

Силовой агрегат — Управление ускорением и скоростью

Land Rover Discovery Sport (L550) · Руководство по ремонту

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Содержание

1. Acceleration и скорость управление
2. Accelerator педаль / снятие и установка
3. Скорость управление
4. Скорость управление / описание и работа
5. Скорость управление выключатели
6. Standard скорость управление
7. Адаптивный скорость управление
8. Адаптивный скорость управление тормоз система Functions
9. Скорость управление датчик / снятие и установка
10. Скорость управление датчик регулировка / общие процедуры
11. Скорость управление скорость управление / диагностика и проверка
12. Скорость управление выключатель / снятие и установка

Acceleration и скорость управление

Acceleration and Speed Control

- Accelerator Pedal (G1350481) / Removal and Installation
- Speed Control

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PowertrainAccelerator Pedal (G1350481) / Removal and Installation

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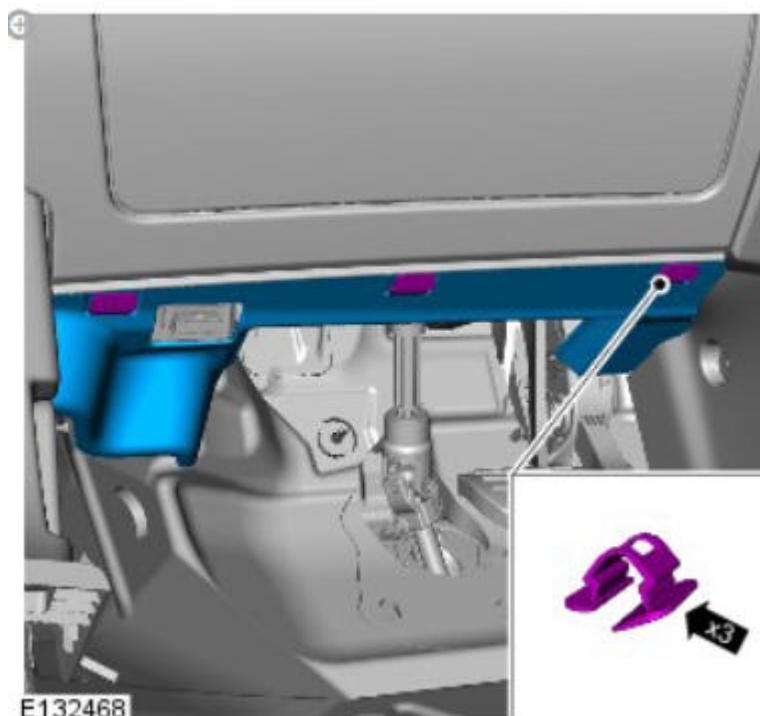
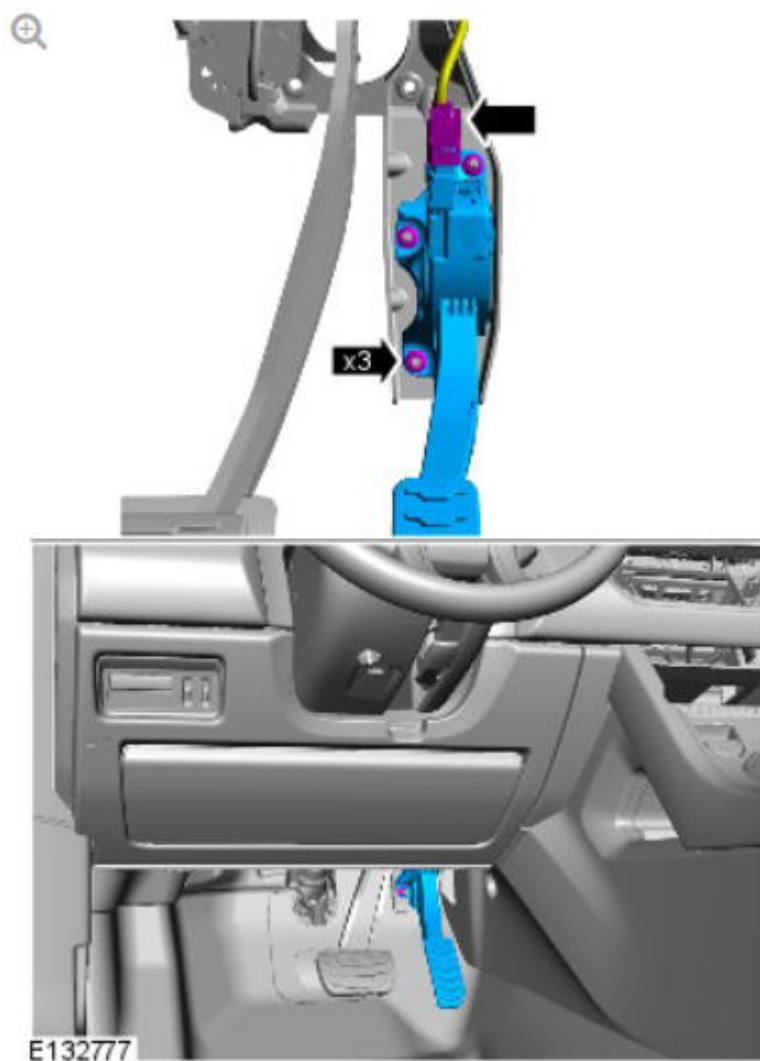
Accelerator педаль / снятие и установка

Accelerator Pedal (G1350481) / Removal and Installation

REMOVAL

NOTES:

- Removal steps in this procedure may contain installation details.
- LH illustration shown, RH is similar.



Torque: 10 Nm

INSTALLATION

1. To install, reverse the removal procedure.

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Acceleration and Speed ControlSpeed Control

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Скорость управление

Speed Control

- Speed Control / Description and operation
- Speed Control Switches
- Standard Speed Control
- Adaptive Speed Control
- Adaptive Speed Control Brake System Functions
- Speed Control Sensor (G1780348) / Removal and Installation
- Speed Control Sensor Adjustment (G1780345) / General Procedures
- Speed Control Speed Control / Diagnosis and Testing
- Speed Control Switch (G1780347) / Removal and Installation

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Accelerator Pedal (G1350481) / Removal and InstallationSpeed Control / Description and operation

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Скорость управление / описание и работа

Speed Control / Description and operation

Speed Control Actuator (G1347794) Removal and Installation

REMOVAL

Refer to: Accelerator Pedal (310-02 Acceleration Control, Removal and Installation).

INSTALLATION

To install, reverse the removal procedure.

Speed Control Deactivator Switch (G1661109) Removal and Installation

REMOVAL

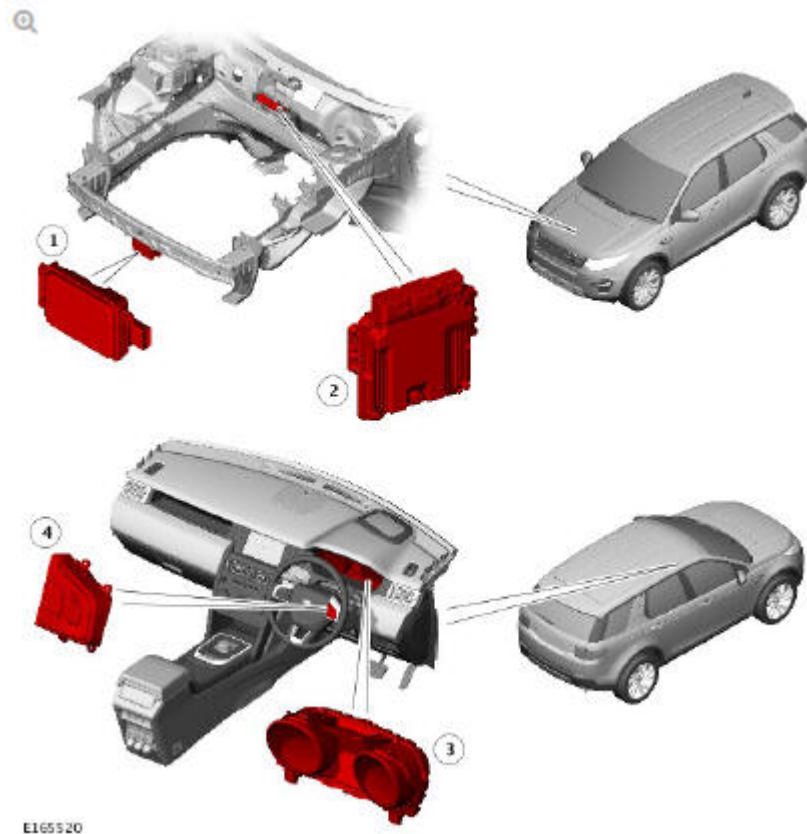
Refer to: Stoplamp Switch (417-01 Exterior Lighting, Removal and Installation).

