

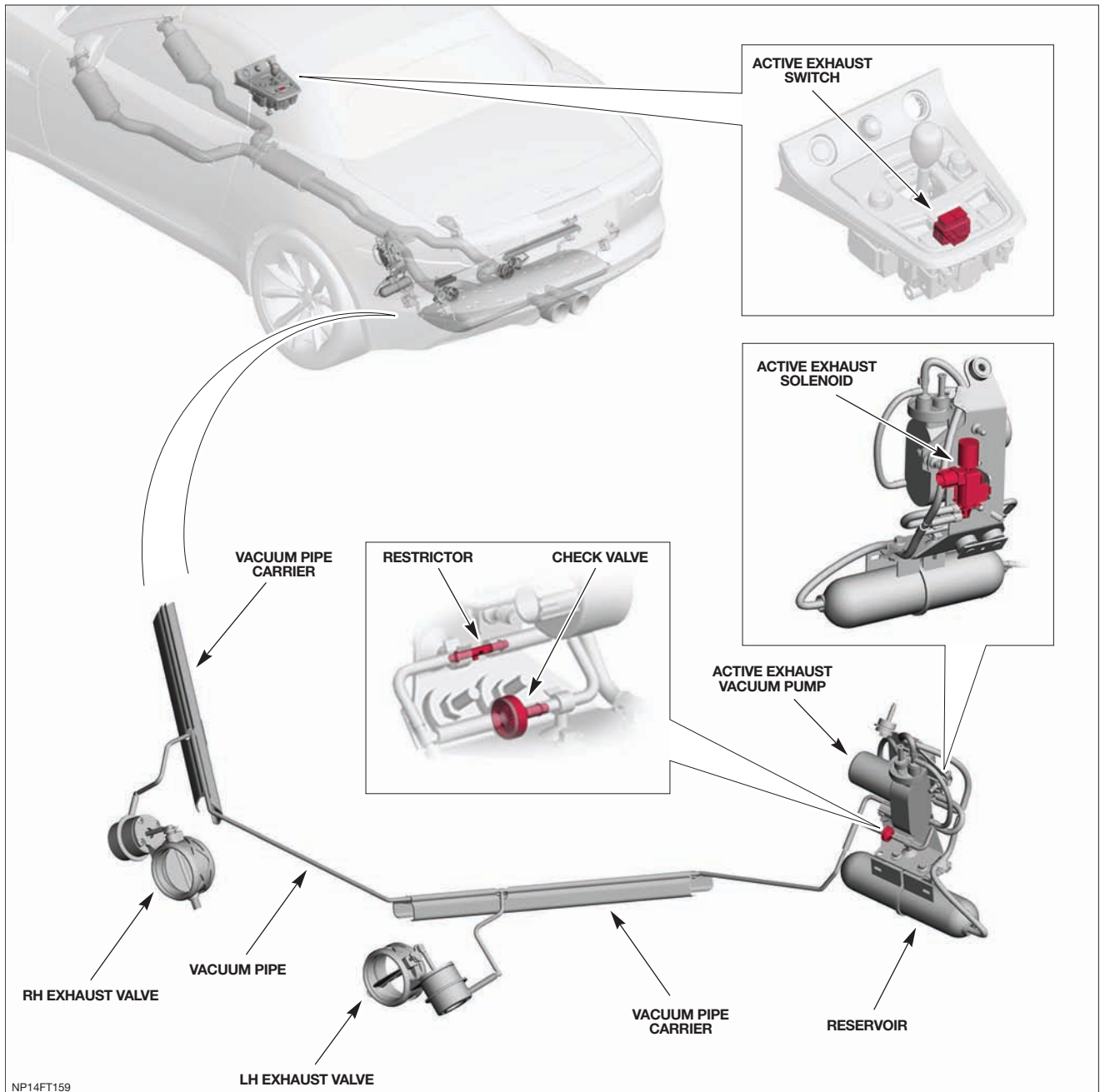
Active Exhaust System Overview

V6 S and V8 S models are equipped with the Active Exhaust System as standard. Electronically controlled bypass valves in the rear section of the exhaust open under hard acceleration, effectively providing a free-flowing straight-through arrangement to produce a louder, richer, more exhilarating exhaust sound during performance driving.

