

SS&S Chapter 13 Instructor Guide

Engines for Sailboats

Slide 1: Engines for Sailboats

No comment



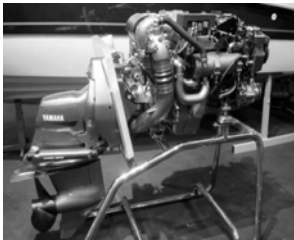
Slide 2: Lesson Objectives

No comment

- Outboard engines for sailboats
- Outboard 2 stroke /4 stroke differences
- Engine maintenance/troubleshooting
- Inboard engines for sailboats
- Diesel/gas fuel differences
- Diesel maintenance
- Electrical systems

Slide 3: Outboard & Inboard

Note: picture shows an inboard/outboard rather than an Inboard



Slide 4: Outboard & Inboard

- What are some of the advantages or disadvantages of an Outboard engine versus an Inboard engine?

Be cautious about comparisons because technology is changing so fast with all engines

Slide 5: Outboard Characteristics

No comment

- Better sailboat maneuverability
- Out of the water when not in use
- Readily removable for repair
- Consumes no cabin space
- Modern engines are very reliable

Slide 6: 2 Stroke Versus 4 Stroke

No comment

- 2 stroke crankshaft turns twice/power stroke
- 4 stroke turns 4 times/power stroke
- 2 stroke lighter- more power/ engine weight
- 2 stroke oil lub. is mixed with gas fuel

Slide 7: 2 Stroke Versus 4 Stroke –cont

Pollution on modern 2 strokers much improved

- 4 stroke more expensive & heavier
- 4 stroke oil in sump & pumped thru engine
- 4 stroke more reliable-quiet-efficient
- 2 stroke more polluting

Slide 8: Outboard Maintenance

No comment

- Modern outboards require little maintenance
- External engine devices more problem than internals

Slide 9: Inboard Engines

- Generally used in larger sailboats
- Can be very quiet / low vibration
- Requires additional safety precautions
- Requires a transmission and stuffing box
- Requires a cooling systems
 - Open system
 - Dual cooling system

As the boat gets larger, the greater the justification for inboards

Slide 10: Stuffing Box

- Prevents drive shaft from leaking water into boat

Older design requires adjusting to prevent major leaks. Newer design adjusts automatically

Slide 11: Diesel Engines

- More costly and heavy
- More reliable and fuel efficient
 - Doesn't need electric ignition

Emphasize great reliability

Slide 12: Diesel Maintenance

- Less maintenance than gas engines
- Fuel contamination - dirty fuel and algae
- Starter motor has heavier starting load
 - Good battery charging & elect. Connections

Emphasize value of sophisticated fuel filtering systems

Slide 13: Batteries

- One for starting, one for accessories
- Battery switch for full control
- Battery protected, secured & vented
- Deep cycle battery allows repeated discharge
- Battery connections important

No comment

Slide 14: Battery Charging

- Long periods being unused hard on battery
- Under charging-over charging equally bad
 - Float versus trickle charging

No comment

Slide 15: Shore Power

- 120V shore power grounding problems
 - Electrolysis can cause major problems
 - Nearby boats can cause damage
 - Portable testers available
 - Consider GFI protection

Explain sacrificial metals. Metals no protection against major shore grounding problems

Slide 16: Sailboat Propellers (w/ inboards)

No comment

- Propeller drag affects performance
- Prop choice –choose efficiency versus drag
- Folding propeller option

Slide 17: Prop Walk

No comment

- Right hand props pull boat to port (slight)
- Prop walk obvious in reverse before boat has a chance to move backwards
 - More pronounced in heavy boats
- Try short burst of reverse power to pull stern to port for docking

Slide 18: Propeller Maintenance

- Vibration indicates need of prop repair
- Guard against galvanic action
 - Sacrificial zincs

Galvanic action occurs independently from shore power influence

Slide 19: Tool Kit

- An entire trip can be ruined for the lack of a simple tool or part

Kit should include tape and wire for unusual jury rigging to get home