INSTALLATION

1. Refer to: Stoplamp Switch (417-01 Exterior Lighting, Removal and Installation).

Speed Control Description and operation

COMPONENT LOCATION



1. Adaptive Speed Control Module (ASCM) - only vehicle with adaptive speed control
2. Engine Control Module (ECM)
3. Instrument Cluster (IC)
4. Right steering wheel switchpack

OVERVIEW

There are three variants of speed control available; a standard speed control system, an adaptive speed control system and an Automatic Speed Limiter (ASL) system.

The standard speed control system maintains a set speed selected by the driver until operation is suspended or cancelled by a further input from the driver and is controlled by the Engine Control Module (ECM).

The adaptive speed control system includes the same functionality as the standard system, and has the following additional functions:

- Follow Mode: Automatically reduces vehicle speed, to less than the set speed, in order to maintain a selected time gap behind a slower moving vehicle, then automatically accelerate the vehicle back to the set speed, once the way ahead is clear.
- Queue Assist: Stops the vehicle a set distance behind the vehicle in front if it comes to a halt. When the vehicle in front moves away, a brief press of the accelerator pedal resumes adaptive speed control operation.
- Forward alert: Alert the driver when the vehicle comes within a given time gap of a slower moving vehicle.
- Intelligent emergency braking (IEB): Applies the brakes to reduce the impact velocity if a collision is unavoidable.

The ASL system restricts the vehicle speed to an adjustable preset maximum, and will prevent the vehicle exceeding that speed.

Automatic Speed Limiter (ASL)

The ASL system is activated via an 'LIM' switch on the right steering wheel switchpack. The system speed is set using the speed control SET '+' and '-' switches. The selected speed is displayed in the instrument cluster. The set speed can be adjusted at any time using the speed control '+' or '-' switches. ASL can be suspended by pressing the 'CANCEL' switch. ASL can be resumed using the 'RESUME' switch, at any vehicle speed from stationary up to 30 km/h (19 mph) above the previously selected limit speed. If the vehicle speed is too high to resume ASL operation, a message will be displayed in the instrument cluster.

The ASL system allows full driver control of the vehicle speed up to the set speed. The speed limiter will restrict the vehicle speed and will not allow the speed to go over the set limit. If kickdown is activated (by fully depressing the accelerator pedal), ASL will be temporarily overridden.

This system operates in exclusivity with the standard speed control system and the adaptive speed control system, only one of these systems can be active at any one time.

On a vehicle fitted with the ASL system, the speed control system that was in use when the ignition was turned off (ignition mode 0) is saved and enabled again when the ignition is turned back on (ignition mode 6).

However the speed settings are not remembered and will have to be set again with the SET '+' switch.

SPEED CONTROL

The speed control systems have the following components:

- SET '+' switch
- '-' switch
- RESUME switch
- CANCEL switch

The speed control system also uses:

- Engine Control Module (ECM)
- Right steering wheel switchpack time gap increase and decrease control switches (adaptive speed control)
- Brake pedal switch
- Anti-lock Brake System (ABS) control module (adaptive speed control)
- Accelerator Pedal Position (APP) sensor
- Clutch pedal position sensor (manual transmission only)
- Instrument Cluster (IC)
- Transmission Control Switch (TCS)
- Transmission Control Module (TCM)
- Terrain Response switchpack (All Wheel Drive (AWD) vehicles).

ADAPTIVE SPEED CONTROL

The adaptive speed control system uses an Adaptive Speed Control Module (ASCM) to track targets ahead. When a moving target vehicle ahead is considered to be in the host vehicle's path, the adaptive speed control system will monitor the time gap between the host and the target vehicle.

When a target vehicle in front is travelling at a slower speed than the host vehicle's set speed, the host vehicle's speed will be lowered by the adaptive speed control system. The adaptive speed control system slows the host vehicle speed by requesting a slower vehicle speed from the engine and/or applying the brakes, until the correct gap between the host and target vehicle is attained. When the slower target vehicle moves into an adjacent lane or accelerates, then the host vehicle will accelerate back to the set speed. The driver can choose between four gap settings. These gaps are time gaps and not fixed distance gaps to the

slower vehicle in front. When engaging the adaptive speed control or changing the time gap it will be temporarily displayed in the Instrument Cluster (IC).

The system will detect but not react to the following:

- Vehicles in the oncoming lane
- Stationary vehicles (the system will react to stationary objects under certain conditions)
- Pedestrians.

To activate the adaptive speed control the vehicle speed must be at a minimum of 32 km/h (20 mph) and the maximum set speed is the minimum of the following two; 200 km/h (124 mph) and the vehicle maximum speed minus 10 km/h (6 mph). The adaptive speed control (including queue assist) will remain active down to stationary. With adaptive speed control (including queue assist) the driver can resume down to 10 km/h (6 mph). Adaptive speed control only functions when a set speed is entered in the system using the SET '+' switch on the right steering wheel switchpack. The adaptive speed control system only intervenes with the set speed when it detects a target vehicle, and then only if the minimum time gap is breached or is about to be breached.

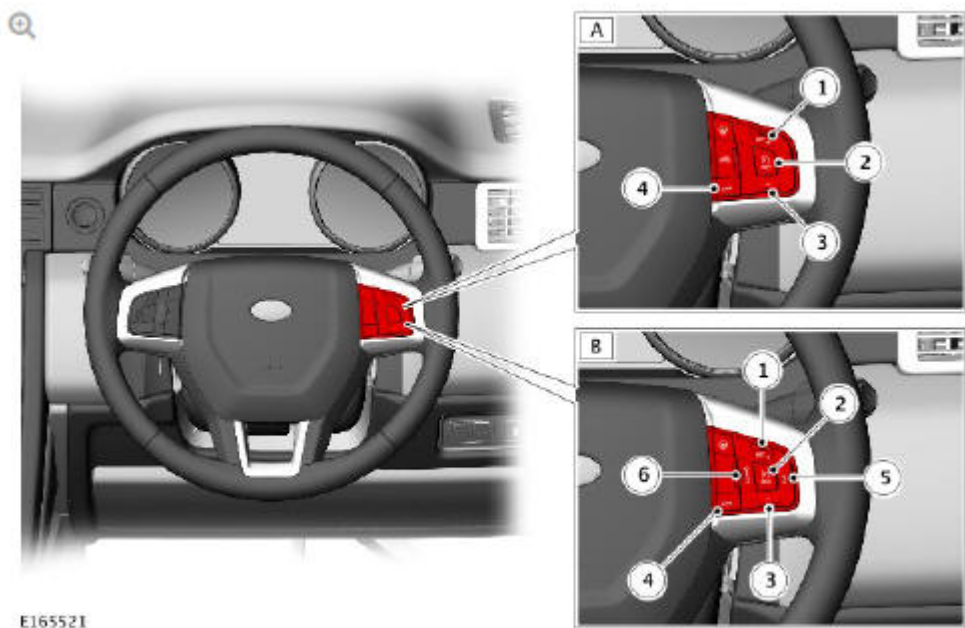
It is important to note that the system is intended for use in limited driving situations, does not remove control and responsibility from the driver, and at all times can be quickly overridden. The adaptive speed control system is not a collision warning system and will under certain conditions not react to stationary objects.

