

Important Safety Instructions

Appropriate service methods and correct repair procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual carrying out the work.

Anyone who departs from the instructions provided in this manual must first establish that personal safety or vehicle integrity is not compromised by the choice of method, tools or components.

Warnings, Cautions and Notes in This Manual



WARNING: Warnings are used to indicate that failure to follow a procedure correctly may result in personal injury.



CAUTION: Cautions are used to indicate that failure to follow a procedure correctly may result in damage to the vehicle or equipment being used.

• **NOTE:** Notes are used to provide additional essential information required to carry out a complete and satisfactory repair.

Generic warnings or cautions are in their relevant description and operation procedure within section 100-00. If the generic warnings or cautions are required for a procedure, there will be a referral to the appropriate description and operation procedure.

If a warning, caution or note only applies to one step, it is placed at the beginning of the specific step.

Trustmark Authoring Standards (TAS) Removal and Installation Procedures

• **NOTE:** TAS style procedures can be identified by steps that have no accompanying step text and the magenta color of the electrical connectors and fasteners such as nuts, bolts, clamps or clips.

A TAS removal and installation procedure uses a sequence of color illustrations to indicate the order to be followed when removing/disassembling or installing/assembling a component.

Many of the TAS procedures will have the installation information within the removal steps. These procedures will have the following note at the beginning of the procedure:

• **NOTE:** Removal steps in this procedure may contain installation details.

Items such as O-ring seals, gaskets, seals, self-locking nuts and bolts are to be discarded and new components installed unless otherwise stated within the procedure. Coated nuts or bolts are to be reused, unless damaged or otherwise stated within the procedure.

Specification procedures will contain all technical data that are not part of a repair procedure.

TAS Graphics

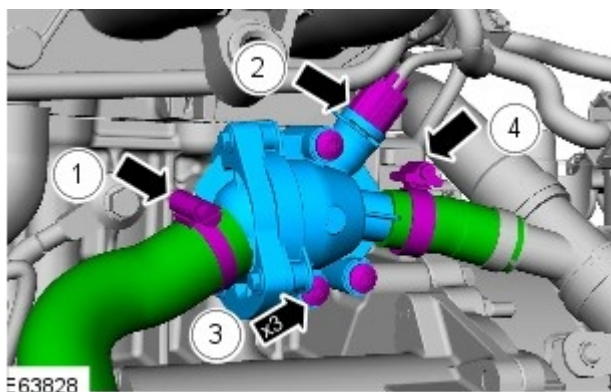
Colors used in the graphic are as follows:

- Blue - Indicates the target item, item to be removed/installed or disassembled/assembled
- Green and Brown - Indicates a secondary item that needs to be detached, removed/installed or disassembled/assembled prior to the target item
- Magenta - Indicates electrical connectors and fasteners such as nuts, bolts, clamps or clips
- Pale Blue - is for the special tool(s) and general equipment.

There may be multiple steps assigned to one illustration.

Numbered pointers are used to indicate the number of electrical connectors and fasteners such as nuts, bolts, clamps or clips.

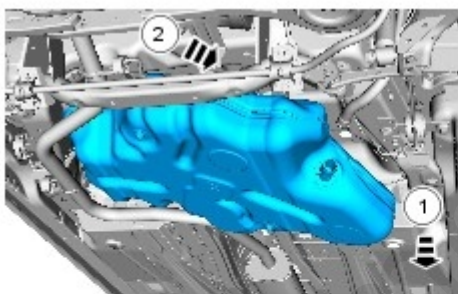
Items in the illustration can be transparent or use cutouts to show hidden detail(s).



TAS Symbols

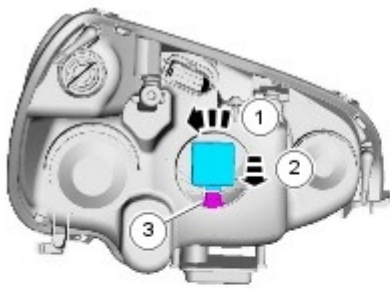
Symbols are used inside the graphics and in the text area to enhance the information display. The following paragraphs describe the various types and categories of symbols.

Prohibition symbols advise on prohibited actions to either avoid damage or health and safety related risks.



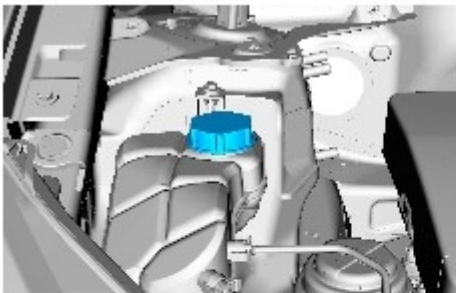
E85026

Health and Safety symbols recommend the use of particular protection equipment to avoid or at least reduce the risk or severity of possible injuries.



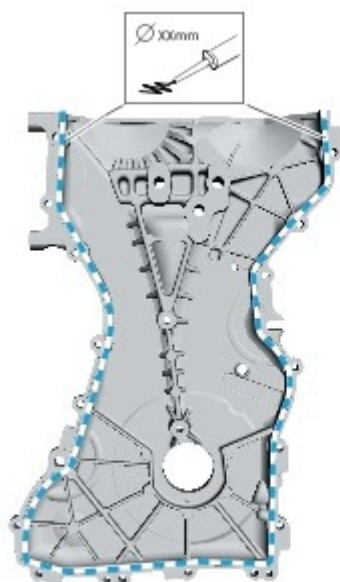
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Warning symbols are used to indicate potential risks resulting from a certain component or area.



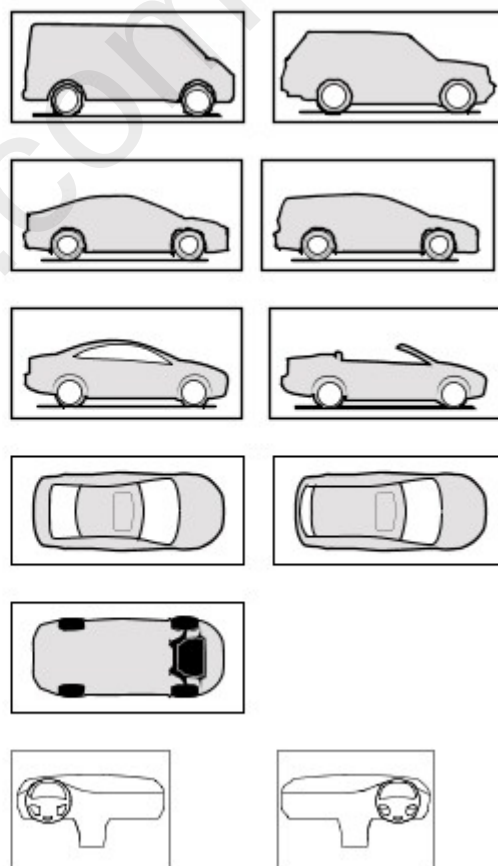
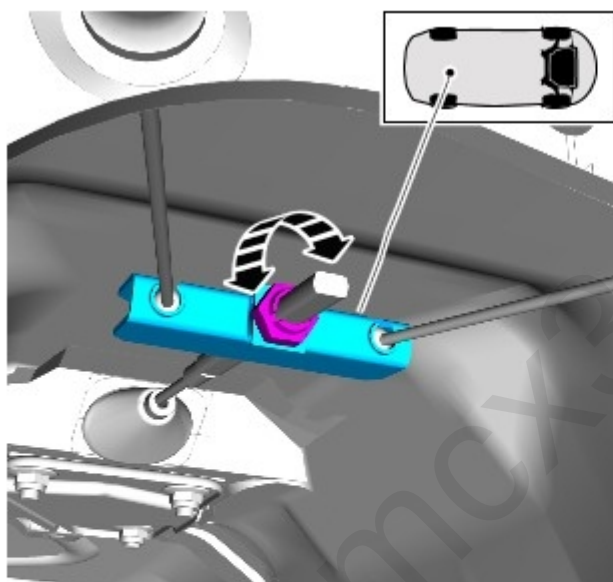
E85028

Instruction symbols are used to apply sealer, lubricant, weight, tape or cleaning detergent to a component.



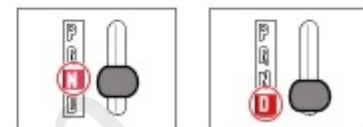
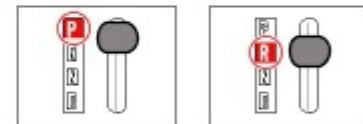
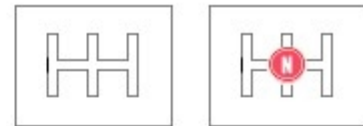
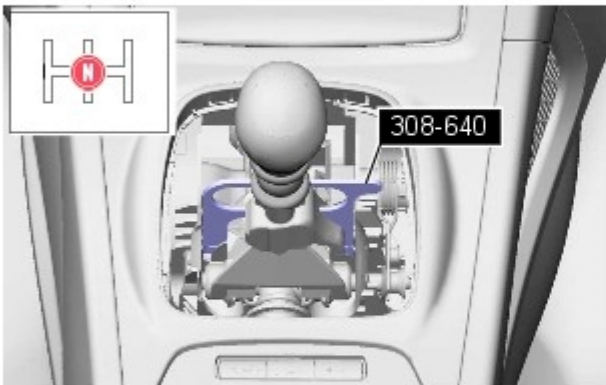
E84834

Location symbols are used to show the location of a component or system within the vehicle.



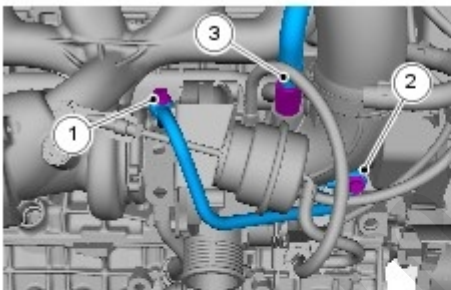
E84835

Gearshift lever or selector lever position symbols are used to show which gearshift lever or selector lever position is to be set.

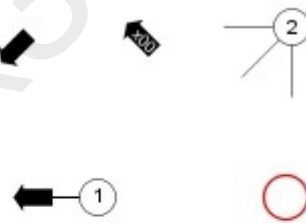


E84836

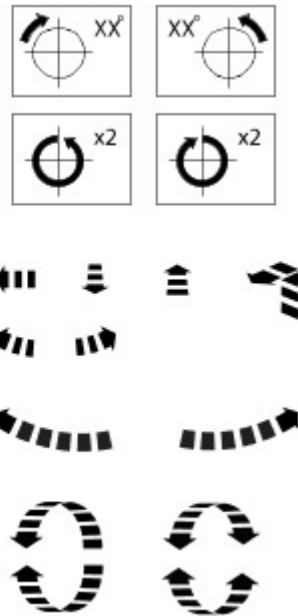
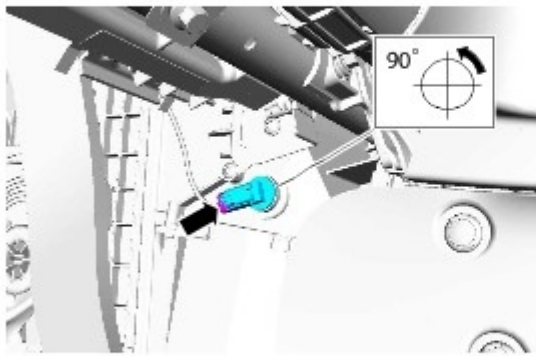
Pointer symbols are used to draw the attention to components and give special instructions such as a required sequence or number of components. The number of components is reflected by the value inside the luty arrow. A sequence number is located inside the circle. Numbers inside circles are also used to allocate special information such as tightening torques or chemicals to a particular component.



E84837



Movement arrows are used to show three dimensional or rotational movements. These movements can include specific values inside the symbol if required.



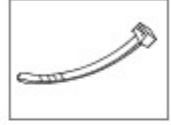
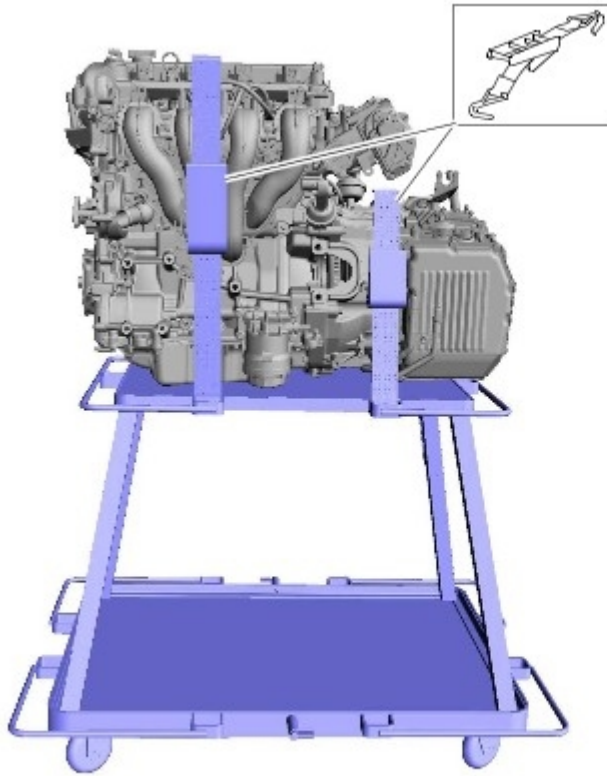
E84838

Standard tool symbols recommend the use of certain standard tools. These tools can include dimension values if required.



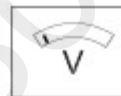
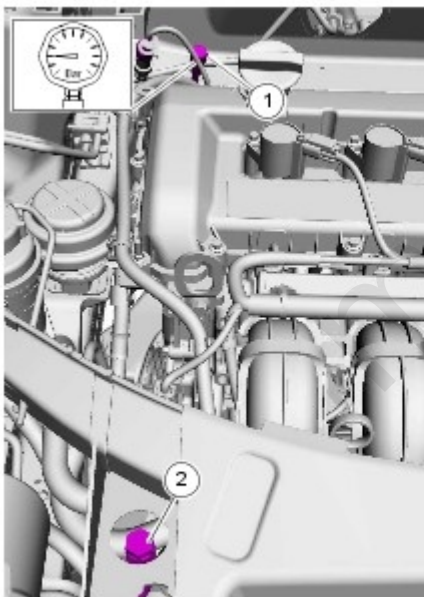
E84839

The following graphic illustrates a set of symbols that are used to provide detailed information on where to apply a material.



E84840

Measurement symbols provide detailed information on where to carry out a specific measurement. These symbols can include specific values if required.



E84841

Special Tools and Torque Figure(s)

Special tools will be shown with the tool number in the illustration. The special tool number(s), general equipment, material(s) and torque figure(s) used for the procedure step will be shown in the text column.

General Information - Important Safety Instructions

Description and Operation

Safety Notice

Appropriate service methods and correct repair procedures are essential for the safe, reliable operation of all motor vehicles, as well as the safety of the person doing the work. This manual provides general directions for accomplishing service and repair work with tested effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the person doing the work. This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in the manual must first establish that neither personal safety or vehicle integrity is compromised from choices of methods, tools or parts.

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General Information - How To Use This Manual

Description and Operation

Copyright Statement

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How To Use This Manual

This manual covers all aspects necessary in order to service the vehicle effectively.

The manual is structured into five main sections, General Information, Chassis, Powertrain, Electrical and Body and Paint with each section dealing with a specific part of a vehicle system.

Each of the five main sections contain sub-sections dealing with items which form a part of that specific system.

Pages at the start of the manual list all sections available. Each section has a contents list detailing, where applicable, Specifications, Description and Operation, Diagnosis and Testing, General Procedures and Repair Procedures.

Where components need to be removed or disassembled in sequence, each operation in the sequence will be identified numerically and also graphically in an accompanying illustration.

All left-hand and right-hand references to the vehicle are taken from a position sitting in the driver seat looking forward.

All left-hand and right-hand references to the engine are taken from a position at the flywheel looking towards the front camshaft pulley.

Inspection and Verification

Visual Inspection Charts, Symptom Charts and other information charts (such as diagnostic routines) or supplement test procedures with technical specifications will navigate the user to a specific test procedure.

Symptom Chart

The symptom chart indicates symptoms, sources and actions to address a condition.

Pinpoint Tests

For electrical systems, pinpoint test steps are used to identify the source of a concern in a logical, step-by-step manner. Pinpoint tests have two columns: CONDITIONS and DETAILS/RESULTS/ACTIONS.

The CONDITIONS column is used exclusively for graphics and icons (with or without captions) and the DETAILS/RESULTS /ACTIONS column provides direction to another test step or specific corrective actions.

The boxed numbers indicate the order in which the described action is to be carried out.

Component Tests

A component test is used when a component is tested in multiple pinpoint tests, or if a procedure is too complicated to be formatted within a single page of the pinpoint test.

Graphics

Test graphics show the measurement or test to be carried out in a test step.

A representative tester graphic is used for voltmeters and ohmmeters.

If multiple measurements are made in a single graphic, the test leads are drawn with a solid line until the test lead splits to indicate the multiple measurements, at which point dashed lines are used.

Breakout box type testers are represented by a double circle test pin. Test pins are labelled with the pin number.

• **NOTE:** Dimensions quoted are to design engineering specifications with service limits quoted, where applicable.

Workshop Manual Organization

The five main sections, together with the areas which they cover are given below:

- **Section 1** - General Information.
- **Section 2** - Chassis.
- **Section 3** - Powertrain.
- **Section 4** - Electrical.
- **Section 5** - Body and Paint.

Sub-section numbers appear after the initial section number, for example, **Section 412-01** covers Climate Control, which is part of the electrical section.

In the number given above, the first digit of the number '**4**' indicates the section **i.e. Electrical**.

The second and third digits '**12**' of the number indicate the vehicle system **i.e. Climate Control**.

The last two digits of the number '**01**' indicate the part of the system covered by the sub-section **i.e. Air Conditioning (A/C) Compressor**.

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General Information - General Service Information

Description and Operation

Introduction

This manual has been written in a format that is designed to meet the needs of Land Rover technicians worldwide and to assist them in the efficient repair and maintenance of Land Rover vehicles.

This manual provides descriptions and methods for accomplishing adjustment, service and repair work using tested and effective procedures. Following these procedures will help ensure product reliability.

Special Tools

The Special Tool(s) Table provided at the beginning of each procedure lists the special tool(s) required to carry out repair operations within that specific procedure. Wherever possible, illustrations are provided which will assist technicians in identifying the special tool(s) required and also showing such tool(s) in use.

Special tools may be obtained from the manufacturer, SPX Tools, the addresses of their branches will be found in the Special Tools Glossary.

For additional information, refer to: [Special Tool Glossary](#) (100-00 General Information, Description and Operation).

Important Safety Instructions

Appropriate service methods and correct repair procedures are essential for the safe and reliable operation of all motor vehicles as well as ensuring the personal safety of the individual carrying out the work.

This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Any person who departs from the instructions provided in this manual must first establish that they compromise neither their personal safety nor the vehicle integrity by their choice of methods, tools or parts.

Individuals who undertake their own repairs should have some skill or training and limit repairs to components which could not affect the safety of the vehicle or its passengers. Any repairs required to safety critical items such as steering, brakes, suspension or supplemental restraint system should be carried out by a Land Rover Dealer. Repairs to such items should NEVER be attempted by untrained individuals.

Warnings, Cautions and Notes which appear in this manual

As you read through this manual, you will come across Warnings, Cautions and Notes. A Warning, Caution or Note is placed at the beginning of a series of steps. If the warning, caution or note only applies to one step, it is placed at the beginning of the specific step after the step number.

Warnings, Cautions and Notes have the following meanings:

Warning: Procedures which must be followed to avoid the possibility of personal injury.

Caution: Calls attention to procedures which must be followed to avoid damage to components.

Note: Gives helpful information.

References

References to the Left Hand (LH) or Right Hand (RH) side given in this manual are made when viewing the vehicle or unit from the rear.

Fault Diagnostic Equipment

The vehicle is equipped with a number of electronic control systems to provide optimum performance of the vehicle's systems.

Land Rover approved diagnostic equipment is available and must be used where specified. The use of this equipment will assist with the fault diagnostic abilities of the Dealer workshop. In particular, the equipment can be used to interrogate the electronic systems for diagnosis of faults which may become evident during the life of the vehicle.

This manual is produced as a reference source to supplement Land Rover approved diagnostic equipment.

Features of the equipment include:

- a. Fully upgradeable support for the technician
- b. Structured diagnostics to accommodate all skill levels
- c. Direct print-out of screen information and test results

Testing the vehicle

Operations covered in this manual do not include reference to testing the vehicle after repair. It is essential that work is inspected and tested after completion and if necessary, a road test of the vehicle is carried out, particularly where safety related items are concerned.

Repairs and Replacement Parts

Land Rover parts are manufactured to the same exacting standards as the original factory fitted components. For this reason, it is essential that only genuine Land Rover parts are used during maintenance or repair.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories.

Safety features and corrosion prevention treatments embodied in the vehicle may be impaired if other than Land Rover recommended parts are fitted. In certain territories, legislation prohibits the fitting of parts not to manufacturer's specification. Torque wrench setting figures, where given, must be adhered to and locking devices, where specified must be used. If the efficiency of a locking device is impaired during removal it must be replaced.

Owners purchasing accessories whilst travelling abroad must ensure that the accessory and its fitted location on the vehicle conform to legal requirements.

The terms of the vehicle warranty may be invalidated by the fitting of parts other than those recommended by Land Rover.

• NOTE: The fitting of non-approved Land Rover parts and accessories or the carrying out of non-approved alterations or conversions may be dangerous. Any of the foregoing could affect the safety of the vehicle and occupants; also, the terms and conditions of the vehicle warranty may also be invalidated .

All Land Rover recommended parts have the full backing of the vehicle warranty.

Land Rover Dealers are obliged to supply only Land Rover recommended parts.

Specifications

Land Rover are constantly seeking to improve the specification, design and production of their vehicles and alterations take place accordingly. Whilst every effort is made to ensure the accuracy of this Manual, it should not be regarded as an infallible guide to current specifications of any particular vehicle.

This Manual does not constitute an offer for sale of any particular vehicle. Land Rover dealers are not agents of Land Rover and have no authority to bind the manufacturer by any expressed or implied undertaking or representation.

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General Information - Standard Workshop Practices

Description and Operation

Vehicle in Workshop

When working on a vehicle in the workshop always make sure that:

- Where practicable, the parking brake is applied and the wheels are securely chocked to prevent the vehicle moving forwards or backwards.
- Whenever possible, the ignition key is removed before any work is carried out on the vehicle.
- If the engine is to be run, there is adequate ventilation, or an extraction hose is used to remove exhaust fumes.
- There is adequate room to raise the vehicle and remove the wheels, if necessary.
- Fender covers are always installed if any work is to be carried out in the engine compartment.
- Where practicable, the battery is disconnected if working on the engine, underneath the vehicle, or if the vehicle is raised.

• CAUTIONS:



Prior to disconnecting the battery, refer to the Electrical Section of this manual - Battery disconnection/connection. For additional information, refer to: [Specifications](#) (414-01 Battery, Mounting and Cables, Specifications).



When electric arc welding on a vehicle, always disconnect the generator wiring to prevent the possibility of a surge of current causing damage to the internal components of the generator.

- If using welding equipment on the vehicle, a suitable fire extinguisher is readily available.

Battery - General

• CAUTIONS:



Prior to carrying out any procedures which involve disconnecting/ or connecting the battery, refer to the Electrical Section of this manual - Battery disconnection/connection. For additional information, refer to: [Specifications](#) (414-01 Battery, Mounting and Cables, Specifications).



A discharged battery condition may have been caused by an electrical short circuit. If this condition exists there will be an apparently live circuit on the vehicle even when all normal circuits are switched off. This can cause arcing when the jumper cables are connected.



While it is not recommended that the vehicle is jump started, it is recognized that this may occasionally be the only practical way to mobilize a vehicle. Prior to attempting a jump start, reference must be made to the Electrical Section of this manual - Jump Starting.

Following jump starting of a disabled vehicle, the discharged battery must be checked for serviceability and recharged off the vehicle as soon as possible to avoid permanent damage.

Do not rely on the generator to restore a discharged battery. For a generator to recharge a battery, it would take in excess of eight hours continuous driving with no additional loads placed on the battery.

- Always make sure that the jumper cables are adequate for the task.
- Always make sure that the slave battery is of the same voltage as the vehicle battery. The batteries must be connected in parallel.
- Always make sure that switchable electric circuits are switched off before connecting jumper cables. This reduces the risk of arcing occurring when the final connection is made.

Towing the Vehicle



WARNING: When towing is necessary, reference must be made to the Jacking, Lifting and Towing Section of this Manual.

When the vehicle is being towed dock the remote control and switch on the ignition. (steering lock released and warning lights illuminated). Only then will the steering, turn signal lamps, horn and stop lamps be operational. Failure to follow these instructions may result in personal injury. It must be noted that with the engine not running, the power steering and brake booster will be inoperative therefore, greater effort will be needed to steer the vehicle and apply the brakes.

General Installation Instructions

Component removal

Whenever possible, clean components and the surrounding area before removal.

- Blank off openings exposed by component removal.
- Following disconnection, seal fuel, oil or hydraulic lines immediately using suitable blanking plugs or caps.
- Seal open ends of exposed oilways using suitable tapered hardwood plugs or conspicuous plastic plugs.
- Immediately a component is removed, place it in a suitable container; use a separate container for each component and its associated parts.

- Clean bench and provide marking materials, labels and containers before disassembling components.

Disassembling

Observe scrupulous cleanliness when disassembling components, particularly when brake, fuel, air suspension or hydraulic system parts are disassembled. A particle of dirt or cloth fragment could cause a serious malfunction if trapped in these systems.

- Blow out all tapped holes, crevices, oilways and fluid passages with dry, compressed air.



WARNING: Suitable eye protection must be worn.

- Use suitable marker ink to identify mating parts, do not use a scribe or centre punch as they could initiate cracks or distortion.
- Wire or tape mating parts together where necessary to prevent accidental interchange.
- Suitably identify parts which are to be renewed and to those parts requiring further inspection. Keep these parts separate.
- To make sure that the correct replacement part has been obtained, do not discard a part due for renewal until after comparing it with the new part.

Cleaning Components

Always use cleaning agents which are suitable for the work being undertaken and the components being cleaned. NEVER use gasoline (petrol) as a cleaning agent (degreaser). Always make sure that the component being cleaned is compatible with the cleaning agent.

Always follow the manufacturer's instructions regarding the use of cleaning agents and make sure that the environment in which the work is being undertaken is suitable. See Health and Safety Precautions for further information regarding cleaning.

General Inspection of Components

All components should be inspected for wear or damage before reassembling.

- Always make sure that component to be inspected is clean and free from oil or grease.
- When a component is to be checked dimensionally against design specified values, use the appropriate measuring equipment i.e. micrometers, verniers, surface plates, dial test indicators (DTI).
- Always make sure that all measuring equipment is correctly calibrated before use.
- Reject a component which is not within specified values/limits or if it appears to be damaged.
- A component may be reinstalled if dimensions obtained during checking are at the maximum tolerance limit and it is in an undamaged condition.
- Bearing journal clearances should be checked where necessary using Plastigauge.

Joints and Joint Faces

All gaskets should be installed dry unless stated otherwise. Always apply the specified lubricant to O-rings and install O-rings using the fingers only.

Use gasket removal spray and/or plastic scrapers to remove traces of old gasket.



CAUTION: DO NOT use metal scrapers or emery cloth as these may damage the sealing surfaces.

Many joints use sealants instead of gaskets as the sealing medium. Where this is the case, the sealant together with its part number will be found listed in the relevant repair operation and also in the sealants table.



CAUTION: Always remove all traces of the old sealant prior to reassembly. Use plastic scrapers, specified solvents where available or dry, lint free cloth. DO NOT use metal scrapers or emery cloth as these may damage the sealing surfaces. Make sure that sealing surfaces are free from oil or grease as sealants will not adhere properly to contaminated surfaces.

Do not allow sealant to enter tapped holes or oilways.

Locking Devices

Always replace locking devices with one of the same design and of the correct size.

Tab washers

Always release locking tabs before loosening fixings, do not reuse tab washers.

Locknuts

Always use a backing spanner when loosening and tightening locknuts, brake and fuel pipe unions.

Roll pins

Always install new roll pins of the correct size.

Circlips

Always install new circlips ensuring that they are of the correct size for the groove.

Woodruff keys

Woodruff keys may be reused provided there is no indication of wear or distortion.

Remove any burrs from edges of keyways using a fine file.

Split pins

Never attempt to straighten and reuse a split pin, always make sure that replacement pins are of the correct size for the hole in which they are to be installed.

Screw Threads

- Damaged nuts, bolts and screws must always be discarded. Attempting to recut or repair damaged threads with a tap or die impairs the strength and fit of the threads and is not recommended.
- **NOTE:** During certain repair operations, it may be necessary to remove traces of thread locking agents using a tap. Where this is necessary, the instruction to do so will appear in the relevant operation and it is essential that a tap of the correct size and thread is used.
- Some bolts are coated with a thread locking agent and unless stated otherwise, they must not be reused. New bolts having the same part number as the original must always be installed. When nuts or bolts are to be discarded, the repair operation and relevant torque chart will include an instruction to that effect. Do not use proprietary thread locking agents as they may not meet the specification required. See also Encapsulated ('Patched') Bolts and Screws.
- Always make sure that replacement nuts and bolts are at least equal in strength to those that they are replacing. Castellated nuts must not be loosened to accept a split pin except in recommended cases when this forms part of an adjustment.
- Do not allow oil or grease to enter blind holes, the hydraulic action resulting from tightening the bolt or stud can split the housing and also give a false torque reading.
- Always tighten a nut, bolt or screw to the specified torque figure, damaged or corroded threads can give a false torque reading.
- Nut and bolt loosening and tightening sequences, where given, must ALWAYS be followed. Distortion of components or faulty sealing of joints will result if the sequences are not followed. Where an instruction is given to tighten in stages, these stages must be adhered to; do not attempt to combine stages particularly where certain stages involve tightening by degrees.
- To check or re-tighten a fixing to a specified torque, first loosen a quarter of a turn, then retighten to the specified torque figure.
- Unless instructed otherwise, do not lubricate bolt or nut threads prior to installing.