At cruising speeds, the valves will close, retaining a powerful exhaust note with comfortable sound levels.

In addition to the exhaust valves, the Active Exhaust System comprises:

- Vacuum Pump
- Solenoid Valve
- Reservoir
- Related Pipes (which incorporate a restrictor and a check valve)
- Active Exhaust Switch (located on center floor console)



NP14FT159

ACTIVE EXHAUST SYSTEM

Each exhaust valve consists of a normally open plate valve and pneumatic actuator.

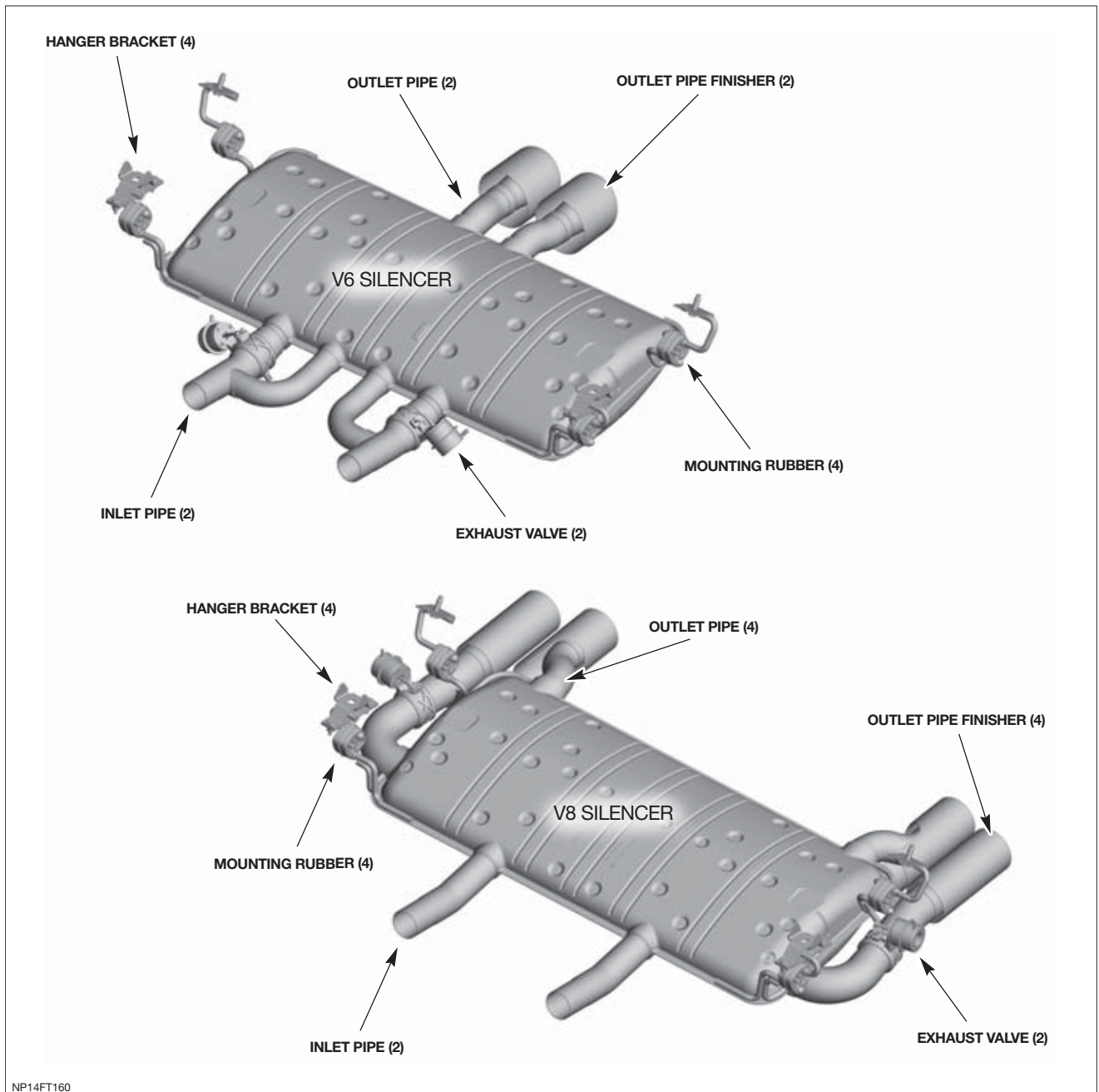
The vacuum pump, solenoid valve, and reservoir are attached to a bracket installed in the left rear wheel housing, behind the wheel arch liner. Plastic pipes are connected between the vacuum pump, reservoir and solenoid valve, and between the solenoid valve and the two exhaust valves.

