



Technical Service Information

VOLKSWAGEN/AUDI ZF5HP19FL/FLA NEUTRALS ON TAKEOFF

COMPLAINT: A Volkswagen/Audi vehicle with a ZF5HP19FL/FLA exhibits a neutralizing condition under heavy throttle in 1st gear or 2nd gear. Under light or moderate throttle positions, the vehicle appears to function correctly and up shift ok, however, while under heavy acceleration from either a standstill, or while driving in 1st gear, on an up shift into 2nd gear or while driving in 2nd gear the transmission feels like it goes into neutral. When the transmission is removed from the vehicle and disassembled it is apparent the “G” clutch has been slipping because the frictions are normally quite burned.

CAUSE: One cause may be a ruptured rubber damper plug in the channel plate section of the valve body. The root cause of the burned clutch may not be apparent during initial inspection, especially if the time is not taken to disassemble the valve body. In the channel plate section of the valve body are located three rubber damper plugs. These damper plugs act as accumulators for the pulse-width-modulated solenoids EDS 2, EDS 3, and EDS 4. The damper plugs must be removed from the valve body and carefully inspected. The reason they must be looked at carefully is because of their tendency to “rupture” or “burst”. If you experience a similar neutralizing effect during heavy acceleration, EDS 3 damper assembly will be the accumulator plug you want to look at closely. EDS 3 solenoid is pulsed “ON” in reverse, neutral, 1st, and 2nd gear. Refer to Figure 1. This drawing illustrates that modulator pressure is fed to solenoid EDS 3. With the solenoid “ON”, modulator pressure flows to the EDS 3 damper plug and then strokes the “G” clutch shift valve and “G” clutch accumulator control valve allowing line pressure to apply the “G” clutch. During heavy acceleration conditions, increased modulator pressure can cause a “rupture” or “burst” hole to occur in the plug and exhaust through the channel plate. When this occurs there will not be sufficient pressure to stroke the “G” clutch shift valve or accumulator control valve which will lead to a partial apply of the “G” clutch and the neutralizing condition.

CORRECTION: Replace the rubber damper assembly, or use the updated aluminum plugs which requires the updated channel plate and spacer plate. Refer to Figure 2 this picture shows the channel plate with the EDS damper plug locations, and also an enlarged view which shows the early style rubber plugs and focuses on the exhaust holes in the channel plate. These rubber damper plugs were used in ZF5HP19 models through 1999. During model year 2000, ZF introduced an updated damper assembly. Figure 4 shows worm track differences in the later channel plate and also an enlarged view which depicts the later style damper pistons and illustrates the bore size difference in the channel plate for the later damper pistons. Refer to Figure 3. This drawing illustrates the same partial hydraulic circuit in Figure 1, *except*, it shows the new design EDS 3 accumulator piston. Notice the top of the accumulator piston, there is no orifice like in the previous plug, instead the surface is solid and in the bottom of the plug is a rubber insert that provides the cushion, or accumulation. The solid top obviously prevents rupturing and these new pistons eliminate the problem.



