



Brakes Technician

SYLLABUS

Your Course Learning Plan

A. General Course Information

Course description: The Brakes students of UAW-LETC will successfully complete a series of activities that will meet the needs of Automotive Dealerships and the aftermarket while following guide lines of the National Automotive Training and Education Foundation (NATEF). These activities will consist of, but not limited to; diagnostics, repair and/or replacement, and adjustment to factory specifications. These activities will take place in the classroom and shop, consisting of written and hands-on exercises. Each phase will have its guidelines and time period. We will cover some areas with more detail than other's depending on the demand for that area.

Prerequisites: Technical Introduction to Dealerships: Module 10, Braking Systems. Electrical 1, and Electrical 2.

Organization: This is a lecture / shop course in which topics are presented by the instructor, shop assignments are explained and assigned projects are completed by students both during class and shop time. Objective quizzes are given at the end of each section and there is a comprehensive final exam. Brake Technician students must have completed Technical Introduction to Dealerships Module 10, Electrical 1, and Electrical 2. When students have completed this course they generally have the same level of expertise as those who have had previous training or experience. Initial emphases are on the use of equipment and basic procedures.

Course objectives:

1. Demonstrate the skill to diagnose and repair hydraulic braking systems.
2. Demonstrate the skill to diagnose and repair drum brake systems.
3. Demonstrate the skill to diagnose and repair disc brake systems.
4. Demonstrate the skill to diagnose and repair mechanical braking systems.
5. Demonstrate the skill to diagnose, repair or replace power brake assist units.
6. Demonstrate the skill to diagnose and repair Anti-lock and TRAC system components.

Textbooks / Software:

1. Toyota Brake System Course 552, Technician Handbook
2. Automotive Brakes Textbook.
3. Video Library.

B. Course Content and Outcomes

- Course content:**
1. General Brake Systems
 2. Pascal's Law, Master Cylinders
 3. Brake Lines
 4. Hydraulic Valves Diagnosis and Repair
 5. Hydraulics Review/Test
 6. Brake Shoes
 7. Brake Drums
 8. Wheel Cylinders, Parking Brakes
 9. Drum Brake Diagnosis, Drum Brake Test
 10. Caliper Assemblies/Rebuilding Caliper Assemblies
 11. Rotor Refinishing
 12. Disc Brake Diagnosis and Repair
 13. Hydraulic Brakes Review, Hydraulic (Base Brakes) Quiz
 14. Power Assist Units
 15. Wheel Bearings
 16. Electrical, ABS Components, ABS Bleeding
 17. Sensor Testing/ABS Component R & R
 18. ABS Diagnosis
 19. ABS Brakes
 20. ABS Brakes and TRAC
 21. Antilock/TRAC Systems Review

- Learning outcomes:** Upon successful completion of this course the student will:
1. Develop and implement a diagnostic strategy that will aid in identification and location of faults in the hydraulic, drum, disc, power booster, Anti-lock brake and TRAC systems.
 2. Demonstrate the skill to follow proper procedures in the repair of hydraulic, drum, disc, power booster and Anti-lock brake systems.
 3. Demonstrate the skills necessary to perform brake service and repair in line with the highest quality standards in the automotive industry.

- Grading (credit) criteria:** Course will be weighted as follows. Task Worksheets 50%, Quizzes 20%, homework assignments 10% and Final exam 20%.
- Task worksheets are vital to the assessment of the student's performance competency. They will be assigned almost every day. Worksheets will be due at the end of each day. Grading will be based on a performance rating of "2" (Proficient) and "3" (Proficient, able to teach others) with a minimum rating of "2" being required for passing. (Extra credit will be given for a performance rating of "3")
- There will be many objective quizzes given relating to current topics. Grading will be based on the percentage of correctly answered questions. A grade of 80% is required for passing.
- The final exam will be comprehensive, relating to all topics covered in the course. Questions are written with heavy emphasis on critical thinking and diagnostic skills. A grade of 80% is required for passing.