COMPONENT DESCRIPTION

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Speed ControlSpeed Control Switches	
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Скорость управление выключатели

Speed Control Switches



- A. Vehicles with standard speed control
 - B. Vehicles with adaptive speed control
1. Set speed '+' switch (Engage speed control/increase speed)
 2. Resume 'RES' (Resume previous set speed)
 3. Set speed '-' switch (Decrease speed)
 4. Cancel 'CAN' (Disengage speed control)
 5. Time gap decrease switch (Vehicles with adaptive speed control only)
 6. Time gap increase switch (Vehicles with adaptive speed control only)

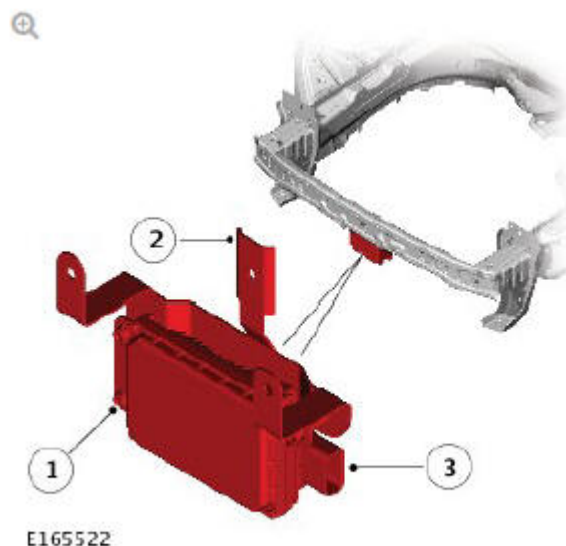
The speed control switches are located on the right steering wheel switchpack. The switches are connected via fly leads to the clockspring. The speed control switches are resistive ladder type switches which vary the resistance of a 5 volt signal supplied from the Central Junction Box (CJB).

The switch information is transmitted on the Local Interconnect Network (LIN) bus by the Steering Wheel Module (SWM) to the Body Control Module (BCM), the BCM then transmits the data on the High Speed (HS) Controller Area Network (CAN) powertrain systems bus for use by the Engine Control Module (ECM) and to the Adaptive Speed Control Module (ASCM) on vehicles with adaptive speed control.

The adaptive speed control switches are the same as used for standard speed control, with the addition of two time gap switches. The time gap switches allow the driver to adjust the follow mode and forward alert functions to one of four pre-set time gaps (gap 1 = 0.8 second; gap 2 = 1.3 seconds; gap 3 = 1.8 seconds; gap 4 = 2.3 seconds). The selected time gap is displayed in the message center when the time gap switches are operated.

When adaptive speed control is engaged, the switches adjust the follow mode time gap. When adaptive speed control is disengaged, the switches adjust the forward alert time gap (provided forward alert is enabled in the instrument cluster menu). The follow mode function defaults to the gap 3 setting each time the ignition is switched on. The forward alert function recalls the last selected time gap when the ignition is switched on.

ADAPTIVE SPEED CONTROL MODULE (ASCM)



1. Adjuster screw
2. Mounting bracket
3. Adaptive Speed Control Module (ASCM)

The ASCM is mounted on a bracket which is attached with three screws to the front armature.

The ASCM contains a forward looking radar transceiver together with related controlling hardware and software. A HS CAN Powertrain bus connection allows the ASCM to communicate with other system control modules. Power supplies to the ASCM are from the ignition relays in the Battery Junction Box (BJB) and the Central Junction Box (CJB).

The ASCM is active whenever the ignition is on, even if speed control is not engaged, in order to operate the forward alert, advanced emergency brake assist (AEBA) and intelligent emergency braking (IEB) functions. With the ignition on, the ASCM is electrically powered, but no radar transmissions are emitted until the vehicle is in motion.

The ASCM transmits a radar beam forward of the vehicle and detects the returning signals reflected off other vehicles and objects ahead. The radar beam is electronically scanned at a rate of 20 sweeps/second across a total arc of 20° centered on the longitudinal axis of the vehicle. The radar operates at millimetric wavelengths (76 - 77 GHz) and transmits a frequency modulated continuous wave signal at a relatively low power level (no high power pulses). The control module detects the range, relative velocity and angle of objects within the scanned arc for up to a distance of approximately 130 meters (426.5 feet).

The ASCM compares vehicle speed data from the Anti-lock Brake System (ABS) control module with the relative speed of an external object as detected by the radar to determine if the object is stationary or not. If tires are fitted which are different in diameter from those specified for the vehicle, the vehicle speed, calculated by the ABS control module, will not be the true road speed. This situation may cause stationary objects to be falsely identified as moving vehicles and result in automatic deceleration on a clear road.

The ASCM continuously monitors both moving vehicles and stationary objects to determine if it can 'see' normally. If the ASCM can detect only a few objects, because it is physically blocked (for example by an accumulation of snow or mud on the lower grill of the front bumper, or an incorrectly located licence plate), or there are few roadside objects or other vehicles in the area, it may determine that it is blocked. The ASCM then inhibits adaptive speed control and records a Diagnostic Trouble code (DTC). The system will reset after an ignition cycle. In this case the ASCM does not have a fault and should not be replaced.

If the ASCM is replaced in service it must be mechanically aligned vertically.

Horizontal alignment is achieved by putting the ASCM into service mode using approved Land Rover diagnostic equipment. The vehicle then needs to be driven for a short period while the ASCM performs a calibration routine. Calibration is complete when the follow mode warning indicator in the Instrument Cluster (IC) stops flashing.

For additional information, refer to: Speed Control Sensor Adjustment (310- 03 Speed Control, General Procedures).

OPERATION

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Speed Control / Description and operationStandard Speed Control

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Standard скорость управление

Standard Speed Control

The speed control system is integrated with the engine management system and uses fueling intervention to automatically maintain a set vehicle speed.

Once engaged, the system can also be used to accelerate the vehicle without using the accelerator pedal. The speed control system comprises the following main components:

- '+' and '-' (SET/increase speed and decrease speed) switches - located on right steering wheel switchpack
- 'RES' (resume) switch - located on right steering wheel switchpack
- 'CAN' (cancel) switch - located on right steering wheel switchpack
- Clockspring
- Speed control warning indicator in Instrument cluster (IC).

The speed control system also uses inputs from the brake pedal switch, clutch pedal position sensor (manual transmission only), the Accelerator Pedal Position (APP) sensor, the Engine Control Module (ECM) and the Antilock Brake system (ABS) control module.

The speed control is operated by the driver using only the switches on the right steering wheel switchpack. When speed control is active, the ECM regulates the output signals to the fuel injectors to adjust the fuel supply as required to maintain the set speed.

During speed control operation, the ECM controls vehicle speed by adjusting fuel injection duration and timing. When the accelerator pedal is pressed with speed control active, the ECM outputs a calculated throttle angle signal in place of the actual throttle angle signals produced by the APP sensor. The calculated throttle angle is derived from fuel demand based on the torque required to overcome the rolling resistance (vehicle motion drag).

The minimum set speed for speed control is 32 km/h (20 mph). Speed control is automatically suspended if the following conditions apply:

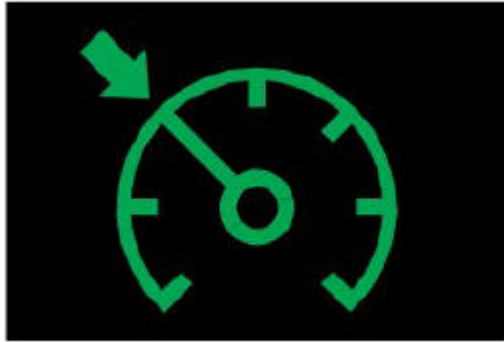
- Vehicle speed falls below 24 km/h (15 mph)
- The brake pedal is pressed
- The clutch pedal is pressed (manual transmission only)
- The cancel button is pressed
- Neutral, park or reverse gear is selected
- The Electric Park Brake (EPB) is applied
- The difference between actual speed and the set speed is too great
- If the accelerator pedal is used to accelerate beyond the set speed for too long (more than 5 minutes)
- System error causes shut-off
- Hill Descent Control (HDC) is selected
- All Terrain Progress Control (ATPC) is selected
- Terrain Response program 'Sand', 'Mud' or 'Rock Crawl' is selected.

There are four standard speed control switches located on the right steering wheel switchpack:

- Set speed '+' (increase speed) switch
- Decrease speed '-' switch
- Cancel 'CAN' switch
- Resume 'RES' switch.

The standard speed control switches are located on the right steering wheel switchpack. The switches are resistive ladder type switches which vary the resistance of a voltage signal sent to them. The resistive ladder is wired to the Steering Wheel Module (SWM) within the right steering wheel switchpack. The SWM is a Local Interconnect Network (LIN) node, which transmits the data to the Body Control Module (BCM) which passes the data onto the High Speed (HS) Controller Area Network (CAN) Powertrain systems bus. In the event of the ECM logging a speed control switch fault Diagnostic Trouble Code (DTC), fault finding should start at the right steering wheel switchpack and clockspring. The ECM diagnostic detects that the right steering wheel switchpack has not provided an updated live counter.

