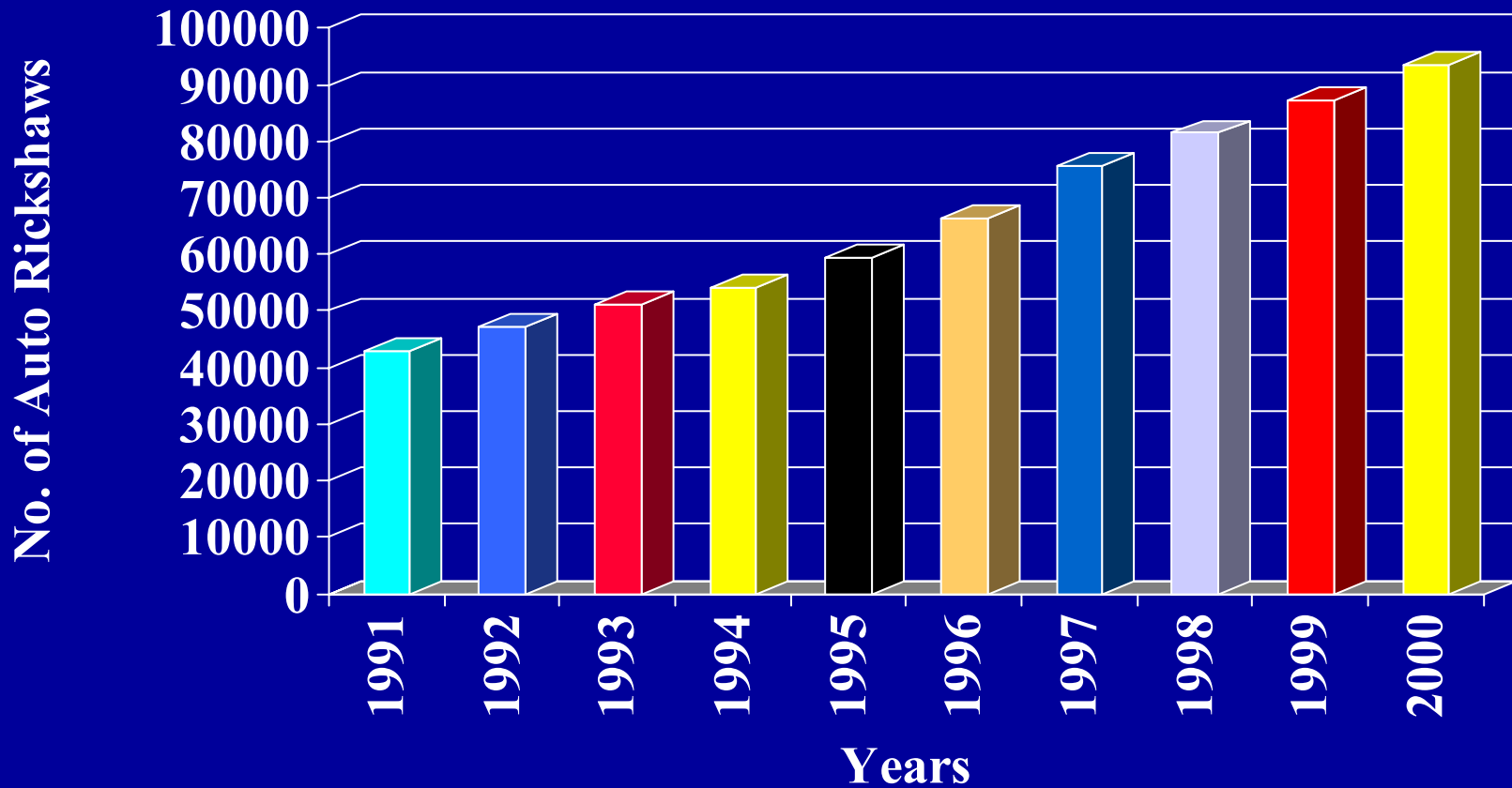
**BY**

**DR. S.N.A. ZAIDI**

# HISTORY OF THREE WHEELERS IN PAKISTAN

- Three Wheelers were Introduced in Pakistan in Late 1960s
- In 1991, Around 43,000 Auto Rickshaws were plying on Roads. This Number has Increased to 94,000 in the Year 2000
- Initially Designed as Short Distance and Limited Person Carrier
- All of Auto Rickshaws are 2-Stroke Engines

