

# Used Cayennes: A good idea?

2003–2006 Cayennes are bargains. Here's what you need to know.

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In June 1998, Porsche announced its intention to enter the Sport Utility Vehicle market. It was a shock to the automotive world, as if Porsche had borrowed a line directly from Monty Python: “And now for something completely different!”

From Porsche’s perspective, however, the SUV segment offered great potential due to its size and continued growth. Annually, the market for premium SUVs (priced \$40,000 and higher) was more than twice the size of the sports-car segment. The SUV was very popular in the United States, and many existing Porsche owners were SUV buyers.

Porsche’s decision to build the Cayenne, although complex, probably came down to this: An SUV would attract a far larger customer base while providing a product other than sports cars, which had always been a tough sell in tough economic times.

As it turned out, Porsche’s decision and subsequent execution proved nothing less than brilliant. The first Cayenne impressed nearly everyone who drove one and, more importantly, sold strongly.

Between 2003 and early 2007, Porsche sold more than 150,000 Cayennes — making it the best-selling Porsche ever. Model years 2005 and 2006 saw a drop in Cayenne sales, but that was true of the SUV market as a whole due to a sharp rise in oil prices. With Cayennes backing up on dealer lots, Porsche chose to “skip” the 2007 model year, opting instead to sell its stock of 2006 models. A greatly revised 2008 Cayenne lineup went on sale in early March 2007.

Today, depreciation has brought prices for early Cayennes into the teens and mid-twenties, making them attractive buys considering their utility and engineering. This *Tech Forum* will examine the first-genera-

tion, 2003–2006 Cayenne. We’ll consider its creation and development as well as some problem areas that time and miles have uncovered.

## Cayenne Objectives

Before Porsche’s first SUV had a name, it had a development number. Not surprisingly, Porsche set some lofty goals for Type 9PA: It had to be a sporty multi-purpose vehicle with an upscale interior, full-time all-wheel drive, best-in-class handling on road, uncompromised traction, and outstanding off-road capability. Since the Cayenne would be heavy, Porsche wanted a completely new V8 in both naturally-aspirated and turbocharged configurations. These would have to meet all noise and emissions requirements worldwide while setting the competitive standard in their respective market segments.

In June 2000, Porsche announced the name of its new SUV: Cayenne. Naming it after a spicy pepper broke with Porsche tradition, perhaps fittingly. Executives were quick to point out that the name meant the same thing in any language, and that it started similarly to "Carrera." That second point predicted something else: the Cayenne's styling, which would adopt 911 cues.

For Porsche, another important "must" was that the Cayenne had to be recognized as a Porsche — not a rebadged VW. This mattered because the Cayenne would share its basic chassis and certain body components with Volkswagen's Touareg. Even so, Porsche looked at its relationship with VW like any other supplier: VW would supply Cayenne bodies, but the Cayenne would be designed at Weissach and powered by V8s built in Zuffenhausen.

Final assembly would take place at Porsche's new factory in Leipzig. In February 2000, Porsche began construction of the new, highly modern manufacturing plant in former East Germany. Porsche's investment in the facility was tremendous but necessary to ensure cost efficiencies. The factory was completed on August 20, 2002. It would not be used for Cayennes alone, however: It was the manufacturing base for the 2004 Carrera GT, and was expanded as Porsche geared up for the launch of its 2009 Panamera sedan.

### Model Development

The \$55,900 Cayenne S and \$88,900 Cayenne Turbo were released in the U.S. for MY 2003. Both models utilized all-aluminum, 4.5-liter V8s with dual overhead camshafts, four valves per cylinder, and an "integral dry sump" oiling system. The new V8s used a bore and stroke of 93 x 83 mm, and both featured Porsche's Vario-cam intake valve timing control to provide better emissions and fuel mileage under cruising conditions along with improved power under heavy acceleration. Other features included sequential-port fuel injection, E-gas electronic throttle, and Bosch Motronic ME 7.1.1 engine management.

The Cayenne S's M48/00 engine had a compression ratio of 11.5:1 and was rated at 340 bhp at 6000 rpm and 310 lb-ft of torque from 2500 to 5500 rpm. As a result, Porsche said the SUV could reach 60 mph from a standstill in 6.4 seconds. While the Cayenne Turbo's M48/50 V8 had a compression ratio of 9.5:1, twin turbochargers helped it make a lofty 449 hp at 6000 rpm along with 458 lb-ft of torque from 2250 to 4750 rpm. Its 0–60-mph time was claimed to be just 5.3 seconds.

