



Outboard Motor Service

Outdoor Power and Recreation

POST-SECONDARY



Competitor Name: _____

Province/Territory _____

Outboard Motor Service

Do not start this lab until you are told that the competition is ready to start.

If there is something you do not understand, you may ask for clarification from the Judge.

If you have completed this lab early, please check your answers and wait quietly until everyone has finished, or all the time is used.

Section 1: Information Retrieval

Using the service manual, locate and record the following specifications and torques.

Locate and record the Model and Serial Number.

Determine the following information from the Model and Serial Number.

| | |
|------------------------------------|--|
| Model Pre-fix: | |
| Model Number: | |
| Transom Height Measurement: | |
| Weight | |
| Oil Pump Type | |
| Serial Number: | |
| Ignition System Type | |



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Section 2: Lower Unit

Following the service manual procedure, remove the lower unit to service the water pump.

Torques and Specifications

| | |
|--|--|
| Torques | |
| Gearcase Bolts (in Lbf-ft) | |
| Specifications | |
| Recommended Lower Unit/Gearcase Oil | |
| Lower unit/Gearcase Ratio | |
| Reduction System type | |

Lower Unit inspection:

Remove the lower unit (the lower unit is already drained of oil) Remove and inspect the water pump.

Record any issues with the water pump:

Theory of Operation Questions:

Answer the following questions regarding the Lower Unit and Cooling System.

1. What gear should the lower unit be in prior to installation?

• _____

2. What is the procedure for refilling the lower unit?

• _____



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3. Why must you fill it in this manner?

- _____

4. What would be the most expected cause of milky gear oil?

- _____

5. What would black gear oil indicate?

- _____

6. Does this outboard use an open loop or closed loop cooling system?

- _____

7. At what temperature does the thermostat start to open?

- _____

8. What type of water pump design is used?

- _____

9. What is the PRIMARY purpose of the trim tab?

- _____

10. What is the trim tab made of?

- _____

11. Why is the trim tab made of this metal?

- _____

12. What is the propeller shaft rotation when shifted in forward?

- _____

13. Explain prop pitch.

- _____

14. Dry running an outboard would cause what kind of damage to the water pump?

- _____



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 Reassemble the lower unit and reinstall. Torque all fasteners. Have the judge verify your torque wrench settings.

Section 3: Compression

Following the service manual procedure, perform a compression test. Look up all specifications and torques. Record results.

Torques and Specifications

| Specifications | |
|---------------------------------|--|
| Spark Plug Gap | |
| Compression Test Minimum | |
| Spark Plug Number | |

Compression Test:

Perform the test and record the results.

| Compression Test Results | |
|---------------------------------|--|
| Cylinder 1 | |
| Cylinder 2 | |
| Cylinder 3 | |



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Perform a Leak down test on the problem cylinder only!

1. What position of the piston and valves during this test?

2. Where do you suspect the issue is?

3. What would be your next step?

You are done this lab. Clean up your workstation and hand in your lab sheet to the Judge.



READING



WRITING



PROBLEM SOLVING