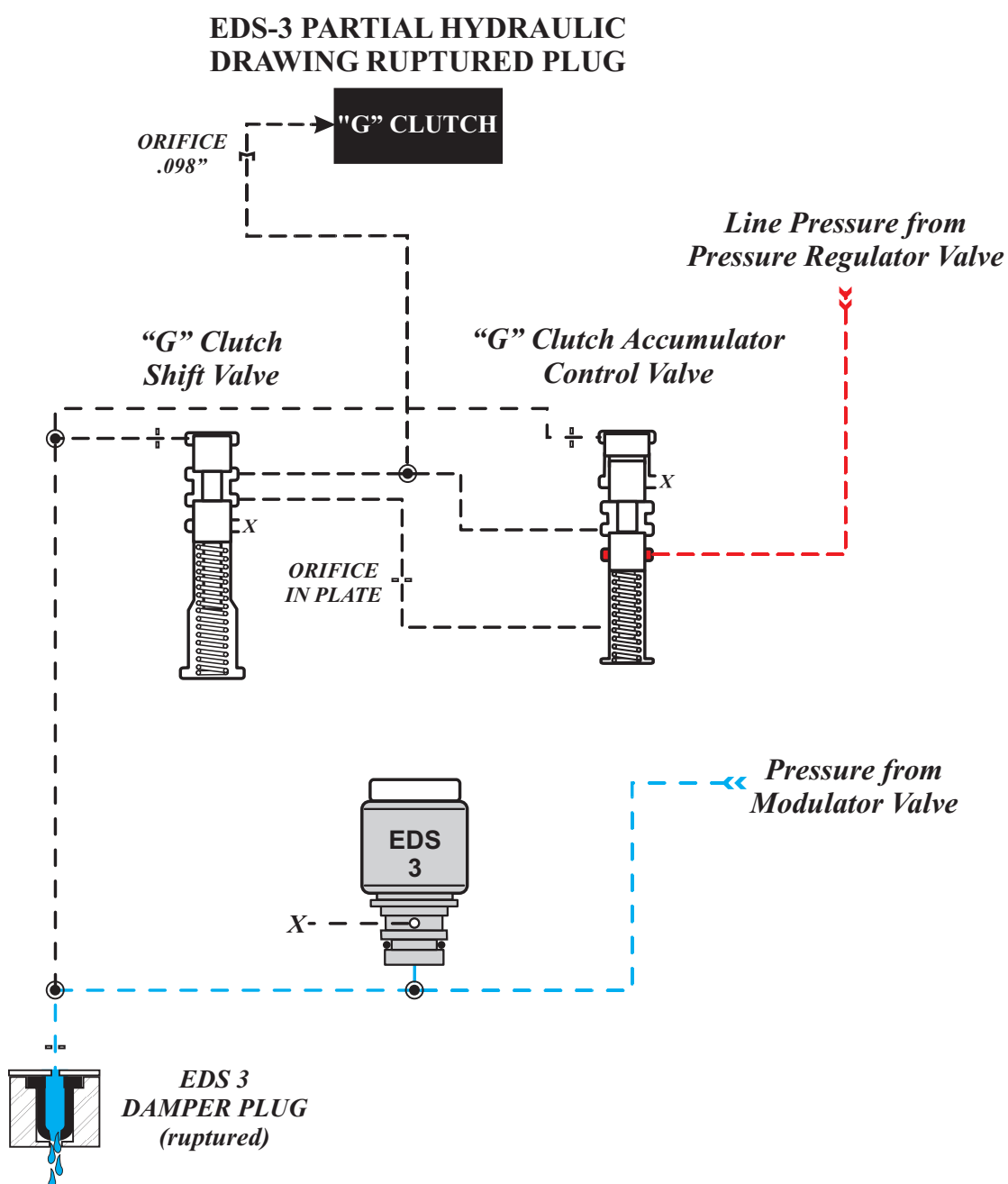
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CORRECTION Continued:

Refer to Figure 4. The text in the enlarged view states the accumulator bores in the channel plate are larger in diameter than the early plate. The bores are larger in diameter to accommodate the updated pistons. The diameter of the accumulator plug bore in the early channel plate is approximately .315 inches and houses the rubber damper plug. The outside diameter of the accumulator piston bore in the later channel plate is approximately .471 inches in diameter for the updated piston. Figure 5 shows the early valve body separator plate, and Figure 6 shows the later separator plate. Note the differences in hole size and configuration between the two plates. ***They are not interchangeable.*** Therefore, if you have a rubber damper that is ruptured, you will have to use a new rubber damper. If you want to use the later style piston to prevent a future incident, you will need to purchase a new channel plate, separator plate and pistons from a ***ZF-AUTHORIZED*** distributor. Most overhaul kits will come with both the rubber plugs and the newer pistons so if you have an overhaul kit you will only need to purchase the new style separator and channel plate. ***Note:*** There are two different versions of the separator plate and channel plate combinations, the first version is the type that has a Pulse Generator, which supplies Turbine shaft speed to the TCM, and is bolted to the middle of the channel plate. The second version is the type that uses a Hall effect turbine speed sensor, which is bolted the case. These 2 different channel plates are not interchangeable. Refer to the chart below for the correct part numbers for the version needed.

