

Porsche 928 Project

(Once and a while Hayes falls into a project that takes them back to their roots)



Before



After



Installed



Racing

Explanation By: Constantine Golovaty

"After acquiring our 1989 Porsche 928S4 which came with an automatic transmission, we discovered some 928 automatics would suffer thrust bearing failure (TBF) of their engine. This problem manifests itself by different symptoms, most significant being the engine seizing while under operation. A tear down of the engine finds the aluminum alloy V8 block ruined due to the crankshaft machining itself from the rear to the front of the engine. The engine is almost always a total loss and very few parts can be salvaged. This problem had become well known within the 928 owners community but its cause was not.

We undertook a study to find the root cause of this problem. We found the flywheel coupling system Porsche employed to transmit engine power to the rear-mounted transmission was not holding the driveshaft tightly enough. Also known as a transaxle system, this placing of a front mounted engine and a rear mounted transmission helps to evenly distribute the two greatest weight masses of the car at opposite ends, effectively giving the 928 a near perfect 50/50 weight distribution. This transaxle system has been used by Porsche in other models and is currently being used by Chevrolet in the C-5 and newer Corvettes, a testament to the design's great benefits.

In the case of the 928, the driveshaft, a length of solid steel bar approximately 1 inch in diameter and approximately 5 feet long, is suspended in a torque tube by two or three bearing units. The torque tube is bolted to the engine and transmission keeping both units aligned for the effective transmission of power by the driveshaft.

Our research found the original front flywheel clamp could not hold the driveshaft from slipping a bit through the flywheel clamp when it shortened under torque. When the driveshaft returned to its normal length it would hang up in the flywheel clamp and start a forward push against the flywheel and ultimately the thrust bearing within the engine. After time the crankshaft would bore itself through the engine by thousandths of an inch, causing catastrophic failure.

Hayes Manufacturing was contacted and with their expertise a new clamp was devised which could be retrofitted with no modifications to the flywheel and which could hold the driveshaft much better than the original clamp. Tests were done and the Hayes Manufacturing clamp was found to hold the driveshaft without any movement to over 4500 psi. The original clamp let movement at 2000-2200 psi and after being heated to 200 degrees F for one half hour, let movement at 1700 psi or lower. Heat had no effect on the Hayes Manufacturing clamp (See comparison below).

Existing Porsche
Clamp System



New (improved) Clamp
System

This new clamp was tested in a 1986 Porsche 928S automatic which was converted for track use where the new clamp was put through it's paces under race type and normal driving conditions for a few years and thousands of miles. After such use the clamp worked flawlessly and never let the driveshaft slip from it's original position. Currently we have started selling this new clamp to other Porsche 928 enthusiasts who are installing it into their own automatic equipped 928s, some after already losing their original engine to TBF and are rebuilding their car."

Constantine Golovaty
President
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Hayes Manufacturing would like to thank Constantine Golovaty for the opportunity to work with him on this project.



P.S. Keep your eyes out for more improvements from Black Sea Research and Hayes Manufacturing.