Speed Control Warning indicator



The speed control warning indicator illuminates when speed control is engaged.

Engage Speed Control

Speed control is engaged by pressing the SET '+' switch. On receipt of the switch input, the ECM adopts the current vehicle speed as the speed control set speed. When speed control is engaged, the Instrument Cluster (IC) illuminates the speed control warning indicator and the set speed is displayed in the message center.

Once engaged the speed can be increased by one of 3 methods:

- Press and hold the SET '+' switch which will cause the vehicle to accelerate. When the switch is released the attained speed will be set as the cruise speed
- Repeatedly pressing the SET '+' switch. Each press increases the vehicle speed by 2 km/h (1 mph)
- Use the accelerator pedal to increase the vehicle speed. Once the required speed is reached, a single press of the SET '+' switch will set the cruise speed.

Speed control adjustment is limited around the current vehicle speed. This means speed adjustment will not occur when the 'RES' switch is pressed or if the vehicle speed is noticeably different to set speed. This is noticeable when resuming speed control and a large difference exists between the set speed and the current speed. The driver can set a new speed, but cannot adjust the old speed.

Reduce Cruising Speed

The set speed can be reduced by pressing and holding the decrease speed '-' switch until the required speed is reached. When the switch is released the speed is reset at that value. The set speed can be reduced incrementally by pressing and releasing the decrease speed '-' switch. Each press will reduce the speed by 2 km/h (1 mph).

Suspend Speed Control

Suspending speed control means speed control has been deactivated without loss of the memory speed. In all suspend events, the memory speed is retained. Speed control can be suspended in a number of ways, as described previously in this section.

A single press of the resume 'RES' switch will resume speed control at the previously set speed.

NOTE:

In the event that a memory speed has been lost during a driving cycle, confirm with the customer if the "Cruise Not Available" message was observed. Loss of memory speed implies a fault has occurred. The message 'Cruise Not Available' may only be displayed on demand for some errors, so speed control needs to be requested via the SET '+' switch to drive the message.

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Адаптивный скорость управление

Adaptive Speed Control

WARNING:

The adaptive speed control system is not a collision warning or avoidance system. At all times the driver must be prepared to intervene to control the vehicle speed.

Adaptive speed control operation is similar to the standard speed control system for engaging, suspending and resuming speed control. The main differences between the two systems is that adaptive speed control remains engaged below 24 km/h (15 mph) and uses the brakes to slow the vehicle, to a halt if necessary.

If adaptive speed control is suspended by pressing the cancel 'CAN' switch, the brake pedal, it can be re-engaged by pressing the resume 'RES' switch once the vehicle speed is above 10 km/h (6 mph).

The adaptive speed control system utilizes the following main components:

- Adaptive Speed Control Module (ASCM)
- Right steering wheel switchpack switches
- ECM
- Electric throttle
- Fuel Injectors
- ABS control module and Hydraulic Control Unit (HCU)
- Adaptive speed control warning indicator (in the instrument cluster)
- Forward alert warning indicator.

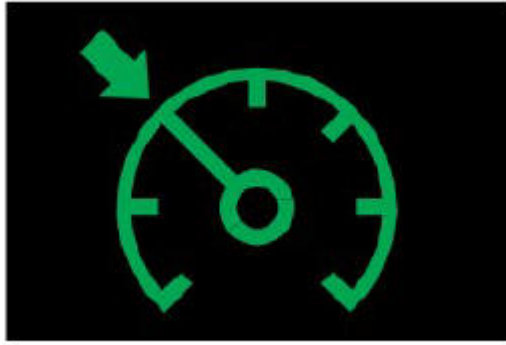
The adaptive speed control system uses a forward looking radar sensor (integrated in the ASCM) to scan the road ahead, to detect objects that are moving in the same lane. When a target is identified, the adaptive speed control system will monitor the time gap between itself and the target vehicle. When closing in and the adaptive speed control system predicts that the time gap will fall below the set driver selected level, the adaptive speed control system will intervene, slowing the vehicle by backing off the throttle and/or applying the brakes, until the correct gap is attained. The driver can choose between four gap settings, 0.8 1.3 1.8 and 2.3 seconds.

Adaptive speed control is active when the vehicle is moving. Adaptive speed control only functions when a set speed is entered via the operation of the SET '+' switch. The adaptive speed control system only intervenes with the set speed when it detects a slower target vehicle in the host vehicle's path, and then only if it predicts the time gap will be breached.

The ECM, electric throttle and fuel injection control are unchanged from those used for the standard speed control system.

With the ignition ON (ignition mode 6), the ASCM is powered up but no radar transmissions are emitted until the vehicle is in motion.

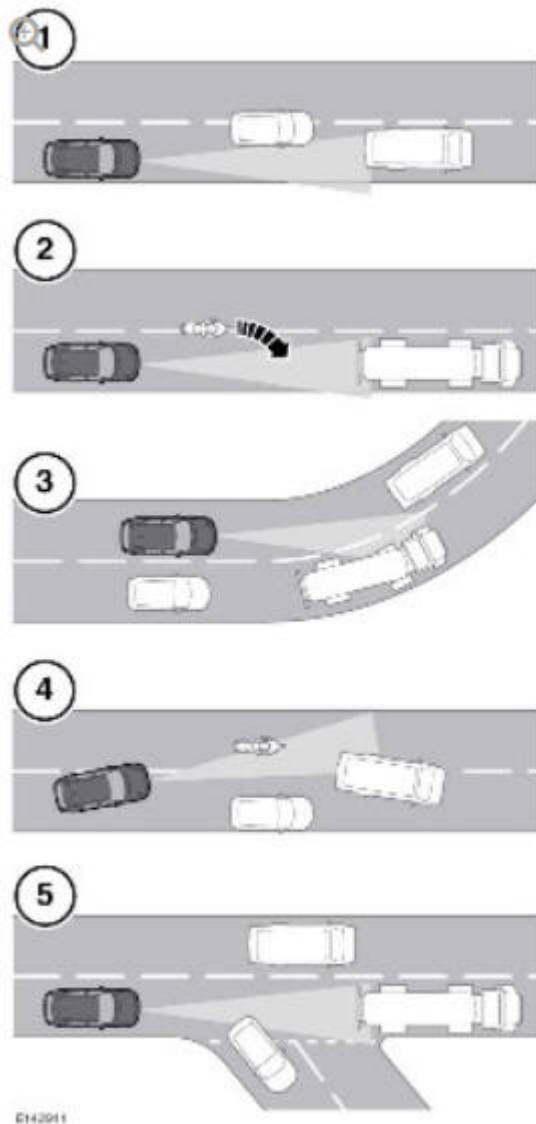
Speed Control Warning indicator



The speed control warning indicator illuminates when standard speed control or adaptive speed control is engaged.

Adaptive Speed Control System Restrictions

The adaptive speed control system is only intended to provide enhanced speed control in certain restricted conditions. The following illustration shows circumstances where the adaptive speed control system may brake late or unexpectedly. The driver is required to intervene in these situations.



1. Driving on a different line to the vehicle in front
2. Vehicles that merge into the same lane are only detected once they have moved fully into the lane

3. On bends in the road there can be issues with detection of the vehicle in front when going into and coming out of a bend
4. Moving around a stationary vehicle may cause uncertainty regarding which vehicle is being followed
5. A vehicle in front moving out of your lane may cause uncertainty regarding which vehicle is being followed

On the approach to, or exit from a bend, a target vehicle may be lost or a new target acquired as vehicles ahead change their angular position with respect to the ASCM. On a straight road, if the sensing vehicle is in follow mode below its selected set speed, losing the target vehicle will cause the sensing vehicle to accelerate to this set speed. This acceleration is undesirable either on a bend in the road, or entering a bend in the road when the target is suddenly lost, and in this situation the system inhibits the resumption of the set speed.

Follow Mode

A set speed is selected and this speed is maintained until a slower vehicle is encountered in the lane ahead. When the vehicle ahead comes within the effective range of the ASCM radar, the system identifies it as a target vehicle. To indicate that the system is in follow mode, the follow mode warning indicator illuminates in the IC and the current time gap setting is displayed in the message center. When the distance between the two vehicles closes to the set time gap, the adaptive speed control system reduces engine speed and, if necessary, applies the brakes to maintain the set time gap.