Cayennes destined for North America were available with Porsche's six-speed

Tiptronic automatic transmission while Rest of World (RoW) Cayenne Ss could be ordered with a six-speed manual gearbox. The Cayenne S got the A48/00 Tiptronic while the Turbo used the A48/50. While the six forward ratios were the same in both units, the differential's final drive ratios differed based on engine torque (4.100:1 for the S, 3.700:1 for the Turbo).

A transfer-case gear reduction of 2.7:1 proved especially effective for off-road excursions. Under normal driving conditions, 38 percent of engine torque was applied to the front wheels, with 62 percent going to the rear wheels. The standard suspension system for the Cayenne S was fully independent with steel springs, wide-base double control arms up front, and a multi-link rear setup. The Turbo got a level control system with load-bearing air springs at both axles and electronically controlled dampers (the latter was also available as an option on the Cayenne S). Damper valving could be set to Comfort, Normal, or Sport.

Both Cayennes came with Porsche Stability Management (PSM) as standard equipment to ensure stable behavior of the vehicle when turning, especially under high lateral forces. PSM can apply braking to any wheel, adjust ignition timing to cut power, reduce throttle, or even shift the Tiptronic transmission. An optional tire pressure monitoring system (TPMS) was available on both Cayenne models. The original Cayenne S had a curb weight of 4,950 pounds, said Porsche, while the Turbo weighed in at 5,190. With rear seats folded, 62.5 cubic feet of cargo space was available. Payload capacity was 6,750–6,790 pounds, with a towing capacity of over 7,700 pounds.

The first real change for the Cayenne took place for model year 2004, when Porsche introduced a base model called simply Cayenne. It had fewer options but used the same all-wheel-drive system. VW's 3.2-liter "VR6" six-cylinder was chosen, an interesting engine due to its 15° vee, cast-iron block, and single aluminum cylinder head. Externally, it appeared to be a straight six. The VR6 was originally designed for a transverse installation in front-wheel-drive Passats and Corrados.

With a bore and stroke of 84 x 95.9 mm and a compression ratio of 11.5:1, the \$42,900 Cayenne was rated at 250 hp at 6000 rpm and 229 lb-ft from 2500 to 5500 rpm. It was approximately 150 pounds lighter than a Cayenne S, and Porsche claimed a 0–60 time of 8.1 seconds. In the Cayenne, Porsche offered a six-speed manual for the first time in North America, but most were ordered with the Tiptronic.

For MY 2006, Porsche unveiled the Cayenne Turbo S. Rated at 521 hp at 5500 rpm and 530 lb-ft of torque at just 2750 rpm, the Turbo S was hailed as the world's most powerful production V8 vehicle in 2006. Porsche indicated 1,500 Turbo Ss would be produced, with approximately 600 slated for the U.S. market. Porsche's usually conservative performance figures came in at 0–60 mph in 4.8 seconds with a top speed north of 170 mph, making the Turbo S the world's fastest production SUV. As a result, the Turbo S got bigger brake rotors, sized 381 mm up front and 358 mm rear. The base MSRP came in at \$112,000, but these rockets are selling in the low to mid fifties these days thanks to heavy depreciation.

After skipping the 2007 model year, Porsche introduced a freshened Cayenne lineup for 2008 with 3.6-liter V6s, 4.8-liter V8s, revised chassis, facelifted bodywork, and myriad refinements.

### Common Problem Areas

Eight years have passed since the Cayenne hit the road, and we've seen enough examples with real miles to feel confident in saying that Porsche got this one right. These Porsches may be trucks, but they have proven to be great trucks.