Where it is stated that bolts and screws may be reused, the following procedures must be carried out:

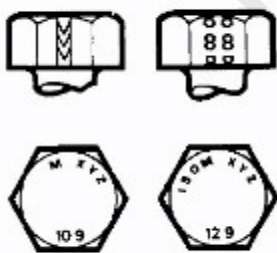
- Check that threads are undamaged.
- Remove all traces of locking agent from the threads.



CAUTION: DO NOT use a wire brush; take care that threads are not damaged.

- Make sure that threads are clean and free from oil or grease.
- Apply the specified locking agent to the bolt threads.

Bolt and Nut Identification



E48627

An ISO metric bolt or screw made of steel and larger than 6 mm in diameter can be identified by either of the symbols ISO M or M embossed or indented on top of the bolt head.

In addition to marks identifying the manufacturer, the top of the bolt head is also marked with symbols indicating the strength grade e.g. 8.8, 10.9, 12.9, 14.9. Alternatively, some bolts and screws have the M and strength grade symbol stamped on the flats of the hexagon.

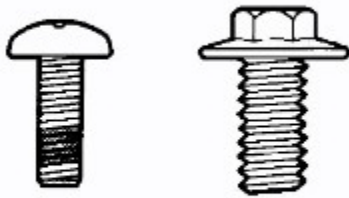
Encapsulated ('Patched') bolts and screws



E48628

Encapsulated ('patched') bolts and screws have a thread locking agent applied to the threads during manufacture. Most thread locking agents are colored, the band of color extending for 360 degrees around the thread. Some locking agents however, are neutral in color and may not be so easily identified apart from a slightly darker area of thread where the locking agent has been applied. The locking agent is released and activated by the tightening process and is then chemically cured to provide the locking action.

Self-locking bolts and screws



E48629

Unless stated in a specific repair procedure, self-locking bolts and screws i.e. nylon patched or trilobular thread can be reused provided that resistance is felt when the locking portion enters the female thread.

Nylon patched bolts and screws have a locking agent either applied to, or inserted in the threaded portion. They are identified by the presence of a colored section of thread extending approximately 180 degrees around the thread or by a colored plug inserted into the bolt.

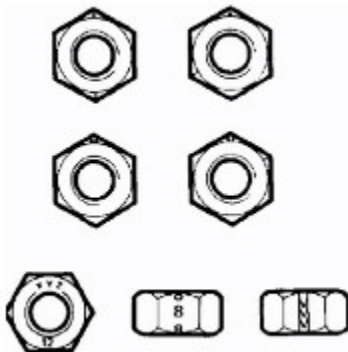
Trilobular bolts have a special thread form which creates a slight interference with the thread of the hole or nut into which it is screwed.



CAUTION: Do Not reuse self-locking fasteners in critical locations e.g. drive plates/flywheel or engine bearings. Do not install non self-locking fasteners where a self-locking fastener is specified.

Trilobular bolts should not be used as a substitute for patched bolts.

Nut identification



E48630

A nut with an ISO metric thread is marked on one face or one of the hexagonal flats with the strength grade symbol 8, 12, 14. Some nuts with the strength grade 4, 5 or 6 are also marked and some have the metric symbol M on the hexagonal flat opposite the strength grade marking.

A clock face system is sometimes used as an alternative method of indicating the strength grade. The external chamfers or a face of the nut is marked in a position relative to the appropriate hour mark on a clock face to indicate the strength grade.

A dot is used to locate the 12 o'clock position and a dash to indicate the strength grade. If the grade is above 12, two dots identify the 12 o'clock position.

When tightening a slotted or castellated nut, never loosen it to insert a split pin except where specified as part of an adjustment procedure. If difficulty is experienced in correctly positioning the slot, alternative washers or nuts should be selected.

Where a nut is tightened to adjust or maintain bearing pre-load, the tightening procedure must be adhered to.

Self-locking nuts



E48631

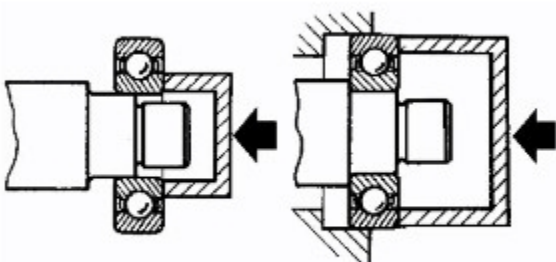
Unless stated otherwise, self-locking nuts once removed must be discarded and new nuts of the same type and strength grade installed.

Ball and Roller Bearings

When removing and installing bearings, make sure that the following practices are observed to make sure component serviceability:

⚠ CAUTION: Service tools have been developed for removing the majority of bearings; these must always be used where specified.

- Remove all traces from bearing under inspection by cleaning with a suitable degreasant; maintain absolute cleanliness throughout operations.
- Conduct a visual inspection for markings on rolling elements, raceways, outer surfaces of outer or inner surfaces of inner rings. Reject any bearings found to be marked since marking in these areas indicates onset of wear.
- Hold inner race of bearing between finger and thumb of one hand and rotate outer race to check that it revolves absolutely smoothly. Repeat holding outer race and rotating inner race. DO NOT spin the bearing.
- Rotate outer ring gently using a reciprocating movement whilst holding inner ring; feel for any check or obstruction to rotation. Reject bearing if movement is not absolutely smooth.
- Check bearing for blueing or signs of overheating.
- Lubricate bearing with the specified lubricant.
- Inspect bearing surface of shaft and bearing housing for discoloration or other markings which indicate overheating of bearing or movement between bearing and seating.
- Before installing bearing, make sure that shaft and bearing housing are clean and free from burrs.
- If one bearing of a pair shows signs of wear, overheating etc., it is advisable to replace bearings as a pair unless it is suspected that one bearing may have been faulty when installed, was installed incorrectly or the fault arose due to oil seal failure.
- Never reinstall a bearing unless it is in a fully serviceable condition.



E48560

- When installing a bearing to a shaft, only apply force to the inner ring of the bearing. When installing a bearing into a housing, only apply force to the outer ring of the bearing.



CAUTION: Service tools have been developed for installing the majority of bearings; these must always be used where specified.

- In the case of grease lubricated bearings, fill the space between the bearing and outer seal with the recommended grade of grease before installing the seal.



CAUTION: When a waxed oil seal (installed dry) type of oil seal is to be installed, take great care that grease does not contaminate the running surface of the seal.

- Always make suitable reference marks between the components of separable bearings e.g. taper roller bearings when disassembling to make sure correct location of components when assembling. Never install new rollers in an outer ring, always install a new bearing assembly.

Brake Pads and Linings

Always install the correct grade and specification of brake pads and linings. When replacing these items, always replace as complete axle sets.

Brake Hydraulics

Always observe the following recommendations when working on the braking system:



WARNING: Do not intermix brake fluid of different specifications.

- Always use two spanners when loosening or tightening brake pipes or hose connections.
- Make sure that hoses run in a natural curve and are not kinked or twisted.
- Install brake pipes and hoses securely in their retaining clips and make sure that they cannot contact a potential chafing point.
- Containers used for brake fluid must be kept absolutely clean.
- Do not store brake fluid in unsealed containers, the fluid will absorb water which will lower the boiling point of the fluid.
- Do not allow brake fluid to be contaminated with other fluids such as mineral oil and do not put brake fluid in a container which has previously been used for storing other fluids.
- Do not reuse brake fluid which has been bled from the system.
- Always use brake fluid or a suitable brake cleaning fluid to clean hydraulic components.
- Unless stated otherwise, use only clean brake fluid to lubricate hydraulic seals and components.
- Always install blanking plugs to hoses, pipes or components immediately after disconnection.
- Check thread compatibility of original equipment with replacement components.
- Observe absolute cleanliness when working with hydraulic components.

Pipes and Hoses

When removing or installing flexible hydraulic pipes and hoses, make sure that the following procedures are observed to make sure component serviceability:

- Prior to removal, clean area around hose or pipe end which is to be disconnected.
- Obtain appropriate blanking plugs or caps before disconnecting hose or pipe end fittings in order that connections can be plugged immediately following disconnection.
- Always install blanking plugs or caps to pipes and unions immediately following disconnection.
- Clean hose or pipe and blow through with an air line.



WARNING: Suitable eye protection must be worn.

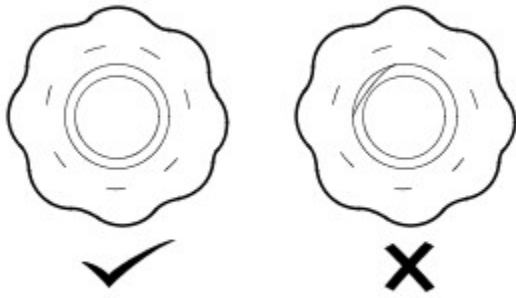
- Check hoses externally for cracks, separation of plies, security of end fittings and external damage; replace faulty hoses.
- Check pipes for signs of corrosion and chafing, replace as necessary.



CAUTION: If pipes are found to be chafed, rectify clips, mounting points etc., to prevent further problems in service.

- When installing hoses, make sure that no unnecessary bends are introduced and that hoses are not kinked, twisted or positioned close to potential chafing points.
- When installing pipes, make sure that pipes are positioned and clipped clear of potential chafing points.
- Always replace sealing washers installed to banjo bolts, sealing plugs etc.
- Always use a backing spanner when tightening unions and do not overtighten union nuts or banjo bolts.
- After any work on hydraulic systems, always check for fluid leaks whilst a second operator applies working pressure to the brake pedal or operates the system that has been worked on.

Fuel system hoses



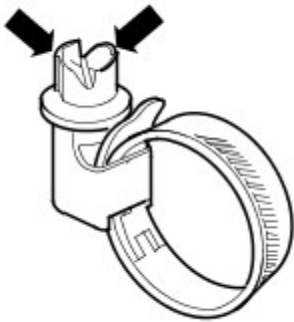
E48632

All fuel hoses are made up of two laminations, an armoured rubber outer sleeve and an inner viton core. Whenever a hose is removed, make sure that the inner bore is inspected to check that the viton lining has not become separated from the outer sleeve.



WARNING: Never attempt to repair fuel hoses or rectify leaking 'quick-fit' connectors the fuel hose and connectors must be replaced as an assembly.

Fuel system hose clips



E48636

Certain fuel system hose clips are of the 'break-off head' type where a slot in the screw head shears off when the clip is tightened to a specific torque. These clips may be removed using a screwdriver and must be replaced with new clips on reassembly. Clips must be tightened until the portion of the slot shears off. Do not attempt to tighten clips by any other method, do not install any other type of clip.

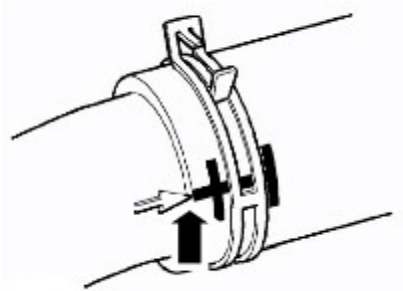
Cooling system hoses



CAUTION: The following precautions must be observed to make sure that the integrity of the cooling system hoses and their connection to the system is maintained.

Hose orientation and connection

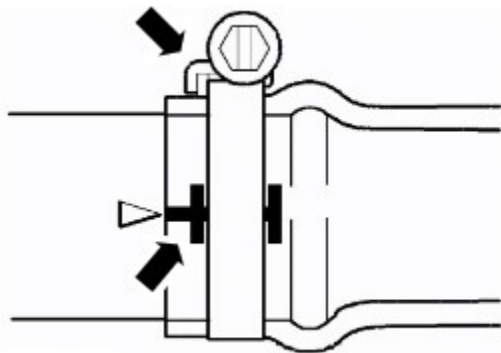
Correct orientation of cooling system hoses is important to make sure that hoses do not become fatigued or damaged through contact with adjacent components.



E48633

Where orientation marks are provided on the hose and corresponding component, the marks must be aligned when the hose is installed. Hoses must be installed fully on to their connection points, usually a moulded form on a pipe provides a positive indicator.

Hose clips



E48634

Markings are usually provided on the hose to indicate the correct clip position. If no markings are provided, position the clip directly behind the retaining lip at the end of the stub pipe. Worm drive clips should be orientated with the crimped side of the drive housing facing towards the end of the hose or the hose may become pinched between the clip and the stub pipe retaining lip. Unless otherwise stated, worm drive clips should be tightened to 3 Nm (2 lb-ft). Make sure that hose clips do not foul adjacent components.



E48635

Oetiker clips may be removed by bending the tag (arrowed) and releasing the free end of the clip. Clips must not be reused. When installing new clips, make sure clip is positioned on hose before tightening and make sure that when clip is tightened, the tag is located in the longitudinal slot in the free end of the clip (arrowed in illustration).

Heat protection

Always make sure that heatshields and protective sheathing are in good condition; replace if damage is evident. Particular care must be taken when routing hoses close to hot engine components such as the exhaust manifolds and exhaust gas recirculation (EGR) pipes. Hoses will relax and deflect slightly when hot, make sure this movement is taken into account when routing and securing hoses.

Electrical Precautions

General

The following guidelines are intended to make sure the safety of the operator whilst preventing damage to the electrical and electronic components of this vehicle.

Equipment

Prior to commencing any test procedure on the vehicle, make sure that the relevant test equipment is working correctly and that any harness or connectors are in good condition. It is particularly important to check the condition of all plugs and leads of mains operated equipment.

Polarity

Never reverse connect the vehicle battery and always make sure the correct polarity when connecting test equipment.

High voltage circuits

Whenever disconnecting live ht circuits, always use insulated pliers and never allow the open end of the ht lead to contact other components, particularly ECU's.

Vehicles installed with Bi-Xenon headlamp bulbs



WARNING: The following precautions must be observed as failure to comply may result in exposure to ultra-violet rays, severe electric shock, burns or risk of an explosion.

- Safety goggles and gloves must be worn.
- Make sure that headlamps are switched off before removing bulbs.

- Do not touch the glass portion of the bulb.
- On no account should headlamps be switched on with the bulb removed from the headlamp.
- Bulb testing may only be carried out with the bulb installed in the headlamp.
- Bulbs must be disposed of in accordance with the local authority bye-laws.

Connectors and harnesses

The engine compartment of a vehicle is a particularly hostile environment for electrical components and connectors. Always observe the following:

- Make sure electrically related items are dry and oil free before disconnecting/connecting test equipment.
- Make sure that disconnected multiplugs and sensors are protected from any possible oil, coolant or other liquid contamination. Any such contamination could impair performance or lead to component failure.
- Never force connectors apart or pull on the wiring harness.
- Always make sure locking tabs are disengaged before disconnecting multiplugs etc. and make sure that correct orientation is achieved before connection.
- Make sure that any protection covers, insulation etc. are replaced if disturbed.

Having confirmed that a component is faulty, carry out the following:

- Switch off the ignition and disconnect the battery.
- Remove the component and support the disconnected harness.
- When replacing electrical components, keep oily hands away from electrical connections and make sure that locking tabs on connectors are fully engaged.

Battery Disconnection/Connection

Always refer to the Electrical Section of this manual - Battery Connection/Disconnection prior to attempting to connect or disconnect the battery.

For additional information, refer to: [Specifications](#) (414-01 Battery, Mounting and Cables, Specifications).

Fuel Handling Precautions

The following information lists basic precautions which must be observed if fuel is to be handled safely. It also outlines other areas of risk which must not be ignored. As this information is issued for basic guidance only, consult your local Fire Department where any doubt as to personal and environmental safety exists - See also Health and Safety Precautions.

General precautions

Always have the correct type of fire extinguisher containing Foam, CO₂, Gas or powder accessible when handling or draining fuel or dismantling fuel systems. Fire extinguishers must also be located in areas where fuel is stored.

Make sure that suitable warning signs are exhibited.

Keep all sources of ignition well away from areas where fuel is being handled.

Make sure that any leadlamps are flameproof and kept clear of spillage.

• WARNINGS:



Do not disassemble or reassemble fuel system components whilst vehicle is over a pit.



No one should be permitted to repair components associated with fuel without first having specialist training.

Always disconnect the vehicle battery before carrying out disassembly, reassembly or draining work on a fuel system.

Fuel tank and system draining

Draining must be carried out in accordance with the procedures given in the relevant Fuel System section of this manual.

• WARNINGS:



Never drain fuel or work on a fuel system while the vehicle is over a pit. Extraction or draining of fuel must be carried out in a well ventilated area.



Always attach fuel vapor warning labels to fuel tanks immediately after draining.



Containers used for storing fuel must be clearly marked with the contents and placed in a safe storage area which meets the requirements of the local authority.



CAUTION: Some fuel lines are now installed with 'quick release' connectors. If a connector is damaged, no attempt must be made to repair the connector, a new fuel line and connector(s) assembly must be installed.

Always release pipe clips fully before attempting to disconnect fuel pipes.

Fuel tank repairs



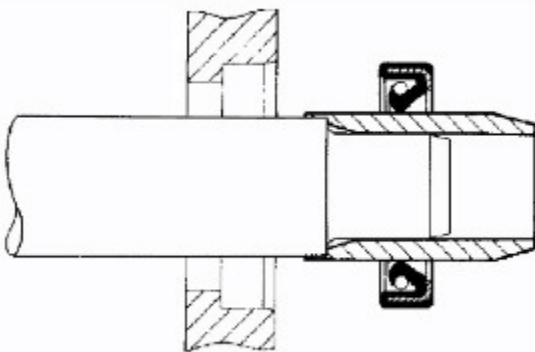
CAUTION: No attempt should be made to repair a plastic fuel tank. If the structure of the tank is damaged, a new

tank must be installed.

Oil seals

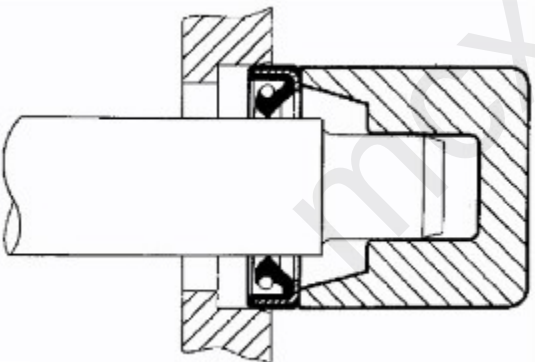
Never use a seal which has been improperly stored or handled.

- Take great care when removing old seals that the sealing surfaces and seal housing are not damaged.
- Carefully examine seal before installing to make sure that it is clean and undamaged.
- Make sure that the surface on which the seal is to run and also the seal housing is clean and free from burrs or scratches. Renew the component if the sealing surface cannot be restored.
- Special tools and protection sleeves are provided for installing the majority of seals and must be used when specified.
- Many seals are now coated with a protective wax and DO NOT need to be lubricated prior to installing. Always check the relevant repair procedure which will state if a seal must be installed dry. Never touch these seals with oily hands as the oil will contaminate the protective coating and affect the sealing properties of the seal; also, make sure that installing tools and protection sleeves are free from oil and grease. Seals which must be lubricated prior to installing should have the recommended lubricant applied to the areas specified in the repair procedure.
- Make sure that a seal is installed the correct way round. For example, the lip of the seal must face towards the lubricant which it is sealing.
- When installing an oil seal, make sure that it is positioned square to shaft and housing. Where the seal is to be installed to a housing prior to installing over a shaft, take care not to allow the weight of an unsupported shaft to rest on the seal.



E48561

- Always use the recommended special tool and protection sleeve to install an oil seal. If no tool is specified, use a suitable mandrel approximately 0.4 mm (0.015 in) smaller than the outside diameter of the seal. Use adhesive tape on the shaft to protect the sealing lip of the seal.



E48562

- Press or drift the seal in to the depth of its housing if the housing is shouldered or flush with the face of the housing where no shoulder is provided. Make sure that the seal is not tilted in the housing when it is installed.

Supplementary Restraint System (SRS) Precautions



WARNING: Do not install rear facing child seats in the front passenger seat.

The SRS contains components which are potentially hazardous to service personnel if not handled correctly. The following guidelines and precautions are intended to alert personnel to potential sources of danger and emphasise the importance of ensuring the integrity of the SRS components installed to the vehicle.



WARNING: The following precautions **MUST** be adhered to when working on the SRS system:

- The correct procedures must always be used when working on SRS components.
- Persons working on the SRS system must be fully trained and have been issued with the safety guidelines.
- The airbag modules contain extremely flammable and hazardous compounds. Contact with water, acids or heavy metals may produce harmful or explosive results. Do not dismantle, incinerate or bring into contact with electricity before the unit has been deployed.
- Always replace a seat belt assembly that has withstood the strain of a severe vehicle impact or if the webbing

- **shows signs of fraying.**
- **Always disconnect the vehicle battery before carrying out any electric welding on a vehicle installed with an SRS system.**



CAUTION: Do not expose airbag modules or seat belt pre-tensioners to temperatures exceeding 85° C (185° F).

It should be noted that these precautions are not restricted to operations performed when servicing the SRS system. The same care should be exercised when working on ancillary systems and components located in the vicinity of SRS components; these include but are not limited to:

- Steering wheel airbag, rotary coupler.
- Passenger front airbag.
- Side curtain airbag modules - front and rear.
- Seat belt pre-tensioners.
- SRS harnesses, link leads and connectors.
- Side (thorax) air bags.

Making the system safe

Before working on or in the vicinity of SRS components, make sure the system is rendered safe by performing the following operations:

- Remove the remote control.
- Disconnect battery, earth lead first.
- Wait 2 minutes for the SRS power circuit to discharge before commencing work.

• **NOTE:** The SRS uses energy reserve capacitors to keep the system active in the event of electrical supply failure under crash conditions. It is necessary to allow the capacitors sufficient time to discharge (2 minutes) in order to avoid the risk of accidental deployment.

Installation

In order to make sure system integrity, it is essential that the SRS system is regularly checked and maintained so that it is ready for effective operation in the event of a collision. Carefully inspect SRS components before installation. Do not install a part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.



WARNING: The integrity of the SRS systems is critical for safety reasons. Make sure the following precautions are always adhered to:

- **Do not install accessories or other objects to trim panels which cover airbags.**
- **Never install used SRS components from another vehicle or attempt to repair an SRS component.**
- **When repairing an SRS system, only use genuine new parts.**
- **Never apply electrical power to an SRS component unless instructed to do so as part of an approved test procedure.**
- **Special fixings are necessary for installing an airbag module – do not use other fixings.**
- **Always use new fixings when replacing an SRS component and make sure that all fixings are tightened to the correct torque.**

• CAUTIONS:



Take care not to trap airbag modules when installing interior trim components.



Make sure SRS components are not contaminated by oil or grease.

• **NOTE:** Following seat belt pre-tensioner deployment, the seat belts can still be used as conventional seat belts but will need to be replaced as soon as possible to make sure full SRS protection. Do not use the seat belts if the retraction mechanism is not working correctly.

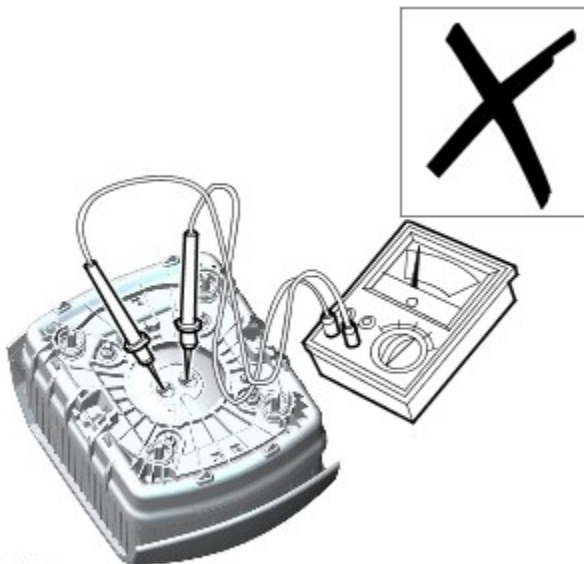
• **NOTE:** If the SRS components are to be replaced, the part number/bar code of the new unit must be recorded.

SRS component testing precautions

The SRS components are triggered using relatively low operating currents, always adhere to the following :



WARNING: Never use a multimeter or other general purpose equipment on SRS components. Use only Land Rover approved diagnostic equipment to diagnose system faults.



E87442

WARNING: Do not use electrical test equipment on the SRS harness while it is connected to any of the SRS components, it may cause accidental deployment and injury.

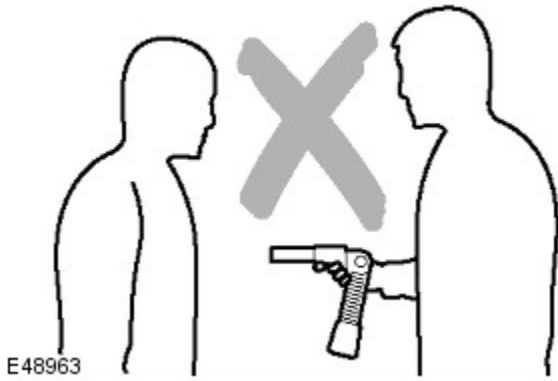
Handling and storage

Always observe the following precautions when handling SRS components:



E87443

- Never drop an SRS component. The airbag diagnostic control unit is a particularly shock sensitive device and must be handled with extreme care. Airbag modules and seat belt pre-tensioners could deploy if subjected to a strong shock.
- Never wrap your arms around an airbag module. If a module has to be carried, hold it by the cover with the cover uppermost and the base away from your body.
- Never transport airbag modules or seat belt pre-tensioners in the passenger compartment of a vehicle. Always transport airbag modules or seat belt pretensioners in their original packaging in the luggage compartment of the vehicle.
- Never attach anything to an airbag cover or any trim component covering an airbag module. Do not allow anything to rest on top of an airbag module.
- Always keep components cool, dry and free from contamination.
- Never apply grease or cleaning solvents to seat belt pre-tensioner units, component failure could result.
- Always store an airbag module with the deployment side uppermost. If it is stored deployment side down, accidental deployment will propel the airbag module with sufficient force to cause serious injury.
- Keep new airbag modules in their original packaging until just prior to installing. Place the old module in the empty packaging for carriage.



• **WARNINGS:**

 When handling a side curtain airbag module, hold by the gas generator housing, DO NOT hold by the airbag. Do not wrap the thumb around the gas generator while holding. Do not drape airbag over shoulder or around neck. For seat buckle type pre-tensioners, hold by the piston tube, with the open end of the piston tube pointing towards the ground and the buckle facing away from your body. Do not cover the end of the piston tube. DO NOT hold buckle type pre-tensioners by the bracket assembly or cable. Never point the piston tube towards your body or other people.

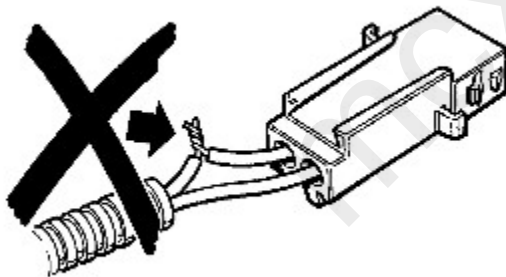
 Airbag modules and seat belt pre-tensioners are classed as explosive devices. For overnight and longer term storage, they must be stored in a secure steel cabinet which has been approved as suitable for the purpose and has been registered with the local authority.

 Store airbag modules or seat belt pre-tensioners in a designated storage area. If there is no designated storage area available, store in the locked luggage compartment of the vehicle and inform the workshop supervisor.

 **CAUTION:** Improper handling or storage can internally damage the airbag module making it inoperative. If you suspect the airbag module has been damaged, install a new module and refer to the deployment/disposal procedures for disposal of the damaged module.

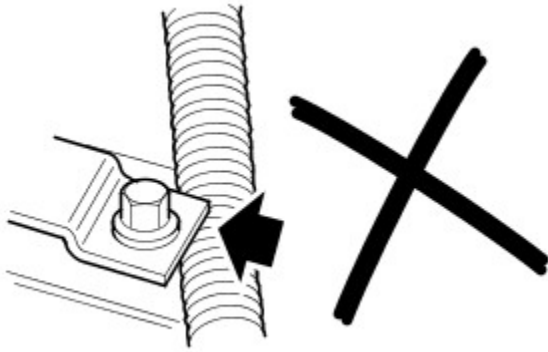
SRS harness and connectors

Always observe the following precautions with regards to SRS system electrical wiring:



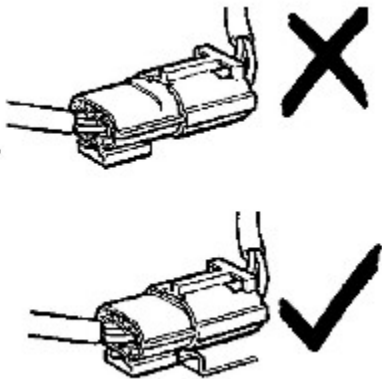
- Never attempt to modify, splice or repair SRS wiring.
- Never install electrical equipment such as a mobile telephone, two-way radio or in-car entertainment system in such a way that it could generate electrical interference in the airbag harness. Seek specialist advice when installing such equipment.

• **NOTE:** SRS wiring can be identified by a special yellow outer sleeve protecting the wires (black with yellow stripe protective coverings are sometimes used).



E48964

⚠ WARNING: Always make sure SRS wiring is routed correctly. Be careful to avoid trapping or pinching the SRS wiring.



E48966

⚠ WARNING: Do not leave the connectors hanging loose or allow SRS components to hang from their harnesses. Look for possible chafing points.

Side impact crash sensor inspection

After any degree of side body damage, inspect the side impact crash sensors. Replace a crash sensor if there is any sign of damage.

⚠ CAUTION: Take extra care when painting or carrying out bodywork repairs in the vicinity of the crash sensors. Avoid direct exposure of the crash sensors or link harnesses to heat guns, welding or spraying equipment. Take care not to damage sensor or harness when reinstalling components.

