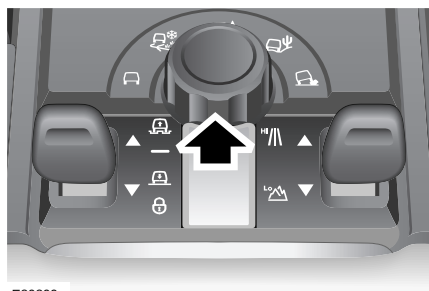


Terrain response

PRINCIPLE OF OPERATION



E80899

The Terrain Response™ system is a permanently active system, continuously providing benefits in traction and driveability. These benefits can be further enhanced for specific off-road driving conditions by the selection of one of the four special programs. Dependant on the selected special program, the system optimises the vehicle set-up for the prevailing conditions, providing the maximum in traction, driveability and vehicle response.

The systems comprising Terrain Response are:

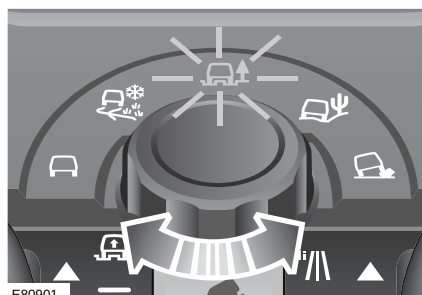
- Engine management.
- Gearbox management.
- Intelligent differential control.
- Dynamic stability, traction control and Hill Descent Control (HDC) systems.
- Air suspension.

The system will provide a variable throttle response, ranging from very cautious (large pedal movement has a minimum effect on engine power) when driving in slippery conditions, to very responsive (engine power is allowed to rise more quickly) when driving over sand.

Note: Changing from one special program to another will result in the system adopting a different set of criteria for the systems it controls. For instance, the engine revs produced by the current throttle position might increase or decrease slightly in the new program, or the suspension could change height. The changes are not dramatic, but are noticeable.

To obtain the maximum benefits from the system, it is suggested that you experiment with the different features in an environment that will not affect other road users.

USING TERRAIN RESPONSE



E80901

Rotate the control to select the required special program. When the selector reaches either end of its range, it can be turned further, but doing so has no effect.

In addition to General, four special programs are available:

- Grass/gravel/snow (also includes ice).
- Mud/ruts.
- Sand.
- Rock Crawl.

When the starter switch is turned on, the indicators around the control are illuminated, with the active program highlighted in amber.

Terrain response

If a special program is active, the special program indicator will also be displayed on the message centre.



If the starter switch is turned off when a special program is selected, the program will remain in the system memory for approximately six hours. The system will return to that program when the starter switch is turned back on.

The message centre will confirm that the previously selected special program is still selected. After six hours, the system will automatically revert back to the General program.

General



Select as soon as a special program is not required.

All systems, except Hill Descent Control (HDC), will adopt settings based on the conditions sensed. HDC will remain active if it was manually selected. The suspension will also change from raised to normal ride height when the vehicle starts moving.

The General setting is suitable for surfaces that match typical road surfaces, including dry cobbles, Tarmac or wooden planks.

Grass-Gravel-Snow



Use this special program for surfaces which are firm, but have a coating of loose material. This could be grass, snow or loose gravel, pebbles or sand. This program should also be selected in icy conditions.

HDC will engage automatically in low range, but can be manually de-selected. See **USING HDC** (page 169).

Start off in a higher gear than usual, second gear in high range or third gear in low range.

Manual transmission vehicles: when Grass/Gravel/Snow program is selected, confirmation will be given in the message centre. This message will appear only once per ignition cycle.

Using the vehicle with snow chains fitted could affect operation of Terrain Response. See **USING SNOW CHAINS** (page 248).

Note: *If the vehicle cannot obtain forward traction in deep snow, switch off Dynamic Stability Control (DSC). DSC must be switched on as soon as conditions permit. See **USING STABILITY CONTROL** (page 166).*

Mud-Ruts



Use this special program when traversing muddy or deeply rutted ground that is soft and uneven and demands maximum axle displacement. Unevenness of the ground could be caused by roots, brushwood or small logs.

System settings are similar to Grass-Gravel-Snow, except for the individual systems that optimise traction and driveability in muddy/rutted driving conditions. Low range is recommended for this program.

Terrain response

If low range is not selected, the message centre will prompt the driver. If the Mud-Ruts program and low range are selected together, the vehicle ride height will be raised automatically.

Sand



Use this special program on soft and predominantly dry, yielding sandy ground, such as dry beaches and sand deserts. Also use for deep gravel.

Where the sand is damp or wet, select Mud-Ruts special program.

Note: *If the sand is extremely soft and dry and of a depth that allows the wheels to sink, switch off Dynamic Stability Control (DSC). DSC must be switched on as soon as conditions permit. See **USING STABILITY CONTROL** (page 166).*

Rock Crawl



Use this special program on solid, unyielding ground, which demands high levels of wheel displacement and careful vehicle control, such as clusters of boulders. This program would also be used for crossing river beds strewn with submerged rocks.

Rock Crawl is only selectable in low range. If selection is attempted in high range, the driver will be prompted to select low range. This special program will utilise system control settings to optimise the vehicle suspension and traction system for extreme suspension articulation and good low-speed control.

Wading

When driving through water less than 600 mm (24 inches) deep, select the Terrain Response program suitable for the surface beneath the water.

Increased suspension height

When a special program requires increased suspension height, the system will automatically raise the suspension, unless there is electric load on the trailer socket, indicating that a trailer is attached to the vehicle.