In the pipes between the solenoid valve and the exhaust valves, a restrictor is installed in parallel with a check valve. The restrictor slows the flow of air through the pipes, to damp the opening of the exhaust valves. The check valve ensures that air flows only through the restrictor when the exhaust valves are opened, but allows the restrictor to be bypassed when the exhaust valves are closed, to give an undamped closing movement.

The solenoid valve controls the operation of the exhaust valves by connecting them to the reservoir and vacuum pump or to atmosphere. Atmospheric pressure enters the solenoid valve through a filter attached to a vent.

Operation of the Active Exhaust System is controlled by the ECM.

Active Exhaust Rear Silencers



NP14FT160

Principles of Operation

The position of the exhaust valves are set by the Engine Control Module (ECM) depending on engine speed, accelerator pedal position, and the mode selected by the active sports exhaust switch or JaguarDrive switchpack.

On vehicle startup the exhaust valves are always open, to enhance the exhaust sound.

When there is no active sports exhaust switch fitted or when the active sports exhaust switch is set to 'Off', the exhaust valve position is closed when driving in mid speed and load conditions, then open for high speed and load conditions. This serves to both enhance the sound quality in the vehicle and reduce back pressure to enhance engine performance.

When the active sports exhaust switch is set to 'On' the exhaust valves open over the majority of the engine speed and load range to further enhance the sports driving experience, only closing where specific engine operating conditions dictate.

If Dynamic Mode is selected on the JaguarDrive switchpack, the active sports exhaust system will automatically choose the 'On' mode. If Dynamic Mode is de-selected, the system resumes the prior state.

When the active exhaust switch is turned 'On', a hard-wired signal is sent to the JaguarDrive switchpack, also located on the center floor console, which in turn transmits that signal on the High Speed CAN BUS network to the ECM.

The ECM will also energize the active exhaust relay in the Central Junction Box 5 seconds after the ignition is switched on. When the relay is energized, it supplies power to the vacuum pump and the solenoid valve. The vacuum pump is connected to ground and runs continuously while the relay is energized, maintaining a depression in the reservoir and pipes to the solenoid valve.

The solenoid valve is connected to ground through the engine control module. When the ECM determines the exhaust valves require closing it connects the solenoid valve to ground.

