

# 6L80 and 6L90 Torque Converter Similarities & Interchangeability

January 18, 2026

## Introduction

The General Motors 6L80 and 6L90 transmissions are widely used in a variety of GM vehicles, from trucks to performance cars. Both are six-speed automatic transmissions, prized for their robustness and adaptability. A key component in these transmissions is the torque converter, responsible for transmitting engine power to the transmission and facilitating smooth gear changes. Understanding the similarities and interchangeability of torque converters between the 6L80 and 6L90 is essential for automotive enthusiasts, mechanics, and anyone considering transmission upgrades or replacements.

## Overview of the 6L80 & 6L90 Transmissions 6L80 Transmission

The 6L80 transmission was introduced by GM in 2005 as a successor to the 4L60E and 4L80E. It is found in many GM vehicles, such as the Chevrolet Silverado, GMC Sierra, Camaro, and Cadillac CTS-V. The 6L80 is renowned for its balance of strength and versatility, designed for both cars and light trucks.

## 6L90 Transmission

The 6L90, debuting in 2007, is essentially an upgraded version of the 6L80. Its architecture is similar, but it is reinforced to handle higher torque and heavier vehicle applications, such as the HD Silverado/Sierra and large SUVs. The 6L90 features a larger case, more clutch capacity, and internal enhancements for durability.

## Similarities Between 6L80 & 6L90 Torque Converters

- **Design and Function:** Both torque converters are designed for their six-speed automatic transmissions, sharing similar mechanical principles and operating characteristics.
- **Lock-Up Clutch:** Both use an integrated lock-up clutch to improve fuel economy and reduce heat during highway driving.
- **Mounting Dimensions:** The converters often share similar bolt patterns for attaching to the flex plate and the transmission input shaft spline count is the same.
- **Electronic Control:** Both work in conjunction with the Transmission Control Module (TCM) for precise engagement and disengagement, offering smooth operation and efficiency.
- **Physical Appearance:** When viewed side by side, the overall size and construction of the torque converters are quite similar, with bell housing and input shaft alignments that echo each other in appearance.

## Key Differences Between 6L80 & 6L90 Torque Converters

While the similarities are notable, there are crucial differences:

- **Stall Speeds:** The stall speed (the RPM at which the torque converter transfers the most torque) varies depending on vehicle application and engine pairing. 6L90-equipped vehicles, often heavier or more powerful, may have lower stall speed converters for increased towing or load capacity.
- **Internal Strength:** The 6L90 torque converters share the same internal architecture and minus the turbine and impeller blade angle.
- **Physical Size:** These converters share the same height and weight depending on application.
- **Part Numbers and Applications:** GM assigns different part numbers to torque converters for the 6L80 and 6L90, reflecting their intended applications and internal specifications. Some of these numbers are shared between 6L80 and 6L90 this is for the towing package in the 6L80.

## Interchangeability: Can You Swap 6L80 & 6L90 Torque Converters?

The question of interchangeability is common, especially among those seeking replacement or performance upgrades. The answer is nuanced:

- Input Shaft Spline Count: 6L80 and 6L90 torque converters share the same 36-spline input, making them physically compatible in terms of turbine hub. However, there are some small differences between early and late turbine hubs.

### **Early Design**

### **Late Design**

- Flex plate Compatibility: Flex plate bolt patterns are often the same for most of GM's powerplants. The exception to this is Cadillac models with the 4.4L engines in the early 2000's and diesel applications – the pilot and bolt circle pattern are different.
- Bellhousing Fitment: There are 3 different bellhousings. One for certain Cadillac models and the Corvette.
- Internal Specifications: The internal architecture remains the same.
- Electronics and Tuning: Both converters use a lock-up clutch controlled by the TCM. The TCC solenoid and Pressure control solenoid are both PWM. The TCC solenoid is duty cycle driven and uses ISS and engine RPM to keep slip around 4 RPM to as much as 20 RPM when applied.
- Aftermarket Solutions: Many aftermarket companies build upgraded torque converters for both transmissions. These may include billet covers and pistons to help combat the flexing of these parts.

## **Conclusion**

The 6L80 and 6L90 torque converters are similar in many physical respects but are optimized for their specific transmissions and application. Interchangeability exists, primarily due to the internal structure and intended use of each converter. Direct swaps are possible, but caution is required to avoid mismatches that could result in poor performance or converter damage. Knowing which parts can salvage appropriate cores, careful parts verification and attention to detail are the keys to a successful 6L80/6L90 converter build.

