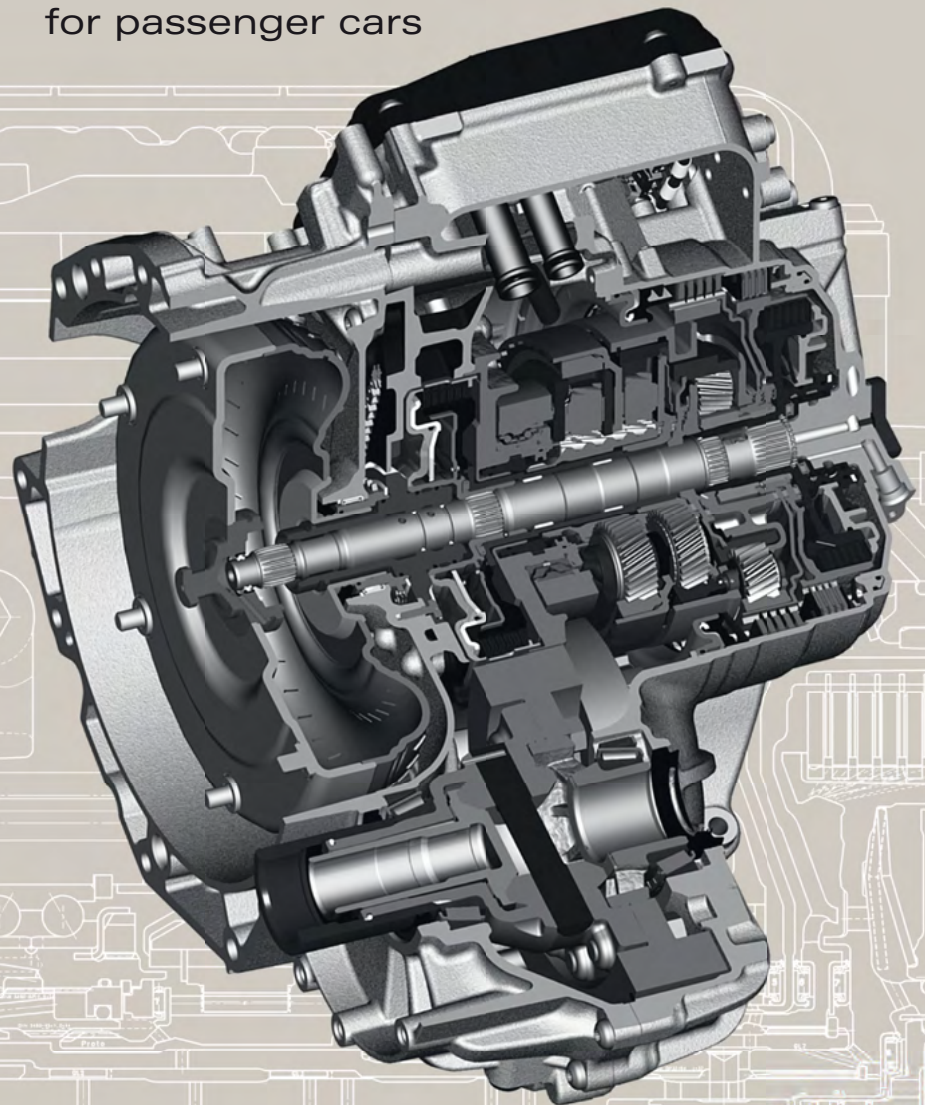




# Heading for a whole new dimension



9HP 9-speed automatic transmission  
for passenger cars



# The future is modular

The new, innovative 9HP automatic transmission for vehicles with front-transverse mounted engines updates the classic advantages of all ZF automatic transmissions for the future: excellent efficiency and dynamics with low fuel consumption, agility combined with driving comfort, and superior driving pleasure – all created by passionate engineering.

