

JAGUARDRIVE CONTROL

The 2009 XF uses a 2-stage version of dynamic stability control (DSC) similar to that introduced on 2007MY XK, called JaguarDrive Control. It combines the normal on-off DSC function, which reacts as soon as it detects slip, with TracDSC, which allows a degree more slip before intervening, for a more dynamic driving style. TracDSC also allows a degree of wheel over-spin on deep soft surfaces, which is essential for running with snow chains. The system defaults to normal 'DSC on' with each ignition-on sequence.

JaguarDrive Control offers different dynamic driving modes that interact with the DSC system, which change the characteristics of engine mapping, transmission shifts and brake interventions depending on driving conditions and circumstances. On naturally-aspirated vehicles, the system has DSC and TracDSC modes, and on supercharged vehicles, the system has DSC, TracDSC and Dynamic mode. Dynamic mode allows a more aggressive driving style, all combined with DSC on or off, or Trac DSC on.

The system is controlled by buttons adjacent to the JaguarDrive Selector located on the center console. The buttons allow the selection of one of the following 3 modes:

- Special modes off
- Winter mode
- Dynamic mode (supercharged only)

The instrument cluster will display the selected JaguarDrive Control mode in the message center.

The JaguarDrive Control system uses a combination of a number of vehicle subsystems to achieve the required vehicle characteristics for the mode selected. The following subsystems make up the JaguarDrive Control system:

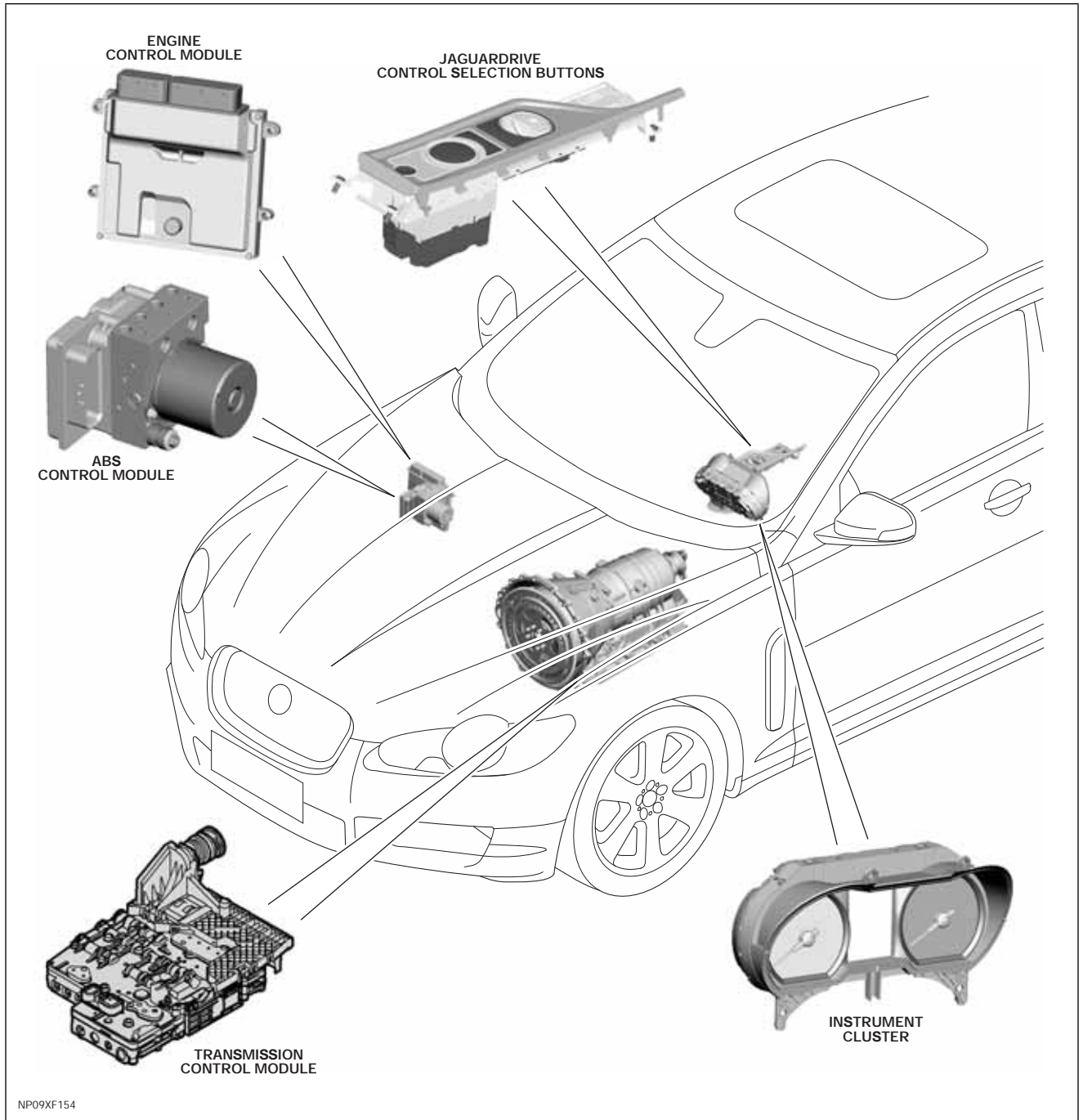
- Engine management system (EMS)
- Automatic transmission
- Brake system