C. Class/Shop Policies

Student Expectations:

1. Be on time for the start of class and return to class for final roll-call.
2. Wear safety glasses in the shop at all times.
3. Appropriate working attire shall be worn.
4. Access to shop vehicles only as authorized by the instructor.
5. No cell phones or other electronic devices.
6. Participate in classroom discussions.
7. Observe classroom etiquette.
8. Participate in shop clean up.
9. Attendance to shop activities in assigned area.
10. Approval by instructor required prior to being absent from assigned area.
11. Clean all tools prior to returning them to the tool crib.
12. Follow all safety rules; be concerned with your safety and the safety of others.
13. Report all injuries regardless of the nature or severity to the instructor.

D. Other resources

Online and Network resources:

Techinfo.Toyota.Com
All data, Mitchell On Demand

Tentative Schedule

DAY	TASK	TOPIC/ACTIVITY
1	Worksheet BR-60, Vehicle Identification Numbers Worksheet BR-61, Vehicle Service Information Worksheet BR-24, Brake Inspection	General Brake Systems Quiz: Introduction to Brake Systems and Friction Brake Theory Text: Toyota Course 552, Brakes System, Technician Handbook, Section 1, Fundamental Principles, pages 1-6 Text: Automotive Brakes, Technician Handbook, Chapter 1, Introduction to Brake Systems, pages 9-22 Text: Automotive Brakes, Technician Handbook, Chapter 11, Friction Brake Theory, pages 179-190
2	Toyota Worksheet 5-1, Brake Pedal Measurement Worksheet BR-1, Diagnosing Pressure Concerns Worksheet BR-2, Inspecting Master Cylinder for Internal/External Leaks	Pascal's Law, Master Cylinders Pressure Concerns in the Brake System Brake Pedal Height Master Cylinder Repair Procedures Quiz: Hydraulic System Fundamentals, Master Cylinders, Calipers, and Wheel Cylinders, Master Cylinder, Caliper and Wheel Cylinder Service Text: Toyota Course 552, Brakes System, Technician Handbook, Section 1, Fundamental Principles, pages 4-10 and 13-21 Text: Automotive Brakes, Technician Handbook, Chapter 4, Hydraulic System Fundamentals, pages 61-69 Text: Automotive Brakes, Technician Handbook, Chapter 5, Master Cylinders, Calipers, and Wheel Cylinders, pages 71-88 Text: Automotive Brakes, Technician Handbook, Chapter 6, Master Cylinder, Caliper, and Wheel Cylinder Service, pages 91-108

3	Worksheet BR-20, Brake Line Inspection Worksheet BR-19, Brake Line Fabrication	<p>Brake Lines Brake Line Inspection and Service Fabricating Double Flare and ISO Type Brake Lines</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 10, Hydraulic Valve, Switch, Line, and Hose Service, pages 172 -177</p>
4	Toyota Worksheet 8-1, LSPV Adjustment Worksheet BR-21, Restoring Brake Fluid to Proper Level Worksheet BR-22, Brake System Valves Worksheet BR17, Brake System Bleeding Worksheet BR-18, Hydraulic System Flushing	<p>Hydraulic Valves Diagnosis and Repair Brake Valve Service Diagnosing Malfunctions in the Hydraulic System Bleeding and Flushing Hydraulic System</p> <p>Quiz: Hydraulic Valves, Switches, Lines, Hoses and Hydraulic Valve, Switch, Line and Hose Service</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 9, Hydraulic Valves, Switches, Lines, and Hoses, pages 151-163 Text: Automotive Brakes, Technician Handbook, Chapter 10, Hydraulic Valve, Switch, Line, and Hose Service, pages 165-170 Text: Toyota Course 552, Brakes System, Technician Handbook, Section 8, Hydraulic Control, pages 97-114</p>
5		<p>Hydraulics Review / Test</p> <p>Quiz: Hydraulics</p>
6	Worksheet BR-16, Brake Shoe Removal and Inspection	<p>Brake Shoes Drum Brake Service</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 14, Drum Brake System Components and Operation, pages 231-251</p>
7, 8	Worksheet BR-14, Brake Drum Measurement and Inspection Worksheet BR-15, Brake Drum Refinishing	<p>Brake Drums Inspecting and Measuring Brake Drums Refinishing Brake Drums</p> <p>Quiz: Drum Brake System Components and Operation, and Drum Brake Service</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 15, Drum Brake Service, pages 255 269</p>
9	Worksheet BR-23, Wheel Cylinders Worksheet BR-27, Brake Shoe Adjustment Worksheet BR-26, Parking Brakes Worksheet BR-25, Parking Brake Operation	<p>Wheel Cylinders, Parking Brakes Removing and Replacing Wheel Cylinders Making Final Adjustments</p> <p>Quiz: Parking Brakes and Parking Brake Service</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 18, Parking Brakes, pages 313-327 Text: Automotive Brakes, Technician Handbook, Chapter 19, Parking Brake Service, pages 329-342 Text: Toyota Course 552, Brakes System, Technician Handbook, Section 3, Drum Brakes, pages 25-34 Text: Toyota Course 552, Brakes System, Technician Handbook, Section 6, Parking Brake, pages 65-70</p>