A message will be displayed on the message centre.

Driver override options

The following two systems controlled by Terrain Response may also be operated by the driver.

- Air Suspension
- Hill Descent Control

In some special programs, the Terrain Response system will switch on HDC and, in low range, the system will automatically raise the suspension to off-road height.

Both the HDC and ride height selections can be cancelled by the driver at any time. If HDC or a specific ride height has not been selected by the system, the driver can select them at any time.

HDC and ride height selections will be confirmed through the message centre and by the individual system information indicators, irrespective of whether the system or driver selected them. Use of special programs, particularly in low range, may prompt some driving advice and warnings as well as additional information on the message centre.

Note: *Use the CommandShift function on the gearbox to lock the vehicle in a particular gear.*

Terrain response

Inappropriate special program selection

CAUTION

 Selecting an inappropriate special program will not endanger the driver or damage the vehicle. It will, however, impair the vehicle's response to the conditions and reduce the durability of the suspension and drive systems.

If selection of an inappropriate special program is attempted, such as choosing Rock Crawl while in high range - the symbol of that program will flash amber and an audible chime will sound. The message centre will advise that the special program is unavailable and suggest corrective action.

If the requirements have not been met after 60 seconds, the warnings will cease and the message centre will show the active program.

If the system becomes partly inoperable, it may not be possible to select some special programs. A warning will be given when selection of an affected program is attempted.

If the system becomes totally inoperable, all of the special program indicators will be switched off and the message centre will display a message.

The suspension system provides an automatic levelling function. See **ADJUSTING THE SUSPENSION** (page 180). If low range is needed, it is likely that mobility and vehicle composure would benefit from increased ground clearance.

Terrain response

Messages

The following table lists the messages relating to Terrain Response that could appear in the message centre. Market criteria mean that some messages will not apply to your vehicle and will therefore not appear.

Message	Meaning	What to do?
CAUTION! RISK OF GROUNDING WITH SUSPENSION AT NORMAL HEIGHT	Terrain Response system would have selected off-road height but the driver has manually lowered the vehicle (or the system cannot raise the vehicle).	Raise suspension manually to off-road height if possible and appropriate.
HDC FAULT SYSTEM NOT AVAILABLE	HDC system fault.	Drive with care and do not attempt to descend steep slopes. Seek qualified assistance immediately.
HDC NOT AVAILABLE IN THIS GEAR	HDC not operative because of incorrect gear selection. See USING HDC (page 169).	Select correct gear if HDC is required.
HDC NOT AVAILABLE SPEED TOO HIGH	HDC unavailable, speed threshold exceeded. Max HDC operating speed is 50 km/h (30 mph), max speed for HDC selection is 80 km/h (50 mph).	Reduce vehicle speed.
HDC TEMPORARILY NOT AVAILABLE SYSTEM COOLING	HDC switched off while brake system is cooling.	Wait until message disappears before attempting to descend steep slopes.
PROGRAM CHANGE IN PROGRESS	It is temporarily impossible to select a new program. This can be due to ABS or DSC activity or the overheating of the electronic differentials.	If conditions change within 60 seconds, the chosen program will be selected. If the message is prompted by electronic differential overheat, then it will take longer but there will be separate advice about this. Once the differentials have cooled, try to reselect the special program.

Terrain response

Message	Meaning	What to do?
RECOMMEND LOW RANGE IS SELECTED FOR MUD-RUTS PROGRAM	Low range is recommended for Mud-Ruts special program.	Select low range.
RECOMMEND RAISING SUSPENSION TO OFF ROAD HEIGHT IN DEEP MUD-RUTS	Mud-Ruts program is being used in high range. Suspension raised automatically in low range.	Raise suspension manually to off-road height or select low range.
RECOMMEND STARTING IN 2ND/3RD GEAR FOR SLIPPERY CONDITIONS	In slippery conditions start off in a higher gear than usual.	Select second/third gear.
RESET SUSPENSION HEIGHT IF CLEAR OF OBSTACLE	Suspension still in extended mode.	Check if vehicle is clear of obstacle. If clear, select required suspension.
SELECT LOW RANGE TO ACTIVATE ROCK CRAWL	Vehicle is not in low range, so Rock Crawl cannot be activated.	Select low range if Rock Crawl is required.
SELECT NEUTRAL FOR RANGE CHANGE	Range change will not occur until neutral is selected.	Select neutral.
SLOW DOWN OR VEHICLE WILL LOWER/RAISE	Vehicle will automatically lower/raise if vehicle speed increases.	Choose to slow down or accept height change.
SPEED TOO HIGH FOR RANGE CHANGE	Vehicle speed is too high for requested range change.	Reduce speed to 40 km/h (25mph) on automatic transmission or 20 km/h (12 mph) on manual transmission.
SYSTEM FAULT SOME PROGRAMS NOT AVAILABLE	There is a fault on the Terrain Response system.	Be careful off-road as full Terrain Response programs are not available. Seek qualified assistance immediately.
SYSTEM FAULT SPECIAL PROGRAMS NOT AVAILABLE	There is a fault on the Terrain Response system.	Be careful off-road as Terrain Response programs are not available. Seek qualified assistance immediately.

Terrain response

Message	Meaning	What to do?
TRAILER CONNECTED OFF ROAD HEIGHT NOT SELECTED AUTOMATICALLY	Vehicle has not achieved off-road height as trailer socket is being used.	If a trailer is connected, do nothing. If no trailer is connected but something else, such as a bike rack, is connected, raise to off-road height manually. If nothing is connected, check socket for faults.