The JaguarDrive Control software is stored in the JaguarDrive Selector module located integrally in the selector itself. The module detects the selection made using the buttons and transmits a signal on the HS CAN bus, which is received by each of the subsystem control modules.

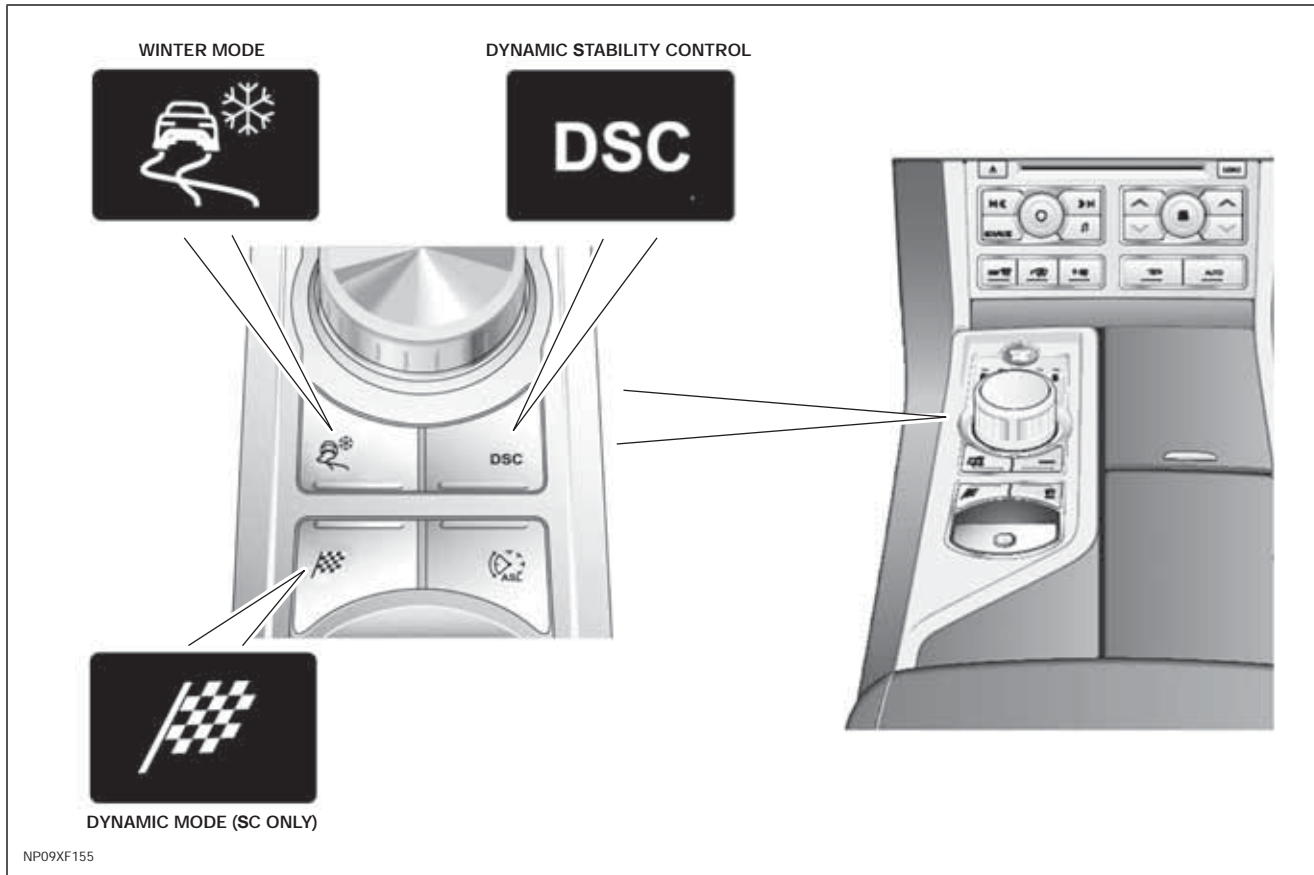
Each of the affected subsystem control modules contain software, which applies the correct operating parameters to their controlled system for the JaguarDrive Control mode selection made.

