

**COURSE SYLLABUS:**  
**GENERAL SERVICE TECHNICIAN 2**  
2007-2008

Course Description: General Service Technician 2 is the second class in Ketchikan High School's General Service Technician Program. This class is only open for Juniors who have elected to complete the GST program in 3 years. Students MUST take GST 3 to graduate from the GST program. Students will work to complete the GST task list in Electrical/Electronic Systems, Engine Performance, Heating/Air Conditioning, Engine Repair, Manual Drive Train and Axles, and Automatic Transmissions. GST Program graduates may be eligible for advance college credit from the University of Alaska Southeast and other participating post-secondary automotive programs

Prerequisite: Junior Standing, Successful Completion of GST 1 with 80 average or better. (NOTE: Seniors who have completed GST 1 in their junior year must take GST 3 instead.)

Course Fee: \$100 per year

Credits: 2

Course Length: 2 Semesters, 115 minute classes, 330 hours, class meets with GST3 class.

Required: 3 ring binder, coveralls

Provided: Shirt, locker, safety glasses, shop coat

Grading: 20% participation 40% tests and assignments 40% Shop work

Notebook: Students are required to keep a 3 ring binder organized and up-to-date. It will be graded regularly.

Texts:

Automotive Service: by Tim Gilles, Delmar Publishers

Automotive Excellence Volume 1: McGraw Hill/ Glencoe

Automotive Excellence Volume 2: McGraw Hill/ Glencoe

Automotive Electricity and Electronics: by James Halderman, Pearson Prentice-Hall

**GST 2: COURSE OBJECTIVES:**

On successful completion of this course, the student will be able to demonstrate the following skills in accordance with NATEF GST Program 2005 Standards:

**INTRODUCTION TO AUTO SHOP AND PERSONAL SAFETY**

- A1. Identify general shop safety rules and procedures.
- A2. Utilize safe procedures for handling of tools and equipment.
- A3. Identify and use proper placement of floor jacks and jack stands
- A4. Identify and use proper procedures for safe lift operation.
- A5. Utilize proper ventilation procedures for working in the lab/shop area.
- A6. Identify marked safety areas.
- A7. Identify the location and use of fire blankets.

- A8. Identify the location and types of fire extinguishers; demonstrate knowledge of the procedures for using fire extinguishers.
- A9. Identify the location and use of eye wash stations.
- A10. Identify the location of the posted evacuation routes.
- A11. Comply with the required use of safety glasses, gloves, shoes during lab/shop activities.
- A12. Identify and wear appropriate clothing for lab/shop activities.
- A13. Comply with appropriate hairstyles for lab/shop activities.
- A14. Demonstrate knowledge of safety aspects of supplemental restraint systems (SRS) and antilock brake systems (ABS).
- A15. Locate and demonstrate knowledge of material safety data sheets (MSDS).

### **TOOLS AND EQUIPMENT (Review of GST 1 Tasks)**

### **LOOKING FOR INFORMATION (Review of GST1 Tasks)**

### **PREPARING VEHICLE FOR SERVICE (Review of GST1 Tasks)**

### **PREPARING VEHICLE FOR CUSTOMER (Review of GST1 Tasks)**

### **VEHICLE SERVICE (11 skills reviewed from GST1)**

#### **ENGINE REPAIR**

- ER1. Inspect engine assembly for fuel, oil, coolant, and other leaks, determine necessary action.
- ER2. Test coolant; drain and recover coolant; flush and refill cooling system with recommended coolant; bleed air as required.
- ER3. Perform oil and filter change. (Review from GST 1)
- ER4. Remove and replace radiator.
- ER5. Inspect powertrain mounts; determine necessary action.

#### **AUTOMATIC TRANSMISSION**

- AT1. Service transmission; perform visual check of transmission; replace fluids and filters.