Clock spring

⚠ CAUTION: Always follow the procedure for installing and checking the clock spring as instructed in the SRS repairs section. Comply with all safety and installation procedures to make sure the system functions correctly. Observe the following precautions:

- Do not unlock and rotate the clock spring when it is removed from the vehicle.
- Do not turn the road wheels when the clock spring is removed from the vehicle.
- Always make sure the clock spring is removed and installed in its central position and with the front road wheels in the straight ahead position - refer to SRS repair section for the correct removal and installation procedure.
- If a new clock spring is being installed, make sure the locking tab holding the coupler's rotational position is not broken; units with a broken locking tab must not be used.

Airbag and pre-tensioner deployment

⚠ WARNING: During deployment parts of the airbag module become hot enough to burn you. Wait 30 minutes after deployment before touching the airbag module.

Deployment procedures and precautions as detailed in this manual should be strictly adhered to. Only personnel who have undergone the appropriate training should undertake deployment of airbag and pre-tensioner modules. The following precautions must be complied with:

- Only use deployment equipment approved for the intended purpose.
- Deployment of airbag / pre-tensioner modules must be performed in a well ventilated area which has been designated for the purpose.
- Make sure airbag / pre-tensioner modules are not damaged or ruptured before attempting to deploy.
- Where local legislation exists, notify the relevant authorities of intention to deploy airbag and pretensioner units.
- When deploying airbag pre-tensioner units, make sure that all personnel are at least 15 metres (45 feet) away from the deployment zone.

- Make sure deployment tool is connected correctly, in compliance with the instructions detailed in the SRS section of this manual. In particular, make sure deployment tool is NOT connected to battery supply before connecting to airbag module connector.
- When deploying seat belt pre-tensioners, make sure pre-tensioner unit is secured correctly to the seat.
- When removing deployed airbag modules and pre-tensioner units, wear protective clothing. Use gloves and seal deployed units in a plastic bag.
- Following deployment of any component of the SRS system within the vehicle, all SRS components must be replaced. DO NOT reuse or salvage any parts of the SRS system.
- Do not lean over an airbag module when connecting deployment equipment.

If a vehicle is to be scrapped, undeployed airbag modules and pre-tensioner units must be manually deployed. In this case airbags can be deployed in the vehicle. Before deployment, make sure the airbag module is secure within its correct mounting position. Deployment of the driver's airbag in the vehicle may damage the steering wheel; if the vehicle is not being scrapped, deploy the module outside of the vehicle.

SRS Component Replacement Policy

• CAUTIONS:



The restraints control module (RCM) must be replaced after every time any SRS component has been deployed.



The SRS side impact sensor must be replaced if there are any signs of physical damage or if the RCM is registering a fault.

The following information details the policy for replacement of SRS components as a result of a vehicle accident.

Impacts which do not deploy the airbags or pre-tensioners

Check for structural damage in the area of the impact paying particular attention to bumper armatures, longitudinals and bracketry.

Impacts which deploy the airbags or pre-tensioners

The replacement and inspection policy is dependent on the type and severity of the crash condition. The following guidelines are the minimum that should be exercised as a result of the deployment of specific SRS components.

Check for structural damage in the area of impact paying particular attention to bumper armatures, longitudinals and bracketry.

Front Airbag Deployment - Driver and Passenger



CAUTION: If the front airbags are deployed, the following components must be replaced:

- Driver airbag module
- Steering wheel
- Passenger airbag module
- Instrument panel
- Fly leads (where applicable) connecting front airbag modules to SRS harness
- All seat belt buckle pre-tensioner
- All occupied seats at the time of the crash should have their seat belts replaced
- Any seat belt with a deployed retractor pretensioner should be replaced.
- Rotary coupler
- Any front impact sensors that have been physically damaged or if a fault is being registered
- RCM

Additionally, the following items must be inspected for damage and replaced as necessary:

- Front passenger's seat belt retractor and webbing, tongue latching function, 'D' loop and body anchorage point
- Rear seat belt buckles, webbing, buckle covers, body anchorage points and tongue latching function
- Front seat frames and head restraints
- Steering column - if adjustment is lost or if there are signs of collapse
- Seat belt height adjusters
- Rear seat belts

Side Air Bags



CAUTION: If the side (thorax) air bags are deployed, the following components must be replaced on the side of the vehicle on which the deployment occurred:

- Side (thorax) airbag
- Any side impact sensors that have been physically damaged or if a fault is being registered
- RCM

Additionally, the following items must be inspected for damage and replaced as necessary:

- Front seat belts, retractors and webbing, tongue latching function, 'D' loop and body anchorage points
- Rear seat belt buckles, webbing, buckle covers, tongue latching function, and body anchorage points
- Front seat frame and head restraints
- Door trim casing
- Seat belt height adjusters

- Rear seat belts

Side Curtain Airbag Modules



CAUTION: If the head airbag modules are deployed, the following components must be replaced on the side of the vehicle on which the deployment occurred:

- Side curtain airbag modules
- Headliner and all pillar trims
- Link lead between airbag gas generator and RCM harness
- Airbag retaining clips
- Front seat belt buckle pre-tensioners
- Any side impact sensors that have been physically damaged or if a fault is being registered
- RCM

Additionally, the following items must be inspected for damage and replaced as necessary:

- Component mounting brackets
- Front seat belts, retractors and webbing, tongue latching function, 'D' loop and body anchorage points
- Rear seat belt buckles, webbing, buckle covers, tongue latching function, and body anchorage points
- Adjacent trim components
- Seat belt height adjusters

Rear impacts



CAUTION: If the seat belt pre-tensioners are deployed during a rear impact, the following components must be replaced:

- Seat belt pre-tensioners
- Front and rear seat belt retractors used during the impact
- RCM

Additionally, the following items must be inspected for damage and replaced as necessary:

- Seat belt height adjusters
- Front seat belts, retractors and webbing, tongue latching function, 'D' loop and body anchorage points
- Rear seat belt buckles, webbing, buckle covers, tongue latching function, and body anchorage points

Air Conditioning System Precautions

The air conditioning system contains fluids and components which could be potentially hazardous to the service engineer or the environment if not serviced and handled correctly. The following guidelines are intended to alert the service engineer to potential sources of danger and emphasise the importance of ensuring the integrity of the Air Conditioning operating conditions and components installed to the vehicle.

Where necessary, additional specific precautions are detailed in the relevant sections of this Manual and also in the Health and Safety Section. These precautions must be referred to prior to commencing repair operations.

The refrigerant used in the air conditioning system is HFC-134a (Hydrofluorocarbon) R134a.

• WARNINGS:



WARNING: Servicing must only be carried out by personnel familiar with both the vehicle system and the charging and testing equipment. All operations must be carried out in a well ventilated area away from open flame and heat sources.



WARNING: R134a is a hazardous liquid and when handled incorrectly can cause serious injury. Suitable protective clothing, consisting of face protection, heat proof gloves, rubber boots and rubber apron or waterproof overalls, must be worn when carrying out operations on the air conditioning system.

Remedial actions



WARNING: Due to its low evaporating temperature, R134a must be handled with care. R134a splashed on any part of the body will cause immediate freezing of that area. Also, refrigerant cylinders and replenishment trolleys when discharging will freeze skin to them if contact is made.

If an accident involving R134a should occur, conduct the following remedial actions:

- If liquid R134a enters the eye, do not rub it. Gently run large quantities of eye wash over affected eye to raise the temperature. If an eye wash is not available, cool, clean water may be used to flush the eye. After rinsing, cover the eye with a clean pad and seek immediate medical attention.
- If liquid R134a is splashed onto the skin, run large quantities of water over the affected area to raise the temperature. Implement the same action if the skin comes in contact with discharging cylinders. Wrap the contaminated body parts in blankets (or similar materials) and seek immediate medical attention.
- If the debilitating effects of inhalation of R134a vapour are suspected, seek fresh air. If the affected person is unconscious, move them away from the contaminated area to fresh air and apply artificial respiration and/or oxygen and seek immediate medical attention.

Service precautions

Observe the following precautions when handling components used in the air conditioning system:

- Air conditioning units must not be lifted by their hoses, pipes or capillary lines.
- Hoses and lines must not be subjected to any twist or stress; the efficiency of the system will be impaired by kinks or restrictions. Make sure that hoses are correctly positioned before tightening couplings, and make sure that all clips and supports are utilised.
- Flexible hoses should not be positioned closer than 100 mm (4.0 in) to the exhaust manifold unless protected by heat shielding.
- Completed assemblies must be checked for refrigeration lines touching metal panels. Any direct contact of components and panels may transmit noise and so must be eliminated.
- The appropriate torque wrench must be used when tightening refrigerant connections to the stipulated value. An additional spanner must be used to hold the union to prevent twisting of the pipe when tightening connections.
- Before connecting any hose or pipe, make sure that refrigerant oil is applied to the seat of the new O-rings, **BUT NOT** to the threads of the connection.
- All protective plugs or caps must remain in place in the component until immediately prior to connection.
- Make sure components are at room temperature before uncapping/unplugging, to prevent condensation of moisture from the air that enters it.
- When disconnecting, immediately plug or cap all air conditioning pipes to prevent ingress of dirt and moisture into the system.
- Components must not remain uncapped/unplugged, if a system has been left uncapped/unplugged for 20 minutes or longer, a new receiver/drier must be installed.
- The receiver/drier contains desiccant which absorbs moisture. It must be positively sealed at all times. A receiver/drier that has been left uncapped for longer than 20 minutes must not be used; install a new unit.
- The receiver/drier should be the last component connected to the system to make sure optimum dehydration and maximum moisture protection of the system.
- Whenever a component of the refrigeration system is replaced, it will also be necessary to install a new receiver/drier unit.
- Use alcohol and a clean lint-free cloth to clean dirty connections.
- Make sure that all new parts installed are marked for use with R134a.
- When a major repair has been completed, a leak test should be conducted; refer to the Repairs Section of this manual for the correct procedure.

Refrigerant oil



CAUTION: Refrigerant oil easily absorbs water and must not be stored for long periods. Do not pour unused refrigerant oil back into the container. Always use an approved refrigerant oil.

When replacing components in the air conditioning system, drain the refrigerant oil from the component being replaced into a graduated container. On assembly, add the quantity of refrigerant oil drained to the new component - See Air Conditioning Compressor Replacement in this Section.

Compressor

A new compressor is sealed and pressurised with Nitrogen gas. When installing a new compressor, slowly release the sealing cap; gas pressure should be heard to vent as the seal is broken.



CAUTION: A new compressor should always be sealed and could be pressurised with nitrogen gas. To avoid possible oil loss, release the sealing cap(s) slowly. Do not remove the cap(s) until immediately prior to connecting the air conditioning pipes to the compressor.

Rapid refrigerant discharge

If the air conditioning system is involved in accident damage and the system is punctured, the refrigerant will discharge rapidly. The rapid discharge of refrigerant will also result in the loss of most of the oil from the system. The compressor must be removed and all the remaining oil in the compressor drained and refilled as instructed in the air conditioning section of this manual.

Precautions for refrigerant recovery, recycling and recharging

When the air conditioning system is recharged, any existing refrigerant is first recovered from the system and recycled. The system is then charged with the required weight of refrigerant and volume of refrigerant oil.



WARNING: Refrigerant must always be recycled before reuse to make sure that the purity of the refrigerant is high enough for safe use in the air conditioning system. Recycling should always be carried out with equipment which is design certified by Underwriter Laboratory Inc. for compliance with SAE J1991. Other equipment may not recycle refrigerant to the required level of purity.

• CAUTIONS:



A R134a Refrigerant Recovery Recycling Recharging Station must not be used with any other type of refrigerant. Refrigerant R134a from domestic and commercial sources must not be used in motor vehicle air conditioning systems.



The system must be evacuated immediately before recharging commences. Delay between evacuation and recharging is not permitted.

Air Conditioning Compressor Replacement

A new compressor is supplied filled with a full charge (X cm³) of refrigerant oil.

A calculated quantity of oil must be drained from the new compressor before installing. To calculate the quantity of oil to be drained:

- Remove the drain plug from the old compressor.

- Invert the compressor and gravity drain the oil into a calibrated measuring cylinder. Rotate the compressor clutch to make sure the compressor is completely drained.
- Note the quantity of oil drained (Y cm³).
- Calculate the quantity of oil to be drained from the new compressor using the following formula: $X \text{ cm}^3 - (Y \text{ cm}^3 + 20 \text{ cm}^3) = Q \text{ cm}^3$
- Remove the drain plug from the new compressor and drain Q cm³ of oil. install and tighten the compressor drain plug.

Vehicle Weights

Item	kg	lb
Maximum Gross Vehicle Weight (GVW) - All models (1)	2505	5511
Approximate unladen weight (2):		
3.2 Petrol	1825	4015
2.2 Diesel	1820	4004
Maximum weight of unbraked trailer:		
On-road	750	1650
Off-road	750	1650
Maximum towable weight (mass) - Trailers with overrun brakes:		
On-road	2000	4400
Off-road	2000	4400
Gross train weight - Trailers with overrun brakes (3):		
On-road	4505	9911
Off-road	4505	9911
Nose weight:		
On-road	150	330
Off-road	150	330
Maximum front axle load - All models (4)	1310	2882
Maximum rear axle load - All models (4)	1360	2992
Maximum roof rack load - All models (5)	75	165

(1) The maximum permissible weight of the vehicle including passengers and load.

(2) This figure includes the toolkit, all fluids to the correct levels and spare wheel but excludes the driver and passengers.

(3) The maximum permissible weight of the vehicle and braked trailer and their respective loads.

(4) The front and rear maximum loads cannot be reached simultaneously as this will exceed the GVW limit. When calculating rear axle loading, remember that the trailer nose weight, the load in the vehicle's luggage area, weight on the roof rack, and the weight of rear seat passengers must all be added together.

(5) This figure includes the weight of the roofrack.

Vehicle Dimensions

Item	mm	in
Length - excluding license plate plinth - All models	4500	177.2
Width - All models:		
Mirrors extended	2180	85.83
Mirrors folded	2005	78.95
Maximum height - including roof rails - All models	1820	71.65
Wheelbase - All models	2660	104.7
Track:		
Front with 16" wheels	1611	63.43
Front with 17"/18"/19" wheels	1601	63.03
Rear with 16" wheels	1624	63.94
Rear with 17"/18"/19" wheels	1614	63.54
Vehicle ride height (1):		
Front	490.7±12	19.32±0.47
Rear	504.6±12	19.87±0.47
Underbody running clearance to exhaust - Minimum - Kerb weight	229	9.0
Front axle to underbody clearance	216	8.5
Rear axle to differential casing clearance	267	10.5
Suspension travel from kerb - ROW (unladen):	227	8.9
Front (bump/rebound)	105/80	4.13/3.15
Rear (bump/rebound)	130/90	5.12/3.54
Total articulation	335	13.2
Suspension travel from kerb - NAS (unladen):		
Front (bump/rebound)	102/76	4/3
Rear (bump/rebound)	127/89	5/3.5
Total articulation	330	13.2
Wading depth	500	19.7
Departure angle - Towbar NOT installed	34°	
Departure angle - Fixed height towbar - NOT NAS vehicles	19°	
Departure angle - Detachable towbar installed - NOT NAS vehicle	18°	
Departure angle - Towbar installed - NAS vehicles	19°	
Approach angle	31°	
Breakover angle	157°	
Maximum gradient for continuous operation	30°	
Maximum gradient for drive through operation (2)	45°	

(1) Ride height is measured vertically from wheel center to underside of wheelarch. All figures are with vehicle at 'Showroom' height - full fluids, full tank of fuel, no occupants/luggage, tires inflated to normal pressures.

(2) 5 seconds maximum duration.

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General Information - Health and Safety Precautions

Description and Operation

Introduction

Modern vehicles contain many materials and liquids which if not handled with care can be hazardous to both personal health and the environment. Also, many of the procedures associated with vehicle maintenance and repair involve physical hazards or other risks to health.

This subsection lists some of these hazardous operations and the materials and equipment associated with them. Precautions necessary to avoid these hazards are identified.

The list is not exhaustive and all operations and procedures and the handling of materials, should be carried out with health and safety in mind.

Before using any product the Materials Safety Data Sheet supplied by the manufacturer or supplier should be consulted.



WARNING: Many liquids and other substances used in motor vehicles are poisonous and should under no circumstances be consumed and should, as far as possible, be kept from contact with the skin. These liquids and substances include acid, anti-freeze, brake fluid, fuel, windscreen washer additives, lubricants, refrigerants and various adhesives.

Acids and Alkalis

For example - alkalis such as caustic soda used in cleaning materials; acids such as sulphuric acid used in batteries.

Both alkalis and acids are irritant and corrosive to the skin, eyes, nose and throat. They cause burns and can destroy ordinary protective clothing.

Avoid splashes to the skin, eyes and clothing. Wear suitable protective impervious apron, gloves and goggles. Do not breath mists.

Make sure access to eye wash bottles, shower and soap are readily available for splashing accidents.

Display Eye Hazard sign.

Air Bags

Highly flammable, explosive – observe No Smoking policy.

Used within the vehicle as safety restraints.

The inflator contains a high-energy propellant which, when ignited, produces a VERY HOT GAS (2500°C).

The gas inflator (generator) used in air bags is Sodium Azide. This material is hermetically sealed in each air bag module and is completely consumed during deployment. No attempt should be made to open an air bag inflator as this will lead to the risk of exposure to Sodium Azide. If a gas generator is ruptured, full protective clothing should be worn when dealing with the spillage.

After normal deployment, gloves and safety goggles should be worn during the handling process.

Deployed air bags should be disposed of in a plastic bag in accordance with local regulations at an approved chemical waste site.

Following any direct contact with Sodium Azide:

- Wash affected areas thoroughly with water.
- **SEEK IMMEDIATE MEDICAL ASSISTANCE.**

Air Bags - Do's

- Do store modules in an upright position.
- Do keep modules dry.
- Do carry modules with the cover side pointing away from the body.
- Do place modules with their cover side upwards.
- Do carefully inspect modules for damage.
- Do stand to one side when connecting modules.
- Do make sure all test equipment is properly calibrated and maintained.
- Do wash hands after handling deployed air bags.

Air Bags - Do Not

- Do Not store highly flammable material together with modules or gas generators.
- Do Not store gas generators at temperatures exceeding 80°C.
- Do Not store modules upside down.
- Do Not attempt to open a gas generator housing.
- Do Not expose gas generators to open flame or sources of heat.
- Do Not place anything on top of a module cover.
- Do Not use damaged modules.
- Do Not touch a fired module or gas generator for at least 10 minutes after firing.
- Do Not use any electrical probes on the wiring circuit.

Air Suspension

Whenever work is being undertaken on the air suspension system, suitable eye protection must be worn.

Air Conditioning Refrigerant

Highly flammable, combustible – observe No Smoking policy.

Skin contact may result in frostbite.

Instructions given by the manufacturer must be followed. Avoid naked lights, wear suitable protective gloves and goggles.

If refrigerant comes into contact with the skin or eyes, rinse the affected areas with water immediately. Eyes should also be rinsed with an appropriate irrigation solution such as a solution of 9% Sodium Chloride and Purified Water. **DO NOT RUB THE EYES AND SEEK IMMEDIATE MEDICAL ATTENTION.**

Air Conditioning Refrigerant

Do Not

- Do Not expose refrigerant bottles to sunlight or heat.
- Do Not expose refrigerant bottles to frost.
- Do Not drop refrigerant bottles.
- Do Not vent refrigerant to atmosphere under any circumstance.
- Do Not mix refrigerants.

Adhesives and Sealants

Many adhesives and sealants are highly flammable – OBSERVE NO SMOKING POLICY. These items, should be stored in flameproof cabinets in No Smoking areas. Cleanliness and tidiness in use should be observed, for example disposable paper covering benches. All adhesives and sealants should be dispensed from applicators where possible; containers, including secondary containers, should be labelled appropriately.

Anaerobic, Cyanoacrylate (super-glues) and other Acrylic Adhesives

Many are irritant, sensitizing or harmful to the skin and respiratory tract. Some are eye irritants.

Skin and eye contact should be avoided and the manufacturer's instructions followed.

Cyanoacrylate adhesives (super-glues) MUST NOT contact the skin or eyes. If skin or eye tissue is bonded, cover with a clean moist pad and **SEEK IMMEDIATE MEDICAL ATTENTION**. Do not attempt to pull skin tissue apart. Use in well ventilated areas as vapors can cause irritation to the nose and eyes.

For two-pack systems see Resin-based and Isocyanate Adhesives/Sealers.

Solvent-based Adhesives/Sealers - See Solvents

Follow manufacturers instructions.

Water-based Adhesives/Sealers

Those based on polymer emulsions and rubber/latex may contain small amounts of volatile, toxic and harmful chemicals. Skin and eye contact should be avoided and adequate ventilation provided during use.

Hot Melt Adhesives

In the solid state, they are safe. In the molten state they may cause burns and health hazards may arise from the inhalation of toxic fumes.

Use appropriate protective clothing and a thermostatically controlled heater with a thermal cut-out and adequate extraction.

Resin-based Adhesives/Sealers, for example Epoxide and Formaldehyde Resin-based

Mixing should be carried out in well ventilated areas as harmful or toxic volatile chemicals may be released.

Skin contact with uncured resins and hardeners can result in irritation, dermatitis, and absorption of toxic or harmful chemicals through the skin. Splashes can damage the eyes.

Provide adequate ventilation and avoid skin and eye contact.

Isocyanate (Polyurethane) Adhesives/Sealers

See also Resin-based Adhesives

Individuals suffering from asthma or respiratory allergies should not work with or near these materials as sensitivity reactions can occur.

Over exposure is irritating to the eyes and respiratory system. Excessive concentrations may produce effects on the nervous system including drowsiness. In extreme cases, loss of consciousness may result. Long term exposure to vapour concentrations may result in adverse health effects.

Prolonged contact with the skin may lead to skin irritation and in some cases, dermatitis.

Splashes entering the eye will cause discomfort and possible damage.

Any spraying should preferably be carried out in ventilated booths which incorporate facilities for removing vapors and spray droplets from the breathing zone.

Wear appropriate gloves, eye and respiratory protection.

Antifreeze

May be flammable when undiluted.

Vapors may be given off from coolant antifreeze when heated. Avoid breathing these vapors.

Antifreeze may be absorbed through the skin in toxic or harmful quantities. Antifreeze, if swallowed, can be fatal; **SEEK IMMEDIATE MEDICAL ATTENTION.**

Battery Acids

See also Alkalies and Acids.

Gases released during battery charging are explosive. Always remove the battery from the vehicle prior to charging. Never use naked flames or allow sparks near charging or recently charged batteries. NEVER add acid to a battery, the chemical reaction produced will be violent and explosive. In cases of eye contact, wash affected area with copious amounts of water and **SEEK IMMEDIATE MEDICAL ATTENTION.**

Make sure there is adequate ventilation during battery charging, observe NO SMOKING POLICY.

Brake Pads and Linings

Always fit the correct grade and specification of brake pads and linings. When renewing pads and linings, always replace as complete axle sets.

Brake and Clutch Fluid

Splashes to the skin and eyes are irritating and in the long term can be damaging, avoid prolonged skin contact. In cases of eye contact, wash affected area with copious amounts of water and **SEEK IMMEDIATE MEDICAL ATTENTION.**

Chemical Materials

All chemical materials should always be used with caution and stored and handled with care. They may be toxic, harmful, corrosive, irritant or highly flammable and give rise to hazardous fumes and dusts.

The effects of excessive exposure to chemicals may be immediate or delayed; briefly experienced or permanent; cumulative; superficial; life threatening; or may reduce life expectancy.

Chemical Materials - Do's

- Do carefully read and observe hazard and precaution warnings given on material containers (labels) and in any accompanying leaflets, posters or other instructions. Material health and safety data sheets can be obtained from manufacturers.
- Do remove chemical materials from the skin and clothing as soon as practicable after soiling. Change heavily soiled clothing and have it cleaned.
- Do organise work practices and protective clothing to avoid soiling of the skin and eyes.
- Do avoid breathing vapors, aerosols, dusts or fumes; inadequate container labelling; fire and explosion hazards.
- Do wash before job breaks, before eating, smoking, drinking or using toilet facilities when handling chemical materials.
- Do keep work areas clean, uncluttered and free of spills.
- Do store chemical materials according to national and local regulations.
- Do keep chemical materials out of the reach of children.

Chemical Materials - Do Not

- Do Not mix chemical materials except under the manufacturers instructions; some chemicals can form other toxic or harmful chemicals, give off toxic or harmful fumes or become explosive when mixed together.
- Do Not spray chemical materials, particularly those based on solvents, in confined spaces, for example when people are inside a vehicle.
- Do Not apply heat or flame to chemical materials except under the manufacturers instructions. Some are highly flammable and some may release toxic or harmful fumes.
- Do Not leave containers open. Fumes given off can build up to toxic, harmful or explosive concentrations. Some fumes are heavier than air and will accumulate in confined areas such as pits.
- Do Not transfer chemical materials to unlabelled containers.
- Do Not clean hands or clothing with chemicals. Chemicals, particularly solvents and fuels, will dry skin and may cause irritation leading to dermatitis or be absorbed through the skin in toxic or harmful quantities.
- Do Not use emptied containers for other materials except when they have been cleaned under supervised conditions.
- Do Not sniff or smell chemical materials, even brief exposure to high concentrations of fumes can be toxic or harmful.

Corrosion Protection Materials

Some corrosion protection materials are highly flammable – observe NO SMOKING POLICY.

These materials are varied and the manufacturers instructions must always be followed. The materials may contain solvents, resins or petroleum products. Skin and eye contact should be avoided. They should only be sprayed in conditions of adequate ventilation and not in confined spaces.

Dust

Dust or powder produced during repair operations may be irritant, harmful or toxic. Avoid breathing dusts from powdery chemical materials or those arising from dry abrasion operations. Wear respiratory protection if ventilation is inadequate.

Fine dusts of combustible material can present an explosion hazard. Avoid explosive limits and sources of ignition.

Electrical Equipment

Electric shock can result from the use of faulty electrical equipment or from the misuse of equipment in good condition.

Make sure that electrical equipment is maintained in good condition and frequently tested. Faulty equipment should be labelled and preferably removed from the work station.

Make sure that flexes, cables, plugs and sockets are not frayed, kinked, cut, cracked or otherwise damaged. If using cable reel extension equipment, ALWAYS ensure that the cable is fully unwound from the reel.

Make sure that electrical equipment and flexes do not come into contact with water.

Make sure that electrical equipment is protected by the correct rated fuse.

Never misuse electrical equipment and never use equipment which is in any way faulty. The results could be fatal.

Make sure that the cables of mobile electrical equipment cannot get trapped and damaged, such as in a vehicle hoist.

Make sure that the designated electrical workers are trained in basic First Aid.

In cases of electrocution:

- Switch off the power supply before approaching the victim.
- If this is not possible, **DO NOT TOUCH THE VICTIM** but push or drag the person from the source of electricity using dry, non-conductive material.
- Commence resuscitation if trained to do so.
- **SEEK IMMEDIATE MEDICAL ATTENTION.**

Exhaust Fumes

These contain asphyxiating, harmful and toxic chemicals and particles such as carbon oxides, nitrogen oxides, aldehydes, lead and aromatic hydrocarbons. Engines should be run only under conditions of adequate exhaust extraction or general ventilation and not in confined spaces.

Gasoline (Petrol) engine

There may not be adequate warning of odour or of irritation before toxic or harmful effects arise. These may be immediate or delayed.

Gas Oil (Diesel engine)

Soot, discomfort and irritation usually give adequate warning of hazardous fume concentrations.

Fibre Insulation

The fibrous nature of surfaces and cut edges can cause skin irritation. This is usually a physical and not a chemical effect.

Precautions should be taken to avoid excessive skin contact through careful organization of work practices and the use of gloves.

Fire

Many of the materials found on or associated with the repair of vehicles are highly flammable. Some give off toxic or harmful fumes if burnt; others such as fluoroelastomers when burnt or damaged by excessive heat can break down and produce highly corrosive hydrofluoric acid - See Fluoroelastomers.

Should any material be in a burnt or overheated condition, handle with extreme caution and wear protective clothing when handling such items. Dispose of such material in accordance with local regulations.

Decontaminate and dispose of protective clothing immediately after use.

Observe strict fire safety when storing and handling flammable materials or solvents, particularly near electrical equipment or welding processes.

Make sure, before using electrical or welding equipment, that there is no fire hazard present.

Have a suitable fire extinguisher available when using welding or heating equipment.

First Aid

Apart from meeting any legal requirements it is desirable for someone in the workshop to be trained in First Aid procedures.

Splashes in the eye should be flushed carefully with clean water for at least ten minutes.

Soiled skin should be washed with soap and water.

In case of cold burns, from alternative fuels, place affected area in cool to cold water.

Individuals affected by inhalation of gases and fumes should be removed to fresh air immediately. If effects persist, consult a doctor.

If liquids are swallowed inadvertently, consult a doctor giving him the information on the container or label. Do not induce vomiting unless this action is indicated on the label.

Fluoroelastomers (Synthetic Rubber)

Many 'O' rings, seals, hoses, flexible pipes and other similar which appear to be manufactured from natural rubber are, in fact, made of synthetic materials called Fluoroelastomers.

Under normal operating conditions, these materials are safe and do not constitute a health hazard. However, if the materials are damaged by burning or exposure to excessive heat, they can break down and produce highly corrosive hydrofluoric acid.



WARNING: Contact with hydrofluoric acid can cause serious burns on contact with the skin. If skin contact does occur, carry out the following steps immediately:

Remove any contaminated clothing.

SEEK IMMEDIATE MEDICAL ATTENTION

Irrigate affected area of skin with copious amounts of cold water or limewater for 15 to 60 minutes.

Foams - Polyurethane

Used in sound and noise insulation. Cured foams used in seat and trim cushioning.

Unreacted components are irritating and may be harmful to the skin and eyes. Wear gloves and goggles.

Individuals with chronic respiratory diseases, asthma, bronchial medical problems, or histories of allergic diseases should not work in or near uncured materials.

The components, vapors or spray mists can cause direct irritation, sensitivity reactions and may be toxic or harmful.