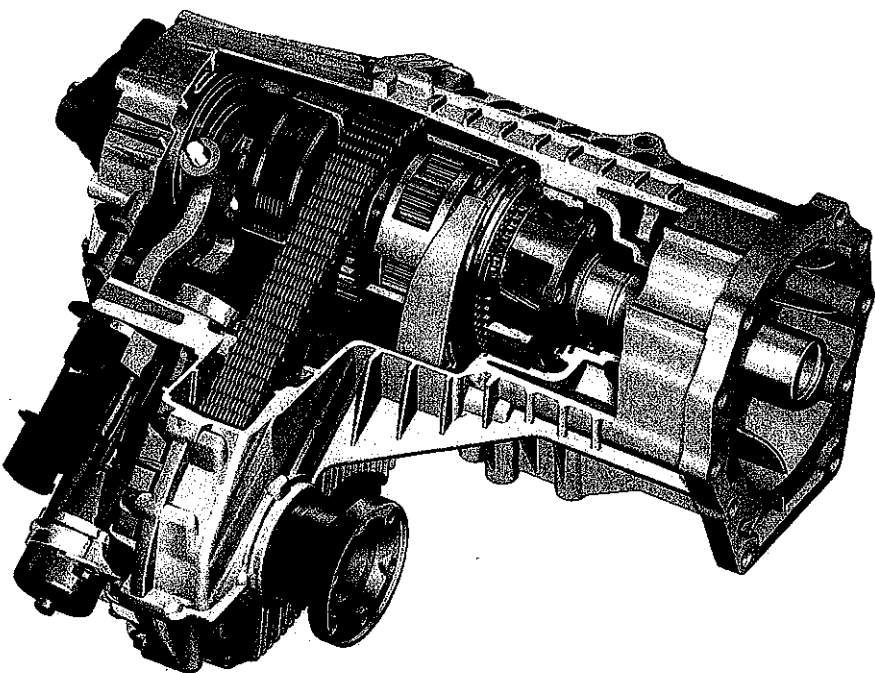
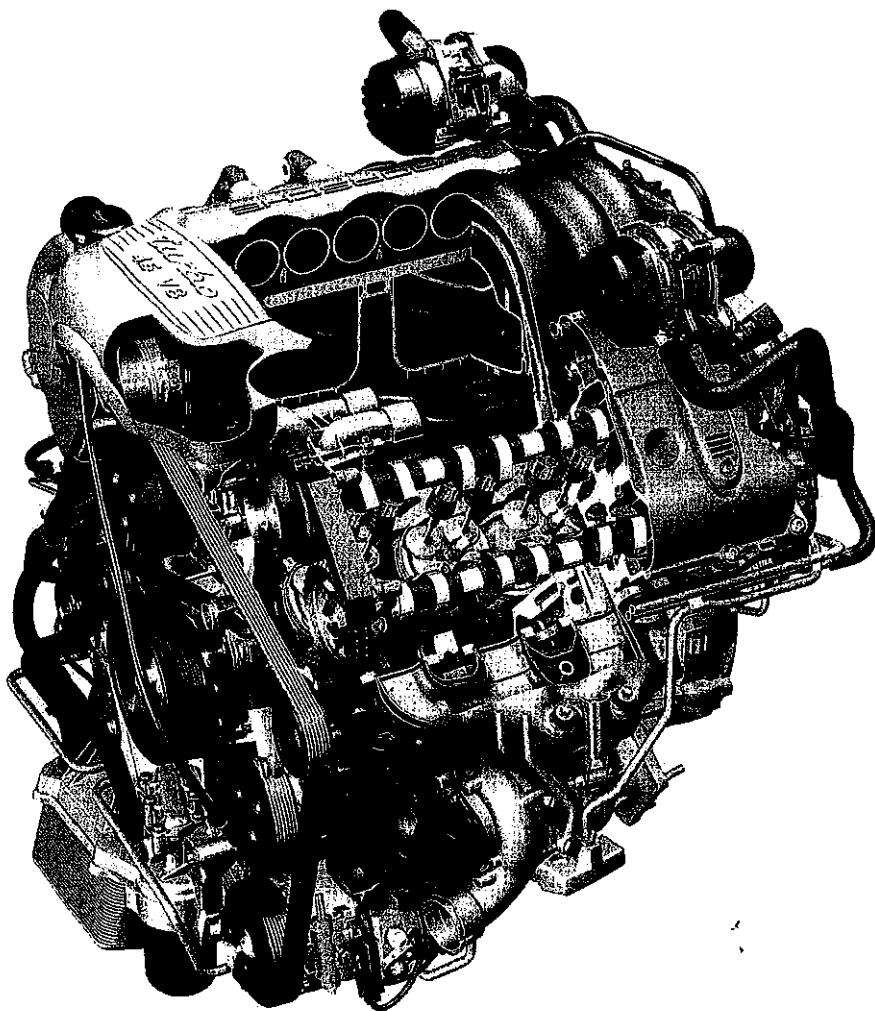
That said, Cayennes suffer from problems that are only discovered when they meet the real world and spend time in the hands of customers — just like other cars and trucks from every manufacturer. Some parts may not meet specifications, some items end up installed incorrectly, some components fail under certain conditions, some things wear out prematurely, and some owners postpone scheduled service and maintenance.