SERVICE INFORMATION:

	ZF PART NUMBER FOR PULSE GENERATOR TSS	ZF PART NUMBER HALL EFFECT TSS
SEPARATOR PLATE.....	1060-327-109.....	1060-327-127
CHANNEL PLATE.....	1060-327-140.....	1060-327-141
PISTONS (3) REQUIRED.....	1068-227-039.....	1068-227-039



EDS 3 is used to control the engagement of the "G" clutch. This hydraulic circuit drawing shows oil flow with a ruptured EDS 3 Damper.

NOTE: *With a ruptured EDS 3 Damper Plug, EDS 3 oil pressure exhausts through the hole in the bottom of the damper plug thereby not accumulating and passing to both Shift Valve "G" and Accumulator Control Valve "G".*

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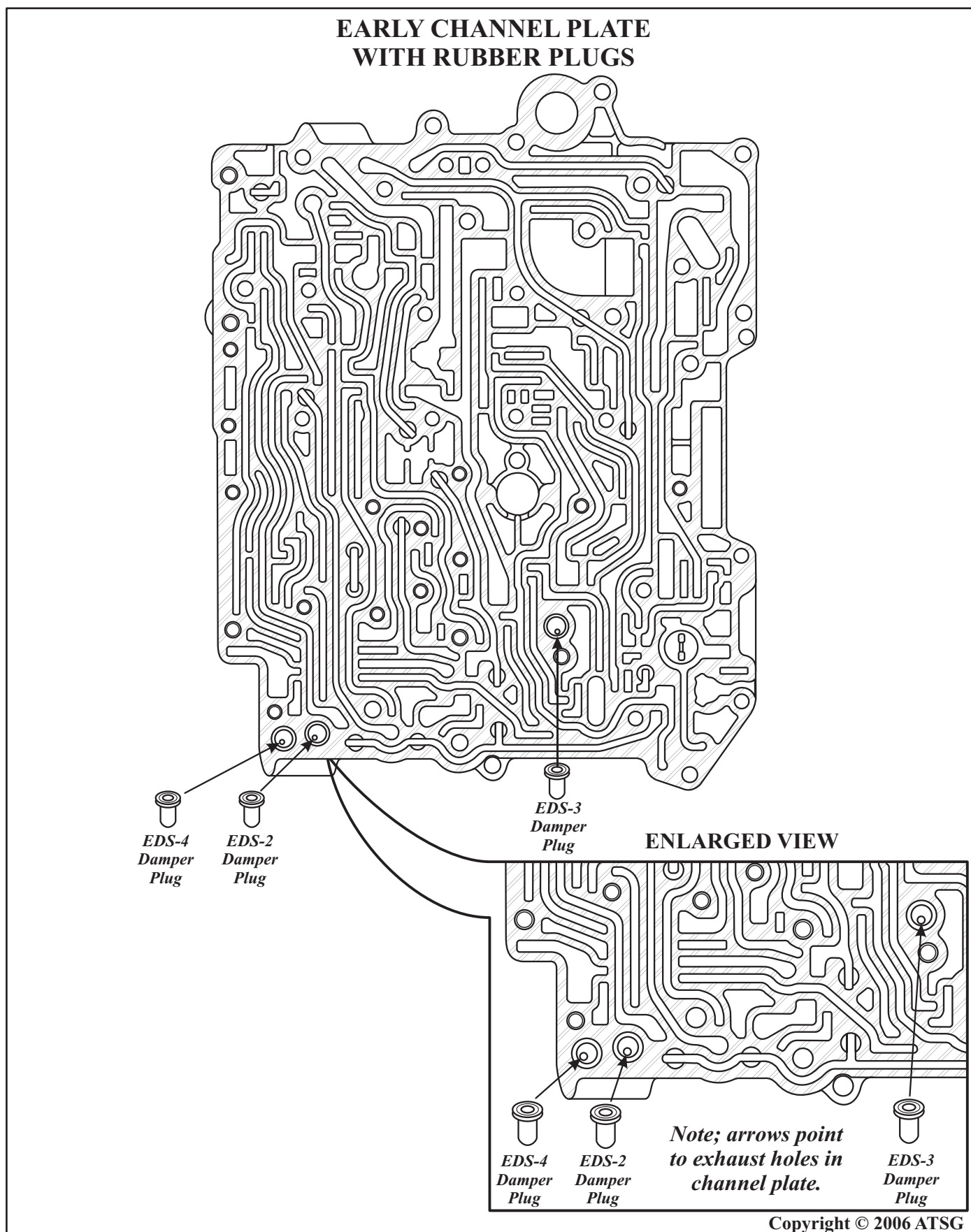
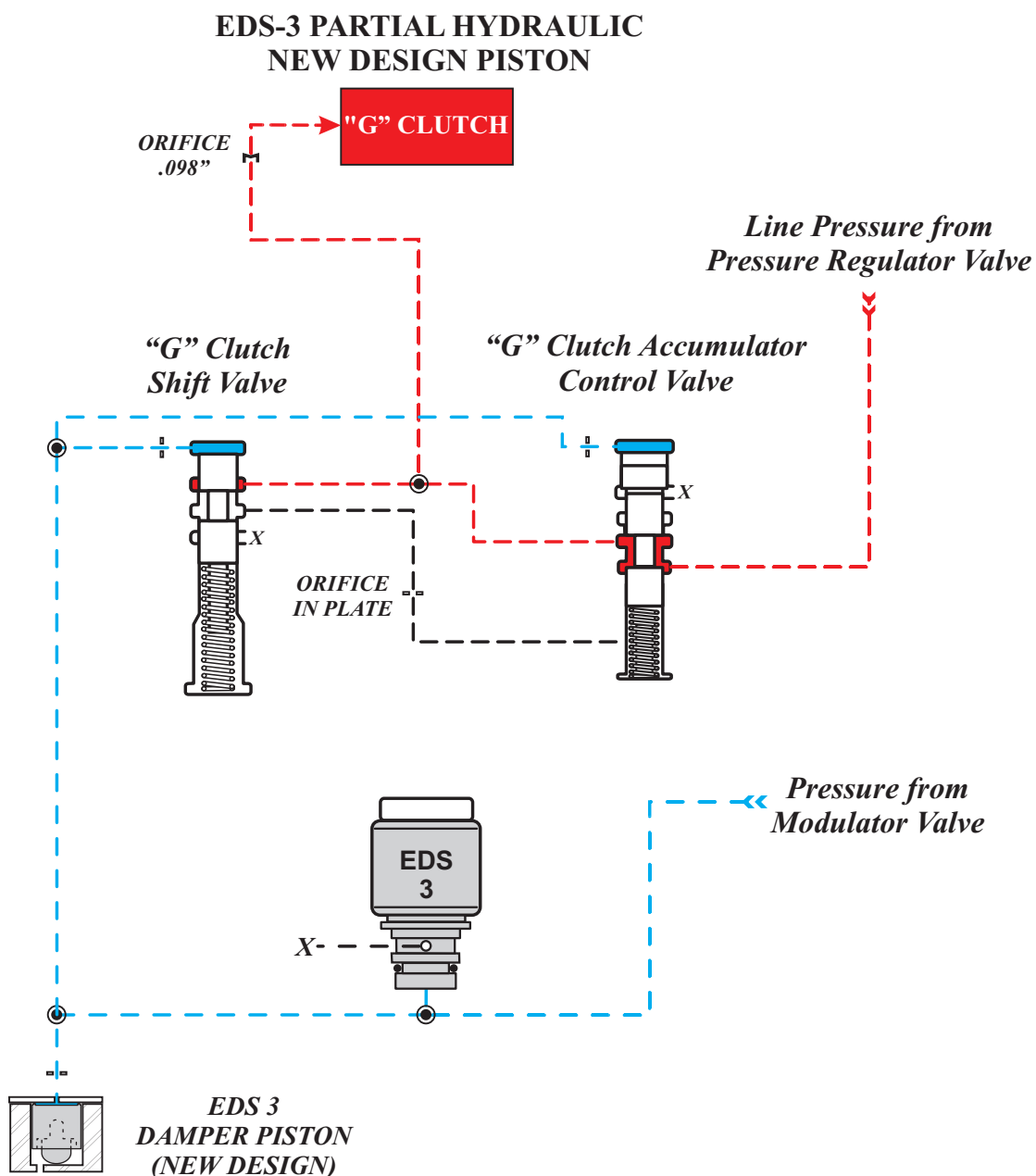


Figure 2
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This hydraulic circuit drawing shows oil flow with New Design EDS 3 Damper Piston.