Vapors and spray mists must not be inhaled. These materials must be applied with adequate ventilation and respiratory protection. Do not remove the respirator immediately after spraying, wait until the vapour/mists have cleared.

Burning of the uncured components and the cured foams can generate toxic and harmful fumes. Smoking, naked flames or the use of electrical equipment during foaming operations and until vapors/mists have cleared should not be allowed. Any heat cutting of cured foams or partially cured foams should be carried out in areas having suitable fume extraction equipment.

Fuels

Avoid skin contact with fuel where possible. Should contact occur, wash the affected skin with soap and water.

Gasoline (Petrol)

Highly flammable - OBSERVE NO SMOKING POLICY.

Swallowing gasoline (petrol) can result in mouth and throat irritation and absorption from the stomach can result in drowsiness and unconsciousness. Small amounts can be fatal to children. Inhalation into the lungs, through vomiting, is a very serious hazard.

Gasoline (petrol) dries the skin and can cause irritation and prolonged or repeated contact may cause dermatitis; if it is allowed to enter the eyes, it will cause severe smarting. Wash affected area with copious amounts of water and **SEEK IMMEDIATE MEDICAL ATTENTION.**

Gasoline (petrol) may contain appreciable quantities of benzene, which is toxic upon inhalation and the concentration of vapors must be kept very low. High concentrations will cause eye, nose and throat irritation, nausea, headache, depression and symptoms of drunkenness. Very high concentrations will result in rapid loss of consciousness.

Make sure there is adequate ventilation when handling and using gasoline (petrol). Great care must be taken to avoid the serious consequences of inhalation in the event of vapour build up arising from spillages in confined spaces.

Special precautions apply to cleaning and maintenance operations on gasoline (petrol) storage tanks.

Gasoline (petrol) should not be used as a cleaning agent. It must not be siphoned by mouth.

Gas-oil (Diesel Fuel)

Combustible.

Prolonged skin contact with high boiling point gas oils (diesel fuel) may cause serious skin disorders including skin cancer.

Inhalation into the lungs will cause internal bleeding - **SEEK IMMEDIATE MEDICAL ATTENTION.**

If swallowed, DO NOT induce vomiting - SEEK IMMEDIATE MEDICAL ATTENTION.

Kerosene (Paraffin)

Used also as heating fuel, solvent and cleaning agent.

Flammable - OBSERVE NO SMOKING POLICY.

Irritation of the mouth and throat may result from swallowing. The main hazard from swallowing arises if liquid aspiration into the lungs occurs.

Liquid contact dries the skin and can cause irritation or dermatitis. Splashes in the eye may be slightly irritating.

In normal circumstances the low volatility does not give rise to harmful vapors. Exposure to mists and vapors from kerosene at elevated temperature should be avoided (mists may arise in dewaxing). Avoid skin and eye contact and make sure there is adequate ventilation.

If swallowed, DO NOT induce vomiting - SEEK IMMEDIATE MEDICAL ATTENTION.

Gas Cylinders

Gases such as oxygen, acetylene, argon and propane are normally stored in cylinders at pressures of up to 138 bar (13800 kPa) (2000 lbf/in²) and great care should be taken in handling these cylinders to avoid mechanical damage to them or to the valve gear attached. The contents of each cylinder should be clearly identified by appropriate markings.

Cylinders should be stored in well ventilated enclosures, and protected from ice and snow or direct sunlight. Fuel gases, for example acetylene and propane should not be stored in close proximity to oxygen cylinders.

Care should be exercised to prevent leaks from gas cylinders and lines and also to avoid sources of ignition.

Only trained personnel should undertake work involving gas cylinders.

General Workshop Tools and Equipment

It is essential that all tools and equipment are maintained in good condition and the correct safety equipment is used where required.

Never use tools or equipment for any purpose other than that for which they were designed. Never overload equipment such as hoists, jacks, axle and chassis stands or lifting slings. Damage caused by overloading is not always immediately apparent and may result in a fatal failure the next time that the equipment is used.

Do not use damaged or defective tools or equipment, particularly high speed equipment such as grinding wheels. A damaged grinding wheel can disintegrate without warning and cause serious injury.

Wear suitable eye protection when using grinding, chiselling or sand blasting equipment.

Wear a suitable breathing mask when using abrasive blasting equipment or using spraying equipment.

Make sure there is adequate ventilation to control dusts, mists and fumes.

High Pressure Air, Lubrication and Oil Test Equipment

Always keep high pressure equipment in good condition, and regularly maintained, particularly at joints and unions.

Never direct a high pressure nozzle, for example diesel injector, at the skin as the fluid may penetrate to the underlying tissue and cause serious injury.

Jacking

Always refer to the Jacking and Lifting section of this manual prior to raising the vehicle off the ground.

When vehicle is to be raised by means of a jack, ensure that it is standing on level ground, that parking brake is applied and wheels are chocked. ALWAYS use the recommended jacking points and ensure that vehicle jack has sufficient load capacity for the weight of the vehicle.



WARNING: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Ensure that hoists have sufficient load capacity for the weight of the vehicle.

Legal Aspects

There are many laws and regulations relating to health and safety in the use and disposal of materials and equipment in a workshop.

For a safe working environment and to avoid environmental pollution, workshops should be familiar, in detail, with the many health and safety laws and regulations within their country, published by both national and local authorities.

Lubricants and Greases

Avoid all prolonged and repeated contact with mineral oils. All lubricants and greases may be irritating to the eyes and skin.

Used Engine Oil

Prolonged and repeated contact with engine oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer. Adequate means of skin protection and washing facilities must be provided.

Do not employ used engine oils as lubricants or for any application where appreciable skin contact is likely to occur.

Health Protection Precautions

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Do not put oily rags into pockets.
- Avoid contaminating clothes, particularly underpants, with oil.
- Heavily soiled clothing and oil-impregnated footwear should not be worn. Overalls must be cleaned regularly.
- First Aid treatment should be obtained immediately for open cuts and wounds.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin.
- Wash with soap and water to make sure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanoline replace the natural skin oils which have been removed.
- Do not use gasoline (petrol), kerosene (paraffin), diesel fuel (gas oil), thinners or solvents for cleaning skin.
- If skin disorders develop, obtain medical advice without delay.
- Where practicable, degrease components prior to handling.
- Where there is a risk of eye contact, eye protection should be worn, for example chemical goggles or face shields; in addition an eye wash facility should be provided.

Environmental Precautions

This section provides general information which can help to reduce the environmental impacts from the activities carried out in workshops.

Emissions to air

Many of the activities that are carried out in workshops emit gases and fumes which can contribute to global warming, depletion of the ozone layer and/or the formation of photochemical smog at ground level. By considering how the workshop activities are carried out, these gases and fumes can be minimised, thus reducing the impact on the environment.

Exhaust fumes

Running car engines is an essential part of workshop activities and exhaust fumes need to be ventilated to atmosphere. However, the amount of time engines are running and the position of the vehicle should be carefully considered at all times, to reduce the release of poisonous gases and minimise the inconvenience to people living nearby.

Solvents

Some of the cleaning agents used are solvent based and will evaporate rapidly to atmosphere if used carelessly, or if containers are left unsealed. All containers must be firmly closed when not required and solvent should be used sparingly. Wherever possible, solvents having a low toxicity and flammability should be selected. Always follow the instructions supplied by the solvent manufacturer. Similarly, many paints are solvent based and the spray should be used in such a way as to reduce emissions to a minimum.

Refrigerant

It is illegal to release any refrigerant into the atmosphere. Discharge and replacement of these materials from air conditioning units should only be carried out using the appropriate equipment.

Discharges to water

Most workshops will have two systems for discharging waste water - storm drains and foul drains. Storm drains should only receive clean water i.e. rainwater. Foul drains will accept many of the normal waste water i.e. washing water, detergents and domestic type waste BUT NOT oil, petrol, solvent, acids, hydraulic fluid, antifreeze and similar fluids. If in doubt, always consult the local authority or water company.

Spillages

Every precaution must be taken to prevent spillage of oil, fuel, solvents etc., reaching the drains. All handling of such materials must take place well away from drains and preferably in an area with a suitable containing wall to prevent discharge into drains or watercourses. If a spillage occurs, it must be soaked up immediately using a spill kit where provided.

Checklist

Spillage prevention:

- Store liquids in a secure area.
- Make sure that taps on liquid containers are secure and cannot be accidentally turned on.
- Protect bulk storage tanks from vandalism by locking the valves.
- Transfer liquids from one container to another in an area away from open drains.
- Ensure lids are replaced securely on containers.
- Have spill kits available near to points of storage and liquid handling areas.

Spill Kits

Special materials are available to absorb a number of different substances. They can be in granular form, ready to use and are supplied in suitable containers. Disposal of used spill absorbing material is dealt with in Waste management.

Land contamination

Oils, fuels and solvents etc. can contaminate any soil with which they come into contact. Such materials MUST never be disposed of by pouring on to soil and every precaution must be taken to avoid spillage reaching soil. Waste materials

stored on open ground could either leak or have contaminating substances washed off them that would contaminate the land. Always store these materials in suitable skips or similarly robust containers.

Legal compliance

Some sites may have a discharge consent for effluent discharge to the foul drain for a car wash etc. It is essential to know the types of effluent which are allowed to be discharged into the drain and to check the results of any monitoring carried out by the Water Company.

Where paint spraying operations are carried out it may be necessary to apply to the Local Authority for an air emissions licence to operate the plant. If such a licence is necessary, additional precautions will be necessary to comply with the requirements and the results of any air quality monitoring must be checked regularly.

Checklist

Always adhere to the following:

- Know what legal consents and licences apply to the operations.
- Check that the emissions and discharges comply with legal requirements.

Waste Management

Pollution can be reduced by careful handling, storage and disposal of all waste materials that occur on sites. Legislation makes it illegal to dispose of waste materials other than to licensed waste carriers and disposal sites.

This means that it is necessary to not only know what the waste materials are but also to have the necessary documentation and licences.

Handling and storage of waste

Ensure that waste materials are not poured down the drain or on to soil and are stored in such a way that they do not escape on to land or soil.

All waste must be segregated into individual types e.g. oils, metals, batteries, scrap components etc. This will prevent any reaction between different materials and assist in disposal.

Disposal of waste

Dispose of waste in accordance with the following guidelines:

- **Fuel, hydraulic fluid, anti-freeze and oil:** Keep separate and dispose of to specialist contractors.
- **Refrigerant:** Collect in specialist equipment and reuse.
- **Detergents:** Safe to pour down the foul drain if diluted.
- **Paint, thinners:** Keep separate and dispose of to specialist contractor.
- **Components:** Return to supplier for refurbishment or disassemble and reuse any suitable parts. Dispose of remainder in ordinary waste.
- **Small parts:** Reuse any suitable parts, dispose of the remainder in ordinary waste.
- **Metals:** Can be sold if separate from general waste.
- **Tyres:** Keep separate and dispose of to specialist contractor. DO NOT attempt to dispose of tyres by burning.
- **Components/materials containing asbestos:** Keep separate and dispose of to specialist contractor.
- **Oil and fuel wastes (e.g. rags, used spill kit material):** Keep separate and dispose of to specialist contractors.
- **Air filters:** Keep separate and dispose of to specialist contractors.
- **Rubber/plastics:** Dispose of in ordinary waste.
- **Hoses:** Dispose of in ordinary waste.
- **Batteries:** Keep separate and dispose of to specialist contractors.
- **Air bags - DANGER EXPLOSIVES:** Keep separate and dispose of to specialist contractors.
- **Electrical components:** Return to supplier for refurbishment or disassemble and reuse any suitable components. Dispose of remainder in ordinary waste.
- **Catalytic converters:** May be sold if kept separate from general waste.
- **Packaging:** Compact/recycle as much as possible and dispose of in ordinary waste.
- **Office/paper waste:** Recycle paper and toner and ink cartridges, dispose of remainder in ordinary waste.

Noise

Car alarm testing, panel beating, running engines, using air tools etc. are operations which invariably produce a large amount of noise. The location of such activities and also the time of day must be carefully considered having regard to the proximity of houses schools etc.

Some operations may produce high noise levels which could, in time, damage hearing. In these cases, suitable ear protection must be worn.

Solder

Solders are mixtures of metals such that the melting point of the mixture is below that of the constituent metals (normally lead and tin). Solder application does not normally give rise to toxic lead fumes, provided a gas/air flame is used. Oxy-acetylene flames should not be used, as they are much hotter and will cause lead fumes to be produced.

Some fumes may be produced by the application of any flame to surfaces coated with grease, and inhalation of these should be avoided.

Removal of excess solder should be undertaken with care, to make sure that fine lead dust is not produced, which can give toxic effects if inhaled. Respiratory protection may be necessary.

Solder spillage and filings should be collected and removed promptly to prevent general air contamination by lead.

High standards of personal hygiene are necessary in order to avoid ingestion of lead or inhalation of solder dust from clothing.

Solvents

For example acetone, white spirit, toluene, xylene, trichloroethane.

Used in cleaning and dewaxing materials, paints, plastics, resins and thinners.

Some may be highly flammable or flammable.

Skin contact will degrease the skin and may result in irritation and dermatitis following repeated or prolonged contact. Some can be absorbed through the skin in toxic or harmful quantities.

Splashes in the eye may cause severe irritation and could lead to loss of vision.

Brief exposure of high concentrations of vapors or mists will cause eye and throat irritation, drowsiness, dizziness, headaches and, in the worst circumstances, unconsciousness.

Repeated or prolonged exposure to excessive but lower concentrations of vapors or mists, for which there might not be adequate warning indications, can cause more serious toxic or harmful effects.

Aspiration into the lungs, for example through vomiting, is the most serious consequence of swallowing.

Avoid splashes to the skin, eyes and clothing. Wear protective gloves, goggles and clothing if necessary.

Make sure there is good ventilation when in use, avoid breathing fumes, vapors and spray mists and keep containers tightly sealed. Do not use in confined spaces.

When spraying materials containing solvents, for example paints, adhesives, and metal coatings, use extraction ventilation or personal respiratory protection in the absence of adequate general ventilation.

Do not apply heat or flame except under specific and detailed manufacturers instructions.

Suspended Loads



CAUTION: Never improvise lifting tackle.

There is always a danger when loads are lifted or suspended. Never work under an unsupported, suspended or raised load, for example a suspended engine.

Always make sure that lifting equipment such as jacks, hoists, axle stands and slings are adequate and suitable for the job, in good condition and regularly maintained.

Viton

In common with many other manufacturers vehicles, some components installed to Land Rover vehicles have seals, 'O' rings or gaskets which contain a material known as 'Viton'.

Viton is a fluoroelastomer, that is a synthetic rubber type which contains Fluorine. Although Viton is the most well known fluoroelastomer, there are others, including Fluorel and Tecnoflon.

When used under design conditions fluoroelastomers are perfectly safe. If, however, they are exposed to temperatures in excess of 400°C, the material will not burn, but will decompose, and one of the products formed is hydrofluoric acid.

This acid is extremely corrosive and may be absorbed directly, through contact, into the general body system. **WHERE CASES OF SKIN CONTACT OCCUR, SEEK IMMEDIATE MEDICAL HELP.**

O-rings, seals or gaskets which have been exposed to very high temperatures will appear charred or as a black sticky substance.

DO NOT, under any circumstances touch them or the attached components.

Enquiries should be made to determine whether Viton or any other fluoroelastomer has been used in the affected O-ring, seal or gasket. If they are of natural rubber or nitrile there is no hazard. If in doubt, be cautious as the material may be Viton or any fluoroelastomer.

If Viton or any other fluoroelastomers have been used, the affected area should be decontaminated before the

commencement of work.

Disposable heavy duty plastic gloves should be worn at all times, and the affected area washed down using wire wool and a limewater (calcium hydroxide) solution to neutralise the acid before disposing of the decomposed Viton residue and final cleaning of the area. After use, the plastic gloves should be discarded carefully and safely.

Welding

Welding processes include Resistance Welding (Spot Welding), Arc Welding and Gas Welding.

Resistance Welding

This process may cause particles of molten metal to be emitted at a high velocity, and the eyes and skin must be protected.

Arc Welding

This process emits a high level of ultra-violet radiation which may cause arc-eye and skin burns to the operator and to other persons nearby. Gas-shielded welding processes are particularly hazardous in this respect. Personal protection must be worn, and screens used to shield other people.

CONTACT LENS WEARERS ARE ADVISED TO REVERT TO ORDINARY SPECTACLES WHEN ARC WELDING as the arc spectrum is believed to emit microwaves which dry out the fluid between the lens and the eye. This may result in blindness when the lens is removed from the eye.

Metal spatter will also occur, and appropriate eye and skin protection is necessary.

The heat of the welding arc will produce fumes and gases from the metals being welded, the rods and from any applied coatings or contamination on the surfaces being worked on. These gases and fumes may be toxic and inhalation of these should be avoided. The use of extraction ventilation to remove the fumes from the working area may be necessary particularly in cases where the general ventilation is poor, or where considerable welding work is anticipated. In extreme cases or confined spaces where adequate ventilation cannot be provided, air-fed respirators may be necessary.



CAUTION: Some of the components installed to the vehicle e.g. the interior cross beam and underbonnet cross member are manufactured from magnesium alloy. On no account should any welding operations be attempted on these components.

Gas Welding (and Cutting)

Oxy-acetylene torches may be used for welding and cutting, and special care must be taken to prevent leakage of these gases, with consequent risk of fire and explosion.

The process will produce metal spatter and eye and skin protection is necessary.

The flame is bright, and eye protection should be used, but the ultra-violet emission is much less than that from arc welding, and lighter filters may be used.

The process itself produces few toxic fumes, but such fumes and gases may be produced from coatings on the work, particularly during cutting away of damaged body parts, and inhalation of the fumes should be avoided.

In brazing, toxic fumes may be produced from the metals in the brazing rod, and a severe hazard may arise if brazing rods containing cadmium are used. In this event particular care must be taken to avoid inhalation of fumes and expert advice may be required.

SPECIAL PRECAUTIONS MUST BE TAKEN BEFORE ANY WELDING OR CUTTING TAKES PLACE ON VESSELS WHICH HAVE CONTAINED COMBUSTIBLE MATERIALS, FOR EXAMPLE BOILING OR STEAMING OUT OF FUEL TANKS.

Warning Symbols on Vehicles

Decals showing warning symbols will be found on various vehicle components.

These decals must not be removed. The warnings are for the attention of owners/operators and persons carrying out service or repair operations on the vehicle.

General Information - Solvents, Sealants and Adhesives

Description and Operation

Solvents



WARNING: Always handle all solvents, sealers and adhesives with extreme care. Some contain chemicals or give off fumes which can be dangerous to health. Always follow the manufacturers instructions. If in doubt about any substance, particularly a solvent, DO NOT use it.



CAUTION: If in doubt about the suitability of any proprietary solvent or sealer for a particular application, contact the manufacturer of the product for information.

The Health and Safety Precautions subsection refers to some commonly used chemicals and materials, hazards associated with their use, and safety measures to be taken. Some of these chemicals may be included as an ingredient in a sealer or adhesive.

Sealers

Certain procedures in this manual involve the use of sealants during installation of components. Where a sealant is required, the application, together with the Land Rover part number is given in the General Specification at the start of each section and an instruction that a sealant must be used appears in the relevant repair procedure.

It is essential that the sealant(s) specified for a particular procedure are used, DO NOT use any other sealant.

Always remove traces of old sealant using a plastic scraper or suitable solvent, never use emery cloth or metal scrapers.

Adhesives

Whenever a procedure involves the use of an adhesive, the adhesive specified must be used and the manufacturer's instructions regarding application together with any health and safety precautions must be followed.

General Information - Road/Roller Testing

Description and Operation

Road or rolling road testing may be carried out for various reasons and a procedure detailing pre-test checks, through engine starting and stopping, pre-driving checks, on-test checks to final checks on completion of the test are given.

Unless complete vehicle performance is being checked, the full road test procedure need not be carried out. Instead, those items particularly relevant to the system(s) being checked can be extracted.

Pre-Test Checks



WARNING: If the brake system hydraulic fluid level is low, pedal travel is excessive or a hydraulic leak is found, do not attempt to road test the vehicle until the reason for the low fluid level, excessive pedal travel or hydraulic leak is found and rectified.

It is suggested that pre-test and functional tests of those systems/circuits which affect the safe and legal operations of the vehicle, such as brakes, lights and steering, should always be carried out before the road or rolling road test.

- Engine oil level
- Engine coolant level
- Tires, for correct pressure, compatible types and tread patterns, and wear within limits.
- There is sufficient fuel in the tank to complete the test.
- Check all around the engine, transmission and under the vehicle for oil, coolant, hydraulic and fuel leaks. Make a note of any apparent leaks and wipe off the surrounding areas to make it easier to identify the extent of the leak on completion of the test.

Starting the Engine

• **NOTE:** On initial drive away from cold and within the first 1.5 km (1 mile), do not depress accelerator pedal beyond half travel until the vehicle has attained a minimum speed of 25 km/h (15 miles/h). Never operate at high engine speed or with the accelerator pedal at full travel whilst the engine is cold.

With the ignition off, check:

- The parking brake is applied.
- **Automatic transmission:** The selector lever is in 'P' - PARK.
- **Manual transmission:** The gear lever is in NEUTRAL.
- All instrument gauges read zero.

With the ignition on, check:

- Ignition controlled warning lights come on.
- Engine temperature gauge registers a reading compatible with the engine temperature.
- Fuel gauge registers a reading appropriate to the fuel level in the tank.
- The operation of the parking brake warning light and fluid level warning indicator light.

On Road Test Check:



CAUTION: At commencement of road testing, check the brake operation while still travelling at low speed before continuing with the test. If the brakes pull to one side, or appear to be otherwise faulty, do not continue with the road test until the fault has been found and rectified.

- The parking brake releases completely.
- Gear changing is smooth, and there are no abnormal noises or vibrations from the transmission.
- The engine power output is satisfactory, acceleration is smooth and accelerator pedal operation is not stiff or heavy, and engine speed returns to idle correctly.
- There is no excessive or abnormally colored smoke from the engine under normal driving, heavy load or overrun conditions.
- Steering operation is smooth, accurate, not excessively heavy or with excessive free play or vibration. Does not pull to one side and self centres smoothly after cornering.
- All instruments register the correct readings and operate correctly.
- Switches and controls operate smoothly and positively, warning or indicator lights operate correctly and the direction indicator control self cancels when the steering is returned to the straight ahead position.
- Heating and ventilation systems work correctly and effectively.
- Brakes operate efficiently.

Brake Testing

Avoid brake testing on busy roads where it can cause inconvenience or danger to other road users.



CAUTION: Brake testing which includes heavy brake applications should not be carried out with new brake pads/discs until the components have bedded-in. New brake friction components will not reach full efficiency until the bedding-in process is complete. Note that when new parking brake shoes or rear brake discs have been installed, it is essential that the 'bedding-in' procedure is carried out.

For additional information, refer to: [Parking Brake Shoes Bedding-In](#) (206-05 Parking Brake and Actuation, General Procedures).

Test the brakes at several speeds within the normal operating range using both light and heavy pedal pressure. Note any tendency to snatch, pull or drag, and any undue delay in application or release.

Allow the vehicle to coast and note any tendency to pull to one side, or evidence that the brakes are binding.

After stopping the vehicle (not immediately after a period of heavy braking), carefully check the brake temperature. A disc which feels appreciably hotter than the others, could indicate that the pads on that disc are binding.

After completion of the test, check for:

- Oil, coolant, hydraulic, air and fuel leaks.
- Abnormal temperature of any moving components or assemblies, e.g. wheel hubs, transmission etc., which might indicate over tightness or lack of lubrication.

Rolling Road Testing

Four-Wheel Rolling Road



CAUTION: When utilising a four-wheel rolling road for testing, ensure all relevant health and safety requirements are adhered to.

Provided that front and rear rollers are rotating at identical speeds and that normal workshop safety standards are applied, there is no speed restriction during testing except any that may apply to the tires.

Ensure that the parking brake is released prior to engaging roller driving mechanism.

Two-Wheel Rolling Road



CAUTION: On no account should an attempt be made to carry out any form of testing on a two-wheel rolling road.

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General Information - Special Tool Glossary

Description and Operation

Service Tools

Special service tools have been developed to facilitate removal, dismantling and assembly of mechanical components in a cost effective and time efficient manner. The use of such special tools also helps prevent the potential for damage to components.

Some operations described in this manual cannot be carried out properly without the aid of the relevant service tools.

All orders and enquiries from the United Kingdom and European countries except Germany, Austria, Switzerland and Spain and countries not in the following list should be sent direct to:

SPX UK Ltd.,

Genoa House,

Everdon Park,

Daventry,

Northants,

NN11 5YJ

England

Tel: 0044 (0) 1327 303467/303455

Fax: 0044 (0) 1327 706632

e-mail: spxsalesuk@servicesolutions.spx.com

Overseas orders for the following countries should be placed with the local distributor.

Germany, Austria and Switzerland

SPX Europe GMBH,

Porschestraße 4,

63512 Hainburg,

Germany

Tel: 0049 61829590

Fax: 0049 6182959299

Spain

SPX Iberica SA,

C/Francisco Arrio,

158 nave 72 (Nudo Oeste),

19004 Guadalajara,

Spain

Tel: 0034 949208381

Fax: 0034 949208327

North America

SPX Corporation

665, Eisenhower Drive,

Owatonna,

MN 55060,

USA

Tel: 0018 772979110

Fax: 0018 005787375

Australia

SPX Australia,

28, Clayton Road,
Notting Hill,
Victoria 3168,
Australia

Tel: 0061 00395446222

Fax: 0061 00395445222

e-mail: sales@spx.com.au

Japan and East Asia

Jatek Ltd.,

5 - 53, Minawacho 2-chome,
Kohoku-ku,
Yokohama,
Kanagawa 223-0051,
Japan

Tel: 0081 455627700

Fax: 0081 455627800

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General Information - Diagnostic Trouble Code (DTC) Index **DTC: Audio Amplifier Module (AAM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the audio amplifier system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Audio System](#) (415-01 Information and Entertainment System, Description and Operation).