The core of the innovative concept is its modular construction system. This design makes the most of the available space and creates the best possible conditions for versatile front transverse applications. Here are some of the most significant advantages at a glance:

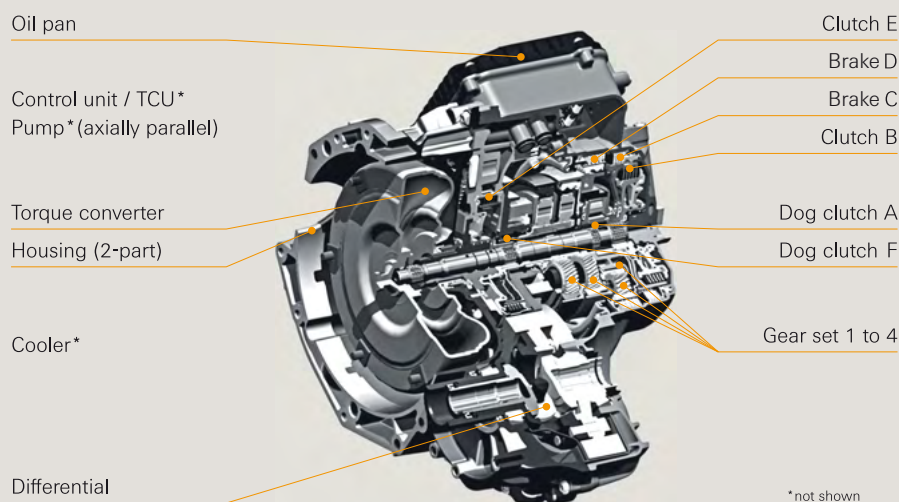
- Planetary gearset with 9 speeds, 4 simple gearsets, and 6 shift elements. Gearsets are nested to save space
- Wide transmission ratio spread (nearly 10) with small ratio steps
- The first-ever use of interlocking dog clutches in a passenger car powershift transmission
- Torque converter with excellent vibration and oscillation isolation for optimal comfort during starting (driveoff) and shifting

- Low engine speeds for increased fuel savings
- Proven ZF control systems technology helps provide the excellent shift quality known from the 8HP

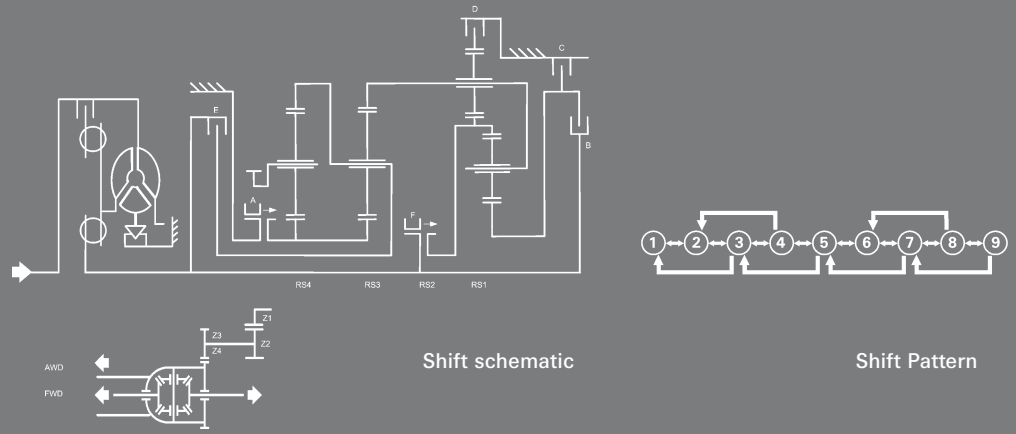
These and other advantages make the 9HP automatic transmission extremely flexible and an optimal choice for front-wheel-drive and all-wheel-drive cars worldwide. The 9HP is also naturally suitable for use with hybrid drive systems.

## Efficiency through reduction

The new 9HP also provides increased performance with less fuel consumption: 0 to 100 km/h (62 mph) times are reduced by 2 seconds when compared with 6-speed automatic transmissions, and in real-world testing at a constant speed of 120 km/h (74.5 mph), the 9HP reduced fuel consumption by 12 percent in a gasoline-powered SUV and by 16 percent in a diesel-powered SUV. At the same time, the engine speeds at 120 km/h are approximately 700 rpm lower, which means less noise and greater driving comfort. These advantages are all due to the greater transmission ratio spread of the 9HP.



