
















# Automatic Transmissions and Transaxles, 6e










## Chapter 15 Transmission/Transaxle Removal & Disassembly





### Opening Your Class

KEY ELEMENT	EXAMPLES
<b>Introduce Content</b>	This course or class covers operation and service of <b>Automatic Transmissions and Transaxles, 6e</b> . It correlates material to task lists specified by ASE and NATEF.
<b>Motivate Learners</b>	Explain how the knowledge of how something works translates into the ability to use that knowledge to figure why the engine does not work correctly and how this saves diagnosis time, which translates into more money.
<b>State the learning objectives for the chapter or course you are about to cover and explain this is what they should be able to do as a result of attending this session or class.</b>	Explain the chapter learning objectives to the students. <ol style="list-style-type: none"><li>1. Prepare for ASE Automatic Transmissions (A2) certification test content area "C" (Off-Vehicle Transmission/Transaxle Repair).</li><li>2. Describe automatic transmission repair options.</li><li>3. Describe the automatic transmission/transaxle inspection process.</li><li>4. List the steps need to be followed to remove an automatic transmission/transaxle.</li><li>5. Explain the procedure for disassembling a transmission/transaxle.</li></ol>
<b>Establish the Mood or Climate</b>	Provide a <i>WELCOME</i> , Avoid put downs and bad jokes.
<b>Complete Essentials</b>	Restrooms, breaks, registration, tests, etc.
<b>Clarify and Establish Knowledge Base</b>	Do a round robin of the class by going around the room and having each student give their backgrounds, years of experience, family, hobbies, career goals, or anything they want to share.

ICONS	Ch15 Trans/Transaxle Removal & Disass.
        	<p>1. SLIDE 1 TRANSMISSION/TRANSAXLE REMOVAL &amp; DISASSEMBLY</p> <p>2. SLIDES 2-3 EXPLAIN OBJECTIVES</p> <p>Check for <b>ADDITIONAL VIDEOS &amp; ANIMATIONS</b> @ <a href="http://www.jameshalderman.com/">http://www.jameshalderman.com/</a>  <b>WEB SITE IS CONSTANTLY UPDATED</b></p> <p>4. <b>SLIDES 4-6 EXPLAIN</b> Automatic Transmission Repair Options</p> <p>7. <b>SLIDES 7-11 EXPLAIN</b> Inspection</p> <p><b>DISCUSSION: HAVE STUDENTS DISCUSS REPAIRS THAT CAN BE DONE WITH TRANSMISSION STILL IN VEHICLE. WHAT PARTS AND COMPONENTS CAN BE REPLACED WITH TRANSMISSION/TRANSAXLE STILL IN VEHICLE?</b></p> <p>12. <b>SLIDE 12 EXPLAIN FIGURE 15-1a</b> This Saturn did not shift correctly and one technician was ready to replace the unit. However another technician thought that the problem could be due to a fault in the valve body.</p> <p>13. <b>SLIDE 13 EXPLAIN FIGURE 15-1b</b> Removing the valve body shows the non-planetary gears used in the Saturn automatic transaxle.</p> <p>14. <b>SLIDE 14 EXPLAIN FIGURE 15-1c</b> The valve body was disassembled and a broken pressure regulator spring was found to be the cause of the customer concern.</p> <p>15. <b>SLIDE 15 EXPLAIN FIGURE 15-2</b> A transmission identification number on the side of the unit. The information on this tag is needed when ordering parts, as there are often several versions of the same transmission used in similar vehicles and the differences could affect the parts needed.</p> <p><b>DEMONSTRATION: SHOW THE LOCATION OF TRANSMISSION ID TAGS ON SEVERAL TRANSMISSIONS AND REVIEW WHAT THE NUMBERS &amp; LETTERS STAND FOR.</b></p> <p><b>HANDS-ON TASK: HAVE THE STUDENTS FIND TAG NUMBER ON AN AUTOMATIC TRANSMISSION OR TRANSAXLE. HAVE THEM WRITE THIS NUMBER &amp; YEAR, MAKE, MODEL, AND VIN FOR TRANSMISSION IDENTIFICATION.</b></p>