Audio Amplifier Module (AAM)

DTC	Description	Possible Cause	Action
B1A01-11	Speaker #1	Front Left Tweeter Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Front Left Tweeter Speaker circuit for short to ground
B1A01-12	Speaker #1	Front Left Tweeter Speaker circuit - short to power	Refer to electrical circuit diagrams and check Front Left Tweeter Speaker circuit for short to power
B1A01-13	Speaker #1	Front Left Tweeter Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Front Left Tweeter Speaker circuit for open circuit
B1A01-1A	Speaker #1	Front Left Tweeter Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Front left tweeter speaker connection for crossload
B1A01-49	Speaker #1	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A02-11	Speaker #2	Front Right Tweeter Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Front Right Tweeter Speaker circuit for short to ground
B1A02-12	Speaker #2	Front Right Tweeter Speaker circuit - short to power	Refer to electrical circuit diagrams and check Front Right Tweeter Speaker circuit for short to power
B1A02-13	Speaker #2	Front Right Tweeter Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Front Right Tweeter Speaker circuit for open circuit
B1A02-1A	Speaker #2	Front Right Tweeter Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Front right tweeter speaker connection for crossload
B1A02-49	Speaker #2	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A03-11	Speaker #3	Front Left Woofer Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Front Left Woofer Speaker circuit for short to ground
B1A03-12	Speaker #3	Front Left Woofer Speaker circuit - short to power	Refer to electrical circuit diagrams and check Front Left Woofer Speaker circuit for short to power

DTC	Description	Possible Cause	Action
B1A03-13	Speaker #3	Front Left Woofer Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Front Left Woofer Speaker circuit for open circuit
B1A03-1A	Speaker #3	Front Left Woofer Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Front left woofer speaker connection for crossload
B1A03-49	Speaker #3	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A04-11	Speaker #4	Front Right Woofer Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Front Right Woofer Speaker circuit for short to ground
B1A04-12	Speaker #4	Front Right Woofer Speaker circuit - short to power	Refer to electrical circuit diagrams and check Front Right Woofer Speaker circuit for short to power
B1A04-13	Speaker #4	Front Right Woofer Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Front Right Woofer Speaker circuit for open circuit
B1A04-1A	Speaker #4	Front Right Woofer Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Front right woofer speaker connection for crossload
B1A04-49	Speaker #4	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A05-11	Speaker #5	Rear Left Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Rear Left Speaker circuit for short to ground
B1A05-12	Speaker #5	Rear Left Speaker circuit - short to power	Refer to electrical circuit diagrams and check Rear Left Speaker circuit for short to power
B1A05-13	Speaker #5	Rear Left Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Rear Left Speaker circuit for open circuit
B1A05-1A	Speaker #5	Rear Left Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Rear left speaker connection for crossload
B1A05-49	Speaker #5	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A06-11	Speaker #6	Rear Right Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Rear Right Speaker circuit for short to ground
B1A06-12	Speaker #6	Rear Right Speaker circuit - short to power	Refer to electrical circuit diagrams and check Rear Right Speaker circuit for short to power
B1A06-13	Speaker #6	Rear Right Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Rear Right Speaker circuit for open circuit
B1A06-1A	Speaker #6	Rear Right Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Rear right speaker connection for crossload
B1A06-49	Speaker #6	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A07-11	Speaker #7	Rear Left Surround Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Rear Left Surround Speaker circuit for short to ground
B1A07-12	Speaker #7	Rear Left Surround Speaker circuit - short to power	Refer to electrical circuit diagrams and check Rear Left Surround Speaker circuit for short to power
B1A07-13	Speaker #7	Rear Left Surround Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Rear Left Surround Speaker circuit for open circuit
B1A07-1A	Speaker #7	Rear Left Surround Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Rear left surround speaker connection for crossload

DTC	Description	Possible Cause	Action
B1A07-49	Speaker #7	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A08-11	Speaker #8	Rear Right Surround Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Rear Right Surround Speaker circuit for short to ground
B1A08-12	Speaker #8	Rear Right Surround Speaker circuit - short to power	Refer to electrical circuit diagrams and check Rear Right Surround Speaker circuit for short to power
B1A08-13	Speaker #8	Rear Right Surround Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Rear Right Surround Speaker circuit for open circuit
B1A08-1A	Speaker #8	Rear Right Surround Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Rear right surround speaker connection for crossload
B1A08-49	Speaker #8	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A09-11	Speaker #9	Center Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Center Speaker circuit for short to ground
B1A09-12	Speaker #9	Center Speaker circuit - short to power	Refer to electrical circuit diagrams and check Center Speaker circuit for short to power
B1A09-13	Speaker #9	Center Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Center Speaker circuit for open circuit
B1A09-1A	Speaker #9	Center Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Center speaker connection for crossload
B1A09-49	Speaker #9	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A10-11	Speaker #10	Left Subwoofer Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Left Subwoofer Speaker circuit for short to ground
B1A10-12	Speaker #10	Left Subwoofer Speaker circuit - short to power	Refer to electrical circuit diagrams and check Left Subwoofer Speaker circuit for short to power
B1A10-13	Speaker #10	Left Subwoofer Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Left Subwoofer Speaker circuit for open circuit
B1A10-1A	Speaker #10	Left Subwoofer Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Left subwoofer speaker connection for crossload
B1A10-49	Speaker #10	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1A11-11	Speaker #11	Right Subwoofer Speaker circuit - short to ground	Refer to electrical circuit diagrams and check Right Subwoofer Speaker circuit for short to ground
B1A11-12	Speaker #11	Right Subwoofer Speaker circuit - short to power	Refer to electrical circuit diagrams and check Right Subwoofer Speaker circuit for short to power
B1A11-13	Speaker #11	Right Subwoofer Speaker circuit - open circuit	Refer to electrical circuit diagrams and check Right Subwoofer Speaker circuit for open circuit
B1A11-1A	Speaker #11	Right Subwoofer Speaker circuit - resistance below threshold	Refer to electrical circuit diagrams and check Right subwoofer speaker connection for crossload
B1A11-49	Speaker #11	Internal electronic failure	Install a new module, refer to the new module/component installation note at the top of the DTC Index
B1D84-11	Headphone panel 1	Headphone panel 1 left or right signal circuit - short to ground	Refer to electrical circuit diagrams and check headphone panel 1 left or right signal circuit for short to ground
B1D84-13	Headphone panel 1	Headphone panel 1 left or right signal circuit - open circuit	Refer to electrical circuit diagrams and check headphone panel 1 left or right signal circuit for open circuit

DTC	Description	Possible Cause	Action
B1D84-23	Headphone panel 1	Headphone panel 1 control line circuit - signal stuck low	Refer to electrical circuit diagrams and check headphone panel 1 control line for short to ground. Check for stuck switch/button
B1D85-11	Headphone panel 2	Headphone panel 2 left or right signal circuit - short to ground	Refer to electrical circuit diagrams and check headphone panel 2 left or right signal circuit for short to ground
B1D85-13	Headphone panel 2	Headphone panel 2 left or right signal circuit - open circuit	Refer to electrical circuit diagrams and check headphone panel 2 left or right signal circuit for open circuit
B1D85-23	Headphone panel 2	Headphone panel 2 control line circuit - signal stuck low	Refer to electrical circuit diagrams and check headphone panel 2 control line for short to ground. Check for stuck switch/button
B1D86-11	Headphone panel 3	Headphone panel 3 left or right signal circuit - short to ground	Only 2 headphone panels available on this vehicle. If this DTC is logged, check/amend Car Configuration File to reflect 2 panels only using the manufacturer approved diagnostic system
B1D86-13	Headphone panel 3	Headphone panel 3 left or right signal circuit - open circuit	Only 2 headphone panels available on this vehicle. If this DTC is logged, check/amend Car Configuration File to reflect 2 panels only using the manufacturer approved diagnostic system
B1D86-23	Headphone panel 3	Headphone panel 3 control line circuit - signal stuck low	Only 2 headphone panels available on this vehicle. If this DTC is logged, check/amend Car Configuration File to reflect 2 panels only using the manufacturer approved diagnostic system
B1D87-11	Headphone panel 4	Headphone panel 4 left or right signal circuit - short to ground	Only 2 headphone panels available on this vehicle. If this DTC is logged, check/amend Car Configuration File to reflect 2 panels only using the manufacturer approved diagnostic system
B1D87-13	Headphone panel 4	Headphone panel 4 left or right signal circuit - open circuit	Only 2 headphone panels available on this vehicle. If this DTC is logged, check/amend Car Configuration File to reflect 2 panels only using the manufacturer approved diagnostic system
B1D87-23	Headphone panel 4	Headphone panel 4 control line circuit - signal stuck low	Only 2 headphone panels available on this vehicle. If this DTC is logged, check/amend Car Configuration File to reflect 2 panels only using the manufacturer approved diagnostic system
U3000-05	Control module - system programming failures	- Software incompatibility - The version of the Local Configuration file does not match that expected	Re-configure the audio amplifier as an existing control module, using the manufacturer approved diagnostic system
U3000-42	Control module - general memory failure	General memory failure	Re-configure the audio amplifier as an existing control module, using the manufacturer approved diagnostic system. Clear DTC, cycle ignition and read DTCs. If DTC returns, suspect audio amplifier module and install a new module. Refer to the new module/component installation note at the top of the DTC Index
U3000-44	Control module - data memory failure	Data memory failure	Re-configure the audio amplifier as an existing control module, using the manufacturer approved diagnostic system. Clear DTC, cycle ignition and read DTCs. If DTC returns, suspect audio amplifier module and install a new module. Refer to the new module/component installation note at the top of the DTC Index
U3000-55	Control Module	Incorrect car configuration data received	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U3000-87	Control Module	Missing message	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing). Check information and entertainment module for Car Configuration File and MOST network DTCs and refer to relevant DTC Index. Carry out MOST/CAN network tests using the manufacturer approved diagnostic system
U3003-16	Battery Voltage	Circuit voltage below threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U3003-17	Battery Voltage	Circuit voltage above threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Anti-Lock Braking System (ABS)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the anti lock braking system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Anti-Lock Control - Stability Assist](#) (206-09C Anti-Lock Control - Stability Assist, Description and Operation).

DTC	Description	Possible Cause	Action
B10DF-46	Master cylinder isolation valve - calibration / parameter memory failure	Valve not calibrated - Internal ABS module failure	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0001-01	Master Cylinder Isolation Valve 1 - electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0002-01	Master Cylinder Isolation Valve 2 - electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0003-01	Low Pressure Feed Valve 1 - electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0004-01	Low Pressure Feed Valve 2 - electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0010-01	Left Front Inlet Control - General electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0011-01	Left Front Outlet Control - General electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0014-01	Right Front Inlet Control - General electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0015-01	Right Front Outlet Control - General electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0018-01	Left Rear Inlet Control - General electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
C0019-01	Left Rear Outlet Control - General electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C001C-01	Right Rear Inlet Control - General electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C001D-01	Right Rear Outlet Control - General electrical failure	Internal ABS module fault	Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0020-01	ABS Pump Motor Control - General electrical failure	- Power supply to pump motor - short circuit - Power supply to pump motor - incorrect voltage - Pump ground circuit fault - Mechanical pump fault	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new ABS module. Refer to the new module/component installation note at the top of the DTC Index
C0020-1C	ABS Pump Motor Control - Circuit voltage out of range	- Power supply to pump motor - short circuit, high resistance - Pump ground circuit fault - Internal ABS module fault	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new ABS module. Refer to the new module/component installation note at the top of the DTC Index
C0020-71	ABS pump motor control - actuator stuck	- Power supply to pump motor - short circuit, high resistance - Mechanical pump fault	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new ABS module. Refer to the new module/component installation note at the top of the DTC Index
C0030-07	Left Front Tone Wheel - Mechanical Failure	Bearing encoder damaged	Install a new left front wheel bearing. For additional information, refer to: Front Wheel Bearing (204-01 Front Suspension, Removal and Installation).
C0031-01	Left Front Wheel Speed Sensor - General electrical failure	- Wheel speed sensor circuit - short to ground, short to power, open circuit - Wheel speed sensor failure	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new wheel speed sensor as required. For additional information, refer to: Front Wheel Speed Sensor (206-09A Anti-Lock Control, Removal and Installation).
C0031-07	Left Front Wheel Speed Sensor - Mechanical Failure	Wheel speed sensor faulty/incorrectly installed	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Check sensor for correct installation. Install a new wheel speed sensor as required. For additional information, refer to: Front Wheel Speed Sensor (206-09A Anti-Lock Control, Removal and Installation).
C0033-07	Right Front Tone Wheel - Mechanical Failure	Bearing encoder damaged	Install a new right front wheel bearing. For additional information, refer to: Front Wheel Bearing (204-01 Front Suspension, Removal and Installation).
C0034-01	Right Front Wheel Speed Sensor - General electrical failure	- Wheel speed sensor circuit - short to ground, short to power, open circuit - Wheel speed sensor failure	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new wheel speed sensor as required. For additional information, refer to: Front Wheel Speed Sensor (206-09A Anti-Lock Control, Removal and Installation).
C0034-07	Right Front Wheel Speed Sensor - Mechanical Failure	Wheel speed sensor faulty/incorrectly installed	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check sensor for correct installation. Clear DTC and retest if DTC returns. Install a new wheel speed sensor as required. For additional information, refer to: Front Wheel Speed Sensor (206-09A Anti-Lock Control, Removal and Installation).

DTC	Description	Possible Cause	Action
			Removal and Installation).
C0036-07	Left Rear Tone Wheel - Mechanical Failure	● Bearing encoder damaged	● Install a new left rear wheel bearing. For additional information, refer to: Rear Wheel Bearing (204-02 Rear Suspension, Removal and Installation).
C0037-01	Left Rear Wheel Speed Sensor - General electrical failure	● Wheel speed sensor circuit - short to ground, short to power, open circuit ● Wheel speed sensor failure	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new wheel speed sensor as required. For additional information, refer to: Rear Wheel Speed Sensor (206-09A Anti-Lock Control, Removal and Installation).
C0037-07	Left Rear Wheel Speed Sensor - Mechanical Failure	● Wheel speed sensor faulty/incorrectly installed	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Check sensor for correct installation. Install a new wheel speed sensor as required. For additional information, refer to: Rear Wheel Speed Sensor (206-09A Anti-Lock Control, Removal and Installation).
C003907	Right Rear Tone Wheel - Mechanical Failure	● Bearing encoder damaged	● Install a new right rear wheel bearing. For additional information, refer to: Rear Wheel Bearing (204-02 Rear Suspension, Removal and Installation).
C003A-01	Left Rear Wheel Speed Sensor - General electrical failure	● Wheel speed sensor circuit - short to ground, short to power, open circuit ● Wheel speed sensor failure	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new wheel speed sensor as required. For additional information, refer to: Rear Wheel Speed Sensor (206-09A Anti-Lock Control, Removal and Installation).
C003A-07	Right Rear Wheel Speed Sensor - Mechanical Failure	● Wheel speed sensor faulty/incorrectly installed	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check sensor for correct installation. Clear DTC and retest if DTC returns. Install a new wheel speed sensor as required. For additional information, refer to: Rear Wheel Speed Sensor (206-09A Anti-Lock Control, Removal and Installation).
C0040-64	Brake Pedal Switch "A" - Signal plausibility failure	● Brake pedal switch circuit - short to ground, short to power, open circuit ● Brake pedal switch failure	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new brake switch as required. For additional information, refer to: Speed Control Deactivator Switch (310-03A Speed Control - I6 3.2L Petrol, Removal and Installation).
C0044-01	TMC Pressure Sensor - General electrical failure	● NOTE: The sensor is internal to the control module ● Sensor failure	● Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0044-28	TMC Pressure Sensor - Signal Offset	● NOTE: The sensor is internal to the control module ● Sensor failure	● Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0044-64	TMC Pressure Sensor - Signal plausibility	● NOTE: The sensor is internal to the control module ● Sensor failure	● Clear DTC and retest if DTC returns. Install a new ABS module, refer to the new module/component installation note at the top of the DTC Index
C0051-28	Steering wheel rotation sensor - Off-set monitoring	● Sensor loose/incorrectly installed ● Vehicle track incorrectly adjusted	● Check the sensor and encoder wheel for correct installation/alignment. Check the steering and suspension for damage/wear which could affect the track, rectify as necessary
C0061-01	Lateral Acceleration Sensor - General Electrical Failure	● Sensor circuit - short to ground, short to power, open circuit ● Internal sensor failure	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new sensor ● Using the manufacturer approved diagnostic

DTC	Description	Possible Cause	Action
			system, carry out the lateral accelerometer calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).
C0061-28	Lateral Acceleration Sensor - Signal bias level out of range/zero adjustment failure	● Sensor incorrectly calibrated	● Clear DTC and retest if DTC returns ● Using the manufacturer approved diagnostic system, carry out the lateral accelerometer calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).
C0061-64	Lateral Acceleration Sensor - Signal plausibility failure	● Lateral acceleration sensor internal failure	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new sensor ● Using the manufacturer approved diagnostic system, carry out the lateral accelerometer calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).
C0062-01	Longitudinal Acceleration Sensor - General electrical failure	● Sensor circuit - short to ground, short to power, open circuit ● Internal sensor failure	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new sensor ● Using the manufacturer approved diagnostic system, carry out the longitudinal accelerometer calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).
C0062-28	Longitudinal Acceleration Sensor - Signal bias level out of range/zero adjustment failure	● Sensor incorrectly calibrated	● Clear DTC and retest if DTC returns ● Using the manufacturer approved diagnostic system, carry out the longitudinal accelerometer calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).
C0062-64	Longitudinal Acceleration Sensor - Signal plausibility failure	● Longitudinal Acceleration sensor internal failure	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new sensor ● Using the manufacturer approved diagnostic system, carry out the longitudinal accelerometer calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).
C0063-01	Yaw Rate Sensor - General electrical failure	● Yaw rate sensor circuit - short to ground, power, open circuit ● Yaw rate sensor internal failure	● Refer to electrical circuit diagrams and check Yaw rate sensor circuit for short to ground, power, open circuit. Clear DTC and retest if DTC returns. Install a new sensor ● Using the manufacturer approved diagnostic system, carry out the yaw rate sensor calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).
C0063-28	Yaw Rate Sensor - Signal bias level out of range/zero adjustment failure	● Sensor incorrectly calibrated	● Clear DTC and retest if DTC returns. ● Using the manufacturer approved diagnostic system, carry out the yaw rate sensor calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).
C0063-64	Yaw Rate Sensor - Signal plausibility failure	● Yaw rate sensor internal failure	● Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Clear DTC and retest if DTC returns. Install a new sensor ● Using the manufacturer approved diagnostic system, carry out the yaw rate sensor calibration routine For additional information, refer to: Accelerometer (206-09C Anti-Lock Control - Stability Assist, Removal and Installation).

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Audio Front Control Module (ACM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the audio front control system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Audio System](#) (415-01 Information and Entertainment System, Description and Operation).

Audio Front Control Module (ACM)

DTC	Description	Possible Cause	Action
B1134-11	Phone input	Phone input circuit - short to ground	Refer to electrical circuit diagrams and check phone input circuit for short to ground
B1134-12	Phone input	Phone input circuit - short to power	Refer to electrical circuit diagrams and check phone input circuit for short to power
B1134-13	Phone input	Phone input circuit - open circuit	Refer to electrical circuit diagrams and check phone input circuit for open circuit
B1A01-11	Speaker #1	Left front speaker circuit - short to ground	Refer to electrical circuit diagrams and check left front speaker circuit for short to ground
B1A01-12	Speaker #1	Left front speaker circuit - short to power	Refer to electrical circuit diagrams and check left front speaker circuit for short to power
B1A01-1A	Speaker #1	Left front speaker circuit - resistance below threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A01-1B	Speaker #1	Left front speaker circuit - resistance above threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A01-1C	Speaker #1	Left front speaker circuit - voltage out of range	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A02-11	Speaker #2	Right front speaker circuit - short to ground	Refer to electrical circuit diagrams and check right front speaker circuit for short to ground
B1A02-12	Speaker #2	Right front speaker circuit - short to power	Refer to electrical circuit diagrams and check right front speaker circuit for short to power
B1A02-1A	Speaker #2	Right front speaker circuit - resistance below threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A02-1B	Speaker #2	Right front speaker circuit - resistance above threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A02-1C	Speaker #2	Right front speaker circuit - voltage out of range	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A03-11	Speaker #3	Left rear speaker circuit - short to ground	Refer to electrical circuit diagrams and check left rear speaker circuit for short to ground
B1A03-12	Speaker #3	Left rear speaker circuit - short to power	Refer to electrical circuit diagrams and check left rear speaker circuit for short to power
B1A03-1A	Speaker #3	Left rear speaker circuit - resistance below threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A03-1B	Speaker #3	Left rear speaker circuit - resistance above threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
B1A03-1C	Speaker #3	Left rear speaker circuit - voltage out of range	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A04-11	Speaker #4	Right rear speaker circuit - short to ground	Refer to electrical circuit diagrams and check right rear speaker circuit for short to ground
B1A04-12	Speaker #4	Right rear speaker circuit - short to power	Refer to electrical circuit diagrams and check right rear speaker circuit for short to power
B1A04-1A	Speaker #4	Right rear speaker circuit - resistance below threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A04-1B	Speaker #4	Right rear speaker circuit - resistance above threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A04-1C	Speaker #4	Right front speaker circuit - voltage out of range	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A56-13	Antenna	Antenna circuit - open circuit	Refer to electrical circuit diagrams and check antenna circuit for open circuit
B1B69-11	Antenna 12 volt supply circuit	Antenna 12 volt supply circuit - short to ground	Refer to electrical circuit diagrams and check antenna 12 volt supply circuit for short to ground
B1B69-15	Antenna 12 volt supply circuit	Antenna 12 volt supply circuit - short to power, open circuit	Refer to electrical circuit diagrams and check antenna 12 volt supply circuit for short to power, open circuit
B1D19-16	Compact disc unit	Circuit voltage below threshold	Install a new integrated audio module, refer to the new module/component installation note at the top of the DTC Index. For additional information, refer to: Audio Unit (415-01 Information and Entertainment System, Removal and Installation).
B1D19-77	Compact disc unit	Commanded position not reachable	Install a new integrated audio module, refer to the new module/component installation note at the top of the DTC Index. For additional information, refer to: Audio Unit (415-01 Information and Entertainment System, Removal and Installation).
B1D19-93	Compact disc unit	No operation	Install a new integrated audio module, refer to the new module/component installation note at the top of the DTC Index. For additional information, refer to: Audio Unit (415-01 Information and Entertainment System, Removal and Installation).
B1D78-11	Auxiliary input	Auxiliary input circuit - short to ground	Refer to electrical circuit diagrams and check auxiliary input circuit for short to ground
B1D78-12	Auxiliary input	Auxiliary input circuit - short to power	Refer to electrical circuit diagrams and check auxiliary input circuit for short to power
B1D78-13	Auxiliary input	Auxiliary input circuit - open circuit	Refer to electrical circuit diagrams and check auxiliary input circuit for open circuit
B1D79-11	Microphone input	Microphone input circuit - short to ground	Refer to electrical circuit diagrams and check microphone input circuit for short to ground
B1D79-12	Microphone input	Microphone input circuit - short to power	Refer to electrical circuit diagrams and check microphone input circuit for short to power
B1D79-13	Microphone input	Microphone input circuit - open circuit	Refer to electrical circuit diagrams and check microphone input circuit for open circuit
U3000-49	Control module	Internal electronic failure	Install a new control module, refer to the new module/component installation note at the top of the DTC Index. For additional information, refer to: Audio Unit (415-01 Information and Entertainment System, Removal and Installation).
U3000-55	Control module	Incorrect car configuration data received	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U3000-87	Control module	Missing message	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing). Check information and entertainment module for Car Configuration File and MOST network DTCs and refer to relevant DTC Index. Carry out MOST/CAN network tests using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
U3000-98	Control module	• Component or system over temperature	Check for additional DTCs and refer to relevant DTC Index, check/monitor system for re-occurrence
U3003-62	Battery voltage	• Mis-match in voltage, of 2 volts or more, between integrated control module and CJB	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

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General Information - Diagnostic Trouble Code (DTC) Index **DTC: Auxiliary Heater Control Module (AHCM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the fuel fired booster heater control system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Fuel Fired Booster Heater](#) (412-02B Auxiliary Climate Control, Description and Operation).

- NOTE: Where an 'on demand self-test' is referred to, this can be accessed via the 'DTC Monitor' tab on the manufacturers approved diagnostic system.

DTC	Description	Possible Causes	Action
B1D22-11	Coolant Temperature Sensor - circuit short to ground	Fuel fired booster heater coolant temperature sensor internal fault	- Check and install a new fuel fired booster heater coolant temperature sensor - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation
B1D22-15	Coolant Temperature Sensor - circuit short to battery or open	Fuel fired booster heater coolant temperature sensor internal fault	- Check and install a new fuel fired booster heater coolant temperature sensor - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation
B1D23-13	Overheat Sensor - circuit open	Fuel fired booster heater coolant temperature sensor internal fault	- Check and install a new fuel fired booster heater coolant temperature sensor - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation
B1D24-11	Glow Plug - circuit short to ground	Fuel fired booster heater glow plug internal fault	- Carry out circuit checks, inspect the glow plug cables and connector. Repair the circuit or check and install a new fuel fired booster heater glow plug as required For additional information, refer to: Fuel Fired Booster Heater Glow Plug And Burner Assembly (412-02B Auxiliary Climate Control, Removal and Installation). - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation

DTC	Description	Possible Causes	Action
B1D24-15	Glow Plug - circuit short to battery or open	Fuel fired booster heater glow plug internal fault	- Carry out circuit checks, inspect the glow plug cables and connector. Repair the circuit or check and install a new fuel fired booster heater glow plug as required For additional information, refer to: Fuel Fired Booster Heater Glow Plug And Bumer Assembly (412-02B Auxiliary Climate Control, Removal and Installation). - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation
B1D25-11	Heater Fuel Pump - circuit short to ground	- Heater fuel pump circuit short to ground - Heater fuel pump failure	- Refer to the electrical circuit diagrams and check the fuel fired booster heater fuel pump and circuit for short to ground - Repair the circuit or check and install a new fuel fired booster heater fuel pump as required For additional information, refer to: Fuel Fired Booster Heater Fuel Pump (412-02B Auxiliary Climate Control, Removal and Installation). - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation
B1D25-15	Heater Fuel Pump - circuit short to battery or open	- Heater fuel pump circuit short to power, open circuit - Heater fuel pump failure	- Refer to the electrical circuit diagrams and check the fuel fired booster heater fuel pump and circuit for short to power, open circuit - Repair the circuit or check and install a new fuel fired booster heater fuel pump as required For additional information, refer to: Fuel Fired Booster Heater Fuel Pump (412-02B Auxiliary Climate Control, Removal and Installation). - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation
B1D26-11	Combustion Air Blower - circuit short to ground	Fuel fired booster heater module failure	- Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - If the diagnostic trouble code reoccurs check and install a new fuel fired booster heater module as required For additional information, refer to: Fuel Fired Booster Heater (412-02B Auxiliary Climate Control, Removal and Installation). - 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
B1D26-15	Combustion Air Blower - circuit short to battery or open	Fuel fired booster heater module failure	- Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - If the diagnostic trouble code reoccurs check and install a new fuel fired booster heater module as required For additional information, refer to: Fuel Fired Booster Heater (412-02B Auxiliary Climate Control, Removal and Installation). - 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
B1D26-92	Combustion Air Blower - performance or incorrect operation	Fuel fired booster heater module failure	Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test)

DTC	Description	Possible Causes	Action
			● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code reoccurs check and install a new fuel fired booster heater module as required For additional information, refer to: Fuel Fired Booster Heater (412-02B Auxiliary Climate Control, Removal and Installation). ● 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
B1D26-93	Combustion Air Blower - no operation	● Fuel fired booster heater module failure	● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) ● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code reoccurs check and install a new fuel fired booster heater module as required For additional information, refer to: Fuel Fired Booster Heater (412-02B Auxiliary Climate Control, Removal and Installation). ● 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
B1D27-11	Heater Coolant Pump - circuit short to ground	● Heater coolant pump circuit short to ground ● Heater coolant pump failure	● Refer to the electrical circuit diagrams and check the fuel fired booster heater water pump and circuit for short to ground ● Repair the circuit or check and install a new fuel fired booster heater water pump as required For additional information, refer to: Fuel Fired Booster Heater Coolant Pump (412-02B Auxiliary Climate Control, Removal and Installation). ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) ● Check for stored diagnostic trouble codes ● Check for correct operation
B1D27-15	Heater Coolant Pump - circuit short to battery or open	● Heater coolant pump circuit short to power, open circuit ● Heater coolant pump failure	● Refer to the electrical circuit diagrams and check the fuel fired booster heater water pump and circuit for short to power, open circuit ● Repair the circuit or check and install a new fuel fired booster heater water pump as required For additional information, refer to: Fuel Fired Booster Heater Coolant Pump (412-02B Auxiliary Climate Control, Removal and Installation). ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) ● Check for stored diagnostic trouble codes ● Check for correct operation
B1D28-11	Fuel Pre-heater - circuit short to ground	● NOTE: The pre heat is performed by the ignition glow plug ● Fuel fired booster heater glow plug internal fault	● Carry out circuit checks, inspect the glow plug cables and connector ● Check and install a new fuel fired booster heater glow plug as required For additional information, refer to: Fuel Fired Booster Heater Glow Plug And Burner Assembly (412-02B Auxiliary Climate Control, Removal and Installation). ● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) ● Check for stored diagnostic trouble codes ● Check for correct operation

DTC	Description	Possible Causes	Action
B1D28-15	Fuel Pre-heater - circuit short to battery or open	• NOTE: The pre heat is performed by the ignition glow plug • Fuel fired booster heater glow plug internal fault	• Carry out circuit checks, inspect the glow plug cables and connector • Check and install a new fuel fired booster heater glow plug as required For additional information, refer to: Fuel Fired Booster Heater Glow Plug And Bumer Assembly (412-02B Auxiliary Climate Control, Removal and Installation). • Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) • Check for stored diagnostic trouble codes • Check for correct operation
B1D29-93	No Start, Even After Restart Attempt - no operation	• No fuel present at fuel fired booster heater module • Exhaust system blocked • Air intake blocked	• Check vehicle fuel level • Check fuel lines to fuel fired booster heater module for blockage, kinking or damage • Check exhaust system and air intake for blockage, kinking or damage • Check fuel for aeration and correct fuel delivery • Check vehicle is not parked on an incline when parking heater is operated • Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) • Check for stored diagnostic trouble codes • Check for correct operation
B1D30-93	No Start In Test Mode - no operation	• No fuel present at fuel fired booster heater module • Exhaust system blocked • Air intake blocked	• Check vehicle fuel level • Check fuel lines to fuel fired booster heater module for blockage, kinking or damage • Check exhaust system and air intake for blockage, kinking or damage • Check fuel for aeration and correct fuel delivery • Check vehicle is not parked on an incline when parking heater is operated • Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) • Check for stored diagnostic trouble codes • Check for correct operation
B1D31-94	Flame Detected Prior to Normal Operation - unexpected operation	• NOTE: The glow plug and flame sensor are a combined unit • Glow plug circuit fault	• Check exhaust system and air intake for blockage, kinking or damage • Carry out circuit checks, inspect the glow plug cables and connector. Repair the circuit or check and install a new fuel fired booster heater glow plug as required For additional information, refer to: Fuel Fired Booster Heater Glow Plug And Bumer Assembly (412-02B Auxiliary Climate Control, Removal and Installation). • Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) • Check for stored diagnostic trouble codes • Check for correct operation
B1D32-92	Multiple Flame Interruption During Heating Cycle - performance or incorrect operation	• No fuel present at fuel fired booster heater module • Exhaust system blocked • Air intake blocked	• Check vehicle fuel level • Check fuel lines to Fuel fired booster heater module for blockage, kinking or damage • Check exhaust system and air intake for blockage, kinking or damage • Check fuel for aeration and correct fuel delivery • Check vehicle is not parked on an incline when parking heater is operated • Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) • Check for stored diagnostic trouble codes • Check for correct operation

DTC	Description	Possible Causes	Action
B1D33-92	Flame Interruption During Normal Operation - performance or incorrect operation	- No fuel present at fuel fired booster heater module - Exhaust system blocked - Air intake blocked	- Check vehicle fuel level - Check fuel lines to fuel fired booster heater module for blockage, kinking or damage - Check exhaust system and air intake for blockage, kinking or damage - Check fuel for aeration and correct fuel delivery - Check vehicle is not parked on an incline when parking heater is operated - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation
B1D34-68	Heater In Lock Out Mode - event information	Fuel fired booster heater system fault	NOTE: For information only, rectify other stored fuel fired booster heater diagnostic trouble codes prior to this diagnostic trouble code - Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for stored diagnostic trouble codes - Check for correct operation
B1D63-11	External Control Relay - circuit short to ground	Fuel fired booster heater module failure	- Check and install a new fuel fired booster heater module as required For additional information, refer to: Fuel Fired Booster Heater (412-02B Auxiliary Climate Control, Removal and Installation). - 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
B1D63-15	External Control Relay - circuit short to battery or open	Fuel fired booster heater module failure	- Check and install a new fuel fired booster heater module as required For additional information, refer to: Fuel Fired Booster Heater (412-02B Auxiliary Climate Control, Removal and Installation). - 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
U0010-00	Medium Speed CAN Communication Bus - no sub type information	Medium speed CAN communication bus off	Using the manufacturer approved diagnostic system, complete a CAN network integrity test
U0028-08	Vehicle Communication Bus A - Bus Signal / Message Failures	- Medium speed CAN communication bus off - Fuel fired booster heater module failure	Using the manufacturer approved diagnostic system, complete a CAN network integrity test
U0300-00	Internal Control Module Software Incompatibility - no sub type information	Fuel fired booster heater module not configured or incorrectly configured	Re-configure the fuel fired booster heater module using the manufacturer approved diagnostic system (Module programming/Configure existing module/Auxiliary heater control module)
U1A37-87	Crash Status Telegram Bus Signal / Message Failures Missing message	Crash signal received over CAN network	NOTE: Event information - the restraints control module has recorded a crash event - Using the manufacturer approved diagnostic system, check other modules for related diagnostic trouble codes
U2101-00	Control Module Configuration Incompatible - no sub type information	- Fuel fired booster heater module not configured or incorrectly configured - Central junction box not configured correctly	- Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) - Check for reoccurrence of the diagnostic trouble code - If the diagnostic trouble code returns - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required - Re-configure the Fuel fired booster heater module using the manufacturer approved diagnostic system

DTC	Description	Possible Causes	Action
			● Check for stored diagnostic trouble codes ● Check for correct operation
U3000-16	Control Module - circuit voltage below threshold	● Fuel fired booster heater module power circuit fault ● Battery/charging system fault	● Check other modules for related diagnostic trouble codes ● If other modules contain low voltage related diagnostic trouble codes, suspect a common cause (battery/charging system fault) ● If not, refer to the electrical circuit diagrams and check the power and ground circuits to the fuel fired booster heater module ● Check for stored diagnostic trouble codes ● Check for correct operation
U3000-17	Control Module - circuit voltage above threshold	● Charging system fault ● Fuel fired booster heater module failure	● Check other modules for related diagnostic trouble codes ● If other modules contain high voltage related diagnostic trouble codes, suspect a common cause (battery/charging system fault) ● If not, refer to the electrical circuit diagrams and check the power and ground circuits to the fuel fired booster heater module ● Check for stored diagnostic trouble codes ● Check for correct operation
U3000-43	Control Module - special memory failure	● Fuel fired booster heater module failure	● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) ● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code returns ● Install a new fuel fired booster heater module as required For additional information, refer to: Fuel Fired Booster Heater (412-02B Auxiliary Climate Control, Removal and Installation). ● 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
U3000-49	Control Module - internal electronic failure	● Fuel fired booster heater module failure	● Using the manufacturer approved diagnostic system, record then clear any stored diagnostic trouble codes then conduct the fuel fired booster heater operation test (Setup and configuration/auxiliary heater/operation test) ● Check for reoccurrence of the diagnostic trouble code ● If the diagnostic trouble code returns ● Install a new fuel fired booster heater module as required For additional information, refer to: Fuel Fired Booster Heater (412-02B Auxiliary Climate Control, Removal and Installation). ● 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
U3003-62	Battery Voltage - signal compare failure	● There is a difference of more than 2 volts between the power supply to the fuel fired booster heater and the battery voltage value broadcast via the CAN bus	● Check other modules for related diagnostic trouble codes ● If other modules contain voltage related diagnostic trouble codes, suspect a common cause (battery/charging system fault) ● If not, refer to the electrical circuit diagrams and check the power and ground circuits to the fuel fired booster heater module

General Information - Diagnostic Trouble Code (DTC) Index

DTC: Terrain Response Control Module (ATCM)

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.