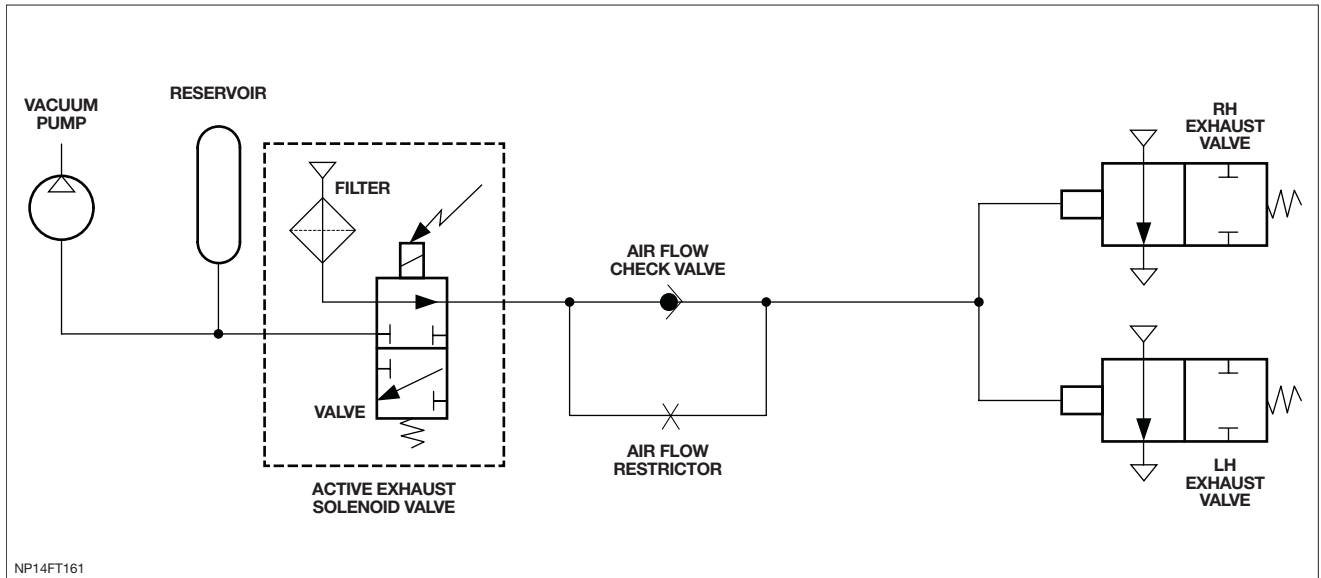
When the solenoid valve energizes it opens the pipe connection from the reservoir and vacuum pump to the exhaust valves; and closes the atmospheric vent. The depression at the reservoir and vacuum pump is then sensed at the exhaust valves, via the check valve, and the exhaust valves close.

When the ECM determines that the exhaust valves require opening, it disconnects the solenoid valve from ground. The solenoid valve de-energizes and closes the pipe connection to the exhaust valves, and opens the atmospheric vent. Atmospheric pressure is then sensed at the exhaust valves, via the restrictor, and the exhaust valves open.