10	Worksheet BR-33, Drum Brake Diagnosis Worksheet BR-28, Drum Brake Final Checks and Adjustments	<p>Drum Brake Diagnosis, Drum Brake Test</p> <p>Drum Brake Diagnosis Final Assembly</p> <p>Quiz: Drum Brakes</p>
11	Worksheet BR-13, Caliper Assembly Removal & Inspection Worksheet BR-11, Caliper Inspection Worksheet BR-12, Brake Pad Service Worksheet BR-9, Caliper Rebuilding Worksheet BR-10, Caliper Reassembly	<p>Caliper Assemblies / Rebuilding Caliper Assemblies</p> <p>Removing and Inspecting Caliper Assembly Servicing Caliper Mounting and Slides Caliper Service Disc Brake Reassembly</p> <p>Quiz: Disc Brake System Components and Operation</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 12, Disc Brake System Components and Operation, pages 191-207 Text: Toyota Course 552, Brakes System, Technician Handbook, Section 4, Disc Brakes, pages 37-44</p>
12	Worksheet BR-6, Disc Brake Rotor Inspection Worksheet BR-7, Disc Brake Rotor Removal and Installation Worksheet BR-8, Disc Brake Rotor Refinishing	<p>Rotor Refinishing</p> <p>Inspecting and Measuring Rotors Removing and Reinstalling Rotors Servicing Rotors</p>
13	Toyota Worksheet 7-1, Brake Rotor Run-Out and Rotor Phase Matching Toyota Worksheet 7-2, Brake Rotor Parallelism Measurement Toyota Worksheet 7-3, On-Car Brake Lathe Worksheet BR-30, Diagnosing Common Brake Concerns	<p>Disc Brake Diagnosis and Repair</p> <p>Diagnosing Pulling and Grabbing Pedal Pulsation Concerns</p> <p>Text: Automotive Brakes Technician Handbook, Chapter 13, Disc Brake Service, pages 209-229 Text: Automotive Brakes Technician Handbook, Chapter 23, Troubleshooting Brake Systems, pages 431-446 Text: Toyota Course 552, Brakes System, Technician Handbook, Section 7, Brake Diagnosis, pages 73- 95</p>
14	Worksheet BR-31, Power Assist Operational Testing Worksheet BR-32, Inspecting Power Booster Vacuum Supply Worksheet BR-34, Inspecting Vacuum-Type Power Booster Check Valve Worksheet BR-29, Hydro-Boost System Inspection	<p>Hydraulic Brakes Review</p> <p>Power Assist Units Power Assist Unit Service</p> <p>Quiz: Power Assist Units and Power Assist Unit Service</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 7, Power Assist Units, pages 111-125 Text: Automotive Brakes, Technician Handbook, Chapter 8, Power Assist Unit Service, pages 129-147 Text: Toyota Course 552, Brakes System, Technician Handbook, Section 5, Brake Booster, pages 47-58</p>