Caleb Perham  
TCRA Technical Coordinator

# Right-to-Modify Bill

January 18, 2026

## Right-to-Modify Bill Gets Congressional Hearing; SEMA Makes Case for Access to Calibration Data

The landmark, SEMA-supported bill to preserve Americans' ability to modify their vehicles has reached an important milestone, with members of a key congressional committee considering the merits of the "**ADAS Functionality & Integrity Act**" ([HR 6688](#)). This bipartisan legislation would require the **National Highway Traffic Safety Administration (NHTSA)** to create guidelines to ensure that automotive businesses have the information needed to properly calibrate **advanced driver assistance systems (ADAS)** after vehicles are modified.

- The U.S. House Energy and Commerce Subcommittee on Commerce, Manufacturing and Trade hearing, titled "Examining Legislative Options to Strengthen Motor Vehicle Safety, Ensure Consumer Choice and Affordability, and Cement U.S. Automotive Leadership," represents a key step for SEMA's top federal legislative priority, where it was discussed alongside other bills that strengthen motor vehicle safety, ensure consumer choice and affordability and cement American automotive leadership.

Bill sponsor U.S. Rep. **Diana Harshbarger (R-Tenn.)** spoke in support of her bill, which would require NHTSA to establish ADAS guidelines to create modification ranges and tolerances for new vehicles starting in **model-year '28**. The bill also requires the guidelines to establish ADAS test procedures that enable aftermarket businesses to properly test and validate that the vehicle systems have been properly calibrated.

SEMA submitted a statement for the record, outlining the critical need for lawmakers to pass HR 6688.

"Millions of Americans modify and customize their vehicles to enhance their vehicles' safety, performance and comfort. Their reasons for modifying vary. For some, it's a means for doing business and earning a livelihood; for others, it's how they recreate or express themselves. Regardless of their needs and preferences, it is imperative that evidence-based calibration and testing procedures are in place to ensure that ADAS is properly functioning for the protection of people both inside and outside the vehicle," wrote **SEMA President and CEO Mike Spagnola**. "Those who choose to modify or customize their vehicles are no less deserving of enjoying the safety benefits of ADAS than vehicle owners who choose to keep their vehicles in their stock condition."

### Background

The ADAS Functionality & Integrity Act would require NHTSA to establish ADAS guidelines to create modification ranges and tolerances for new vehicles starting in model-year '28. The bill also requires NHTSA to create guidelines that establish ADAS test procedures that aftermarket businesses can properly test and validate that the vehicle systems have been properly calibrated.

This legislation is crucial to being able to safely make common modifications, including installing bike racks, wrapping a vehicle, installing larger wheels and tires or installing a winch or aftermarket bumpers, without compromising the functionality of ADAS.

The bill is also timely, because a forthcoming federal mandate that would require new, model-year '29 vehicles to feature automatic emergency braking, bringing important safety systems to all new vehicles sold in the United States.

**Image courtesy of Shutterstock | Korawat Photo Shoot**

# Millions Reached, Jobs Protected: Inside SEMA and PRI's Advocacy Impact

January 18, 2026

In January, SEMA mapped its [advocacy agenda for 2025](#), and our advocates showed up in force as we elevated to heights previously unseen by the automotive aftermarket.

## Here's your 2026 SEMA/PRI advocacy wrap-up:

- More than 125,000 letters to Congress
- More than 3,000,000 voters reached
- Two pro-race track victories (North Carolina and Iowa)
- Two anti-race track bills defeated (Arkansas and Oregon)
- 330,000 jobs protected from electric vehicle (EV) mandates
- Biggest-ever increase of SEMA & PRI PAC Red Line Keyholder donors

## Preserving Vehicle Choice

SEMA was at the White House when President Trump signed into law a **Congressional Review Act** resolution that revoked California's 2024 waiver that allowed the state to ban the sale of new internal-combustion-engine vehicles, not only in California but in 12 other states. SEMA's successful campaign even won international accolades, with the **Federation Internationale de l'Automobile (FIA)** presenting SEMA with its first **President's Award for Excellence in Communication** for our unyielding efforts to mobilize the automotive community against EV mandates.

## Ensuring Your Right to Modify

In a watershed moment for American car culture, SEMA secured the introduction of the **"ADAS Functionality & Integrity Act" (HR 6688)** in the U.S. House of Representatives, marking the first time that Congress has introduced legislation to protect vehicle owners' right to modify. If passed, this bipartisan bill would ensure that aftermarket businesses have the information needed to properly calibrate **advanced driver assistance systems (ADAS) after vehicles are modified**, which is critical to being able to safely modify new vehicles, including common modifications like installing bike racks; wrapping a vehicle; installing larger wheels and tires; or installing a winch, bull bar or an aftermarket bumper.