# GROWTH OF AUTO RICKSHAWS IN PAKISTAN





HARVEST BARN

TOYO

# FUNCTION OF A LUBRICANT

- Reduce Friction
- Removal of Heat
- Reduction in Noise
- Detergency
- Smoke Reduction
- Reduction in Exhaust Blockade



LUBRICITY

# LUBRICANTS FOR RICKSHAWS

This Research was Conducted in 1999

- Two Grades of Gasoline were being Marketed at the Time
  - 80 RON 0.42 Gm/Litre Lead
  - 87 RON 0.35 Gm/Litre Lead
- Auto Oil 90:10 Mixture of 650 MVI and 100 MVI
- 12.5 % Volume of Gasoline
- Manufacturer Recommends only 2 % Rickshaw Oil Mixed with Gasoline

# ENVIRONMENTAL EFFECTS

- Due to Excessive use of Lubricants
- Poor Mileage
- Engine Heating
- Dense Smoke
- High Noise
- High CO in Exhaust Emission

# FORMULATION OF NEW LUBRICANTS

- PSO is the Largest Oil Marketing Company in Pakistan
- PSO Took Initiative and Developed a New Lubricant for Auto Rickshaws

650 MVI	44%
100 MVI	40%
BSHVI	10%
KEROSENE	5%
PARATEMPS – 110	1%
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TOTAL	100%

# OBJECTIVE OF STUDY

1. Effect of Oil on Engine Performance
2. Type and Consumption of Fuel
3. Size of Packing
4. Price of Oil

# RESEARCH PARAMETERS

- Fuel

80 RON	Leaded	0.42 Gm/Litre
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87 RON	Leaded	0.35 Gm/Litre
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- Lubricant