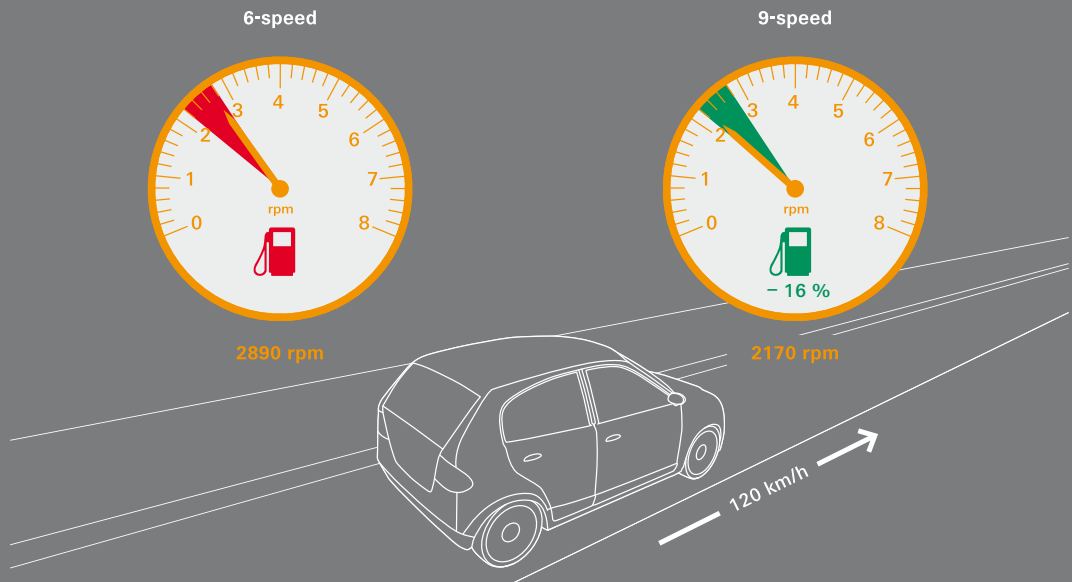
Extremely compact package dimensions (length x depth x height = 367 mm x 621 mm x 428 mm) and an astonishingly low weight of 86 kg (189 lbs.) including oil (9HP48).



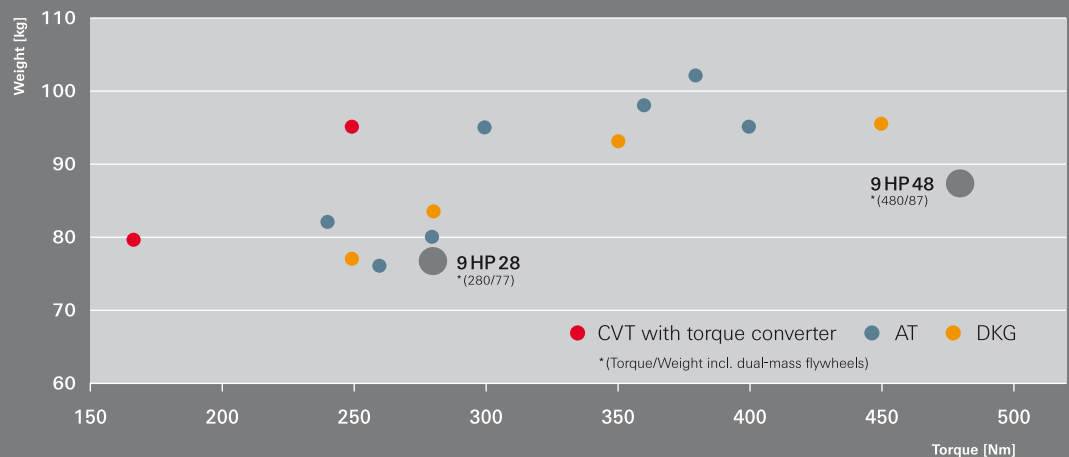
Gear	Brake		Clutch		Dog Clutch		Ratio	Ratio/Steps
	C	D	B	E	F	A		
1		•			•	•	4.70	1.65
2	•				•	•	2.84	1.49
3			•		•	•	1.90	1.38
4				•	•	•	1.38	1.38
5			•	•		•	1.00	1.24
6	•			•		•	0.80	1.16
7		•		•		•	0.70	1.21
8	•	•		•			0.58	1,21
9		•	•	•			0.48	
R		•	•		•		-3.80	Total 9,81

Concept selection

Significant reduction in fuel consumption due to lower engine speeds



Comparison of power-to-weight ratios (9HP vs. competitors)



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**Driveline and Chassis Technology**

