1998 Corvette: Service News: Active Handling

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Corvette Active Handling

This reference manual accompanies the April 1998 *Pro Service News* video. We suggest that you watch the videotape before using the information in this manual. See your Service Manager for the check-out procedure.

The new, optional Active Handling system being offered in the 1998 Corvette will be covered in the upcoming 1998 Corvette Service Manual. In the meantime, here's a preview of how the system works.

Right up front, we need to make this point clear. The Active Handling system is not a magic cure-all that somehow allows a driver to break the laws of physics.

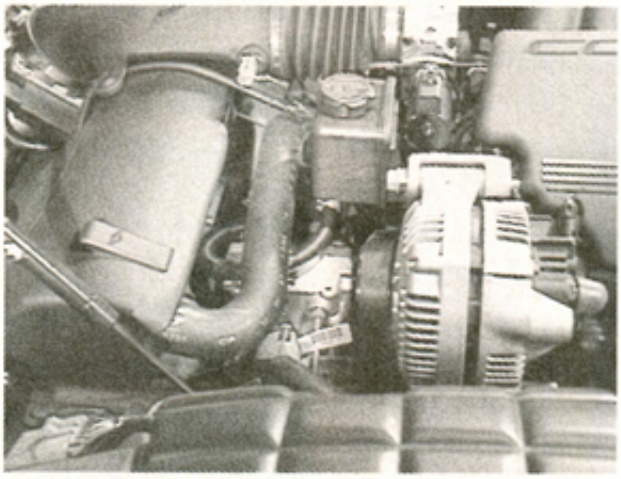
Active Handling is a system that works along with a skilled driver to provide the handling input the driver is asking for. Put another way, it enhances the vehicle's stability.

Active Handling works with a skilled driver.

WHAT'S INSIDE

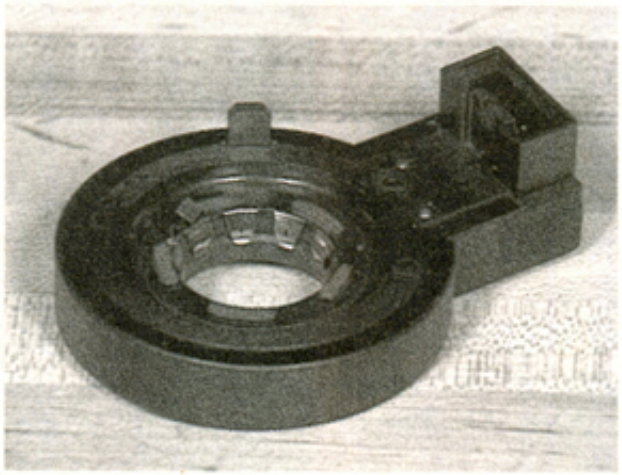
When it comes to servicing the Active Handling system, you'll find that it uses many components you're already familiar with, and adds several new ones.

The electronic brake and Traction Control module, or EBTCM, and the brake pressure modulator valve, or BPMV, have been relocated to the front end of the Corvette for 1998. The control module is shared by the ABS, Traction Control, Magnasteer, and Active Handling systems.



The EBTCM and BPMV have been relocated ahead of the engine for 1998.

The steering wheel position sensor is located on the steering column and is shared with the Magnasteer system.



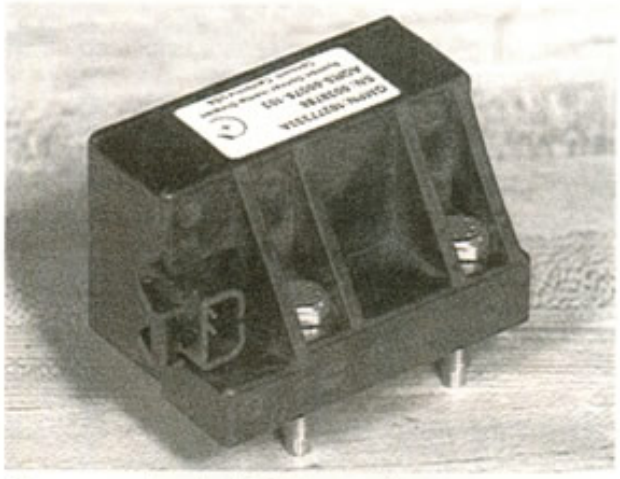
Steering wheel position sensor

Each wheel contains a wheel speed sensor, and these are also part of the ABS system.

Located under the passenger seat is the lateral accelerometer. It measures centrifugal force as the car rounds a turn.