Each subsystem control module also provides a feedback for the selected mode so that the JaguarDrive Control software can check that all systems have changed to the correct operating parameters.

NOTE: The JaguarDrive Control system is a co-coordinating system only. It CANNOT generate a fault in one of the participating subsystems. All participating subsystems should be FULLY diagnosed before assuming a fault with JaguarDrive Control. Replacing the JaguarDrive Selector module should not be done until all other options have been exhausted.



JaguarDrive Modes



Winter Mode

- Press button briefly (500 ms) to activate/deactivate
- Cannot be active at the same time as dynamic mode (supercharged vehicles only)
- Icon and message appear in the message center confirming activation

When activated:

- Damped throttle response
- Starts off in second gear on level ground

Dynamic Stability Control

- Press button briefly (500 ms) to toggle between TracDSC or DSC
- Message center will temporarily display either TracDSC or DSC ON when button is briefly pressed
- Operational whenever the engine is running, unless it's been manually switched off

When active:

- Controls antilock braking systems, traction control and yaw control of the vehicle

Turning OFF Dynamic Stability Control:

- Manually switched OFF by pressing the button for more than 10 seconds
- 'DSC OFF' displayed in the message center when manually switched off
- Instrument cluster warning indicator will illuminate when DSC has been manually switched OFF
- Manual switch OFF is accompanied by a short warning chime

Dynamic Mode (SV8 Only)

- Press button briefly to activate/deactivate

When active:

- TracDSC is automatically selected
- When Jaguar Sequential Shift is selected, up-shifts are fully controlled by the driver
- Selected gear displayed will change from white to amber as rev limiter is approached
- Cannot be active at the same time as ‘Winter mode’

Subsystem Control

Engine Management System

The EMS varies the accelerator pedal maps to change the amount of torque per percentage of pedal travel. The EMS can also change the accelerator pedal response to control the allowed torque change relative to the speed of pedal travel.

Each driving mode uses a combination of operating parameters for each subsystem. Changing between driving modes initiates a different set of operating characteristics, which will be noticeable to the driver. The driver will notice differences in engine response when, for example, the accelerator pedal is held in a constant position and the driving mode is changed from winter to dynamic, the driver will notice the torque and engine speed increase.

NOTE: The change in torque and engine speed can take approximately 30 seconds and care must be taken not to confuse the JaguarDrive Control system operation with an EMS fault.

Transmission Control

The TCM changes the shift maps for the JaguarDrive Control mode selected. This changes the shift points providing early or late upshifts and downshifts. For example, on slippery surfaces in Winter mode the transmission will select 2nd gear for starting from a standstill on a flat surface to minimize wheel slip.

Anti-lock Braking System Control

The ABS module controls several vehicle functions and adjusts the operating parameters of these functions to optimize the selected JaguarDrive Control mode. Traction control uses different slip/ acceleration thresholds to improve traction and vehicle composure. For example, the system sensitivity is increased on slippery surfaces to reduce wheel spin.

If TracDSC is selected or DSC is switched off, then subsequently the JaguarDrive Control mode is changed, DSC is automatically switched back on (or to TracDSC for Dynamic mode).

The stability control uses different threshold values for the selected mode, reducing the requirement for the driver to change the DSC system mode for optimum performance in various driving scenarios.