12.5% Auto Oil

2% New Lubricant

- Silencer

Local

Vespa

Original

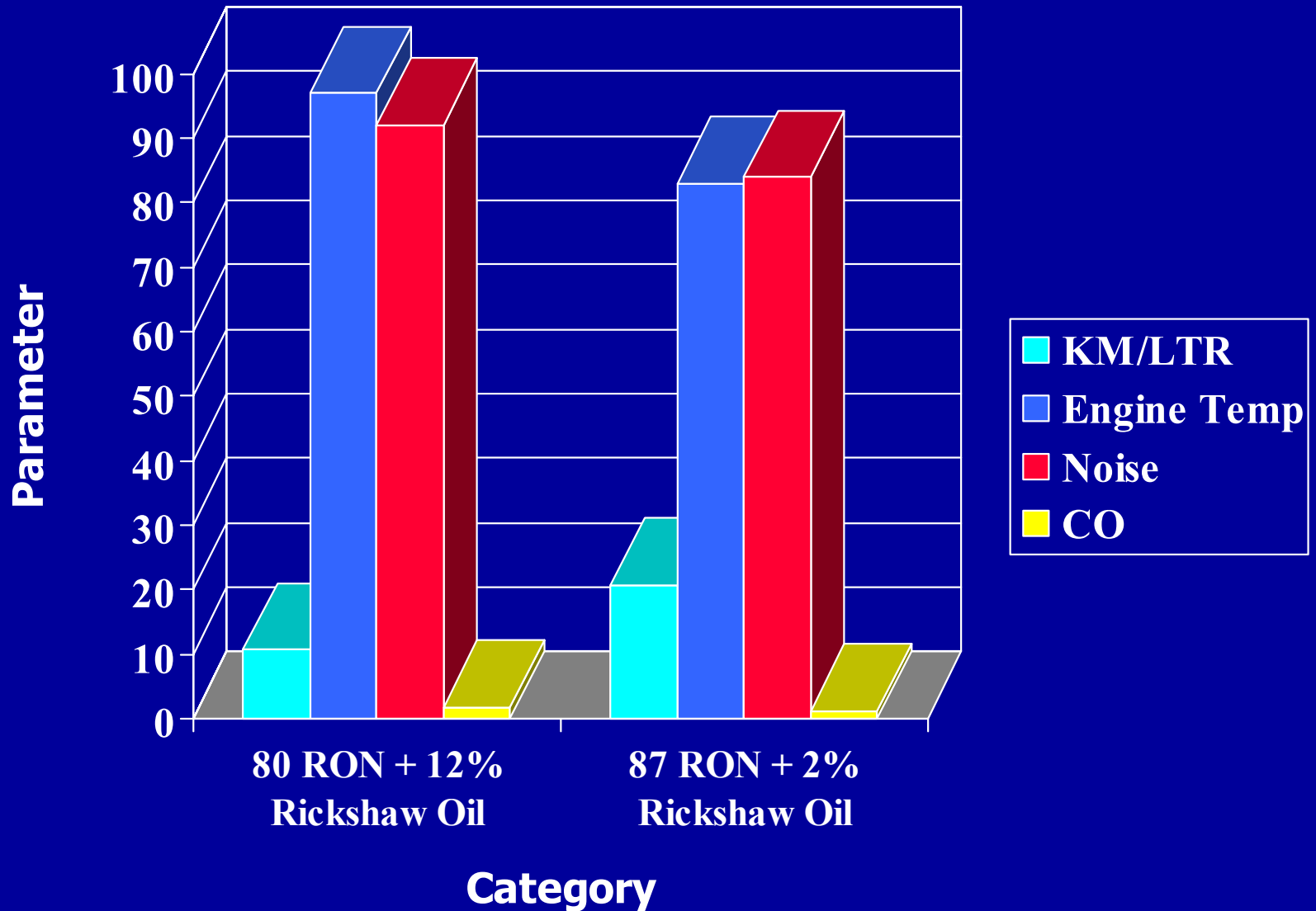
# FUEL EFFICIENCY STUDY

- Effect of Silencer on the Fuel Efficiency of Rickshaw were Studied
- Three Types of Silencers are in Use
  - Local
  - Vespa
  - Original
- Distance Covered            6 Km
- Gear Position                Normal