#### **MANUAL DRIVE TRAIN AND AXLES**

- MD1. Diagnose fluid loss, level, and condition concerns; determine necessary action.
- MD2. Drain and fill transmission/transaxle and final drive unit.
- MD3. Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; determine necessary action.
- MD4. Inspect hydraulic clutch slave and master cylinders, lines and hoses; determine necessary action.
- MD5. Bleed clutch hydraulic system.
- MD6. Diagnose fluid leakage concerns; determine necessary action.
- MD7. Inspect and replace drive axle shaft wheel studs.

MD8. Inspect constant-velocity (CV) joint boots.  
MD9. Remove and replace rear wheel driveshaft.

### **STEERING AND SUSPENSION**

SS3: Flush, bleed, and fill power steering system.  
SS4: Diagnose power steering leakage; determine necessary action.  
SS9: Perform pre-alignment inspection; determine necessary action.  
SS10: Measure vehicle riding height, determine necessary action.

### **BRAKES (Review 29 GST1 tasks)**

### **ELECTRICAL/ELECTRONIC SYSTEMS**

EE1. Diagnose electrical/electronic integrity of series, parallel, and series-parallel circuits using the principles of electricity (Ohm's Law).  
EE2. Use wiring diagrams during diagnosis of electrical circuit problems.  
EE3. Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems.  
EE4. Check electrical circuits with a test light; determine necessary action.  
EE5. Measure source voltage and perform voltage drop tests in electrical/electronic circuits using a voltmeter; determine necessary action.  
EE6. Measure current flow in electrical/electronic circuits and components using an ammeter; determine necessary action.  
EE7. Check continuity and measure resistance in electrical/electronic circuits and components using an ohmmeter; determine necessary action.  
EE8. Check electrical circuits using fused jumper wires; determine necessary action.  
EE9. Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action.  
EE10. Measure and diagnose the cause (s) of excessive key-off battery drain (parasitic draw); determine necessary action.  
EE11. Inspect and test fusible links, circuit breakers, and fuses; determine necessary action.  
EE12. Inspect and test switches, connector, relays, solid state devices, and wires of electrical/electronic circuits; perform necessary action.  
EE13. Repair connectors and terminal ends.  
EE14. Repair wiring harness (including CAN/BUS systems)  
EE15. Perform solder repair of electrical wiring.  
EE23. Perform starter current draw test; determine necessary action.  
EE24. Perform starter circuit voltage drop tests; determine necessary action.  
EE25. Inspect and test starter relays and solenoids, determine necessary action.  
EE26. Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition.  
EE27. Perform charging system output test; determine necessary action.  
EE28. Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action.  
EE29. Inspect, replace, and aim headlights and bulbs.

## **HEATING AND AIR CONDITIONING**

AC1. Identify and visually inspect A/C system components.

AC2. Locate refrigerant label and identify specified refrigerant type (e.g. R-12, R-134a)

AC3. Conduct preliminary performance test of A/C system (i.e. verify compressor engagement, measure outlet duct temperature, sense temperature change across A/C components); determine necessary action.

## **ENGINE PERFORMANCE**

EP1. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals)

EP2. Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action.

EP3. Perform cylinder power balance test; determine necessary action.

EP4. Perform cylinder cranking compression test; determine necessary action.

EP5. Perform cylinder leakage test; determine necessary action.

EP6. Verify engine operating temperature; determine necessary action.

EP7. Prepare 4 or 5 gas analyzer; inspect and prepare vehicle for test; obtain exhaust readings, determine necessary action.

EP9. Retrieve and record stored OBD I diagnostic trouble codes; clear codes.

EP10. Retrieve and record stored OBD II diagnostic trouble codes, clear codes when applicable.

EP11. Obtain and interpret scan tool data.

EP12. Replace fuel filters.

EP13. Remove and replace thermostat and gasket.

EP14. Perform common fastener and thread repair to include: remove broken bolt, restore internal and external threads and repair internal threads with thread insert.

(The following tasks are not listed in NATEF GST but will be required in our program)

EP15. Perform basic ignition system checks; spark check, scope check, plug wire, cap, and spark plug condition check. Determine necessary action.

EP 16. Remove and replace spark plugs using manufacturer's specifications, determine necessary action.

EP 17. Perform basic fuel system checks including fuel pump operation and fuel pressure.