Though we have identified some issues that may sound ominous, we feel that all models of the Cayenne are generally very reliable. Remember: Over time, wear and tear on *any* vehicle occurs and repairs will become necessary. While there is always the risk of scaring people away by listing a car's known problem areas, we feel it is better to inform readers so they are ready for *potential* repairs and things to look for. Being aware of the issues can give you a better understanding of how to recognize them and take a proactive approach.

Thus, the items we've listed are things you *might* face during ownership. We'll cover them one at a time.

### Valve Cover Gasket Leaks (V6)

The V6 valve cover gasket can fail, causing oil leaks around and into the area of the ignition coil and spark plug pockets. Oil in these areas can damage ignition coils and may trigger a CEL. A timely repair of



the gasket may mitigate damage and prevent expenditures to replace the coils.

#### **Valley Coolant Pipe Leaks (V8)**

In the valley between the cylinder heads of all V8-powered Cayennes manufactured prior to MY 2008, three plastic coolant pipes transport coolant between the front and rear of the engine. The large pipe is known to crack, but the smaller pipes can crack, too. Escaping coolant can fill the engine's valley area until it overflows and leaks down the back of the engine and into the Tiptronic's torque converter area.

It is critical to keep an eye out for any coolant leaks in V8 Cayennes, as this problem, if not found and repaired quickly, can cause extensive collateral damage in other areas including the starter and Tiptronic transmission's torque-converter seal. The recommended repair is to install all of Porsche's update parts.

#### **Starter Failure (V8)**

If the valley coolant pipes are allowed to leak for any period of time, coolant can come in contact with the starter and permanently damage it. Because the starter is located below the valley coolant pipes, the pipes need to be removed to gain access to the starter. If your starter is being replaced and the metal coolant pipe update has not yet been performed, this would be the opportune time to perform the update.

#### **Torque Converter Seal (V8)**

If the valley coolant pipes are allowed

Left, above: 2003 4.5-liter Cayenne S V8 matched the displacement of Porsche's first V8 designed for 1978's 928. Left, below: Cayenne's AWD transfer gearbox ensured optimum off-road performance.

to leak for any period of time, the Tiptronic transmission torque converter seal may be damaged. A damaged seal will cause transmission fluid to leak between the transmission and the torque converter. To repair the seal leak, the transmission must be removed. While the engine can remain in the car during this repair, this is a \$3,000+ fix — which is why any coolant leaks should be caught and corrected quickly.

#### **Coolant Crossover Manifold (V8)**

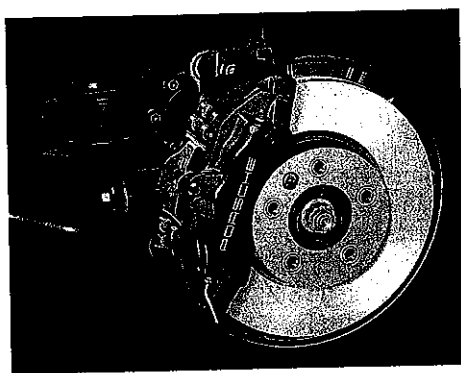
While we're covering 2003–2006 models, 2008-and-newer Cayenne V8s can suffer from a coolant crossover manifold failure at the rear of the engine. This coolant manifold connects to both cylinder heads. A coolant pipe, which appears to be extruded aluminum, is glued and press-fit into the manifold. This aluminum pipe can separate or pop out of the manifold when

the engine is running. If this happens, a significant amount of coolant will be lost. If this occurs, the crossover manifold can be replaced. Another route is to have the aluminum pipe professionally welded back into the coolant crossover manifold, *but the welds must be water-tight under pressure.*

Unfortunately, the engine and transmission must be removed to gain access to the coolant crossover pipe manifold so that it can be removed.