15	<p>Worksheet BR-36, Diagnosing Wheel Bearing Noises, Wheel Shimmy, and Vibration Concerns</p> <p>Worksheet BR-37, Wheel Bearing Service</p> <p>Worksheet BR-38, Wheel Bearing Replacement</p> <p>Worksheet BR-39, Wheel Stud Inspection and Replacement</p> <p>Worksheet BR-40, Sealed Wheel Bearing Assembly Removal and Replacement</p>	<p>Wheel Bearings</p> <p>Diagnosing Wheel Bearing Concerns</p> <p>Servicing Wheel Bearings</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 16, Wheel Bearings and Oil Seals, pages 275-286</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 17, Wheel Bearing and Oil Seal Service, pages 289-311</p> <p>Text: Toyota Course 552, Brakes System, Technician's Handbook, Section 5, Brake Booster, pages 47-58</p>
16	<p>Worksheet BR-41, Parking Brake Indicator Light Inspection</p> <p>Worksheet BR-42, Brake Stop Light Inspection</p> <p>Worksheet BR-43, Antilock Brake System Component Inspection</p> <p>Worksheet BR-44, Antilock Brake System Hydraulic Bleeding</p>	<p>Hydraulic Brake Electrical Systems</p> <p>Parking Brake Indicator Light System</p> <p>Brake Stop Light System</p> <p>Anti-Lock Brakes</p> <p>Antilock Brake System Components</p> <p>Antilock Brake System (ABS) Front and Rear Hydraulic Circuits</p> <p>Antilock Brake System Bleeding</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 20, Brake System Electrical and Electronic Components, pages 345-366</p> <p>Text: Toyota Course 552, Brakes System, Technician Handbook, Section 9, Anti-Lock Brakes, pages 119-140</p>
17	<p>Toyota Worksheet, 10-1, ABS Actuator Checker</p> <p>Toyota Worksheet, 10-2, Speed Sensor Signal Check</p> <p>Toyota Worksheet, 10-3, Toyota Diagnostic Tester</p> <p>Toyota Worksheet, 10-4, Toyota Diagnostic Tester and Vehicle Break-out Box</p> <p>Worksheet BR-45, ABS Component Removal and Installation</p> <p>Worksheet BR-46, Wheel Speed Sensor Circuit Testing</p>	<p>Wheel Speed Sensor Testing</p> <p>ABS Component Service</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 22, Anti-Lock Brake and Traction Control System Service, pages 411-426</p> <p>Text: Toyota Brakes Systems, Technician Handbook, Section 10, ABS Diagnosis, pages 141-154</p>
18	<p>Worksheet BR-3, Diagnosing Poor Stopping and Wheel Lock-up Concerns</p>	<p>ABS Diagnosis</p> <p>Diagnosing Poor Stopping and Wheel Lock-Up Concerns</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 21, Anti-Lock Brake and Traction Control System Components and Operation, pages 369-400</p>
19	<p>Worksheet BR-5, Using Self-Diagnosis and/or Recommended Test Equipment to Diagnose ABS Electronic Control System</p>	<p>ABS Diagnosis</p> <p>Diagnosing ABS Electronic Systems and Components</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 23, Troubleshooting Brake Systems, pages 431-444</p> <p>Worksheet BR-5, Using Self-Diagnosis and/or Recommended Test Equipment to Diagnose ABS Electronic Control System</p>

20		<p>Testing and servicing ABS systems</p> <p>Text: Automotive Brakes, Technician Handbook, Chapter 21, Anti-Lock Brake and Traction Control System Components and Operation, pages 370-399</p> <p>Text: Toyota Course 552, Brakes System, Technician Handbook, Section 11, Other ABS Actuators, pages 165-182</p>
21	<p>Worksheet BR-4, Traction Control System Component Identification</p> <p>Toyota Worksheet 12-1, TRAC and ABS Diagnostic System</p> <p>Toyota Worksheet 12-2, Traction Control System Operation</p> <p>Toyota Worksheet 12-3 TRAC Control System Bleeding</p>	<p>TRAC</p> <p>Identifying traction control system components</p> <p>Diagnosing TRAC systems</p> <p>Quiz: ASE Sample Test Questions</p> <p>Quiz: ABS Systems Achievement Test</p> <p>Text: Toyota Course 552, Brakes System, Technician Handbook, Section 12, Traction Control System (TRAC), pages 185-217</p>
22	<p>Worksheet BR 62 VSC component identification worksheet</p> <p>Worksheet BR 63 VSC component function worksheet</p>	<p>Vehicle Stability Control (VSC)</p> <p>Identifying VSC components</p> <p>Component function</p> <p>Quiz: VSC quiz</p> <p>Text: VSC handout</p>
23		<p>Antilock / TRAC Systems Review</p>
24		<p>Final Test</p>
25		