The follow mode can be disabled by pressing and holding the time gap decrease switch on the right steering wheel switchpack, until the follow mode OFF icon is displayed in the Message center.

Follow Mode Warning Indicator



Automatic braking is limited to approximately 30% of full pressure (0.3 G deceleration) and is intended to provide a smooth, gradual deceleration in follow mode conditions.

Follow mode is effectively a closed loop system. If several vehicles are ahead, the closest vehicle is chosen as the target to follow. If the target vehicle moves out of the ASCM radar range, or if either vehicle changes lane, the system exits follow mode and extinguishes the follow mode warning indicator. The adaptive speed control system then increases vehicle speed back to the original set speed.

Queue Assist

When adaptive speed control is engaged, if the target vehicle comes to a halt, the ASCM reduces engine speed and applies the brakes to halt the sensing vehicle and suspends speed control operation. The ASCM also applies the Electric Park Brake (EPB) if one of the following occurs:

- Adaptive speed control is disengaged with the cancel 'CAN' switch

- The brake pedal is pressed
- Neutral gear is selected
- Hill Descent Control (HDC) is selected
- Automatic Speed Limiter (ASL) is selected
- The vehicle is stationary for more than 3 minutes
- Driver exit is detected
- A system fault is detected.

When the target vehicle moves away, pressing the accelerator pedal for a minimum of 0.2 second (on the flat ground) resumes speed control operation. The sensing vehicle then follows the target vehicle in follow mode or until it stops again, or, if it can no longer detect a target, accelerates back up to the set speed.

Forward Alert

If an object is detected close ahead, a warning tone will be emitted from the IC and a message will be displayed in the message center. The brakes will not be applied.

The forward alert system is active when the warning indicator in the IC is illuminated. Forward alert does not initiate any action, the driver must take the appropriate action when the message is displayed in the message center. The system monitors driver intervention and may not issue the warning if the driver has taken the appropriate action (braking, steering or indicating) early enough.

The sensitivity of the warning can be changed using the gap increase and decrease switches when the adaptive cruise control is not engaged.

Confirmation of the gap change is given in the message center.

Forward Alert Indicator



The forward alert warning indicator illuminates if forward alert is enabled in the IC menu.

NOTE:

This system is intended as a driver aid and should be used as such.

The system is NOT a collision warning or avoidance device.

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Standard Speed Control Adaptive Speed Control Brake System Functions

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Адаптивный скорость управление тормоз система Functions

Adaptive Speed Control Brake System Functions

Advanced Emergency Brake Assist (AEBA)

Advanced Emergency Brake Assist (AEBA) improves braking response during emergency braking, and is an enhancement of the electronic brake prefill and emergency brake assist functions controlled by the ABS control module.

For additional information, refer to: Anti-Lock Control - Traction Control (206-09B Anti-Lock Control - Traction Control, Description and Operation).

With AEBA, if the risk of a collision increases after the vehicle passes the forward alert activation threshold, the ASCM signals the ABS control module to activate the electronic brake prefill and emergency brake assist functions. With AEBA, the electronic brake prefill function operates in two stages:

Stage 1:

- Applies a brake pressure of approximately 3 bar (43.5 lbf/in²) to all of the brakes
- Lowers the AEBA activation threshold in the ABS control module
- Signals to the CJB on the HS CAN Powertrain bus to activate the stop lamps.

Stage 2:

- increases the brake pressure to approximately 10 bar (145 lbf/in²).

Stage 1 is activated if the collision risk increases to a level considered as credible, with the accelerator pedal pressed.

Stage 2 is activated when the accelerator pedal is released during an imminent risk of collision. If the accelerator pedal has already been released when the collision risk increases to the credible level, the two stages of electronic brake prefill are activated simultaneously, to give an immediate brake pressure of 10 bar (145 lbf/in²).

While the second stage of electronic brake prefill is active, if the brake pedal is then pressed quickly, the ABS control module activates AEBA, even if only light pressure is applied to the pedal.

AEBA is available at vehicle speeds above 7 km/h (5 mph) and will function even when forward alert and adaptive cruise control are switched off.

If a fault occurs in the system, a related message is displayed in the message center. AEBA will not be available until the fault is rectified.

Intelligent Emergency Braking (IEB)

Intelligent emergency braking (IEB) reduces the impact velocity if the ASCM determines that a collision is unavoidable, even with driver intervention. It is not designed to prevent accidents from occurring. Typical activation of IEB is approximately 0.8 second before impact. During this 0.8 second period the speed of the sensing vehicle is reduced, thus reducing the impact energy.

If the ASCM determines a collision is unavoidable, it signals the ABS control module to apply emergency brake pressure to all of the brakes. On vehicles without active safety belts, emergency brake pressure is 50 bar (725 lbf/in²) maximum. On vehicles with active safety belts, emergency brake pressure is 100 bar (1450 lbf/in²) maximum.

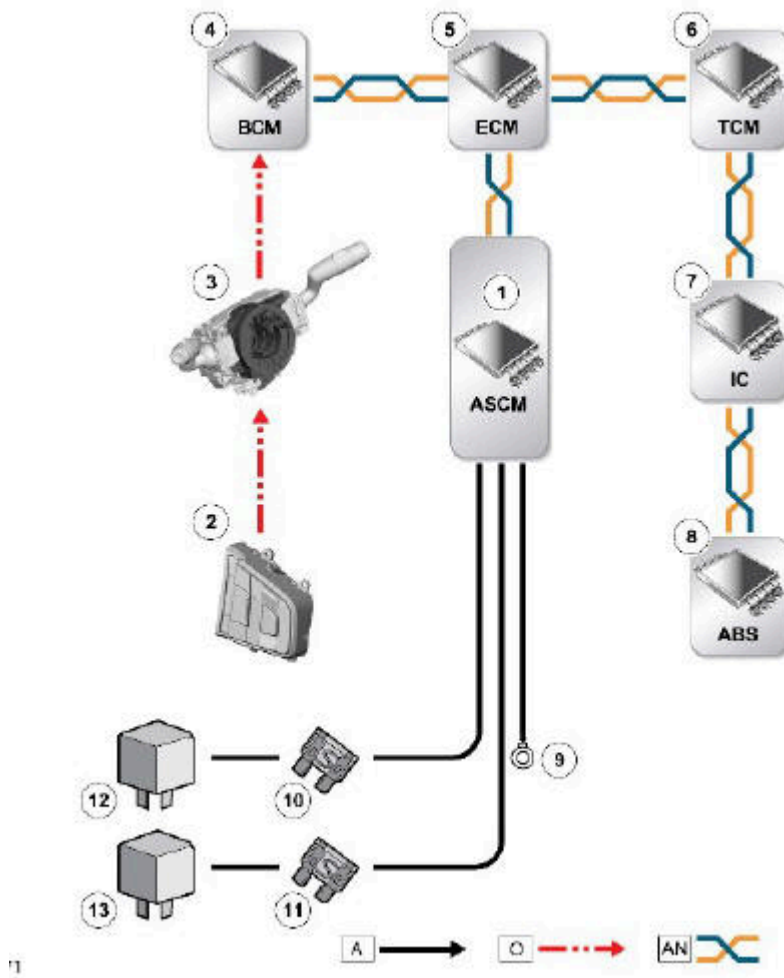
1. Engine Control Module (ECM)
2. Right steering wheel switchpack
3. Clockspring
4. Body Control Module (BCM)
5. Transmission Control Module (TCM) - vehicles with automatic transmission only
6. Instrument Cluster (IC)
7. Anti-lock Brake System (ABS) control module
8. Ground
9. Fuse 5A - located in Battery Junction Box (BJB)

10. Ignition relay - located in BJB

CONTROL DIAGRAM - ADAPTIVE SPEED CONTROL

NOTE:

A = Hardwired; O = LIN Bus; AN = High speed CAN powertrain systems bus



1. Adaptive Speed Control Module (ASCM)

2. Right steering wheel switchpack

3. Clockspring

4. Body Control Module (BCM)

5. Engine Control Module (ECM)

6. Transmission Control Module (TCM) - vehicles with automatic transmission only

7. Instrument Cluster (IC)

8. Anti-lock Brake System (ABS) control module

9. Ground

10. Fuse 5 A - located in Battery Junction Box (BJB)

11. Ignition relay - located in BJB

12. Fuse 5 A - located in CJB

13. Ignition relay - located in CJB

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Adaptive Speed ControlSpeed Control Sensor (G1780348) / Removal and Installation