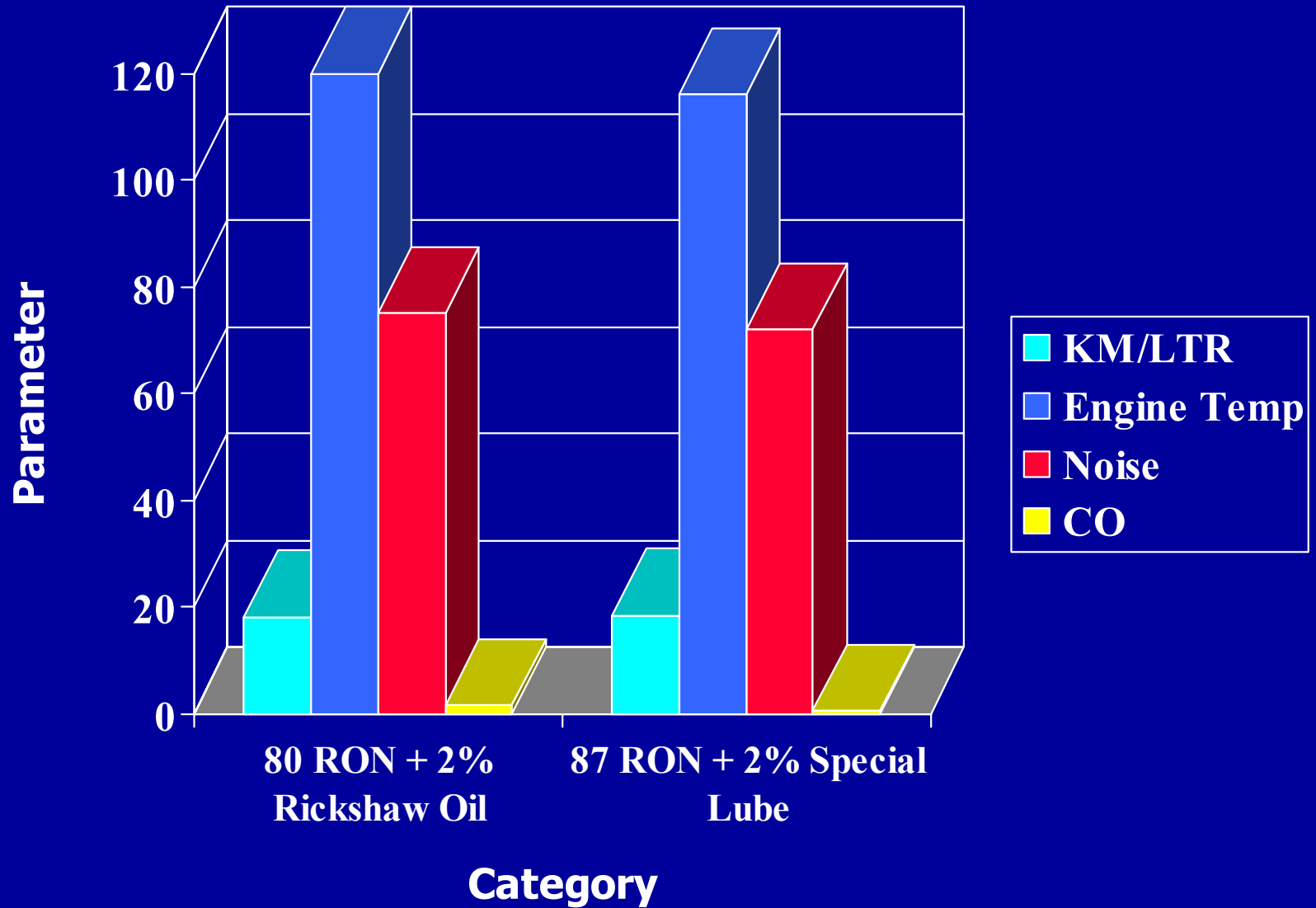
# COMPARISON OF VARIOUS SILENCERS

Parameters	Local Silencers		Vespa		Original	
	80 RON + 12% Rickshaw Oil	87 RON + 2% Rickshaw Oil	80 RON + 2% Rickshaw Oil	87 RON + 2% Special Lube	80 RON + 2% Rickshaw Oil	87 RON + 2% Special Lube
KM/LTR	10.70	20.69	18.18	18.46	17.91	18.75
SMOKE EMISSION	Dense	Invisible	Invisible	Invisible	Invisible	Invisible
ENGINE TEMP	97	83	120	116	106	104
NOISE	92	84	75	72	78	75
% CO	1.8	1.2	1.6	0.6	0.8	0.6