NOTE: With a new design damper piston installed in the valve body, oil pressure only contacts the face of the plug. Since the hole is eliminated in the new plug, it reduces the possibility of the plug rupturing, and normal oil accumulation is achieved.

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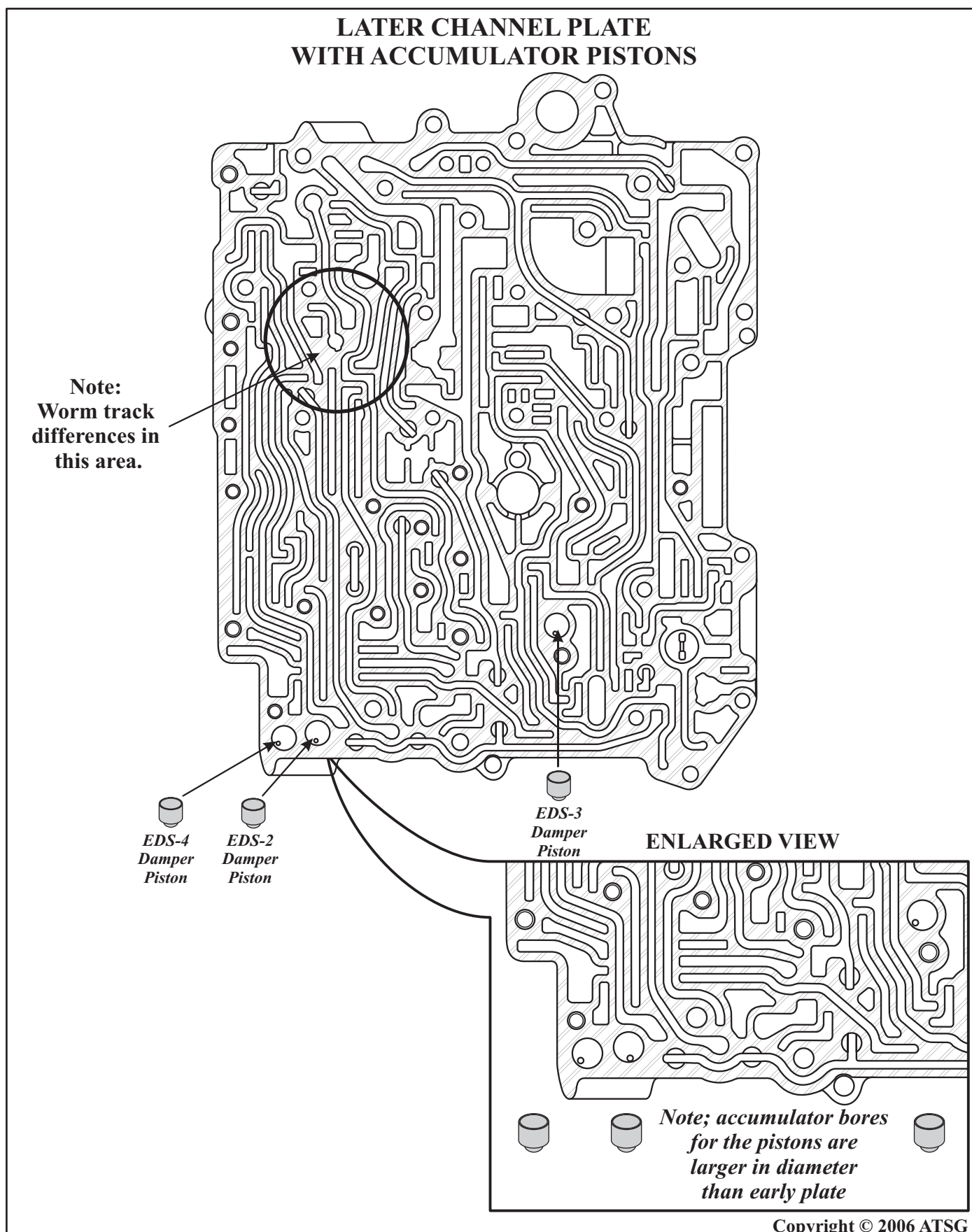
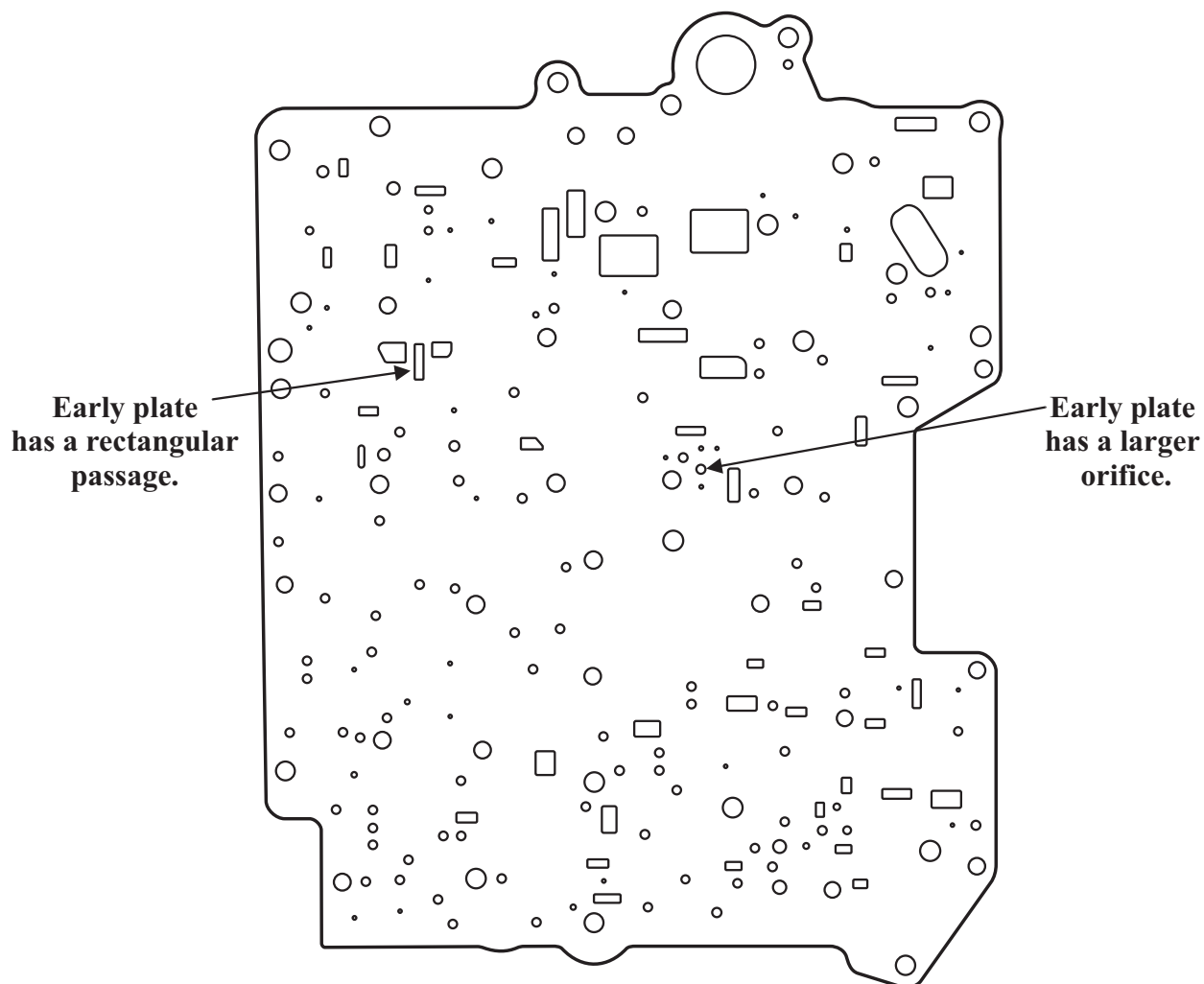