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Скорость управление датчик / снятие и установка

Speed Control Sensor (G1780348) / Removal and Installation

REMOVAL

NOTES:

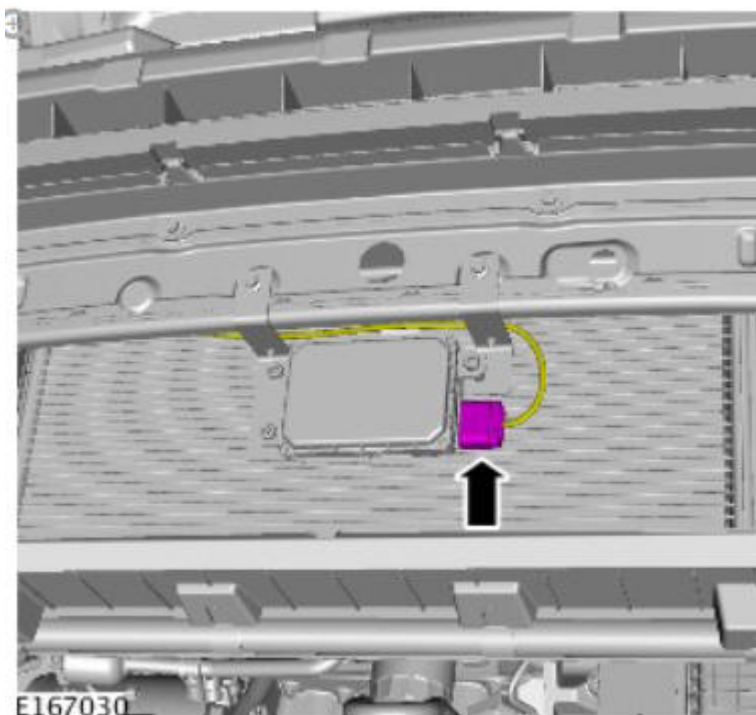
- *Removal steps in this procedure may contain installation details.*
- *The ignition must be switched off.*

WARNING:

Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

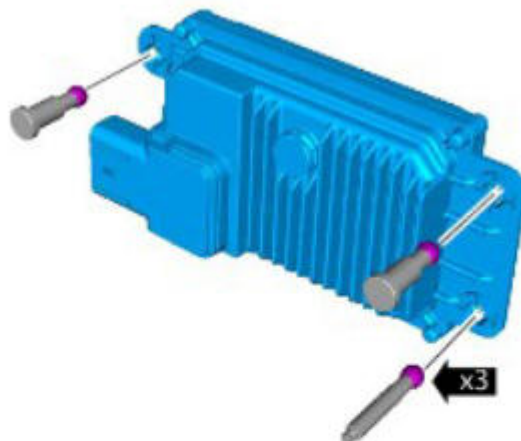
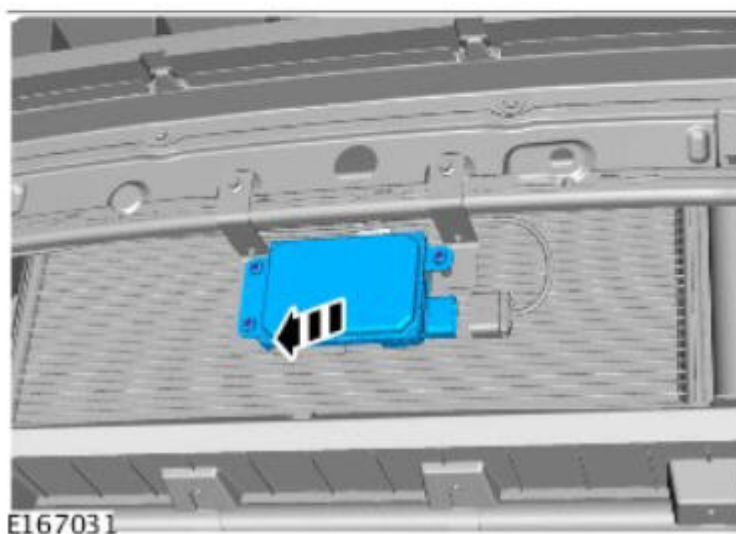
Refer to: Front Bumper Cover (501-19 Bumpers, Removal and Installation).



NOTE:

Make sure that the sensor is correctly located to the bracket.

Audible clicks will be heard to confirm connection.



- Use a suitable tool to release the sensor from the retaining bracket.

INSTALLATION

NOTE:

Make sure that the sensor is aligned after installation as described in the speed control sensor adjustment procedure.

To install, reverse the removal procedure.

Refer to: Speed Control Sensor Adjustment (310-03 Speed Control, General Procedures).

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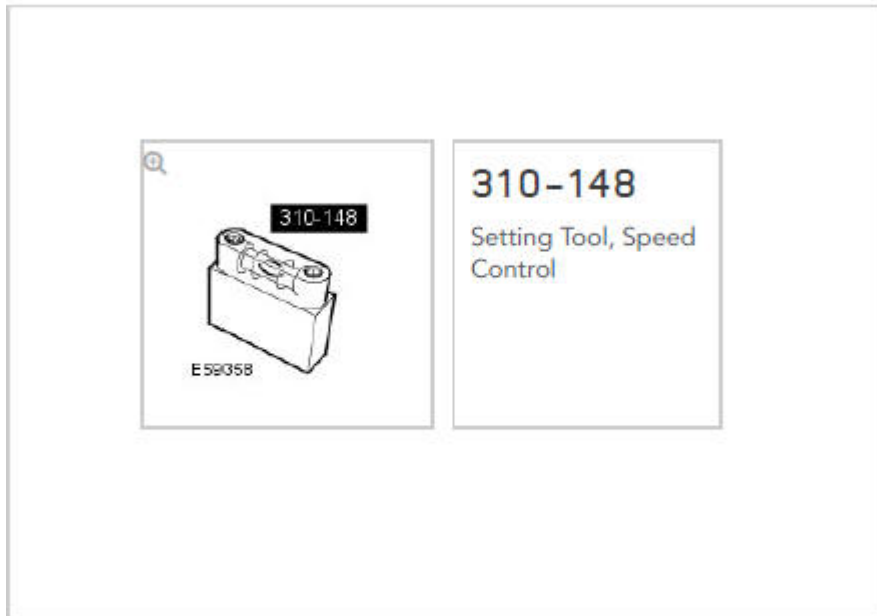
Adaptive Speed Control Brake System FunctionsSpeed Control Sensor Adjustment (G1780345) / General Procedures

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Скорость управление датчик регулировка / общие процедуры

Speed Control Sensor Adjustment (G1780345) / General Procedures

SPECIAL TOOL(S)



CHECK

NOTES:

- *Special tool 310-148 is graduated in 0.5 degree increments.*
- *Removal steps in this procedure may contain installation details.*

WARNING:

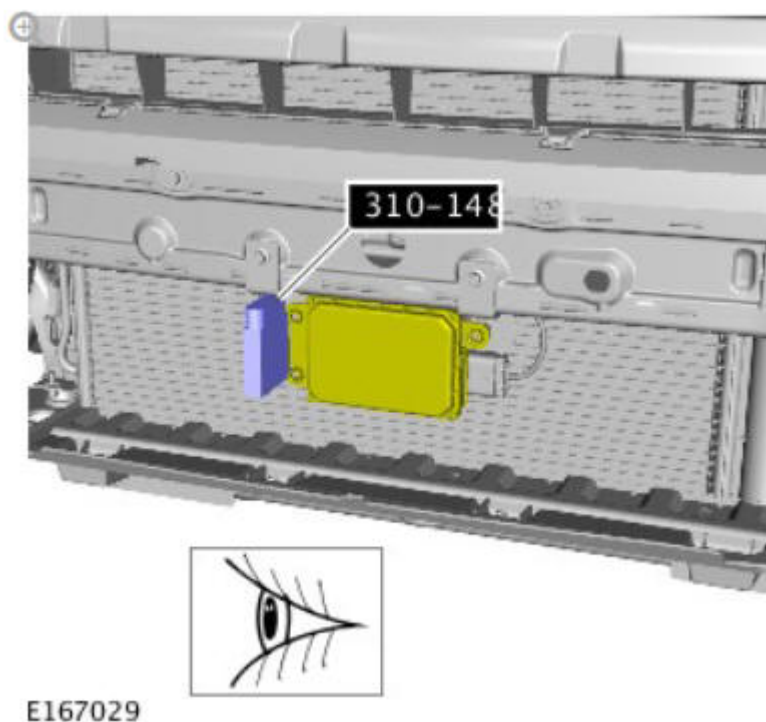
Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

Refer to: Front Bumper Cover (501-19 Bumpers, Removal and Installation).