Incorrect Mode Usage

Selection of an inappropriate mode is discouraged in the following ways:

- The active mode icon is continually displayed in the instrument cluster message center
- In any special mode, when the ignition has been in the off position continuously for more than 6 hours, the JaguarDrive Control system defaults to the special modes off (DSC on)

Selection of an inappropriate mode for the conditions will not cause immediate damage to the vehicle. Continued use of an inappropriate mode may reduce the life of some components. The driver may notice a different vehicle response, with the engine and transmission responses being different than in the special modes off.

Driver Information

The instrument cluster contains a message center, which displays vehicle information to the driver. The message center contains the JaguarDrive Control mode icons, which display the currently selected mode. If no symbol is displayed, no special mode is selected and the system is in special modes off (DSC on).

Any required changes to the subsystems are also passed to the driver in the form of warning illumination in the instrument cluster or appropriate messages in the message center, DSC off for example.

In Dynamic mode, with the transmission in Sequential shift mode, the gear information is displayed in amber when the appropriate engine speed is reached for optimum sporty change point.

Diagnostics

The JaguarDrive Selector module stores information on detected JaguarDrive Control faults and CAN bus errors, which can be interrogated using the Jaguar approved diagnostic tool. The JaguarDrive Control subsystems and the instrument cluster also store fault information relating to CAN bus errors from the JaguarDrive Selector module.

JaguarDrive Control relies on the correct functionality of the subsystems. If one of the subsystems develops a fault, the JaguarDrive Control system will not function, even though the fault is not in the JaguarDrive Control system. The JaguarDrive Selector module and rotary control should only be investigated if there are no apparent faults in any of the subsystems. If a fault in a subsystem is subsequently corrected, the JaguarDrive Control system will function normally after an ignition on and off cycle.

JaguarDrive Control Subsystem Faults

If a fault occurs in a subsystem, the driver is alerted by the illumination of a warning indicator and/ or an appropriate message for that subsystem in the instrument cluster message center. There will be no warning of a JaguarDrive Control system fault.

When a subsystem fault is present and the driver attempts to select a different JaguarDrive Control mode or at the next ignition on cycle, a message 'SYSTEM FAULT SPECIAL MODES NOT AVAILABLE' will appear in the message center. This implies that the JaguarDrive Control system has a fault, but only because a subsystem fault is preventing its operation. This message will be displayed once per ignition cycle, but is repeated if a further selection is made by the driver using the JaguarDrive Control buttons or at the next ignition on cycle.

It is not possible for the JaguarDrive Control module to cause any fault behavior (warning indicator illumination or message generation) in any of the subsystems. Illumination of a subsystem warning indicator and/or a subsystem related message will never be associated with a JaguarDrive Control module or JaguarDrive Control system fault.

The subsystem control modules can detect a fault with the HS CAN bus signal from the transmission selector module. If a fault in the JaguarDrive Control system is detected, the subsystem control modules will operate in the 'special modes off' setting. The subsystem control modules will record a fault code for a failure of the JaguarDrive Control CAN signal. These faults can be retrieved using the Jaguar approved diagnostic tool and will provide useful information to indicate investigation of the JaguarDrive Selector module or the CAN bus network.

JaguarDrive Control System or Control Module Fault

If a fault occurs in the JaguarDrive Control system, all icon LEDs will be turned off (background illumination will remain on) and pressing of the JaguarDrive Control buttons is ignored. The instrument cluster message center will display a message 'SYSTEM FAULT SPECIAL MODES NOT AVAILABLE' when the fault occurs, if the fault is present and the driver attempts to select a special mode (if the control module is able to do this) or at the next ignition on cycle.

If a failure of a JaguarDrive Control icon LED occurs, the JaguarDrive Control system will still function. Any selected special mode will default to 'special modes off' at every ignition on cycle.

The JaguarDrive Control buttons, control module and JaguarDrive Selector module are an integral unit. If a fault occurs in either component, the whole unit requires replacement; however, this is extremely unlikely.

CAN Bus Faults

If a CAN bus fault exists and prevents JaguarDrive Control system operation, all of the JaguarDrive Control icon LEDs will be illuminated and rotation pressing of the JaguarDrive Control buttons is ignored.

If the instrument cluster does not receive a JaguarDrive Control system CAN bus message from the JaguarDrive Control module, the message 'SYSTEM FAULT SPECIAL MODES NOT AVAILABLE' will be displayed when the fault occurs and will be repeated at every ignition on cycle.