Figure 4

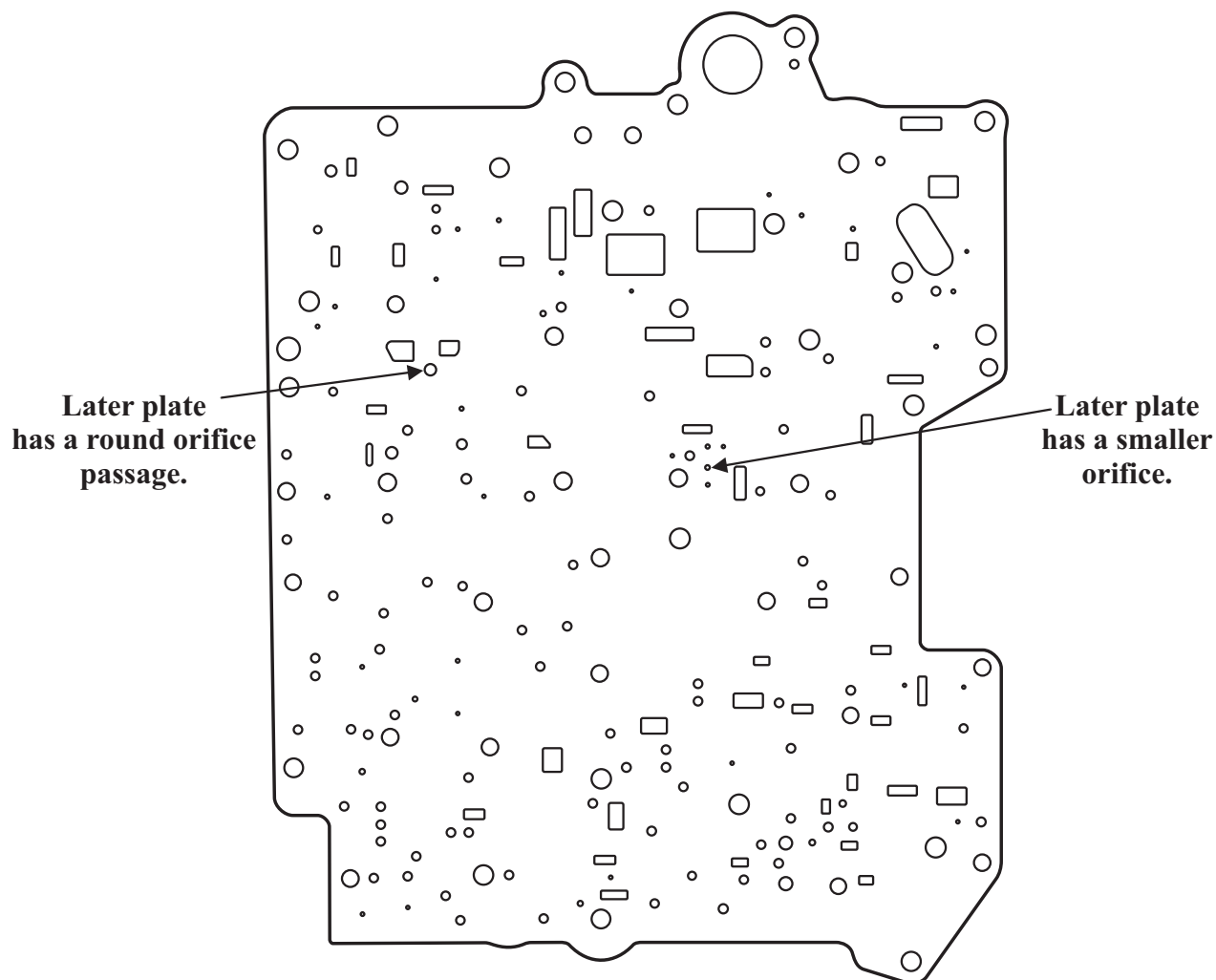
EARLY STYLE SEPARATOR PLATE



**NOTE:
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DIFFERENCES**

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LATER STYLE SEPARATOR PLATE



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