#### Oil Sweating near Left Turbo (Turbo)

Oil sweating may be seen on the left (driver's) side of the engine in Cayenne Turbos. According to a Porsche factory bulletin, this is normal to some extent. The engine crankcase vent line enters the intake system ahead of the turbocharger for cylinders 5 through 8. Oil vapor then passes



Above, left to right: All Cayennes got generously-sized brakes; driveshaft center bearing installation tool 9680; a Cayenne ignition coil that broke in half and triggered a CEL due to misfires.

through the turbocharger and can collect at a low point where the turbo's high-pressure line meets the intercooler piping. Some oil sweating or small leaks may occur in this area. Any oil sweating should be monitored specifically in the area of the valve covers and turbo. If the sweating becomes a major leak, repairs must be made.

#### Driveshaft Vibration

This is a common problem in all models of the first-generation Cayenne; under hard acceleration from a stop or very low speeds, you may hear a thumping noise in the area of the center console, behind the shifter assembly. The noise usually comes from the driveshaft — or “Cardan Shaft” — and is caused by a worn or weak center support bearing that allows the driveshaft to wobble as it spins. This may get worse as the speed of the driveshaft increases.

The driveshaft must be replaced to correct the problem, as the center support bearing is an integral component of the driveshaft assembly. When replacing the drive-

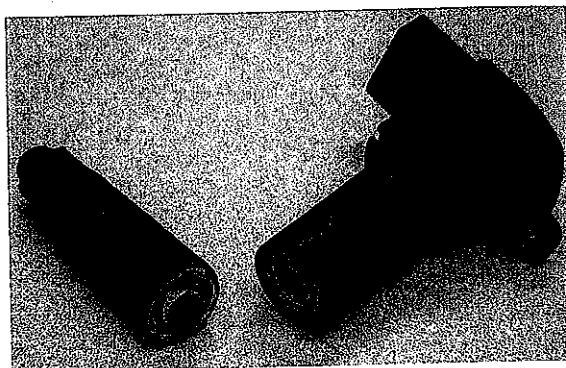
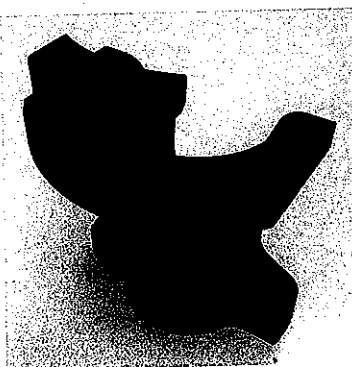
shaft, it is important to set the center support at the correct angle and position; this can only be done with factory tool 9680.

#### Cracked Front Control Arm Bushings

The front lower (rear of arm) control arm bushings have a tendency to crack and can cause some instability in the steering, which will be felt as a slight shimmy in the steering wheel. Some drivers don't notice the problem, but this condition wears the tires unevenly. Fortunately, the bushings are available separately, so there is no need to replace the control arms.

#### Tire-Pressure Monitoring System

The tire-pressure monitoring system (TPMS) will shut down if there is any fault in the system. The most common fault is a dead (or low) battery in any of the four



wheel-sensor units. For more details on TPMS operation and issues, please refer to the April 2010 *Tech Forum*.

#### Ignition Coils

It's fairly common to have ignition misfire faults at times, and this usually causes the Check Engine Light (CEL) to illuminate. Misfire faults are often caused by faulty ignition coils. All Cayennes utilize a coil-on-plug arrangement. While this works well, the coils tend to get very hot and have a tendency to crack over time. Although the coil design has been updated multiple times, the problem seems to continue.

As of September 2010, Porsche has initiated a Service Technical Bulletin relating to ignition coils on all MY 2003–2006 Cayennes. Porsche is extending the warranty on the improved ignition coils for 4 years or 50,000 miles, whichever occurs first, from the first date of the installation of the improved parts. The part numbers covered are 948 602 104 07 and 955 602 101 04 plus all successor part numbers.

The bulletin also notes that Porsche will reimburse customers who paid out of pocket for these repairs if their Cayenne had less than 100,000 miles at the time of repair. Customers will be required to pro-

vide a legible copy of their repair invoice to obtain reimbursement. If you own or owned a Cayenne and had to replace the coils, this may apply to you. You may want to contact Porsche customer service (1-800-PORSCHE) for further information.