NOTE:

Make sure that the special tool is installed to the front of the speed control sensor as it is shown in the illustration to check the level.

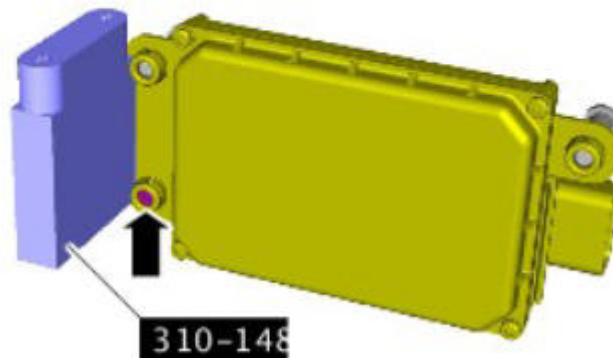


Special Tool(s): 310-148

ADJUSTMENT

NOTES:

- *The speed sensor has no mechanical horizontal adjustment.*
- *The speed sensor must point down by 0.5 degrees.*



Special Tool(s): 310-148

- From the diagnostic tool menu, select: Service Alignment Mode.
- The follow indicator will now be flashing, this indicates that the vehicle is in "service alignment" and now requires driving.
- The vehicle speed must be above 30 mph (48 kph).
- Choose a road with plenty of stationary objects, like street lights, road signs, or barriers. Use an inside or outside lane.
- Following vehicles too closely will obscure the stationary targets from the radar, a time gap of 2 seconds is recommended.
- A straight road will produce a quicker and better result, although the process will still operate on a curved road.
- When the flashing follow indicator light extinguishes, the ACC system is now functional, and a required vehicle speed can now be set by the driver and the ACC system will operate as normal.

Speed Control Specifications

Vehicles with Adaptive Speed Control System:

NOTE:

The speed control sensor must point down by 0.5 degrees.

ITEM	SPECIFICATION
Speed control sensor assembly vertical alignment	90.5° ± 0.9°

DESCRIPTION	NM	LB-FT	LB-IN
Speed control sensor bracket retaining bolts	9	-	80

Vehicles without Adaptive Speed Control System:

DESCRIPTION	NM	LB-FT	LB-IN
Accelerator pedal assembly retaining nut	10	7	-
Speed control switch retaining bolt	2	-	18
Paddle switch retaining bolt	1.3	-	12

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Speed Control Sensor (G1780348) / Removal and InstallationSpeed Control Speed Control / Diagnosis and Testing

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Скорость управление скорость управление / диагностика и проверка

Speed Control Speed Control / Diagnosis and Testing

PRINCIPLES OF OPERATION

For a detailed description of the Speed Control system, refer to the relevant Description and Operation section in the workshop manual. REFER to: Speed Control (310-03 Speed Control, Description and Operation).

INSPECTION AND VERIFICATION

CAUTION:

Diagnosis by substitution from a donor vehicle is NOT acceptable.

Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

NOTES:

- If a control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component.
- When performing voltage or resistance tests, always use a digital multimeter accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the digital multimeter leads into account.
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern
2. Visually inspect for obvious signs of damage and system integrity

Visual Inspection

ELECTRICAL	
■	Fuses
■	Wiring harnesses and connectors
■	Powertrain control module
■	Steering wheel switchpack

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index
5. Check DDW for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and carry out the recommendations as required

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
Speed control inhibited/disabled	<ul style="list-style-type: none"> Steering wheel switchpack fault Engine system fault Anti-lock brake system fault 	<ul style="list-style-type: none"> Check the operation of the speed control switches. Using the Jaguar Land Rover approved diagnostic equipment, check the body control module for related DTCs and refer to the relevant DTC index Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index Using the Jaguar Land Rover approved diagnostic equipment, check the anti-lock brake system control module for related DTCs and refer to the relevant DTC index
Unable to regulate/adjust vehicle speed	<ul style="list-style-type: none"> Steering wheel switchpack fault 	<ul style="list-style-type: none"> Check the operation of the speed control switches. Using the Jaguar Land Rover approved diagnostic equipment, check the body control module for related DTCs and refer to the relevant DTC index
Unable to cancel speed control from steering wheel	<ul style="list-style-type: none"> Steering wheel switchpack fault 	<ul style="list-style-type: none"> Check the operation of the speed control switches. Using the Jaguar Land Rover approved diagnostic equipment, check the body control module for related DTCs and refer to the relevant DTC index
Unable to cancel speed control from brake pedal	<ul style="list-style-type: none"> Brake pedal switch fault 	<ul style="list-style-type: none"> Using the Jaguar Land Rover approved diagnostic equipment, check the anti-lock brake system control module for related DTCs and refer to the relevant DTC index

SYMPTOM:

Speed control inhibited/disabled

POSSIBLE CAUSES:

- Steering wheel switchpack fault
- Engine system fault
- Anti-lock brake system fault

ACTION:

- Check the operation of the speed control switches. Using the Jaguar Land Rover approved diagnostic equipment, check the body control module for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the powertrain control module for related DTCs and refer to the relevant DTC index
- Using the Jaguar Land Rover approved diagnostic equipment, check the anti-lock brake system control module for related DTCs and refer to the relevant DTC index

SYMPTOM:

Unable to regulate/adjust vehicle speed

POSSIBLE CAUSES:

- Steering wheel switchpack fault

ACTION:

- Check the operation of the speed control switches. Using the Jaguar Land Rover approved diagnostic equipment, check the body control module for related DTCs and refer to the relevant DTC index

SYMPTOM:

Unable to cancel speed control from steering wheel

POSSIBLE CAUSES:

- Steering wheel switchpack fault

ACTION:

- Check the operation of the speed control switches. Using the Jaguar Land Rover approved diagnostic equipment, check the body control module for related DTCs and refer to the relevant DTC index

SYMPTOM:

Unable to cancel speed control from brake pedal

POSSIBLE CAUSES:

- Brake pedal switch fault

ACTION:

- Using the Jaguar Land Rover approved diagnostic equipment, check the anti-lock brake system control module for related DTCs and refer to the relevant DTC index

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: (100-00 General Information)

Diagnostic Trouble Code Index - INGENIUM I4 2.0L Diesel, DTC: Engine Control Module (ECM) B10A2-07 to P034B-76 (Description and Operation), Diagnostic Trouble Code Index - GTDi 2.0L Petrol/GTDi 2.0L Petrol - SULEV, DTC: Engine Control Module (ECM) (Description and Operation), Diagnostic Trouble Code Index - INGENIUM I4 2.0L Diesel, DTC: Engine Control Module (ECM) B10A2-07 to P034B-76 (Description and Operation), Diagnostic Trouble Code Index - DTC: Central Junction Box (CJB) (Description and Operation), Diagnostic Trouble Code Index - DTC: Anti-lock Braking System Control Module (ABS) (Description and Operation).

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Speed Control Sensor Adjustment (G1780345) / General ProceduresSpeed Control Switch (G1780347) / Removal and Installation

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Скорость управление выключатель / снятие и установка

Speed Control Switch (G1780347) / Removal and Installation

REMOVAL

NOTE:

Removal steps in this procedure may contain installation details.