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

Mechanical	Electrical
* Tire condition, pressures, etc - Driveline, Engine, Transmission, Suspension, components (correct installation, damage, etc)	- Fuses - Harnesses/Connectors - Terrain response module - Engine Control Module (ECM) - Transmission Control Module (TCM) - Anti-Lock Brake System control module - Active On-demand control module - Dynamic suspension control module * Controller area network (CAN) circuits

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, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

DTC Index

- NOTE: If the control module/transmission is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/transmission.
- NOTE: Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer approved diagnostic system).
- NOTE: When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the Terrain Response system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Ride and Handling Optimization](#) (204-06 Ride and Handling Optimization, Description and Operation).

Terrain Response Control Module

DTC	Description	Possible Cause	Action
C1A00-46	Control Module - calibration / parameter memory failure	- The Terrain Response Control Module has indicated a calibration / parameter memory failure for embedded systems using FLASH memory. This is equivalent to EEPROM in RAM/ROM/EEPROM embedded systems - Corruption in the non-volatile memory storage system (EEPROM) in the Terrain Response Control Module	Rectify this DTC before attempting to rectify others. Record all DTCs logged and clear them. With ignition on select a terrain response special program, turn off the ignition, then turn back on the ignition and verify the selected special program is still active. If the selected terrain response special program is not still active and has returned to the general program, confirm if DTC has returned. Repeat procedure again once more. If DTC is still present install a new terrain response rotary control and control module. Refer to the warranty policy and procedures manual if a module is suspect

DTC	Description	Possible Cause	Action
C1A01-96	LED Circuit - component internal failure	• Terrain response rotary control and control module - LED short circuit to ground • Terrain response rotary control and control module - LED open circuit	• NOTE: If the system is in 'failsafe default mode due to another issue no LEDs will illuminate. This fault does not cause the system to go to 'failsafe default'. Refer to the Description and Operation section of workshop manual. Check terrain response system, special program LEDs. One or more of the LEDs is suspected of not illuminating as appropriate. With the engine running move the terrain response rotary control through all five programs and confirm the appropriate special program LED does not illuminate when the terrain response rotary control is in that position. Suspect the terrain response rotary control and control module, check and install a new terrain response rotary control and control module as required, refer to the new module/component installation note at the top of the DTC Index.
C1A02-94	Rotary Encoder Stuck In Intermediate Position - unexpected operation	• The terrain response rotary control is held in an intermediate position (between the special programs) for more than 60 seconds • Foreign object preventing correct operation of terrain response rotary control • Mechanical damage to the terrain response rotary control	• NOTE: Suspect driver error do not replace the terrain response rotary control at this time Check for foreign object preventing correct operation of terrain response rotary control. Start the vehicle engine, rotate the terrain response rotary control until it has located a genuine detent, wait 60 seconds. Stop the vehicle engine, clear the DTC and retest
U0073-88	Control Module Communication Bus "A" Off - bus off	• Bus off. The Terrain Response Control Module has detected the data bus is not available • CAN bus open circuit • CAN bus short circuit to ground • CAN bus short circuit to power • Failure of another control module on the CAN bus	Refer to electrical circuit diagrams, check CAN circuit for open circuit, short to ground, short to power, repair/renew as necessary. Using the manufacturer approved diagnostic system, carry out network integrity test. Check the system is operating correctly and the DTC does not return.
U0100-87	Lost Communication With ECM/PCM "A" - missing message	• The Terrain Response Control Module has not received one or more expected messages from the Engine Control Module • High speed CAN circuit communications failure • Open circuit Engine Control Module, powerfeed • Open circuit Engine Control Module, ground supply • Engine Control Module disconnected from the high speed CAN communication bus • Open circuit Engine Control Module high speed CAN low circuit • Open circuit Engine Control Module high speed CAN high circuit • Engine Control Module not configured • Engine Control Module failure	Using the manufacturer approved diagnostic system, check the Engine Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Engine Control Module. Refer to electrical circuit diagrams, check power feed and ground supplies, to Engine Control Module for open circuit. Check for open circuit Engine Control Module high speed CAN low circuit. Check for open circuit Engine Control Module high speed CAN high circuit, repair as necessary
U0101-87	Lost Communication with TCM - missing message	• The Terrain Response Control Module has not received one or more expected messages from the Transmission Control Module • High speed CAN circuit communications failure • Open circuit Transmission Control Module, powerfeed • Open circuit	Using the manufacturer approved diagnostic system, check the Transmission Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Transmission Control Module. Refer to electrical circuit diagrams, check power feed and ground supplies, to Transmission Control Module for open circuit. Check for open circuit Transmission Control Module high speed CAN low circuit. Check for open circuit Transmission Control Module high speed CAN high circuit, repair as necessary

DTC	Description	Possible Cause	Action
		Transmission Control Module, ground supply • Transmission Control Module disconnected from the high speed CAN communication bus • Open circuit Transmission Control Module high speed CAN low circuit • Open circuit Transmission Control Module high speed CAN high circuit • Transmission Control Module not configured • Transmission Control Module failure	
U0121-87	Lost Communication With Anti-Lock Brake System (ABS) Control Module - missing message	• The Terrain Response Control Module has not received one or more expected messages from the Anti-Lock Brake System Control Module • High speed CAN circuit communications failure • Open circuit Anti-Lock Brake System Control Module, powerfeed • Open circuit Anti-Lock Brake System Control Module, ground supply • Anti-Lock Brake System Control Module disconnected from the high speed CAN communication bus • Open circuit Anti-Lock Brake System Control Module high speed CAN low circuit • Open circuit Anti-Lock Brake System Control Module high speed CAN high circuit • Anti-Lock Brake System Control Module not configured • Anti-Lock Brake System Control Module failure	Using the manufacturer approved diagnostic system, check the Anti-Lock Brake System Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Anti-Lock Brake System Control Module. Refer to electrical circuit diagrams, check power feed and ground supplies, to Anti-Lock Brake System Control Module for open circuit. Check for open circuit Anti-Lock Brake System Control Module high speed CAN low circuit. Check for open circuit Anti-Lock Brake System Control Module high speed CAN high circuit, repair as necessary. Suspect the Anti-Lock Brake System Control Module, check and install a new Anti-Lock Brake System Control Module as required, refer to the new module/component installation note at the top of the DTC Index. Check the system is operating correctly and the DTC does not return.
U0136-87	Lost Communication With Differential Control Module - Rear - missing message	• The Terrain Response Control Module has not received one or more expected messages from the Rear Differential Control Module • High speed CAN circuit communications failure • Open circuit Rear Differential Control Module, powerfeed • Open circuit Rear Differential Control Module, ground supply • Rear Differential Control Module disconnected from the high speed CAN communication bus • Open circuit Rear Differential Control Module high speed CAN low circuit • Open circuit Rear Differential Control Module high speed CAN high circuit • Rear Differential Control Module not configured • Rear Differential Control Module failure	Using the manufacturer approved diagnostic system, check the Rear Differential Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Rear Differential Control Module. Refer to electrical circuit diagrams, check power feed and ground supplies, to Rear Differential Control Module for open circuit. Check for open circuit Rear Differential Control Module high speed CAN low circuit. Check for open circuit Rear Differential Control Module high speed CAN high circuit, repair as necessary. Suspect the Rear Differential Control Module, check and install a new Rear Differential Control Module as required, refer to the new module/component installation note at the top of the DTC Index. Check the system is operating correctly and the DTC does not return.

DTC	Description	Possible Cause	Action
U0140-87	Lost Communication With Body Control Module - missing message	• The Terrain Response Control Module has not received one or more expected messages from the Body Control Module • High speed CAN circuit communications failure • Open circuit Body Control Module, powerfeed • Open circuit Body Control Module, ground supply • Body Control Module disconnected from the high speed CAN communication bus • Open circuit Body Control Module high speed CAN low circuit • Open circuit Body Control Module high speed CAN high circuit • Body Control Module not configured • Body Control Module failure	Using the manufacturer approved diagnostic system, check the Body Control Module for DTCs and refer to the relevant DTC index. Using the manufacturer approved diagnostic system, carry out network integrity test. Using the manufacturer approved diagnostic system, re-configure the Body Control Module. Refer to electrical circuit diagrams, check power feed and ground supplies, to Body Control Module for open circuit. Check for open circuit Body Control Module high speed CAN low circuit. Check for open circuit Body Control Module high speed CAN high circuit, repair as necessary. Suspect the Body Control Module, check and install a new Body Control Module as required, refer to the new module/component installation note at the top of the DTC Index. Check the system is operating correctly and the DTC does not return.
U0300-55	Internal Control Module Software Incompatibility - not configured	• The Terrain Response Control Module has failed to recognise a matching master configuration ID from the CAN data bus master • Terrain Response Control Module has incorrect CAN configuration • CAN bus master not correctly configured • Message containing configuration ID not received due to CAN bus issue • Message containing configuration ID not transmitted by CAN bus master	Using the manufacturer approved diagnostic system, check the CAN configuration in the Terrain Response Control Module, check correct software versions installed and update as necessary. If similar DTCs from other modules suspect CAN bus or CAN bus master ECU, check CAN bus operation, check the CAN configuration in the CAN bus master module, check correct software versions installed and update as necessary. Check the system is operating correctly and the DTC does not return.
U0401-94	Invalid Data Received From ECM/PCM - unexpected operation	• The Terrain Response Control Module has detected that the Engine Control Module component had operated in a way or at a time that it had not been commanded to operate • The engine management system, Engine Control Module is unable to support normal terrain response functionality, the terrain response system will go into default condition • Engine management system fault • Engine Control Module failure	Using the manufacturer approved diagnostic system, check the Engine Control Module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return
U0402-94	Invalid Data Received From Transmission Control Module - unexpected operation	• The Terrain Response Control Module has detected that the Transmission Control Module component had operated in a way or at a time that it had not been commanded to operate • The transmission system, Transmission Control Module is unable to support normal	Using the manufacturer approved diagnostic system, check the Transmission Control Module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return

DTC	Description	Possible Cause	Action
		terrain response functionality, the terrain response system will go into default condition • Transmission system fault • Transmission Control Module failure	
U0415-94	Invalid Data Received From Anti-Lock Brake System Control Module - unexpected operation	• The Terrain Response Control Module has detected that the Anti-Lock Brake System control module component had operated in a way or at a time that it had not been commanded to operate • The Anti-Lock Brake System , Anti-Lock Brake System control module is unable to support normal terrain response functionality, the terrain response system will go into default condition • Anti-Lock Brake System fault • Anti-Lock Brake System control module failure	Using the manufacturer approved diagnostic system, check the Anti-Lock Brake System control module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return. Suspect the Anti-Lock Brake System control module, check and install a new Anti-Lock Brake System control module as required, refer to the new module/component installation note at the top of the DTC Index.
U0437-94	Invalid Data Received From Differential Control Module-Rear - unexpected operation	• The Terrain Response Control Module has detected that the Rear Differential Control Module component had operated in a way or at a time that it had not been commanded to operate • The Rear Differential system, Rear Differential Control Module is unable to support normal terrain response functionality, the terrain response system will go into default condition • Rear Differential system fault • Rear Differential Control Module failure	Using the manufacturer approved diagnostic system, check the Rear Differential Module for DTCs and refer to the relevant DTC index, rectify as required. Check the system is operating correctly and the DTC does not return. Suspect the Rear Differential Module, check and install a new Rear Differential Module as required, refer to the new module/component installation note at the top of the DTC Index.
U2012-4A	Car Configuration Parameter(s) - incorrect component installed	• The Terrain Response Control Module has detected a mismatch between the hardware connected and the hardware expected • Vehicle not correctly configured • Incorrect components installed for vehicle configuration	Using the manufacturer approved diagnostic system, check the vehicle configuration file, rectify as necessary. Check correct components for vehicle configuration are installed, rectify as necessary. Check the system is operating correctly and the DTC does not return.

General Information - Diagnostic Trouble Code (DTC) Index DTC: Body Control Module (BCM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

For additional information, refer to: [Communications Network](#) (418-00 Module Communications Network, Description and Operation).

Body control module (BCM)

DTC	Description	Possible Cause	Action
B100A-11	Fuel Pump Authorisation - circuit short to ground	Fuel pump authorisation circuit - short to ground	Refer to electrical circuit diagrams and check fuel pump authorisation circuit for short to ground
B100A-15	Fuel Pump Authorisation - circuit short to power or open	Fuel pump authorisation circuit - short to power, open circuit	Refer to electrical circuit diagrams and check fuel pump authorisation circuit for short to power, open circuit
B1024-08	Transponder - Bus signal/Message Failures	Transponder - Bus signal/message failures	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1024-51	Start Control Unit - not programmed	Start control unit - not configured	Re-configure the start control unit using the manufacturer approved diagnostic system
B1024-81	Start Control unit - invalid serial data received	Invalid serial data received	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1024-87	Start control unit - missing message	Missing message	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1024-96	Start control unit - component internal failure	Internal failure	Install a new start control unit, refer to new module/component installation note at the top of the DTC Index
B1025-81	Transponder - invalid serial data	Invalid serial data received	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1026-08	Steering Column Lock - Bus Signal/Message Failures	Steering column lock - Bus signal/message failures	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1026-51	Steering Column Lock - not programmed	Steering column lock - not configured	Re-configure the steering column lock using the manufacturer approved diagnostic system
B1026-52	Steering Column Lock - not activated	Request to enable the steering column lock supply not approved	Check LIN circuit between steering column lock and CJB
B1026-71	Steering Column Lock - actuator stuck	Should be set if the SCL is unable to reach locked and OK position	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1026-82	Steering Column Lock	Steering column lock incorrectly programmed	Install a new steering column lock
B1026-92	Steering Column Lock - performance or incorrect operation	Micro switch/sensor fault	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1026-94	Steering Column Lock - unexpected operation	Status messages are received from the SCL when SCL should be turned off	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1026-96	Steering Column Lock - component internal failure	Internal failure	Install a new steering column lock, refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
B1029-21	Accelerator Pedal Sensor signal amplitude < minimum	Accelerator pedal sensor signal <3% of supply(5V)	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1029-22	Accelerator Pedal Sensor signal amplitude > maximum	Accelerator pedal sensor signal >=97% of supply(5V)	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B108A-23	Start button - signal stuck low	SW1 and SW2 constantly active	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B108B-23	Start Button Circuit "A" - signal stuck low	SW1 constantly active for long time while button press detected at SW2	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B108B-24	Start button circuit "A" - signal stuck high	SW1 never active while button press detected at SW2	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B108C-23	Start button circuit "B" - signal stuck low	SW2 constantly active for long time while button press detected at SW1	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B108C-24	Start button circuit "B" - signal stuck high	SW2 never active while button press detected at SW1	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B108D-24	Start button circuit "C" signal stuck high	SW3 never active while button press detected at SW1	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B1095-12	Wiper On/Off Relay - circuit short to power	Wiper On/Off relay circuit - short to power	Refer to electrical circuit diagrams and check wiper On/Off relay circuit for short to power
B1095-14	Wiper On/Off Relay - circuit short to ground or open	Wiper On/Off relay circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check wiper On/Off relay circuit for short to ground, open circuit
B1096-12	Wiper High/Low Relay - circuit short to power	Wiper High/Low relay circuit - short to power	Refer to electrical circuit diagrams and check wiper High/Low relay circuit for short to power
B1096-14	Wiper High/Low Relay - circuit short to ground or open	Wiper High/Low relay circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check wiper High/Low relay circuit for short to ground, open circuit
B1097-12	Heated Windshield Relay - circuit short to power	Heated windshield relay circuit - short to power	Refer to electrical circuit diagrams and check heated windshield relay circuit for short to power
B1097-14	Heated Windshield Relay - circuit short to ground or open	Heated windshield relay circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check heated windshield relay circuit for short to ground, open circuit
B109B-11	License Plate Light - circuit short to ground	License plate lamp circuit - short to ground	Refer to electrical circuit diagrams and check license plate lamp circuit for short to ground
B109B-13	License Plate Light - open circuit	License plate lamp circuit - open circuit	Refer to electrical circuit diagrams and check license plate lamp circuit for open circuit
B10A2-02	Crash Input - general signal failure	Incorrect signal received	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B10A2-11	Crash Input - circuit short to ground	Crash input circuit - short to ground	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B10A2-15	Crash signal - circuit short to power or open	Crash signal circuit - short to power, open circuit	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B10A2-68	Crash signal - event information	Crash signal - event information	Check RCM for DTCs and refer to the relevant DTC Index
B10A5-12	Alarm Siren - circuit short to power	Alarm siren circuit - short to power	Refer to electrical circuit diagrams and check alarm siren circuit for short to power
B10A5-14	Alarm Siren - circuit short to ground or open	Alarm siren circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check alarm siren circuit for short to ground, open circuit
B10AC-86	Cruise Control Switch - Signal invalid	Signal invalid	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B10AC-87	Cruise Control Switch - Missing message	Missing message	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
B10AC-95	Cruise Control Switch - Wrong assembly	Mis-match between Car Configuration File and vehicle	Check/up-date Car Configuration File using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
B10AD-04	Rain Sensor - System Internal Failure	Internal sensor failure	Install a new rain sensor, refer to new module/component installation note at the top of the DTC Index
B10AD-09	Rain Sensor - Component Failures	- Rain sensor incorrectly installed - Rain sensor internal failure	Check for correct installation of rain sensor. Install a new sensor as required, refer to new module/component installation note at the top of the DTC Index
B10BE-11	Solar Sensor - circuit short to ground	Sunload sensor circuit - short to ground	Refer to electrical circuit diagrams and check sunload sensor for short to ground
B10BE-13	Solar Sensor - open circuit	Sunload sensor circuit - open circuit	Refer to electrical circuit diagrams and check sunload sensor for open circuit
B10C0-12	Fuel Pump Power Supply - circuit short to power	Fuel pump power supply circuit - short to power	Refer to electrical circuit diagrams and check fuel pump power supply circuit for short to power
B10C0-14	Fuel Pump Power Supply - circuit short to ground or open	Fuel pump power supply circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check fuel pump power supply circuit for short to ground, open circuit
B10D7-94	PATS Key - unexpected operation	No response from transponder in key	Replace key
B10E5-11	PCM wake-up signal - circuit short to ground	Engine Control Module (ECM) wake-up signal circuit - short to ground	Refer to electrical circuit diagrams and check ECM wake-up signal circuit for short to ground
B10E5-15	PCM wake-up signal - circuit short to power or open	Engine Control Module (ECM) wake-up signal circuit - short to power, open circuit	Refer to electrical circuit diagrams and check ECM wake-up signal circuit for short to power, open circuit
B10E7-12	Ignition On Relay - circuit short to power	EJB ignition On relay control circuit - short to power	Refer to electrical circuit diagrams and check EJB ignition relay control circuit for short to power
B10E7-14	Ignition On Relay - circuit short to ground or open	EJB ignition On relay control circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check EJB ignition relay control circuit for short to ground, open circuit
B10EA-12	Positive temperature coefficient heater - circuit short to power	Positive temperature coefficient heater circuit - short to power	Refer to electrical circuit diagrams and check positive temperature coefficient heater circuit for short to power
B10EA-14	Positive temperature coefficient heater - circuit short to ground or open	Positive temperature coefficient heater circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check positive temperature coefficient heater circuit for short to ground, open circuit
B10EB-77	Driver door double locking motor - commanded position not reachable	Incorrect feedback from DDM	Check for Lost Communications DTCs and carry out associated pinpoint test using manufacturer approved diagnostic system. If no lost communication DTC, check double locking mechanism for mechanical failure
B10EC-77	Passenger door double locking motor - commanded position not reachable	Incorrect feedback from PDM	Check for Lost Communications DTCs and carry out associated pinpoint test using manufacturer approved diagnostic system. If no lost communication DTC, check double locking mechanism for mechanical failure
B10ED-77	Rear door driver side double locking motor - commanded position not reachable	Incorrect feedback from rear door driver side	Check DDM for Lost Communications DTCs and carry out associated pinpoint test using manufacturer approved diagnostic system. If no lost communication DTC, Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system, check double locking mechanism for mechanical failure
B10EE-77	Rear door passenger side double locking motor - commanded position not reachable	Incorrect feedback from rear door passenger side	Check PDM for Lost Communications DTCs and carry out associated pinpoint test using manufacturer approved diagnostic system. If no lost communication DTC, Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system, check double locking mechanism for mechanical failure
B10EF-12	Sunroof Speed Output - circuit short to power	Sunroof speed output circuit - short to power	Refer to electrical circuit diagrams and check sunroof speed output circuit for short to power
B10EF-14	Sunroof Speed Output - circuit short to ground or open	Sunroof speed output circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check sunroof speed output circuit for short to ground, open circuit
B10F2-12	Sunroof control - circuit short to power	Sunroof control circuit - short to power	Refer to electrical circuit diagrams and check sunroof control circuit for short to power