#### Valvetrain and Cam Timing Faults

Three common areas cause valvetrain and camshaft timing faults. The first is a loose vane-adjuster bolt, which can cause various faults and may trigger a CEL. If this happens, install a new bolt and then ensure correct camshaft timing and proper tightening of the bolt. The second common cause of valvetrain and cam timing faults is a defective camshaft position (hall) sensor, which can also trigger a CEL. This is commonly diagnosed when too many “on/off” segments are identified from the

hall sensor during electronic interrogation of a running engine with an oscilloscope. Finally, a loose or bent camshaft impulse wheel can cause camshaft deviation faults. If this occurs, camshaft replacement will be necessary to fix the problem.

#### Parking Brake Pedal Return Strut

The parking brake return is assisted by a hydraulic strut (like a hood shock). When this strut gets weak, the parking brake will not return all the way and the warning light will stay on. Replacement of the strut is necessary to correct this problem.

#### EVAP Purge Valve

The evaporative emissions system, also known as the EVAP, removes gasoline vapor in the fuel tank by burning it in the engine so it is not released into the atmosphere. A “purge valve” located on the engine is responsible for regulating the release of fuel vapor into the engine. When the purge valve is faulty or operating intermittently, the CEL will illuminate because the valve is an emissions-related component. Replacement of the purge valve is required to correct this problem.

#### Clogged Drain at A/C Evaporator

The A/C evaporator is located inside the dashboard. If the A/C is on, it draws moisture out of the air. This moisture ends up inside of the evaporator housing and is intended to drain out of a hose to the exterior of the vehicle. In the Cayenne, the evaporator housing drain has a tendency to clog up. If this happens, the water in the evaporator housing will overflow and find its way to the driver's side floorboard area—eventually saturating the carpet. The fix is simple: Clear the drain.

#### **A/C Freon Leak**

All Cayenne A/C systems utilize R134A refrigerant, which is under pressure within the system and has a tendency to leak from any point where a seal is even slightly compromised. Specific to the Cayenne, a double-pipe connection at the left (driver's side) rear corner of the engine bay seems to be a common leak point. Each pipe connection is sealed by an O-Ring.

Not specific to the Cayenne, infrequent use of a vehicle's A/C system may cause the O-ring seals to dry out—which can exacerbate the onset of a refrigerant leak. A good habit to cultivate is to operate the A/C system whenever you drive your vehicle, even if only for a short period of time until the air coming out of the vents is cold. Following this practice may help extend the timeframe between service or repairs to your car's A/C system.

#### **Rear Hatch Lift Springs**

The rear hatch lift springs can get weak with time and then fail to support the rear hatch sufficiently. The only repair is to replace both spring-strut assemblies.

#### **Tiptronic Shift Solenoid Failure**

Faulty shift solenoids or associated wiring inside the valve body of Tiptronic transmissions can cause problems. Symptoms can include hard downshifts during deceleration (foot off the gas), a transmission that skips a gear when shifting, or one that will not go into Drive or Reverse at all. If a solenoid is faulty, the valve body must be replaced as a unit; Porsche does not offer these internal components.

#### **Transfer Case Motor**

The transfer case controls the distribution of torque to the front and rear differentials. It also contains the low (off-road) and high (on-road) gearing and provides the means to switch between them. Failure of the electric motor that mechanically switches the drive ratio between low and high range will lock the transfer case into the range being used at the time of the malfunction. The motor must be replaced to

resume normal operation.

#### **Final Thoughts**

Most of our customers who own Cayennes generally love their Porsches. The majority of them seem particularly pleased with this SUV's handling and performance. As for fuel mileage? Well, not so much—but everyone can appreciate the mathematical equation of *Heavy SUV + Fast Driving = More Gas*. From what we've seen, we suspect that only a very small number of Cayennes are used for off-road excursions, but these SUVs were certainly designed and equipped to go beyond the pavement. They are also excellent for towing.

Porsche's first SUV offers good performance, exceptional safety, great utility, superb visibility, and a comfortable cabin. In our view, the Cayenne is a great choice for those who appreciate the sport of driving but need something with four doors and more cargo capacity than a sports car can provide. Enjoy your Porsche. ■

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