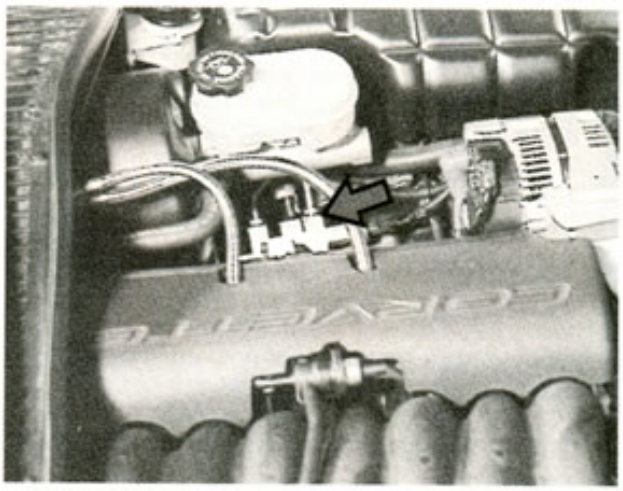
Lateral accelerometer located beneath passenger seat

The yaw rate sensor, located beneath the radio in the central console, measures yaw. This term will be defined later.



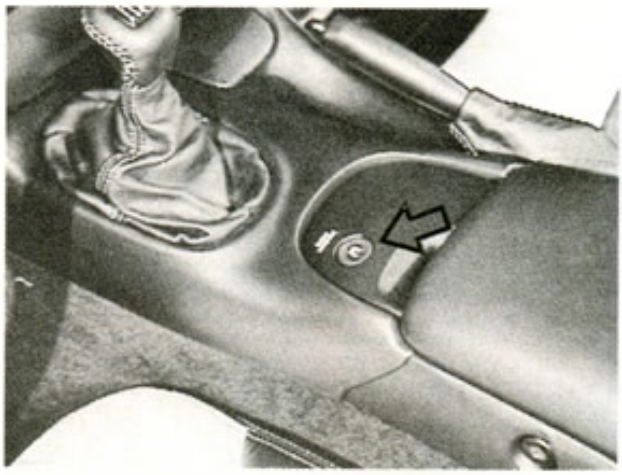
Yaw sensor located inside console

The Active Handling system also uses a unique brake combination valve with a built-in brake pressure sensor.



Combination valve with built-in pressure sensor

Finally, there's a console-mounted on-off switch that also controls the Traction Control system.



Console switch

A brief explanation of several handling terms is appropriate here.

"Yaw" is the pivoting motion around the vertical axis when a vehicle is steered. "Rate of yaw" is expressed as so many degrees per second.

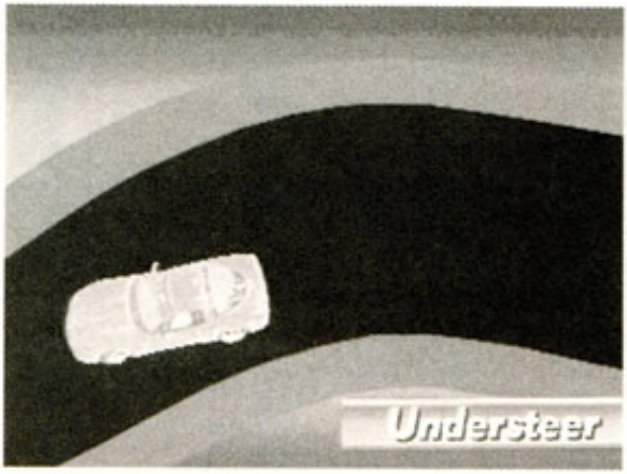
Pivot around vertical axis is called yaw.

When the car is being driven, the Active Handling system monitors the steering wheel position sensor, wheel speed sensors, and the lateral acceleration sensor to calculate the desired yaw rate.

Active Handling system calculates desired yaw rate from sensor inputs.

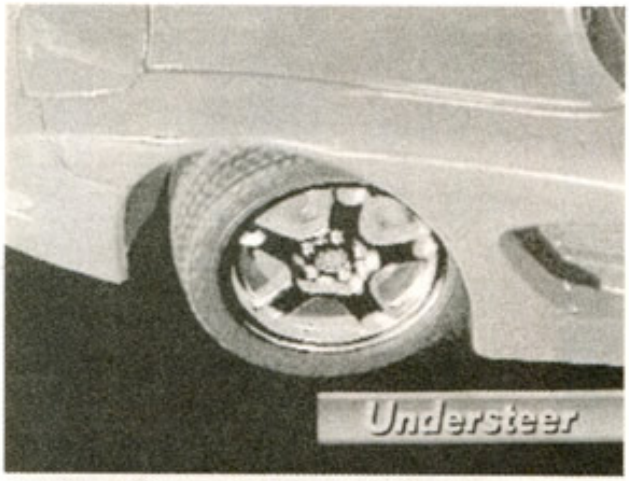
The difference between the desired and actual yaw rates is called the yaw rate error. Active Handling keeps the yaw rate error to a minimum by selectively applying individual wheel brakes as necessary.

A vehicle is said to understeer if its actual yaw is less than the desired rate. NASCAR drivers call this "push," because the front end pushes to the outside of the turn.