DTC	Description	Possible Cause	Action
B10F2-14	Sunroof control - circuit short to ground or open	● Sunroof control circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check sunroof control circuit for short to ground, open circuit
B10F3-11	Left front position light - circuit short to ground	● Left front position light circuit - short to ground	Refer to electrical circuit diagrams and check left front position light circuit for short to ground
B10F4-11	Right front position light - circuit short to ground	● Right front position light circuit - short to ground	Refer to electrical circuit diagrams and check right front position light circuit for short to ground
B10F5-11	Left rear position light - circuit short to ground	● Left rear position light circuit - short to ground	Refer to electrical circuit diagrams and check left rear position light circuit for short to ground
B10F5-12	Left Rear Position light - short circuit to power	● Left rear position light circuit - short to power	Refer to electrical circuit diagrams and check left rear position light circuit for short to power
B10F6-11	Right rear position light - circuit short to ground	● Right rear position light circuit - short to ground	Refer to electrical circuit diagrams and check right rear position light circuit for short to ground
B10F6-12	Right rear position light - short circuit to power	● Right rear position light circuit - short to power	Refer to electrical circuit diagrams and check right rear position light circuit for short to power
B1101-12	Comfort relay - circuit short to power	● Comfort relay control circuit - short to power	Refer to electrical circuit diagrams and check comfort relay control circuit for short to power
B1101-14	Comfort relay - circuit short to ground or open	● Comfort relay control circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check comfort relay control circuit for short to ground, open circuit
B1108-77	Driver door central locking motor - commanded position not reachable	● Incorrect feedback from DDM	Check for Lost Communications DTCs and carry out associated pinpoint test using manufacturer approved diagnostic system. If no lost communication DTC, check central locking mechanism for mechanical failure
B1109-77	Passenger door central locking motor - commanded position not reachable	● Incorrect feedback from PDM	Check for Lost Communications DTCs and carry out associated pinpoint test using manufacturer approved diagnostic system. If no lost communication DTC, check central locking mechanism for mechanical failure
B110A-77	Rear door driver side central locking motor - commanded position not reachable	● Incorrect feedback from rear door driver side	Check DDM for Lost Communications DTCs and carry out associated pinpoint test using manufacturer approved diagnostic system. If no lost communication DTC, Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system, check central locking mechanism for mechanical failure
B110B-77	Rear door passenger side central locking motor - commanded position not reachable	● Incorrect feedback from rear door passenger side	Check PDM for Lost Communications DTCs and carry out associated pinpoint test using manufacturer approved diagnostic system. If no lost communication DTC, Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system, check central locking mechanism for mechanical failure
B1115-11	High Mounted Stoplamp control - circuit short to ground	● High mounted stoplamp control circuit - short to ground	Refer to electrical circuit diagrams and check high mounted stoplamp control circuit for short to ground
B1115-13	High Mounted Stoplamp control - circuit open	● High mounted stoplamp control circuit - open circuit	Refer to electrical circuit diagrams and check high mounted stoplamp control circuit for open circuit
B112A-12	Ignition On Relay B - circuit short to power	● RJB ignition On relay circuit - short to power	Refer to electrical circuit diagrams and check RJB ignition On relay circuit for short to power
B112A-14	Ignition On Relay B - circuit short to ground or open	● RJB ignition On relay circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check RJB ignition On relay circuit for short to ground, open circuit
B112B-07	Steering Wheel Module - Mechanical Failures	● Any position or button on wiper stalk active for more than 60 seconds (180 seconds for speed control buttons) ● Switch internal failure	Check for stuck wiper or speed control buttons. Install a new switch as required, refer to new module/component installation note at the top of the DTC Index
B112B-88	Steering Wheel Module - Bus off	● Lost communications with steering wheel module	Carry out diagnostic strategy associated with this DTC using manufacturer approved diagnostic system
B112C-88	Interior Motion Sensor - Bus off	● Lost communications with interior motion sensor	Carry out diagnostic strategy associated with this DTC using manufacturer approved diagnostic system
B1130-07	Light switch module - Mechanical Failures	● Any buttons on the Light Switch Module active for more than 60 seconds or Exterior Light Switch in illegal combination	Check for stuck light switch buttons. Install a new light switch as required, refer to new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
		Switch internal failure	
B1130-88	Light Switch Module - Bus off	Lost communications with lighting switch module	Carry out diagnostic strategy associated with this DTC using manufacturer approved diagnostic system
B1131-88	Wiper Motor Module - Bus off	Lost communications with wiper motor module	Carry out diagnostic strategy associated with this DTC using manufacturer approved diagnostic system
B113C-11	Hazard switch illumination - circuit short to ground	Hazard switch illumination circuit - short to ground	Refer to electrical circuit diagrams and check hazard switch illumination circuit for short to ground
B113C-15	Hazard switch illumination - circuit short to power or open	Hazard switch illumination circuit - short to power, open circuit	Refer to electrical circuit diagrams and check hazard switch illumination circuit for short to power, open circuit
B113D-12	Sunroof Global Open/Close Control - circuit short to power	Roof opening panel global open/close control circuit - short to power	Refer to electrical circuit diagrams and check roof opening panel global open/close control circuit for short to power
B113D-14	Sunroof Global Open/Close Control - circuit short to ground or open	Roof opening panel global open/close control circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check roof opening panel global open/close control circuit for short to ground, open circuit
B1182-51	Tire Pressure Monitoring System (TPMS) - Not Programmed	TPMS module in Transport/Factory mode	Enter TPMS module into customer mode using manufacturer approved diagnostic system
B11BC-11	Extended accessory relay - circuit short to ground	Extended accessory relay circuit - short to ground	Refer to electrical circuit diagrams and check extended accessory relay circuit for short to ground
B11BC-15	Extended accessory relay - circuit short to power or open	Extended accessory relay circuit - short to power, open circuit	Refer to electrical circuit diagrams and check extended accessory relay circuit for short to power, open circuit
B1A79-11	Rear Fog Lamp - circuit short to ground	Rear fog lamp supply circuit - short to ground	Refer to electrical circuit diagrams and check rear fog lamp supply circuit for short to ground
B1A79-13	Rear Fog Lamp - circuit open	Rear fog lamp supply circuit - open circuit	Refer to electrical circuit diagrams and check rear fog lamp supply circuit for open circuit
B1A84-41	Car Configuration Data - general checksum failure	Checksum error	Configure the CJB as a 'NEW' module using the manufacturer approved diagnostic system
B1A99-04	Power On Reset-System Internal failure	The DTC will be set if the reset counter reaches the maximum value (currently 5)	Install a new CJB, refer to the new module/component installation note at the top of the DTC Index
B1C96-11	Alarm LED Circuit - circuit short to ground	Alarm LED circuit - short to ground	Refer to electrical circuit diagrams and check alarm LED circuit for short to ground
B1C96-15	Alarm LED Circuit - circuit short to power or open	Alarm LED circuit - short to power, open circuit	Refer to electrical circuit diagrams and check alarm LED circuit for short to power, open circuit
B1D00-11	Left-hand Low Beam Circuit - circuit short to ground	Left-hand low beam circuit - short to ground	Refer to electrical circuit diagrams and check left-hand low beam circuit for short to ground
B1D00-13	Left-hand Low Beam Circuit - circuit open	Left-hand low beam circuit - open circuit	Refer to electrical circuit diagrams and check left-hand low beam circuit for open circuit
B1D01-11	Right-hand Low Beam Circuit - circuit short to ground	Right-hand low beam circuit - short to ground	Refer to electrical circuit diagrams and check right-hand low beam circuit for short to ground
B1D01-13	Right-hand Low Beam Circuit - circuit open	Right-hand low beam circuit - open circuit	Refer to electrical circuit diagrams and check right-hand low beam circuit for open circuit
B1D06-11	Left Turn Indicator - circuit short to ground	Left turn indicator circuit - short to ground	Refer to electrical circuit diagrams and check left turn indicator circuit for short to ground
B1D06-13	Left Turn Indicator - circuit open	Left turn indicator circuit - open circuit	Refer to electrical circuit diagrams and check left turn indicator circuit for open circuit
B1D07-11	Right Turn Indicator - circuit short to ground	Right turn indicator circuit - short to ground	Refer to electrical circuit diagrams and check right turn indicator circuit for short to ground
B1D07-13	Right Turn Indicator - circuit open	Right turn indicator circuit - open circuit	Refer to electrical circuit diagrams and check right turn indicator circuit for open circuit
B1D17-00	Battery Backed Sounder - General Failure Information	Internal inclination sensor fault	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
B1D17-88	Battery Backed Sounder - bus off	Lost communications with battery backed sounder	Carry out the network test associated with this DTC using the manufacturer approved diagnostic system
B1D17-96	Battery Backed Sounder - component internal failure	Battery backed sounder - internal failure	Install a new battery backed sounder, refer to new module/component installation note at the top of the DTC Index
B1D18-96	Volumetric Sensor Circuit - component internal failure	Interior motion sensor - internal failure	Install a new interior motion sensor, refer to new module/component installation note at the top of the DTC Index
B1D21-62	Remote Control Switch - Signal compare failure	A request from a programmed remote key was received and the rolling counter was incorrect	Re-synchronise the remote key by using the key to start the vehicle
B1C55-12	Horn Relay Coil Circuit - circuit short to power	Horn relay control circuit - short to power	Refer to electrical circuit diagrams and check horn relay control circuit for short to power
B1C55-14	Horn Relay Coil Circuit - circuit short to ground or open	Horn relay control circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check horn relay control circuit for short to ground, open circuit
B1C82-12	Headlamp Washer Relay Coil Circuit - circuit short to power	Headlamp washer relay control circuit - short to power	Refer to electrical circuit diagrams and check headlamp washer relay control circuit for short to power
B1C82-14	Headlamp Washer Relay Coil Circuit - circuit short to ground or open	Headlamp washer relay control circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check headlamp washer relay control circuit for short to ground, open circuit
B1C84-12	Heated Rear Window Relay Output Circuit - circuit short to power	Heated rear window relay control circuit - short to power	Refer to electrical circuit diagrams and check heated rear window relay control circuit for short to power
B1C84-14	Heated Rear Window Relay Output Circuit - circuit short to ground or open	Heated rear window relay control circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check heated rear window relay control circuit for short to ground, open circuit
B1C90-12	Auxiliary Driving Lamps Relay Coil Circuit - circuit short to power	Auxiliary driving lamps relay control circuit - short to power	Refer to electrical circuit diagrams and check auxiliary driving lamps relay control circuit for short to power
B1C90-14	Auxiliary Driving Lamps Relay Coil Circuit - circuit short to ground or open	Auxiliary driving lamps relay control circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check auxiliary driving lamps relay control circuit for short to ground, open circuit
B1D13-12	Interior Lights #1 Circuit - circuit short to power	Instrument panel interior lights circuit - short to power	Refer to electrical circuit diagrams and check instrument panel interior lights circuit for short to power
B1D13-14	Interior Lights #1 Circuit - circuit short to ground or open	Instrument panel interior lights circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check instrument panel interior lights circuit for short to ground, open circuit
B1D1A-12	Interior Lights Circuit 'C' - circuit short to power	Roof console interior lights circuit - short to power	Refer to electrical circuit diagrams and check roof panel interior lights circuit for short to power
B1D1A-14	Interior Lights Circuit 'C' - circuit short to ground or open	Roof console interior lights circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check roof panel interior lights circuit for short to ground, open circuit
B1D35-24	Hazard Switch - Signal stuck high	Hazard switch is active more than 60 seconds	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C0023-11	Stop Lamp Control - circuit short to ground	Stop lamp control circuit - short to ground	Refer to electrical circuit diagrams and check stop lamp control circuit for short to ground
C0023-13	Stop Lamp Control - circuit open	Stop lamp control circuit - open circuit	Refer to electrical circuit diagrams and check stop lamp control circuit for open circuit
C1108-11	Pedal Sensor(s) Supply Voltage - circuit short to ground	Pedal sensor(s) supply voltage circuit - short to ground	Refer to electrical circuit diagrams and check pedal sensor(s) supply voltage circuit for short to ground
C1108-15	Pedal Sensor(s) Supply Voltage - circuit short to power or open	Pedal sensor(s) supply voltage circuit - short to power, open circuit	Refer to electrical circuit diagrams and check pedal sensor(s) supply voltage circuit for short to power, open circuit
C1A41-21	Clutch Pedal Sensor - signal amplitude < minimum	signal < 3% of supply(5V)	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
C1A41-22	Clutch Pedal Sensor - signal amplitude > maximum	signal $\geq 97\%$ of supply(5V)	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A56-16	Front Left Wheel Module - circuit voltage below threshold (low battery)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A56-86	Front Left Wheel Module - signal invalid (out of range)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A56-93	Front Left Wheel Module - no operation (lost sensor)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A57-11	Left Front Initiator - short to ground	Left front initiator circuit - short to ground	Refer to electrical circuit diagrams and check left front initiator circuit for short to ground
C1A57-12	Left Front Initiator - short to power	Left front initiator circuit - short to power	Refer to electrical circuit diagrams and check left front initiator circuit for short to power
C1A57-13	Left Front Initiator - open circuit	Left front initiator circuit - open circuit	Refer to electrical circuit diagrams and check left front initiator circuit for open circuit
C1A58-16	Front Right Wheel Module - circuit voltage below threshold (low battery)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A58-86	Front Right Wheel Module - signal invalid (out of range)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A58-93	Front Right Wheel Module - no operation (lost sensor)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A59-11	Right Front Initiator - short to ground	Right front initiator circuit - short to ground	Refer to electrical circuit diagrams and check right front initiator circuit for short to ground
C1A59-12	Right Front Initiator - short to power	Right front initiator circuit - short to power	Refer to electrical circuit diagrams and check right front initiator circuit for short to power
C1A59-13	Right Front Initiator - open circuit	Right front initiator circuit - open circuit	Refer to electrical circuit diagrams and check right front initiator circuit for open circuit
C1A60-16	Rear Left Wheel Module - circuit voltage below threshold (low battery)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A60-86	Rear Left Wheel Module - signal invalid (out of range)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A60-93	Rear Left Wheel Module - no operation (lost sensor)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A61-11	Left Rear Initiator - short to ground	Left rear initiator circuit - short to ground	Refer to electrical circuit diagrams and check left rear initiator circuit for short to ground
C1A61-12	Left Rear Initiator - short to power	Left rear initiator circuit - short to power	Refer to electrical circuit diagrams and check left rear initiator circuit for short to power
C1A61-13	Left Rear Initiator - open circuit	Left rear initiator circuit - open circuit	Refer to electrical circuit diagrams and check left rear initiator circuit for open circuit
C1A62-16	Rear Right Wheel Module - circuit voltage below threshold (low battery)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A62-86	Rear Right Wheel Module - signal invalid (out of range)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A62-93	Rear Right Wheel Module - no operation (lost sensor)	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1A63-11	Right Rear Initiator - short to ground	Right rear initiator circuit - short to ground	Refer to electrical circuit diagrams and check right rear initiator circuit for short to ground
C1A63-12	Right Rear Initiator - short to battery	Right rear initiator circuit - short to power	Refer to electrical circuit diagrams and check right rear initiator circuit for short to power

DTC	Description	Possible Cause	Action
C1A63-13	Right Rear Initiator - open circuit	Right rear initiator circuit - open circuit	Refer to electrical circuit diagrams and check right rear initiator circuit for open circuit
C1B14-12	Sensor supply #1 - circuit short to power	Sensor supply #1 circuit - short to power	Refer to electrical circuit diagrams and check sensor supply #1 circuit for short to power
C1D18-00	Localisation failed	Tire pressure monitor localisation failed	Check for additional related DTCs and refer to this DTC Index
C1D21-05	Wheel module - general signal failure	Siemens internal algorithm	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
C1D22-49	Steering Wheel Switch Right Module - Internal failure	Steering wheel switch right module - internal failure	Install a new wash/wipe switch, refer to new module/component installation note at the top of the DTC Index
C2003-07	Steering Wheel Switch Left Module - Mechanical Failures	Steering wheel switch left module - mechanical failure	Install a new indicator switch, refer to new module/component installation note at the top of the DTC Index
C2003-49	Steering Wheel Switch Left Module - Internal failure	Steering wheel switch left module - internal failure	Install a new indicator switch, refer to new module/component installation note at the top of the DTC Index
C2004-12	Headlamp washer relay B - circuit short to power	Headlamp washer relay B circuit - short to power	Refer to electrical circuit diagrams and check headlamp washer relay B circuit for short to power
C2004-14	Headlamp washer relay B - circuit short to ground or open	Headlamp washer relay B circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check headlamp washer relay B circuit for short to ground, open circuit
P0460-15	Fuel Level Sensor A - short to battery or open circuit	Fuel tank unit circuit A short to power, open circuit	NOTE: Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system Refer to the electrical circuit diagrams and check the circuit between the central junction box and the fuel tank unit circuit (F/P sensor) for short to power, open circuit. Using the manufacturer approved diagnostic system check and install latest relevant level of software to the central junction box and the instrument panel cluster. If the level of software is correct carry out a battery reset
P0462-00	Fuel Level Sensor A - no subtype information	Fuel tank unit circuit A short to ground or high resistance	NOTE: Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system Refer to the electrical circuit diagrams and check the circuit between the central junction box and the fuel tank unit circuit (F/P sensor) for short to ground. Using the manufacturer approved diagnostic system check and install latest relevant level of software to the central junction box and the instrument panel cluster. If the level of software is correct carry out a battery reset
P0604-00	Internal Control Module Random Access Memory (RAM) Error	RAM Checksum not correct	Install a new CJB, refer to the new module/component installation note at the top of the DTC Index
P0605-00	Internal Control Module Read Only Memory (ROM) Error	ROM Checksum not correct	Install a new CJB, refer to the new module/component installation note at the top of the DTC Index
P062F-00	Internal Control Module Read Only Memory (ROM) Error	EEP read back value does not match written value	Install a new CJB, refer to the new module/component installation note at the top of the DTC Index
P0801-11	Reverse inhibit control circuit - circuit short to ground	Reverse inhibit control circuit - short to ground	Refer to electrical circuit diagrams and check reverse inhibit control circuit for short to ground
P1346-13	Fuel Level Sensor B - open circuit	Fuel tank unit circuit B short to power, open circuit	NOTE: Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system Refer to the electrical circuit diagrams and check the circuit between the central junction box and the fuel tank unit circuit (Fuel eject sensor) for short to power, open circuit. Using the manufacturer approved diagnostic system check and install latest relevant level of software to the central junction box and the instrument panel cluster. If the level of software is correct carry out a battery reset
P1348-00	Fuel Level Sensor B - no subtype information	Fuel tank unit circuit B short to ground	NOTE: Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system Refer to the electrical circuit diagrams and check the circuit between the central junction box and the fuel

DTC	Description	Possible Cause	Action
			tank unit circuit (Fuel eject sensor) for short to ground. Using the manufacturer approved diagnostic system check and install latest relevant level of software to the central junction box and the instrument panel cluster. If the level of software is correct carry out a battery reset
P1674-00	Control Module Software Corrupted	● A software assertion failed within the module	Load the latest relevant level of software using the manufacturer approved diagnostic system
U0001-00	High Speed CAN Communication Bus	● Bus Off	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0010-00	Medium Speed CAN Communication Bus	● Bus Off	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0100-00	Lost Communication With ECM/PCM 'A'	● Lost communication with ECM	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0101-00	Lost Communication with TCM	● Lost communication with TCM	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0104-00	Lost Communication With Speed Control Module	● Lost communication with speed control module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0126-00	Lost Communication With Steering Angle Sensor Module	● Lost communication with steering angle sensor	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0129-00	Lost Communication With Brake System Control Module	● Lost communication with ABS module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0135-00	Lost Communication With Differential Control Module - Front	● Lost communication with differential control module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0155-00	Lost Communication With Instrument Panel Cluster (IPC) Control Module	● Lost communication with instrument cluster	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0156-00	Lost Communication With Information Center "A"	● Lost communication with information center	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0159-00	Lost Communication With Parking Assist Control Module "A"	● Lost communication with parking aid module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0164-00	Lost Communication With HVAC Control Module	● Lost communication with climate control module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0166-00	Lost Communication With Auxiliary Heater Control Module	● Lost communication with auxiliary heater control module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0181-00	Lost Communication With Headlamp Levelling Control Module	● Lost communication with headlamp Levelling control module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0199-00	Lost Communication With "Door Control Module A"	● Lost communication with Driver Door Module (DDM)	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0200-00	Lost Communication With "Door Control Module B"	● Lost communication with Passenger Door Module (PDM)	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0208-00	Lost Communication With "Seat Control Module A"	● Lost communication with Passenger Seat Module (PSM)	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0214-00	Lost Communication With Remote Function Actuation	● Lost communication with Remote Keyless Entry module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0231-00	Lost Communication With Rain Sensing Module	● Lost communication with rain sensing module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0236-00	Lost Communication With Column Lock Module	● Lost communication with steering column lock module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0252-00	Lost Communication With Lighting Control Module - Rear 'B'	● Lost communication with trailer module	Carry out the associated network test for this DTC using the manufacturer approved diagnostic system
U0301-00	Software Incompatibility with ECM/PCM	● ECM disconnected ● Incorrect ECM installed	Check electrical connections to ECM. Check correct ECM is installed

DTC	Description	Possible Cause	Action
U0401-00	Invalid Data Received From ECM/PCM	Invalid data received from ECM	Check ECM for DTCs and refer to DTC Index
U0405-00	Invalid Data Received From Cruise Control Module	Invalid data received from speed control module	Check speed control module for DTCs and refer to DTC Index
U0515-00	Invalid data received from remote function actuation	Invalid data received from keyless entry module	Check keyless entry module for DTCs and refer to DTC Index. Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
U2005-62	Vehicle Speed - Signal compare failure	Vehicle Speed - Signal compare failure	Check ABS for DTCs and refer to DTC Index
U2010-11	Switch Illumination - circuit short to ground	Switch illumination circuit - short to ground	Refer to electrical circuit diagrams and check switch illumination circuit for short to ground
U2010-15	Switch Illumination - circuit short to power or open	Switch illumination circuit - short to power, open circuit	Refer to electrical circuit diagrams and check switch illumination circuit for short to power, open circuit
U2017-41	Control Module Software #2 - general checksum failure	Signal configuration checksum not correct	Install latest relevant level of software using the manufacturer approved diagnostic system
U2018-41	Control Module Software #3 - general checksum failure	Local configuration checksum not correct	Install latest relevant level of software using the manufacturer approved diagnostic system
U2101-00	Control Module Configuration Incompatible	Each function reports if a car configuration parameter has a value that is unknown	Check and reload Car Configuration File
U3000-51	Control Module - not programmed	Car config or Local config or Signal config is not loaded	Install latest relevant level of software using the manufacturer approved diagnostic system
U3003-16	Battery Voltage	Circuit voltage below threshold	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
U3003-17	Battery Voltage	Circuit voltage above threshold	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Cellular Telephone Control Module (Bluetooth Telephone Module) (BPM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the cellular phone system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Cellular Phone](#) (415-01 Information and Entertainment System, Description and Operation).

Bluetooth Module

DTC	Description	Possible Cause	Action
B1A5613	Bluetooth antenna	Bluetooth antenna circuit - open circuit	Refer to electrical circuit diagrams and check bluetooth antenna circuit for open circuit
B1D7984	Microphone input	Signal amplitude below minimum	Carry out MOST system checks using manufacturer approved diagnostic system
U1A0088	Private Bus circuit	BT chipset communications failure	Install a new bluetooth module. For additional information, refer to: Bluetooth Module (415-01 Information and Entertainment System, Removal and Installation).
U210000	Control module	Initial configuration incomplete	Re-configure the CJB using the manufacturer approved diagnostic system. If DTC remains carry out CAN Network integrity tests using the manufacturer approved diagnostic system
U210100	Control module	Configuration incompatible	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U300044	Control module	Data memory failure	Install a new bluetooth module. For additional information, refer to: Bluetooth Module (415-01 Information and Entertainment System, Removal and Installation).
U300045	Control module	Program memory failure	Install a new bluetooth module. For additional information, refer to: Bluetooth Module (415-01 Information and Entertainment System, Removal and Installation).
U300055	Control module	Incorrect Car Configuration File data received	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U300087	Control module	Missing message	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing). Check information and entertainment module for Car Configuration File and MOST network DTCs and refer to relevant DTC Index. Carry out MOST/CAN network tests using the manufacturer approved diagnostic system
U300098	Control module	Over temperature	Check for additional DTCs and refer to DTC Index. Check/monitor system for re-occurrence
U300362	Battery voltage	Mis-match in battery voltage, of 2 volts or more, between bluetooth module and CJB	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Digital Audio Broadcast Module (DABM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the digital audio broadcast system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Audio System](#) (415-01 Information and Entertainment System, Description and Operation).

Digital Audio Broadcast Module (DAB)

DTC	Description	Possible Cause	Action
B11A4-11	L-Band antenna	DAB L-Band antenna circuit - short to ground	Refer to electrical circuit diagrams and check DAB L-Band antenna circuit for short to ground
B11A4-13	L-Band antenna	DAB L-Band antenna circuit - open circuit	Refer to electrical circuit diagrams and check DAB L-Band antenna circuit for open circuit
B11A5-11	Band 3 antenna	DAB Band 3 antenna circuit - short to ground	Refer to electrical circuit diagrams and check DAB Band 3 antenna circuit for short to ground
B11A5-13	Band 3 antenna	DAB Band 3 antenna circuit - open circuit	Refer to electrical circuit diagrams and check DAB Band 3 antenna circuit for open circuit
U3000-04	Control module	System internal failure	Install a new digital audio broadcast module. For additional information, refer to: Satellite Radio Tuner (415-01 Information and Entertainment System, Removal and Installation).
U3000-4A	Control module	Incorrect component installed	Install a new digital audio broadcast module or Re-configure the digital audio broadcast module using the manufacturer approved diagnostic system
U3000-55	Control module	Incorrect Car Configuration File data received	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U3000-87	Control module	Missing message	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing). Check information and entertainment module for Car Configuration File and MOST network DTCs and refer to relevant DTC Index. Carry out MOST/CAN network tests using the manufacturer approved diagnostic system
U3000-98	Control module	Component or system over temperature	Check for additional DTCs and refer to relevant DTC Index. Check/monitor system for re-occurrence
U3003-62	Battery voltage	Mis-match in battery voltage, of 2 volts or more, between digital broadcast module and CJB	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Driver/Passenger Door Module (DDM/PDM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the driver passenger door system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Handles, Locks, Latches and Entry Systems](#) (501-14 Handles, Locks, Latches and Entry Systems, Description and Operation).

Driver/passenger door module

B108F-23	Cabin Lock/Unlock Switch	Signal stuck low	Carry out the pinpoint test associated with this DTC using the manufacturer approved diagnostic system
B10ED-11	Rear door driver side double locking motor	Circuit short to ground	Refer to the electrical circuit diagrams and check rear door driver side double locking motor control circuit for short to ground
B10ED-15	Rear door driver side double locking motor	Circuit short to power or open	Refer to the electrical circuit diagrams and check rear door driver side double locking motor control circuit for short to power, open circuit
B10EE-11	Rear door passenger side double locking motor	Circuit short to ground	Refer to the electrical circuit diagrams and check rear door passenger side double locking motor control circuit for short to ground
B10EE-15	Rear door passenger side double locking motor	Circuit short to power or open	Refer to the electrical circuit diagrams and check rear door passenger side double locking motor control circuit for short to power, open circuit
B110A-11	Rear door driver side central locking motor	Circuit short to ground	Refer to electrical circuit diagrams and check rear door driver side central locking motor control circuit for short to ground
B110A-15	Rear door driver side central locking motor	Circuit short to power or open	Refer to electrical circuit diagrams and check rear door driver side central locking motor control circuit for short to power, open circuit
B110B-11	Rear door passenger side central locking motor	Circuit short to ground	Refer to electrical circuit diagrams and check rear door passenger side central locking motor control circuit for short to ground
B110B-15	Rear door passenger side central locking motor	Circuit short to power or open	Refer to electrical circuit diagrams and check rear door passenger side central locking motor control circuit for short to power, open circuit
B117C-07	Rear Power Window up	Mechanical Failure	Check for mechanical failure of rear window mechanism
B117C-72	Rear Power Window up	Actuator Stuck Open	Clear DTC and re-test. If DTC returns, install a new rear door module, refer to the new module installation note at the top of the DTC Index
B117C-73	Rear Power Window up	Actuator Stuck Closed	Clear DTC and re-test. If DTC returns, install a new rear door module, refer to the new module installation note at the top of the DTC Index
B117C-92	Rear Power Window up	Performance or incorrect operation	Refer to electrical circuit diagrams and check power and ground supplies to rear door module
B117D-72	Rear Power Window down	Actuator Stuck Open	Clear DTC and re-test. If DTC returns, install a new rear door module, refer to the new module installation note at the top of the DTC Index
B117D-73	Rear Power Window down	Actuator Stuck Closed	Clear DTC and re-test. If DTC returns, install a new rear door module, refer to the new module installation note at the top of the DTC Index

B117E-07	Front Power Window up	Mechanical failure	Check for mechanical failure of front window mechanism
B117E-72	Front Power Window up	Actuator stuck open	Clear DTC and re-test. If DTC returns, install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
B117E-73	Front Power Window up	Actuator stuck closed	Clear DTC and re-test. If DTC returns, install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
B117F-72	Front Power Window down	Actuator stuck open	Clear DTC and re-test. If DTC returns, install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
B117F-73	Front Power Window down	Actuator stuck closed	Clear DTC and re-test. If DTC returns, install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
B11D1-83	LIN Bus Circuit "C"	Value of signal protection calculation incorrect	Refer to the electrical circuit diagrams and test LIN circuit between driver switch pack and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B11D1-86	LIN Bus Circuit "C"	Signal Invalid	Refer to the electrical circuit diagrams and test LIN circuit between driver switch pack and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B11D1-87	LIN Bus Circuit "C"	Missing Message	Refer to the electrical circuit diagrams and test LIN circuit between driver switch pack and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B11F6-11	Driver Folding Mirror Motor	Short To Ground	Refer to electrical circuit diagrams and check driver folding mirror motor for short to ground
B11F6-15	Driver Folding Mirror Motor	Short to power or open	Refer to electrical circuit diagrams and check driver folding mirror motor for short to power, open circuit
B11F7-11	Passenger Folding Mirror Motor	Short To Ground	Refer to electrical circuit diagrams and check passenger folding mirror motor for short to ground
B11F7-15	Passenger Folding Mirror Motor	Short to power or open	Refer to electrical circuit diagrams and check passenger folding mirror motor for short to power, open circuit
B1A98-83	LIN Bus Circuit #1	Value of signal protection calculation incorrect	Carry out the pinpoint test associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams and test LIN circuit between driver side rear door module and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B1A98-86	LIN Bus Circuit #1	Signal Invalid	Refer to the electrical circuit diagrams and test LIN circuit between driver side rear door module and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B1A98-87	LIN Bus Circuit #1	Missing Message	Refer to the electrical circuit diagrams and test LIN circuit between driver side rear door module and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B1C39-29	Key Lock Switch	Signal invalid	Carry out the associated pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
C1B15-11	Sensor Supply #2	Short to ground	Refer to the electrical circuit diagrams and test rear window sensor supply circuit for short to ground
C1B15-15	Sensor Supply #2	Short to power or open circuit	Refer to the electrical circuit diagrams and test rear window sensor supply circuit for short to power or open circuit
U2004-24	Auxiliary Switch Pack	Signal stuck high	Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

Driver/Passenger door module (DDM/PDM)

DTC	Description	Possible Cause	Action
B109C-15	Front Courtesy Light	Short to power or open circuit	Refer to the electrical circuit diagrams and test front courtesy light circuit for short to power or open circuit
B109D-11	Front Courtesy Light	Short to ground	Refer to the electrical circuit diagrams and test front courtesy light circuit for short ground
B10EB-11	Driver door double locking motor	Short to ground	Refer to the electrical circuit diagrams and test driver door double locking motor circuit for short ground
B10EB-15	Driver door double locking motor	Short to power or open circuit	Refer to the electrical circuit diagrams and test driver door double locking motor circuit for short to power or open circuit
B10EC-11	Passenger door double locking motor	Short to ground	Refer to the electrical circuit diagrams and test passenger door double locking motor circuit for short ground
B10EC-15	Passenger door double locking motor	Short to power or open circuit	Refer to the electrical circuit diagrams and test passenger door double locking motor circuit for short to power or open circuit

DTC	Description	Possible Cause	Action
B1108-11	Driver door central locking motor	Short to ground	Refer to the electrical circuit diagrams and test driver door central locking motor circuit for short ground
B1108-15	Driver door central locking motor	Short to power or open circuit	Refer to the electrical circuit diagrams and test driver door central locking motor circuit for short to power or open circuit
B1109-11	Passenger door central locking motor	Short to ground	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1109-15	Passenger door central locking motor	Short to power or open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1163-11	Left Mirror Heater Output short to ground	Short to ground	Refer to the electrical circuit diagrams and test left mirror heater output circuit for short to ground
B1163-15	Left Mirror Heater Output short to power	Short to power or open circuit	Refer to the electrical circuit diagrams and test left mirror heater output circuit for short to power or open circuit
B1164-11	Right Mirror Heater Output short to ground	Short to ground	Refer to the electrical circuit diagrams and test right mirror heater output circuit for short to ground
B1164-15	Right Mirror Heater Output short to power	Short to power or open circuit	Refer to the electrical circuit diagrams and test right mirror heater output circuit for short to power or open circuit
B1165-11	Left Front Puddle Lamp Output short to ground	Short to ground	Refer to the electrical circuit diagrams and test left front puddle lamp output circuit for short to ground
B1165-15	Left Front Puddle Lamp Output open load or short to power	Short to power or open circuit	Refer to the electrical circuit diagrams and test left front puddle lamp output circuit for short to power or open circuit
B1166-11	Right Front Puddle Lamp Output short to ground	Short to ground	Refer to the electrical circuit diagrams and test right front puddle lamp output circuit for short to ground
B1166-15	Right Front Puddle Lamp Output open load or short to battery	Short to power or open circuit	Refer to the electrical circuit diagrams and test right front puddle lamp output circuit for short to power or open circuit
B117E-72	Front Power Window up	Actuator stuck open	Install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
B117E-73	Front Power Window up	Actuator stuck closed	Install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
B117F-72	Front Power Window down	Actuator stuck open	Install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
B117F-73	Front Power Window down	Actuator stuck closed	Install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
B1189-29	Front Window Position Sensor	Signal invalid	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B118A-29	Rear Window Position Sensor	Signal invalid	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A94-11	Driver Mirror	Short to ground	Refer to the electrical circuit diagrams and test driver mirror fold motor circuit for short to ground
B1A94-15	Driver Mirror	Short to power or open circuit	Refer to the electrical circuit diagrams and test driver mirror fold motor circuit for short to power or open circuit
B1A95-11	Passenger Mirror	Short to ground	Refer to the electrical circuit diagrams and test passenger mirror fold motor circuit for short to ground
B1A95-15	Passenger Mirror	Short to power or open circuit	Refer to the electrical circuit diagrams and test passenger mirror fold motor circuit for short to power or open circuit
B1A98-83	LIN Bus Circuit #1	Value of signal protection calculation incorrect	Refer to the electrical circuit diagrams and test LIN circuit between driver switch pack and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B1A98-86	LIN Bus Circuit #1	Signal Invalid	Refer to the electrical circuit diagrams and test LIN circuit between driver switch pack and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B1A98-87	LIN Bus Circuit #1	Missing Message	Refer to the electrical circuit diagrams and test LIN circuit between driver switch pack and DDM for short/open circuits, clear DTC and re-test. If DTC remains install a new switch pack, refer to new module/component installation note at the top of the DTC Index
B1C09-11	Driver Left/Right Mirror Motor Circuit	Short to ground	Refer to the electrical circuit diagrams and test driver left/right mirror motor circuit for short to ground

DTC	Description	Possible Cause	Action
B1C09-15	Driver Left/Right Mirror Motor Circuit	Short to power or open circuit	Refer to the electrical circuit diagrams and test driver left/right mirror motor circuit for short to power or open circuit
B1C10-11	Driver Up/Down Mirror Motor Circuit	Short to ground	Refer to the electrical circuit diagrams and test driver up/down mirror motor circuit for short to ground
B1C10-15	Driver Up/Down Mirror Motor Circuit	Short to power or open circuit	Refer to the electrical circuit diagrams and test driver up/down mirror motor circuit for short to power or open circuit
B1C11-11	Passenger Left/Right Mirror Motor Circuit	Short to ground	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1C11-15	Passenger Left/Right Mirror Motor Circuit	Short to power or open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1C12-11	Passenger Up/Down Mirror Motor Circuit	Short to ground	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1C12-15	Passenger Up/Down Mirror Motor Circuit	Short to power or open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1C13-11	Driver Up/Down Mirror Motor Feedback Circuit	Short to ground	Refer to the electrical circuit diagrams and test driver up/down mirror motor feedback circuit for short to ground
B1C13-15	Driver Up/Down Mirror Motor Feedback Circuit	Short to power or open circuit	Refer to the electrical circuit diagrams and test driver up/down mirror motor feedback circuit for short to power or open circuit
B1C14-11	Driver Left/Right Mirror Motor Feedback Circuit	Short to ground	Refer to the electrical circuit diagrams and test driver left/right mirror motor feedback circuit for short to ground
B1C14-15	Driver Left/Right Mirror Motor Feedback Circuit	Short to power or open circuit	Refer to the electrical circuit diagrams and test driver left/right mirror motor feedback circuit for short to power or open circuit
B1C15-11	Passenger Up/Down Mirror Motor Feedback Circuit	Short to ground	Refer to the electrical circuit diagrams and test passenger up/down mirror motor feedback circuit for short to ground
B1C15-15	Passenger Up/Down Mirror Motor Feedback Circuit	Short to power or open circuit	Refer to the electrical circuit diagrams and test passenger up/down mirror motor feedback circuit for short to power or open circuit
B1C16-11	Passenger Left/Right Mirror Motor Feedback Circuit	Short to ground	Refer to the electrical circuit diagrams and test passenger left/right mirror motor feedback circuit for short to ground
B1C16-15	Passenger Left/Right Mirror Motor Feedback Circuit	Short to power or open circuit	Refer to the electrical circuit diagrams and test passenger left/right mirror motor feedback circuit for short to power or open circuit
C1B14-11	Sensor Supply #1	Short to ground	Refer to the electrical circuit diagrams and test window sensor supply circuit for short to ground
C1B14-15	Sensor Supply #1	Short to power or open circuit	Refer to the electrical circuit diagrams and test window sensor supply circuit for short to power or open circuit
U0010-00	Medium speed CAN communication Bus	Medium speed CAN communication Bus	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0140-00	Lost communication with CJB	Logged when subscribed CAN message missing from CJB	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0208-00	Lost communication With Driver Seat Module (DSM)	Missing message	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0300-00	Internal control module software incompatibility	Invalid configuration message is received	Re-configure the CJB using the manufacturer approved diagnostic system. Clear the DTC and retest. If the DTC is still logged suspect the DDM/PDM, refer to the new module installation note at the top of the DTC Index
U2002-24	Switch	Signal stuck high	Clear DTC and re-test. If DTC remains, install a new passenger side window switch
U2010-11	Switch illumination	Circuit short to ground	Carry out CAN network tests using the manufacturer approved diagnostic system
U2010-12	Switch illumination	Circuit short to battery	Carry out CAN network tests using the manufacturer approved diagnostic system
U2012-08	Car Configuration Parameter(s)	Bus signal/message failures	Cycle the ignition status and re-test. If DTC remains, re-configure the RJB using the manufacturer approved diagnostic system
U2013-24	Switch Pack	Signal stuck high	Clear DTC and re-test. If DTC remains, install a new driver side window switch pack, refer to new module/component installation note at the top of the DTC Index
U2014-44	Control module hardware	Data Memory Failure	Install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index
U2100-00	Initial configuration not complete	No sub type information	Re-configure the DDM/PDM using the manufacturer approved diagnostic system
U3000-49	Control module	Internal electronic failure	Install a new DDM/PDM, refer to the new module installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
U3002-55	Vehicle Identification Number (VIN)	● Not configured	Re-configure the relevant module as new using the manufacturer approved diagnostic system and re-test. If DTC remains install a new module, refer to the new module installation note at the top of the DTC Index
U3002-81	Vehicle Identification Number (VIN)	● Vehicle/component mis-match. Corrupt VIN data being transmitted, module previously installed to other vehicle	Install original module, check for DTCs and refer to relevant DTC Index
U3003-62	Battery voltage	● Mis-match of battery voltage, of 2 volts or lower, between DDM/PDM and CJB	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index DTC: Driver Seat Module (DSM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the driver seat system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Seats](#) (501-10 Seating, Description and Operation).