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	<p><b><u>DEMONSTRATION:</u> SHOW STUDENTS HOW TO CALCULATE REPAIR COSTS. MENTION THAT TECHNICIANS ARE A COST OF SALE. IF THERE IS NO SALE THERE IS NO COST.</b></p>
	<p><b><u>HANDS-ON TASK:</u> HAVE THE STUDENTS LOOK UP R&amp;R TIME FOR AN AUTOMATIC TRANSMISSION/TRANSAXLE ON VEHICLES OF THEIR CHOICE. HAVE THEM FIGURE SHOP LABOR COST TO REMOVE &amp; REINSTALL THAT VEHICLE'S UNIT WHEN THE SHOP RATE IS \$95 PER HOUR. REMIND THEM TO MAKE SURE THAT UNIT NEEDS TO COME OUT FOR REPAIR OR PARTS REPLACEMENT.</b></p>
	<p><b>16. SLIDES 16-20 EXPLAIN Transmission/Transaxle Removal</b></p> <p><b>21. SLIDE 21 EXPLAIN FIGURE 15-3 chain and holding fixture being used on this front-wheel-drive vehicle to support the engine when the transaxle is removed.</b></p> <p><b>22. SLIDE 22 EXPLAIN FIGURE 15-4 transaxle being supported by a transmission jack prior to removal of the unit from underneath the vehicle</b></p>
	<p><b><u>DISCUSSION:</u> HAVE THE STUDENTS DISCUSS VARIOUS SAFETY ISSUES TO CHECK WHEN REMOVING A TRANSMISSION. WHAT ARE SOME THINGS THAT CAN GO WRONG?</b></p>
	<p><b><u>HANDS-ON TASK:</u> HAVE STUDENTS REMOVE AN AUTOMATIC TRANSMISSION OR TRANSAXLE FROM A VEHICLE. GRADE THEM ON THE SAFETY PROCEDURES THEY USE AND THEIR ABILITY TO PERFORM THE JOB.</b></p>
	<p><b><u>ON-VEHICLE NATEF TASK</u> REMOVE AND REINSTALL TRANSMISSION/TRANSAXLE AND TORQUE CONVERTER; INSPECT ENGINE CORE PLUGS, REAR CRANKSHAFT SEAL, DOWEL PINS, DOWEL PIN HOLES, AND MATING SURFACES.</b></p>
	<p><b>YOU NEED TO DECIDE ON WHAT TYPES OF UNITS TO R &amp; R: YOU MAY WANT TO HAVE STUDENTS REMOVE BOTH A TRANSMISSION AND A TRANSAXLE OR JUST A TRANSAXLE, WHICH IS THE MORE DIFFICULT.</b></p>

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	<p><b><u>DEMONSTRATION:</u> SHOW THE STUDENTS HOW TO REMOVE A TORQUE CONVERTER. POINT OUT TO THEM HOW TO INSPECT THE PUMP DRIVE TANGS AND ALSO HOW TO INSPECT THE TORQUE CONVERTER BOLT THREADS.</b></p>
 	<p><b><u>NATEF TASK:</u> INSPECT CONVERTER FLEX (DRIVE) PLATE, CONVERTER ATTACHING BOLTS, CONVERTER PILOT, CONVERTER PUMP DRIVE SURFACES, CONVERTER END PLAY, AND CRANKSHAFT PILOT BORE.</b></p>
	<p>23. SLIDE 23 EXPLAIN Disassembling a Transmission/Transaxle</p>
	<p>24. SLIDE 24 EXPLAIN FIGURE 15-8 Using a holding fixture is the preferred method to use when disassembling and assembling an automatic transmission/transaxle. It allows the unit to be tilted and rotated as needed to get access to the internal and external components.</p>
<p><b>POINT OUT TO THAT A HOLDING FIXTURE IS A VERY VALUABLE FOR DISASSEMBLY &amp; REASSEMBLY</b></p>	
	<p>25. SLIDES 25-27 EXPLAIN Disassembling a Transmission/Transaxle</p>
 <p>QUESTION</p>	<p><b><u>DISCUSSION:</u> HAVE THE STUDENTS TALK ABOUT ORDER OF DISASSEMBLY OF THE UNIT. WHAT IS BEST WAY TO DETERMINE CORRECT ORDER OF DISASSEMBLY?</b></p>
 <p>QUESTION</p>	<p><b><u>DISCUSSION:</u> HAVE THE STUDENTS DISCUSS THE MANY SPECIAL TOOLS NEEDED TO REBUILD AN AUTOMATIC TRANSMISSION.</b></p>
	<p>LET THEM KNOW THAT SOME ARE TO MAKE THE JOB POSSIBLE AND OTHERS ARE TO MAKE JOB EASIER. WHICH TOOLS MAKE JOB POSSIBLE?  <b><u>HANDS-ON TASK:</u> HAVE THE STUDENTS BEGIN DISASSEMBLY OF AUTOMATIC TRANSMISSION OR TRANSAXLE. GRADE STUDENTS ON THEIR ABILITY TO ORGANIZE</b></p>

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	<p>PARTS FOR REASSEMBLY AND COMPLETE TASK.  <b><u>NATEF TASK</u></b> DISASSEMBLE, CLEAN, &amp; INSPECT TRANSMISSION OR TRANSAXLE</p>
	<p><b><u>NATEF TASK:</u></b> INSPECT SERVO AND ACCUMULATOR BORES, PISTONS, SEALS, PINS, SPRINGS, AND RETAINERS; DETERMINE NECESSARY ACTION.</p>
	<p>28. SLIDE 28 EXPLAIN FIGURE 15-16 The master link in this GM 4T65-E is facing upward and is colored black.</p>
	<p>29. SLIDE 29 EXPLAIN Summary</p>