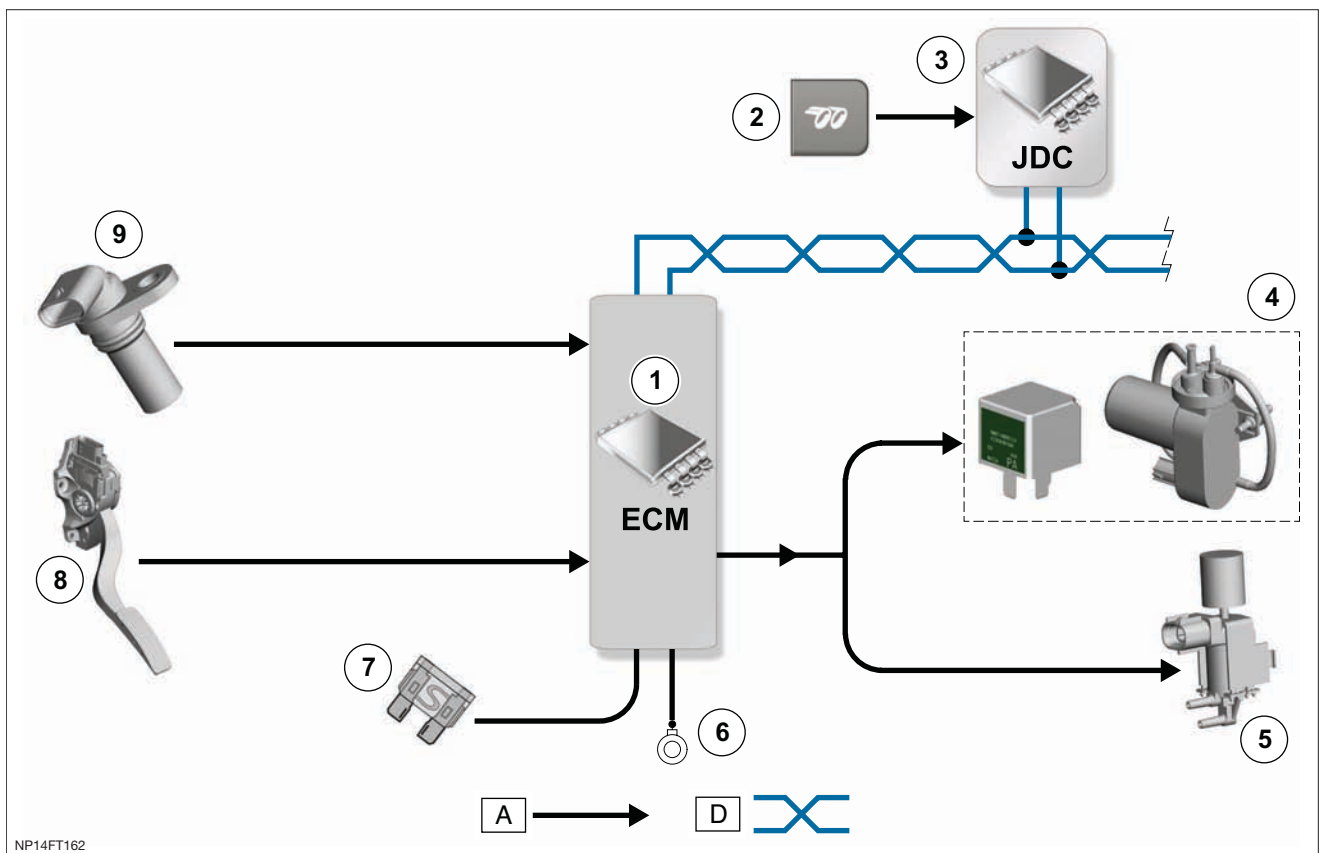
The matrix below provides an overview of system operation, although the system will actively respond to engine load and throttle angle.

Operating Condition	Normal Mode	Loud Mode		Dynamic Mode	
	Exhaust Valve State	Pre-Start	Post-Start	Pre-Start	Post-Start
Start & Idle < 1100rpm	Open / flare	Open / flare	Open / loud	Open / flare	Open / loud
Fast Idle > 1100rpm	Closed / quiet	Open / loud	Open / loud	Open / loud	Open / loud
Blip throttle	Indeterminate	Indeterminate	Open / loud	Indeterminate	Open / loud
Low speed / load	Closed / quiet	—	Open / loud	—	Open / loud
High speed / load	Open / loud	—	Open / loud	—	Open / loud
Ignition off	Default to Normal	Default to Normal	Default to Normal	Default to Normal	Default to Normal

Active Exhaust Vacuum Control Diagram



Active Exhaust Electrical Control Diagram



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|---|-----------------------|---|----------------------------|---|-----------------------------------|
| A | Hardwired | 3 | JaguarDrive Switchpack | 7 | Power Supply |
| D | High Speed CAN | 4 | Active Exhaust Vacuum Pump | 8 | Accelerator Pedal Position Sensor |
| 1 | Engine Control Module | 5 | Active Exhaust Solenoid | 9 | Crankshaft Position Sensor |
| 2 | Active Exhaust Switch | 6 | Ground | | |