## Protecting the Right to Race

SEMA and PRI took the checkered flag in a handful of efforts to protect race tracks nationwide. SEMA **halted legislation in Oregon and Arkansas** that would have shut down important local tracks, and in **North Carolina and Iowa**, helped establish new protections that will enable race tracks to stay open and fight back against nuisance complaints. SEMA and PRI also laid the groundwork for forthcoming action to secure a more sustainable economic landscape for race tracks across the nation via the bipartisan **Motorsports Fairness and Permanency Act (HR 2231/S 2462)**.

## Maintaining Access to Public Lands

SEMA kicked off 2025 with a win for the off-road community, as President Biden signed into law the **Expanding Public Lands Outdoor Recreation Experiences Act (EXPLORE Act)**, which improves the permitting process for motorized recreation events on federal lands. And the California Supreme Court ruled to uphold a SEMA-supported effort to **preserve motorized access to Oceano Dunes**, the only place in California where off-road enthusiasts can drive and camp on the beach for off-roading, camping and exploring.

## Telling Your Story About Tariffs

SEMA has used its platform to share with the Trump Administration and lawmakers how tariffs are impacting your business. SEMA met with the **Department of Commerce** to discuss survey data collected from our member businesses on tariff impacts

and continues to communicate how the automotive aftermarket is impacted by these policies.

#### **Helping Small Businesses Thrive**

SEMA helped secure passage of the **“One Big Beautiful Bill Act,”** which provides tax certainty to American small businesses and will help the aftermarket thrive. The law includes several key provisions that benefit SEMA member companies, including reduced tax rates for individuals and pass-through businesses, the 199a deduction made permanent, Section 179 expensing cap increased, full expensing for research and development and capital investments, expanded business interest deductions and 100% immediate deductibility of certain investments in new factories and improvements.

#### **Defense of Classic Vehicles and Collector Rights**

SEMA made significant gains in the fight to modernize California’s smog-check laws to help collectors of classic vehicles. This effort, dubbed **Leno’s Law**, earned bipartisan support and represents the most significant progress we’ve made in California on this sort of bill in decades.

#### **Protection of Small Businesses from Regulatory Overreach**

SEMA backed a **U.S. Environmental Protection Agency (EPA) proposal** to overturn the 2009 “endangerment” finding on greenhouse gases and repeal the greenhouse gas standards for light- and medium-duty motor vehicles. Our improved relationship with the EPA was never more evident than when EPA Administrator **Lee Zeldin** visited with SEMA leaders at the 2025 SEMA Show in Las Vegas.

Want to learn more? Keep an eye out for the forthcoming 2026 Advocacy Agenda, visit [sema.org/advocacy](https://sema.org/advocacy) for the latest news and resources, and give a follow to SEMA Action on [Instagram](#) to be a part of our growing community of advocates.

*Image courtesy of Tupungato, Shutterstock*

# Board of Directors Nomination Form



I, \_\_\_\_\_ of \_\_\_\_\_

being a member in good standing of TCRA, Nominate the following member for election to the TCRA Board of Directors

Name \_\_\_\_\_ of \_\_\_\_\_

I, the undersigned, accept the nomination

Signed \_\_\_\_\_ Date \_\_\_\_\_

Please send the completed form via e-mail to Chris Horbach, TCRA Executive Director, at [chorbach@tcraonline.com](mailto:chorbach@tcraonline.com)

Or send via traditional USPS to

TCRA

523 Hampton Manor Drive

Valparaiso, IN 46385

# TCRA 2026 Seminar – May 1 & 2

June 5, 2025

## The TCRA 2026 Seminar

May 1 & 2 – Salt Lake City, UT

Touring Randy's Transmissions.



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### Guest Speakers

- Rodger Bland (ATRA)
- Bobby Mace (Babcox – Transmission Digest)
- John Parmenter (Precision International)
- Bob Warnke (Warnke Consulting, LLC)
- Jim Dial (Sonnax)
- Pepe Torres (AUS-TEX Transmission, LLC)

### Member Pricing:

- Member 1st Registration \$320.00 USD
- Additional Attendees \$495.00 USD
- 2 Additional Attendees \$670.00 USD
- 3 Additional Attendees \$845.00 USD
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- 5 Additional Attendees \$1,195.00 USD

**Non-Member Pricing:**

- 1 Non-Member \$470.00 USD
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## JOIN OUR FACEBOOK GROUP

This private group is limited to members only and can be accessed by using the link below:

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