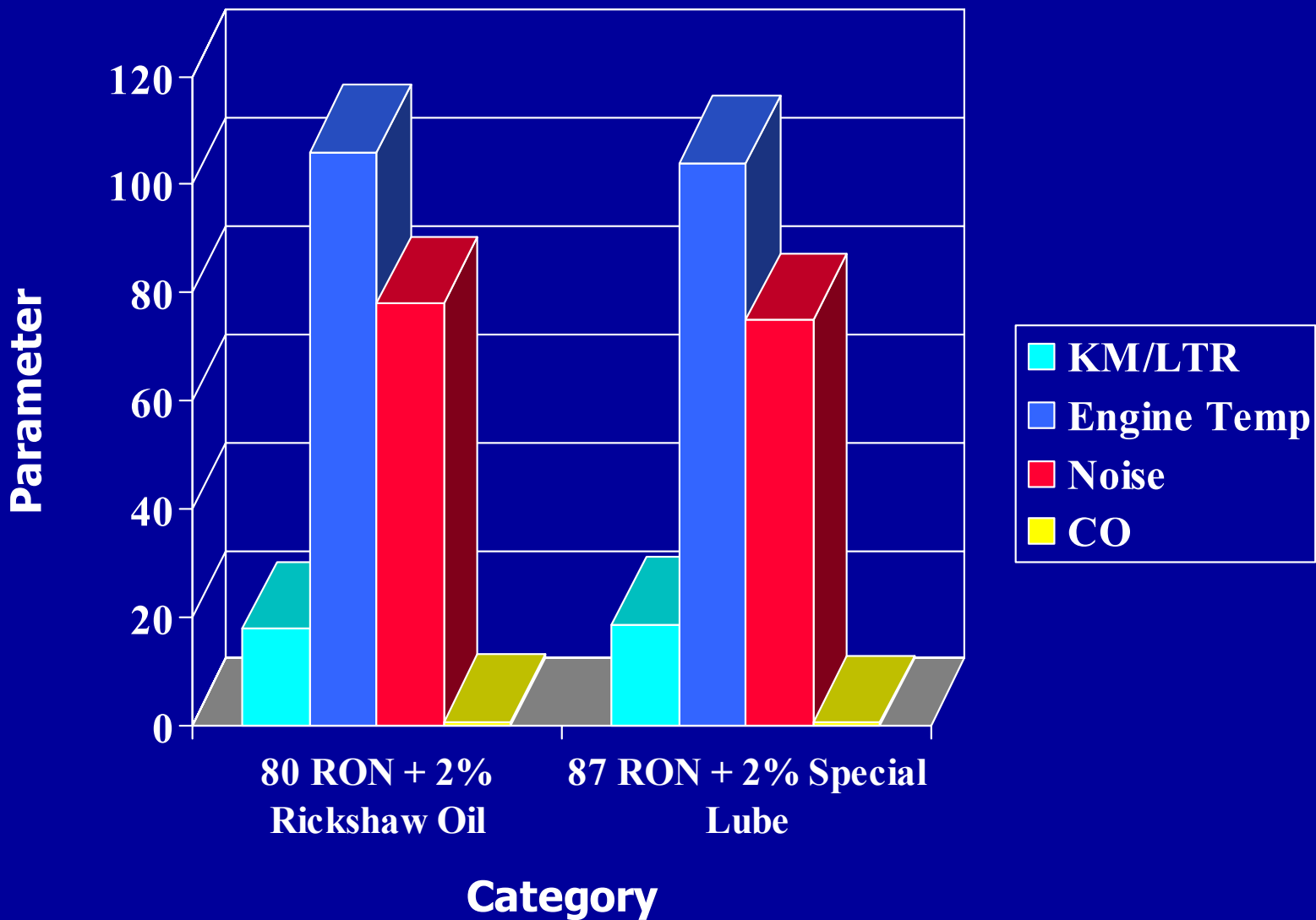
# COMPARISON OF LOCAL SILENCERS



# COMPARISON OF VESPA



# COMPARISON OF ORIGINAL



# ADVERSE EFFECTS OF USING HIGHER QUANTITIES OF LUBRICANTS

- High Quantities of Lubricants Mixed with Gasoline Results in
  - Incomplete Combustion
  - Heavy Smoke
  - Un-burnt Hydro-Carbon
- Excessive Deposits on the Vane of Silencer
- Silencer Blockade
- To Overcome This Difficulty, it is Replaced with Local Made Silencer Which is Without Proper Vanes and Baffles
- Noise From This Type of Silencer is Very High

# RESEARCH GROUP

- 5 Rickshaws Using 80 RON Gasoline + 12.5% Rickshaw Oil
- 5 Rickshaws Using 87 RON Gasoline + 12.5% Rickshaw Oil
- 5 Rickshaws Using 80 RON Gasoline + 2.5% Special Lubes
- 5 Rickshaws Using 80 RON Gasoline + 2.5% Special Lubes



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# RESULTS

- ① 12.5% Rickshaw Oil Creates Tremendous Noise and Smoke Which Adversely Affects General Public and driver
- ② No Beneficial Effects, Over Heating and Knocking was Evident
- ③ Engine Performance Increased
- ④ Maximum Mileage with Less Noise and Smoke