Preventative Maintenance & Troubleshooting

Chapter #13
Preventative maintenance

- Engine cleaning
  - Remove shroud
  - Dirt and oil will insulate crankcase and prevent heat transfer
Checking Engine Oil Level and Condition

- Do not overfill
- If level drops at an excess rate, find out why
- Change every 10-50 hrs., check service info
Changing Oil

- Use evacuator

- Drain oil, Change filter (if applicable) oiling O-ring, refill, run engine for a minute, recheck level... easy...
• Lubricating Cables and Linkage

• $7.00 TOOL
• Spark Plug Service

Material covered in a previous chapter
Air Cleaner Service

• Paper unit – replace
• Foam unit -
  – Wash unit in liquid detergent
  – Wrap in cloth and squeeze dry
  – Saturate in clean oil
  – Squeeze out excess oil
Crankcase Breather Service

- Remove, inspect, & clean
- Replaced damaged gasket  
  - If needed
Muffler

- 1/3 heat transferred by exhaust
- Replace if needed
- Do not modify
Battery Service

• Clean terminal and cable ends
• Check fluid level – add distilled water (if needed)
• Check capacity/condition/life
Pressurized Liquid Cooling System Service

- 50/50 – coolant/water (distilled)
- Change every 2-3 years, check service info
- Check strength with a hydrometer
Storing engine

• Thorough cleaning
• Fog engine or put several teaspoons of oil (Marvels) in cylinder
• Fuel – stabilizer or drain, run dry of fuel
• Change oil
• Throttle off & choke closed
• Clean or replace plug
• Clean air filter
• Outboard make sure all water is removed from engine or it may freeze and crack casting
• Change gear lube
Check Easiest Things First

• Proper carburetion
• Proper ignition
• Adequate lubrication
• Sufficient cooling
• Proper Compression – 30-45 psi for starting & min. 90 psi for efficient operation and sufficient power
Check RPM

- Mechanical tachometer
- Digital tachometer
- Optical
Testing Compression

- Engine must be warm
- Open choke and throttle wide open
- Remove air cleaner
- Remove plug and insert compression gauge
- Crank engine as fast as possible, a minimum of four revolutions
Leak-down Test

- Warm engine
- Remove plug, piston TDC compression stroke, both valves closed
- Install holding fixture, prevent crank from turning
- Install adapted in plug hole
- Shop air at least 90lbs
- Adjust regulator gauge to 80lbs
- Cylinder pressure gauge reads 60lbs or above = OK
- Listening for sound of escape air can pinpoint problem area
Service Information
Engine Identification

• Vertical or Horizontal crankshaft
• # cylinders
• Model #
• Serial #
• Manual or electric start
• Carb type
Engine Troubleshooting Chart

• Textbook pages 259 – 261
  – Tables 13-31thru 13-33
Gateway Community College, 2014

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