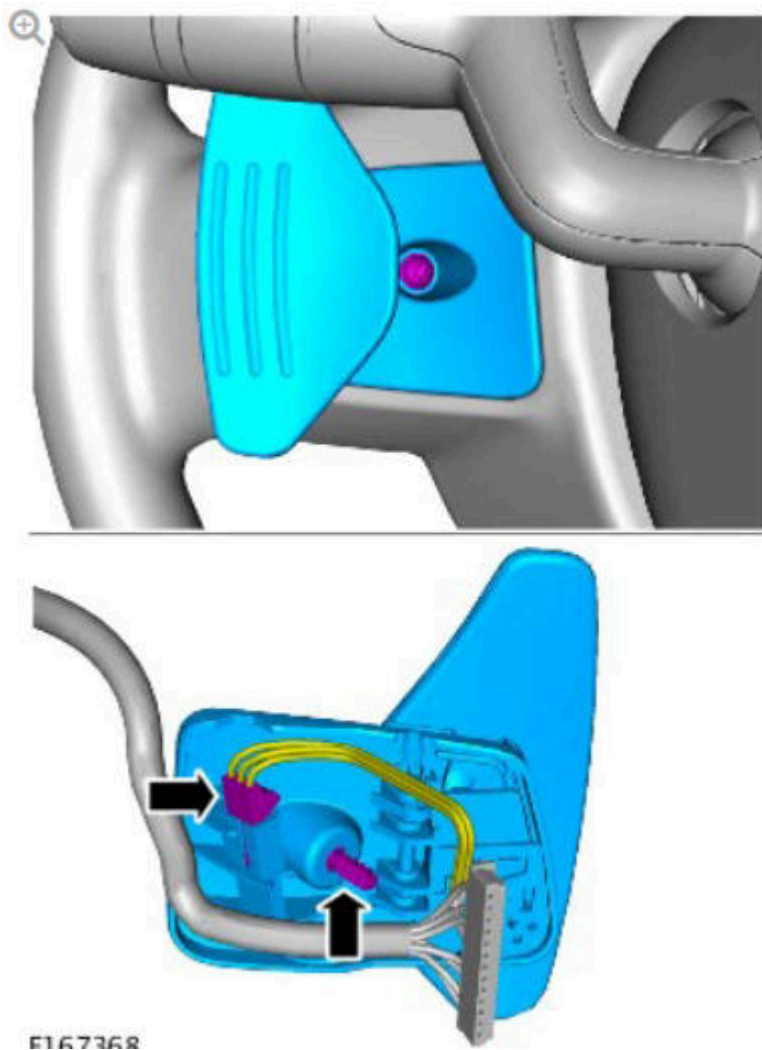
Make the air bag supplemental restraint system (SRS) safe.

Refer to: Standard Workshop Practices (100-00 General Information, Description and Operation).

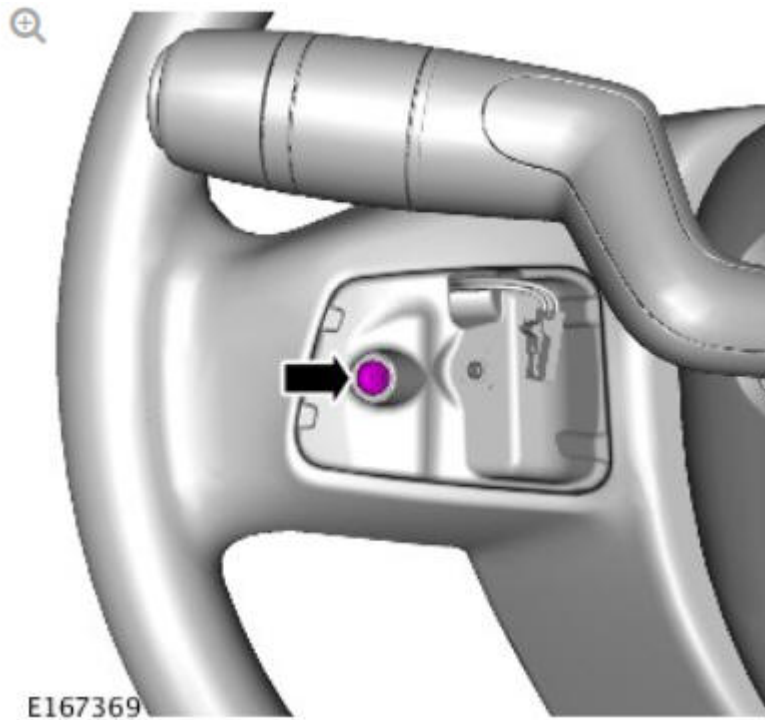
Disconnect the battery ground cable.

Refer to: Specifications (414-01 Battery, Mounting and Cables, Specifications).

Refer to: Driver Airbag Module (501-20B Supplemental Restraint System, Removal and Installation).



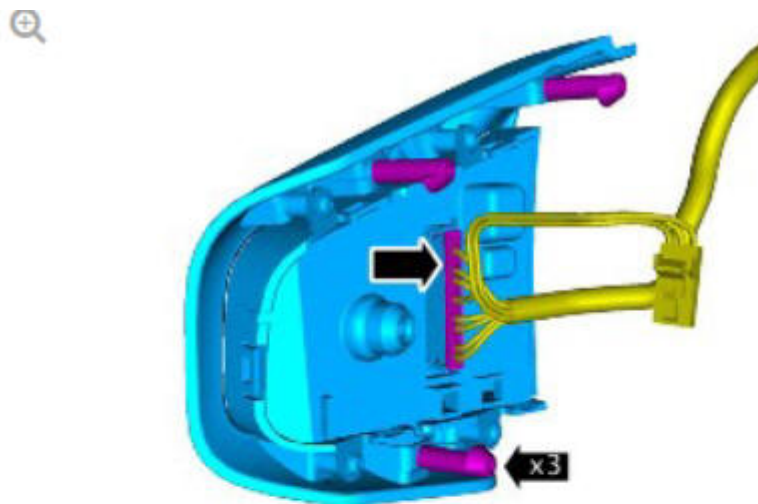
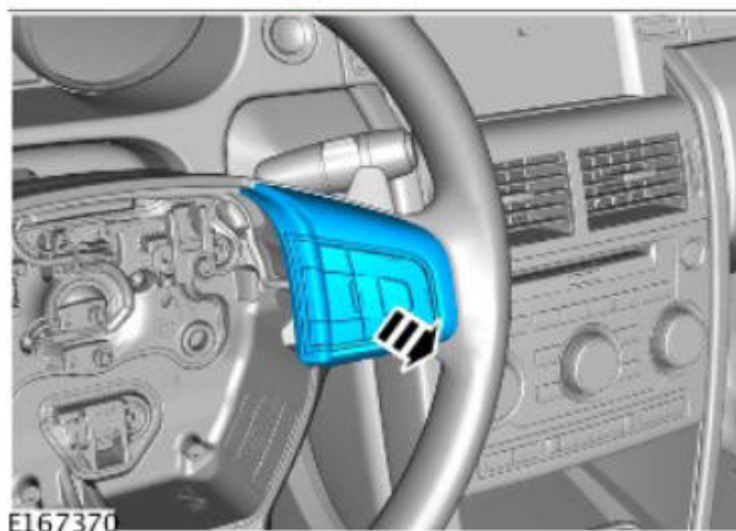
Torque: 1.3 Nm



Torque: 2 Nm

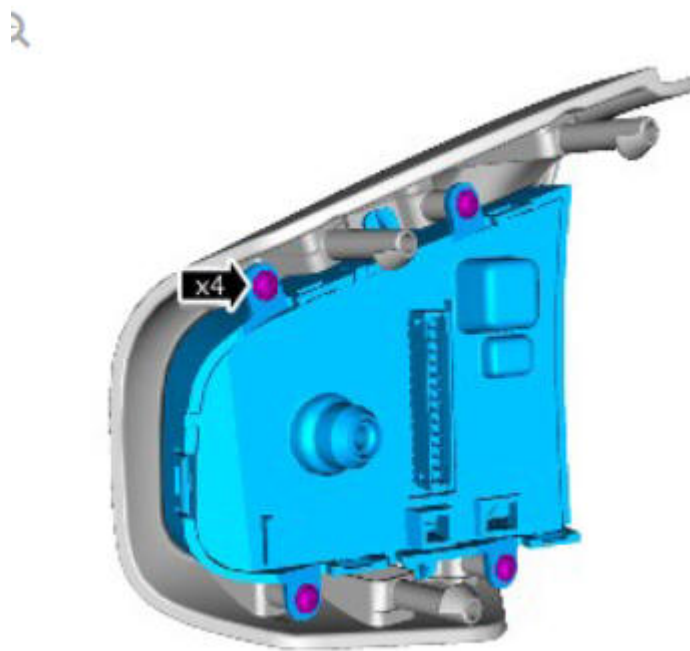
CAUTION:

Take extra care not to damage the edges of the component



NOTE:

Do not disassemble further if the component is removed for access only.

**INSTALLATION**

1. To install, reverse the removal procedure.

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Speed Control Speed Control / Diagnosis and TestingAutomatic Transmission Transaxle

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