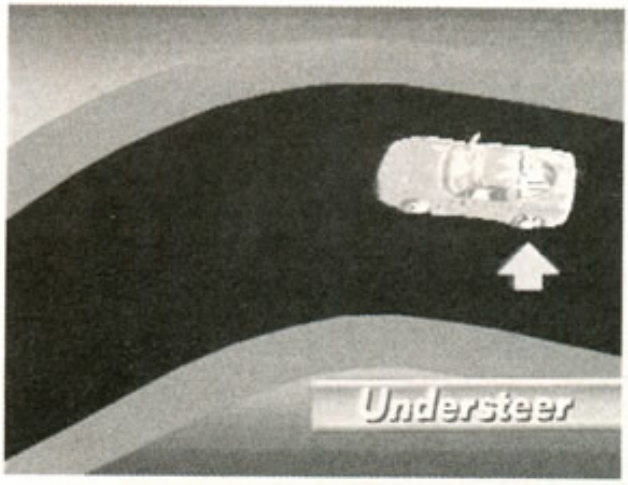
Vehicle experiencing understeer

The driver has to steer even more to counteract the push.



Extra steer is needed to counteract understeer.

If understeer is indicated, the controller commands the inside rear brake to apply.



Active Handling system applies the inside rear brake to counteract understeer.

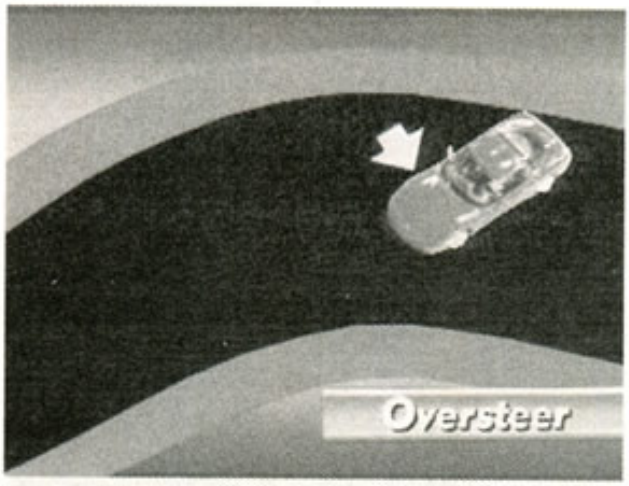
The car is said to oversteer if its actual yaw is greater than the desired rate. Racers call this "loose," meaning that the rear end wants to come around.

Vehicle experiencing oversteer

The driver may have to countersteer to remain on course.

Countersteer

In the case of oversteer, the outside front brake is activated.



Active Handling system applies the outside front brake to counteract oversteer.

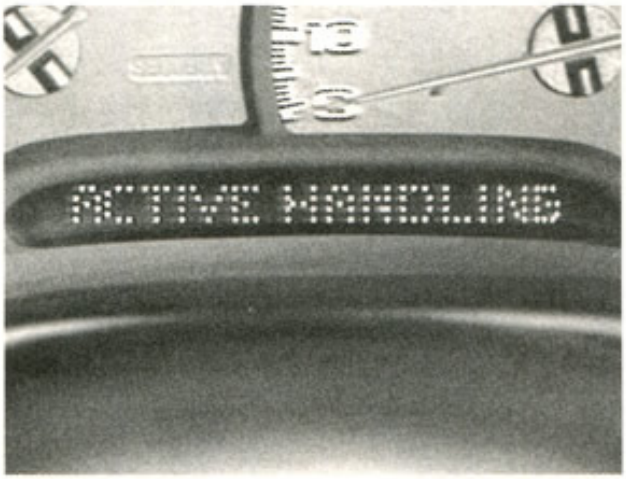
The effect of a single applied brake is something like dragging an oar to steer a boat. It brings the car back to the driver's desired path. Selective brake application is handled by the ABS module.

Earlier we said there's a driver-operated switch on the console. It affects both Active Handling and Traction Control. Both systems are enabled every time the ignition is turned on, so the driver must intentionally disable a system, if it's not needed. The owner's manual explains the various combinations possible.

Driver must intentionally disable the system.

Now for some diagnosis.

In the first example, the Active Handling system functions so transparently that the driver takes the credit for a successful maneuver. During the event, the "Active Handling" message is displayed, but the driver, whose attention is on driving at the time, may not see it.



Active Handling display

The driver may need to experiment in a safe place to be satisfied that the system is functioning properly.

Driver experimenting in safe place

Because Active Handling is integrated with ABS, it's being included in Section 5 — Brakes in the new service manual. There are several unique things to watch out for.

One is the steering wheel position sensor plausibility test. This one tests the system's ability to recognize the straight-ahead position. You'll use your Tech 2 for this 19-step procedure.

The Active Handling system may require you to drive the car to duplicate the conditions that cause a DTC to set. The service manual will contain suggestions on how to do this effectively and safely.

Diagnostic code C1281 is related to a condition called "Sensors Uncorrelated." Be sure to study the service manual on this one, because there are times, particularly when driving aggressively on very slippery roads, that this code could set falsely.

As you can see, the Active Handling system introduces a new level of sophistication to the 1998 Corvette. Servicing it properly calls for careful use of the diagnostic charts in the upcoming service manual. Be sure to study Section 5 — Brakes when the manual becomes available.