Driver seat module (DSM).

DTC	Description	Possible Cause	Action
B1060-11	Seat Headrest Motor Output - Circuit short to ground	• Seat headrest motor circuit short circuit to ground	• Refer to the electrical circuit diagrams and check seat headrest motor circuit for short circuit to ground
B1060-15	Seat Headrest Motor Output - Circuit short to battery or open	• Seat headrest motor circuit short circuit to power, open circuit	• Refer to the electrical circuit diagrams and check seat headrest motor circuit for short circuit to power, open circuit
B1064-31	Seat Headrest Motor Sensor - No signal	• Seat headrest motor sensor circuit open circuit, high resistance • Seat headrest motor sensor internal failure	• Refer to the electrical circuit diagrams and check seat headrest motor sensor circuit for open circuit, high resistance • Check and install new seat headrest motor sensor as required. 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
B106D-24	Headrest Up Switch - Signal stuck high	• Seat headrest up switch circuit short circuit to power	• Refer to the electrical circuit diagrams and check seat headrest up switch circuit for short circuit to power
B106E-24	Headrest Down Switch - Signal stuck high	• Seat headrest down switch circuit short circuit to power	• Refer to the electrical circuit diagrams and check seat headrest down switch circuit for short circuit to power
B1087-83	Lin Bus "A" - Value of signal protection calculation incorrect	• Seat and memory switch pack internal failure	• Check and install new seat and memory switch pack as required. 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
B1087-86	Lin Bus "A" - Signal invalid	• Seat and memory switch pack internal failure	• Check and install new seat and memory switch pack as required. 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
B1087-87	Lin Bus "A" - Missing message	• Seat and memory switch pack circuit open circuit • Seat and memory switch pack internal failure	• Refer to the electrical circuit diagrams and check seat and memory switch pack circuit for communication fault • Check and install new seat and memory switch pack as required. 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

DTC	Description	Possible Cause	Action
B1B86-11	Seat Height Motor Relay - Circuit short to ground	Seat height motor circuit short circuit to ground	Refer to the electrical circuit diagrams and check seat height motor circuit for short circuit to ground
B1B86-15	Seat Height Motor Relay - Circuit short to battery or open	Seat height motor circuit short circuit to power, open circuit	Refer to the electrical circuit diagrams and check seat height motor circuit for short circuit to power, open circuit
B1B87-31	Seat Height Motor Speed/Position Sensor - No signal	- Seat height motor speed/position sensor circuit open circuit, high resistance - Seat height motor speed/position sensor internal failure	- Refer to the electrical circuit diagrams and check seat height motor speed/position sensor circuit for open circuit, high resistance - Check and install new seat height motor speed/position sensor as required. 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
B1B88-11	Seat Slide Motor Relay - Circuit short to ground	Seat slide motor circuit short circuit to ground	Refer to the electrical circuit diagrams and check seat slide motor circuit for short circuit to ground
B1B88-15	Seat Slide Motor Relay - Circuit short to battery or open	Seat slide motor circuit short circuit to power, open circuit	Refer to the electrical circuit diagrams and check seat slide motor circuit for short circuit to power, open circuit
B1B89-31	Seat Slide Motor Speed/Position Sensor - No signal	- Seat slide motor speed/position sensor circuit open circuit, high resistance - Seat slide motor speed/position sensor internal failure	- Refer to the electrical circuit diagrams and check seat slide motor speed/position sensor circuit for open circuit, high resistance - Check and install new seat slide motor speed/position sensor as required. 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
B1B90-11	Seat Tilt Motor Relay - Circuit short to ground	Seat tilt motor circuit short circuit to ground	Refer to the electrical circuit diagrams and check seat tilt motor circuit for short circuit to ground
B1B90-15	Seat Tilt Motor Relay - Circuit short to battery or open	Seat tilt motor circuit short circuit to power, open circuit	Refer to the electrical circuit diagrams and check seat tilt motor circuit for short circuit to power, open circuit
B1B91-31	Seat Tilt Motor Speed/Position Sensor - No signal	- Seat tilt motor speed/position sensor circuit open circuit, high resistance - Seat tilt motor speed/position sensor internal failure	- Refer to the electrical circuit diagrams and check seat tilt motor speed/position sensor circuit for open circuit, high resistance - Check and install new seat tilt motor speed/position sensor as required. 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
B1B92-11	Seat Recline Motor Relay - Circuit short to ground	Seat recline motor circuit short circuit to ground	Refer to the electrical circuit diagrams and check seat recline motor circuit for short circuit to ground
B1B92-15	Seat Recline Motor Relay - Circuit short to battery or open	Seat recline motor circuit short circuit to power, open circuit	Refer to the electrical circuit diagrams and check seat recline motor circuit for short circuit to power, open circuit
B1B93-31	Seat Recline Motor Speed/Position Sensor - No signal	- Seat recline motor speed/position sensor circuit open circuit, high resistance - Seat recline motor speed/position sensor internal failure	- Refer to the electrical circuit diagrams and check seat recline motor speed/position sensor circuit for open circuit, high resistance - Check and install new seat recline motor speed/position sensor as required. 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
B1B94-24	Seat Height Up Switch - Signal stuck high	Seat height up switch circuit short circuit to power	Refer to the electrical circuit diagrams and check seat height up switch circuit short circuit to power
B1B95-24	Seat Height Down Switch - Signal stuck high	Seat height down switch circuit short circuit to power	Refer to the electrical circuit diagrams and check seat height down switch circuit short circuit to power
B1B96-24	Seat Slide Forward Switch - Signal stuck high	Seat slide forward switch circuit short circuit to power	Refer to the electrical circuit diagrams and check seat slide forward switch circuit short circuit to power

DTC	Description	Possible Cause	Action
B1B97-24	Seat Slide Backward Switch - Signal stuck high	Seat slide backward switch circuit short circuit to power	Refer to the electrical circuit diagrams and check seat slide backward switch circuit short circuit to power
B1B98-24	Seat Tilt Up Switch - Signal stuck high	Seat tilt up switch circuit short circuit to power	Refer to the electrical circuit diagrams and check seat tilt up switch circuit short circuit to power
B1B99-24	Seat Tilt Down Switch - Signal stuck high	Seat tilt down switch circuit short circuit to power	Refer to the electrical circuit diagrams and check seat tilt down switch circuit short circuit to power
B1C00-24	Seat Recline Up Switch - Signal stuck high	Seat recline up switch circuit short circuit to power	Refer to the electrical circuit diagrams and check seat recline up switch circuit short circuit to power
B1C01-24	Seat Recline Down Switch - Signal stuck high	Seat recline down switch circuit short circuit to power	Refer to the electrical circuit diagrams and check seat recline down switch circuit short circuit to power
B1C02-24	Memory Store Switch - Signal stuck high	Memory store switch circuit short circuit to power	Refer to the electrical circuit diagrams and check memory store switch circuit short circuit to power
B1C03-24	Memory #1 Switch - Signal stuck high	Memory #1 switch circuit short circuit to power	Refer to the electrical circuit diagrams and check memory #1 switch circuit short circuit to power
B1C04-24	Memory #2 Switch - Signal stuck high	Memory #2 switch circuit short circuit to power	Refer to the electrical circuit diagrams and check memory #2 switch circuit short circuit to power
B1C05-24	Memory #3 Switch - Signal stuck high	Memory #3 switch circuit short circuit to power	Refer to the electrical circuit diagrams and check memory #3 switch circuit short circuit to power
U0010-88	Medium Speed CAN Communication Bus - Bus off	Medium speed CAN bus circuit fault	- Refer to the electrical circuit diagrams and check the power and ground connections to the module - Using the manufacturer approved diagnostic system, complete a CAN network integrity test - Refer to the electrical circuit diagrams and check the CAN network
U0140-00	Lost Communication With Body Control Module - No sub type information	Lost communication with body control module	- Refer to the electrical circuit diagrams and check the power and ground connections to the module - Using the manufacturer approved diagnostic system, complete a CAN network integrity test - Refer to the electrical circuit diagrams and check the CAN network between the seat control module and body control module
U0155-00	Lost Communication With Instrument Panel Cluster (IPC) Control Module - No sub type information	Lost communication with instrument panel control module	- Refer to the electrical circuit diagrams and check the power and ground connections to the module - Using the manufacturer approved diagnostic system, complete a CAN network integrity test - Refer to the electrical circuit diagrams and check the CAN network between seat control module and instrument panel cluster control module
U0199-00	Lost Communication With "Door Control Module A" - No sub type information	Lost communication with door control module	- Refer to the electrical circuit diagrams and check the power and ground connections to the module - Using the manufacturer approved diagnostic system, complete a CAN network integrity test - Refer to the electrical circuit diagrams and check the CAN network between seat control module and door control module
U0300-00	Internal Control Module Software Incompatibility - No sub type information	Seat control module is not configured correctly	Using the manufacturer approved diagnostic system check and install latest relevant level of software to the seat control module. Clear the diagnostic trouble code and re-test
U1A14-49	CAN Initialisation Failure - Internal electronic failure	Seat control module internal failure	- Using the manufacturer approved diagnostic system check and install latest relevant level of software to the seat control module. Clear the diagnostic trouble code and re-test - If fault persists, check and install a new seat control module. Refer to the warranty policy and procedures manual, or determine if any

DTC	Description	Possible Cause	Action
			prior approval programme is in operation, prior to the installation of a new module/ component
U1A4C-00	Build / End of Line mode Active - No sub type information	● Error/mismatch in car configuration file	● Using the manufacturer approved diagnostic system check and up-date the car configuration file as required. Clear the DTC and re-test ● Check and install a new seat control module. 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
U3000-49	Control Module - Internal electronic failure	● Seat control module internal failure	● Check and install a new seat control module. 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
U3001-46	Control Module Improper Shutdown - Calibration / parameter memory failure	● Event information ● Seat control module whilst in manufacturing mode the power has been disconnected	● DTC for information only. Clear the DTC and retest. If the problem persists, renew the module. 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
U3002-81	Vehicle Identification Number - Invalid serial data received	● Error/mismatch in car configuration file ● The seat control module has previously been installed to another vehicle	● Using the manufacturer approved diagnostic system check and up-date the car configuration file as required. Clear the DTC and re-test ● Check and install the original, or a new seat control module. 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
U3003-16	Battery Voltage – Circuit voltage below threshold	● Seat control module supply voltage below threshold	● Check vehicle battery and charging system, repair as required. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power and ground supply circuits to the seat control module. Clear the DTC and re-test
U3003-17	Battery Voltage – Circuit voltage above threshold	● Seat control module supply voltage above threshold	● Check vehicle battery and charging system, repair as required. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power and ground supply circuits to the seat control module. Clear the DTC and re-test

General Information - Diagnostic Trouble Code (DTC) Index **TD4 2.2L Diesel, DTC: Engine Control Module (ECM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

For additional information on the description and operation of the system: For additional information, refer to: [Engine](#) (303-01B Engine - TD4 2.2L Diesel, Description and Operation).

Powertrain control module diesel (PCMD)

DTC	Description	Possible Cause	Action
B10A2-68	Crash Input - Event information	• Air bag event detected	• Using the manufacturer approved diagnostic system, check restraints control module, for related DTCs and refer to the relevant DTC index
P0016-00	Crankshaft Position - Camshaft Position Correlation - Bank 1 Sensor A - No sub type information	• Engine timing incorrect • Timing chain installed incorrectly • The relative positions of the crankshaft position sensor and cam timing plate teeth are not correct	• Check engine timing • Check camshaft sensor timing plate is installed correctly • Check valve timing • Check timing chain installed correctly
P0030-12	HO2S Heater Control Circuit (Bank 1, Sensor 1) - Circuit short to battery	• NOTE: - Circuit O_T_SHT1 - • Front heated oxygen sensor heater control circuit short circuit to power • Front heated oxygen sensor failure	• Refer to the electrical circuit diagrams and check front heated oxygen sensor heater control circuit for short circuit to power • Check and install a new front heated oxygen sensor as required. 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
P0030-13	HO2S Heater Control Circuit (Bank 1, Sensor 1) - Circuit open	• NOTE: - Circuit O_T_SHT1 - • Front heated oxygen sensor heater control circuit high resistance, open circuit • Front heated oxygen sensor failure	• Refer to the electrical circuit diagrams and check the front heated oxygen sensor heater control circuit for high resistance, open circuit • Check and install a new front heated oxygen sensor as required. 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
P0031-11	HO2S Heater Control Circuit Low (Bank 1, Sensor 1) - Circuit short to ground	• NOTE: - Circuit O_T_SHT1 - • Front heated oxygen sensor heater control circuit short circuit to ground • Front heated oxygen sensor failure	• Refer to the electrical circuit diagrams and check front heated oxygen sensor heater control circuit for short circuit to ground • Check and install a new front heated oxygen sensor as required. 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
P0031-16	HO2S Heater Control Circuit Low (Bank 1, Sensor 1) - Circuit voltage below threshold	• NOTE: - Circuit O_T_SHT1 - • Front heated oxygen sensor heater control circuit short circuit to ground • Front heated oxygen sensor failure	• Refer to the electrical circuit diagrams and check front heated oxygen sensor heater control circuit for short circuit to ground • Check and install a new front heated oxygen sensor as required. Refer to the warranty policy and procedures manual, or determine if any prior approval programme is in operation, prior to the

DTC	Description	Possible Cause	Action
			installation of a new module/component
P0032-12	HO2S Heater Control Circuit High (Bank 1, Sensor 1) - Circuit short to battery	- NOTE: - Circuit O_T_SHT1 - - Front heated oxygen sensor heater control circuit short circuit to power - Front heated oxygen sensor failure	- Refer to the electrical circuit diagrams and check front heated oxygen sensor heater control circuit for short circuit to power - Check and install a new front heated oxygen sensor as required. 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
P0045-13	Turbo charger/Supercharger Boost Control A Circuit / Open - Circuit open	- NOTE: - Circuit O_T_BPANEG - - Variable geometry turbocharger actuator vane circuit open circuit	- Refer to the electrical circuit diagrams and check variable geometry turbocharger actuator vane circuit for open circuit - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0045-18	Turbo charger/Supercharger Boost Control A Circuit / Open - Circuit current below threshold	Power stage temperature dependant current limitation	- Refer to the electrical circuit diagrams and check connections are secure and wiring integrity - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0045-19	Turbo charger/Supercharger Boost Control A Circuit / Open - Circuit current above threshold	- NOTE: - Circuit O_T_BPAPOS - - Actuator-vane variable geometry turbocharger - Power stage output 1 (positive) short circuit to power - Turbo charger actuator power stage output 1 circuit over current	- NOTE: This DTC may be logged due to battery voltage. Check the body control module, information and entertainment module and navigation system module for related DTC's. If DTC's are logged suspect generator or battery supply voltage fault. Check and repair as required prior to diagnosing this DTC - Using the manufacturer approved diagnostic system perform the (Turbo, exhaust gas recirculation and air path dynamic test) routine - Refer to the electrical circuit diagrams and check the actuator vane variable geometry turbocharger circuit - O_T_BPAPOS - For short circuit to power
P0046-19	Turbo charger/Supercharger Boost Control A Circuit Range/Performance - Circuit current above threshold	- Power stage excess temperature - Variable geometry turbocharger actuator vane circuit, short circuit to ground, short circuit to power - Variable geometry turbocharger actuator vane failure	- Refer to the electrical circuit diagrams and check the variable geometry turbocharger actuator vane circuit, for short circuit to ground, short circuit to power - Check and install a new variable geometry turbocharger actuator vane as required. 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 - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0047-11	Turbo charger/Supercharger Boost Control A Circuit Low - Circuit short to ground	- NOTE: - Circuit O_T_BPAPOS - - Variable geometry turbocharger actuator vane circuit short circuit to ground	- Refer to the electrical circuit diagrams and check the variable geometry turbocharger actuator vane circuit, for short circuit to ground - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0047-14	Turbo charger/Supercharger Boost Control A Circuit Low - Circuit short to ground or open	- NOTE: - Circuit O_T_BPANEG - - Variable geometry turbocharger actuator vane circuit short circuit to ground, open circuit	- Refer to the electrical circuit diagrams and check the variable geometry turbocharger actuator vane circuit, for short circuit to ground, open circuit - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0047-18	Turbo charger/Supercharger Boost Control A Circuit Low - Circuit current below threshold	Power stage current limitation	- Refer to the electrical circuit diagrams and check connections are secure and wiring integrity - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
P0048-00	Turbo charger/Supercharger Boost Control A Circuit High - No sub type information	Actuator power stage error	- Refer to the electrical circuit diagrams and check connections are secure and wiring integrity - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0048-12	Turbo charger/Supercharger Boost Control A Circuit High - Circuit short to battery	NOTE: - Circuit O_T_BPAPOS - - Variable geometry turbocharger actuator vane circuit short circuit to power	- Refer to the electrical circuit diagrams and check the variable geometry turbocharger actuator vane circuit, for short circuit to power - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0048-15	Turbo charger/Supercharger Boost Control A Circuit High - Circuit short to battery or open	NOTE: - Circuit O_T_BPANEG - - Variable geometry turbocharger actuator vane circuit short circuit to power, open circuit	- Refer to the electrical circuit diagrams and check the variable geometry turbocharger actuator vane circuit, for short circuit to power, open circuit - Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0053-16	HO2S Heater Resistance (Bank 1, Sensor 1) - Circuit voltage below threshold	- Front heated oxygen sensor heater control circuit short circuit to ground - Front heated oxygen sensor failure	- Refer to the electrical circuit diagrams and check front heated oxygen sensor heater control circuit for short circuit to ground - Check and install a new front heated oxygen sensor as required. 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
P0053-17	HO2S Heater Resistance (Bank 1, Sensor 1) - Circuit voltage above threshold	- Front heated oxygen sensor heater control circuit short circuit to power - Front heated oxygen sensor failure	- Refer to the electrical circuit diagrams and check front heated oxygen sensor heater control circuit for short circuit to power - Check and install a new front heated oxygen sensor as required. 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
P0053-1A	HO2S Heater Resistance (Bank 1, Sensor 1) - Circuit resistance below threshold	- Front heated oxygen sensor heater control circuit short circuit to ground - Front heated oxygen sensor failure	- Refer to the electrical circuit diagrams and check front heated oxygen sensor heater control circuit for short circuit to ground - Check and install a new front heated oxygen sensor as required. 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
P0053-1B	HO2S Heater Resistance (Bank 1, Sensor 1) - Circuit resistance above threshold	- Front heated oxygen sensor heater control circuit short circuit to power - Front heated oxygen sensor failure	- Refer to the electrical circuit diagrams and check front heated oxygen sensor heater control circuit for short circuit to power - Check and install a new front heated oxygen sensor as required. 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
P0069-00	MAP - Barometric Pressure Correlation - No sub type information	- Manifold absolute pressure/boost pressure sensor circuit short circuit to ground, short circuit to power, open circuit, high resistance - Manifold absolute pressure/boost pressure sensor internal fault - Barometric pressure sensor failure (internal engine control module fault)	- Using the manufacturer approved diagnostic system perform the (Turbo, exhaust gas recirculation and air path dynamic test) routine - Refer to the electrical circuit diagrams and check the boost pressure sensor circuit - I_A_BPS - For short circuit to ground, short circuit to power, open circuit, high resistance

DTC	Description	Possible Cause	Action
P0072-00	Ambient Air Temperature Sensor Circuit Low - No sub type information	• NOTE: - I_A_IATS - • Ambient air temperature sensor circuit short circuit to ground, open circuit	• Refer to the electrical circuit diagrams and check ambient air temperature sensor circuit - I_A_IATS - For short circuit to ground, open circuit • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0073-00	Ambient Air Temperature Sensor Circuit High - No sub type information	• NOTE: - I_A_IATS - • Ambient air temperature sensor circuit short circuit to power • Ambient air temperature sensor fault	• Refer to the electrical circuit diagrams and check ambient air temperature sensor circuit - I_A_IATS - For short circuit to power
P0087-00	Fuel Rail/System Pressure - Too Low - No sub type information	• NOTE: - Circuit I_A_RALPS - • Fuel rail pressure sensor circuit short circuit to ground, short circuit to power, open circuit, high resistance • Fuel starvation • Fuel lines leaking • Fuel lines restricted • Blocked air filter	• Refer to the electrical circuit diagrams and check the fuel rail pressure sensor circuit for short circuit to ground, short circuit to power, open circuit, high resistance • Check the fuel lines for any signs of leakage, replace as required • Check the fuel lines for any signs of damage, crimping or restrictions, replace as required • Check for blocked air filter, replace as required
P0087-21	Fuel Rail/System Pressure - Too Low - Signal amplitude < minimum	• NOTE: - Circuit I_A_RALPS - • Fuel rail pressure sensor circuit short circuit to ground, short circuit to power, open circuit, high resistance • Fuel starvation • Fuel lines leaking • Fuel lines restricted • Blocked air filter	• Refer to the electrical circuit diagrams and check the fuel rail pressure sensor circuit for short circuit to ground, short circuit to power, open circuit, high resistance • Check the fuel lines for any signs of leakage, replace as required • Check the fuel lines for any signs of damage, crimping or restrictions, replace as required • Check for blocked air filter, replace as required
P0087-22	Fuel Rail/System Pressure - Too Low - Signal amplitude > maximum	• NOTE: - Circuit I_A_RALPS - • Fuel rail pressure sensor circuit short circuit to ground, short circuit to power, open circuit, high resistance • Fuel starvation • Fuel lines leaking • Fuel lines restricted • Blocked air filter	• Refer to the electrical circuit diagrams and check the fuel rail pressure sensor circuit for short circuit to ground, short circuit to power, open circuit, high resistance • Check the fuel lines for any signs of leakage, replace as required • Check the fuel lines for any signs of damage, crimping or restrictions, replace as required • Check for blocked air filter, replace as required
P0087-23	Fuel Rail/System Pressure - Too Low - Signal stuck low	• NOTE: - Circuit I_A_RALPS - • Fuel rail pressure sensor circuit short circuit to ground • Fuel starvation • Fuel lines leaking • Fuel lines restricted • Blocked air filter	• Refer to the electrical circuit diagrams and check the fuel rail pressure sensor circuit for short circuit to ground • Check the fuel lines for any signs of leakage, replace as required • Check the fuel lines for any signs of damage, crimping or restrictions, replace as required • Check for blocked air filter, replace as required
P0088-00	Fuel Rail/System Pressure - Too High - No sub type information	• NOTE: - Circuit I_A_RALPS - • Fuel rail pressure sensor circuit short circuit to power • Fuel starvation • Fuel lines leaking • Fuel lines restricted • Blocked air filter	• Refer to the electrical circuit diagrams and check the fuel rail pressure sensor circuit for short circuit to power • Check the fuel lines for any signs of leakage, replace as required • Check the fuel lines for any signs of damage, crimping or restrictions, replace as required • Check for blocked air filter, replace as required
P0088-21	Fuel Rail/System Pressure - Too High - Signal amplitude < minimum	• NOTE: - Circuit I_A_RALPS - • Fuel lines restricted • Pressure control valve circuit short circuit to power • Pressure control valve	• Using the manufacturer approved diagnostic system, check engine control module, for related DTCs and refer to the relevant DTC index • Check the fuel lines for any signs of damage, crimping or restrictions, replace as required

DTC	Description	Possible Cause	Action
		stuck closed	
P0088-22	Fuel Rail/System Pressure - Too High	• NOTE: - Circuit I_A_RALPS - • Leaking fuel system • Volume control valve circuit short circuit to ground, open circuit • Volume control valve stuck open	• Check for fuel leaks • Refer to the electrical circuit diagrams and check volume control valve circuit for short circuit to ground, open circuit • Check and install a new high pressure fuel pump as required. 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
P0088-24	Fuel Rail/System Pressure - Too High - Signal stuck high	• Leaking fuel system • Pressure control valve stuck • Pressure control valve circuit short circuit to ground, short circuit to power, open circuit	• Check for fuel leaks • Refer to the electrical circuit diagrams and check pressure control valve circuit for short circuit to ground, short circuit to power, open circuit • Check and install new pressure control valve as required. 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
P0088-27	Fuel Rail/System Pressure - Too High - Signal rate of change above threshold	• Leak in high pressure section • Injector nozzle stuck open/worn • Worn high pressure pump, filter blocked • Leaking pressure control valve • Low pressure section pressure low (leak in system, pump output low)	• Check for fuel leaks in high and low pressure systems • Using the manufacturer approved diagnostic system, check for related DTCs and refer to the relevant DTC index
P0089-62	Fuel Pressure Regulator Performance - Signal compare failure	• Fuel low pressure delivery system • Fuel pressure control valve exceeded tolerance threshold	• Check fuel low pressure delivery system • Check and install a new fuel pressure control valve as required. 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
P0089-64	Fuel Pressure Regulator Performance - Signal plausibility failure	• Fuel low pressure delivery system • Fuel pressure control valve exceeded tolerance threshold	• Check fuel low pressure delivery system • Check and install a new fuel pressure control valve as required. 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
P0097-00	Intake Air Temperature Sensor 2 Circuit Low - No sub type information	• NOTE: - Circuit I_A_IATS - • Intake air temperature sensor short circuit to ground	• Refer to the electrical circuit diagrams and check intake air temperature sensor for short circuit to ground • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0098-00	Intake Air Temperature Sensor 2 Circuit High - No sub type information	• NOTE: - Circuit I_A_IATS - • Intake air temperature sensor short circuit to power	• Refer to the electrical circuit diagrams and check intake air temperature sensor for short circuit to power • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P009B-00	Fuel Pressure Relief Control Circuit/Open - No sub type information	• NOTE: - Circuit O_T_PCV - • Pressure control valve control circuit open circuit	• Refer to the electrical circuit diagrams and check pressure control valve circuit for open circuit • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P009C-00	Fuel Pressure Relief Control Circuit Low - No sub type information	• NOTE: - Circuit O_T_PCV - • Pressure control valve control circuit short circuit to ground	• Refer to the electrical circuit diagrams and check pressure control valve circuit for short circuit to ground • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
P009D-00	Fuel Pressure Relief Control Circuit High - No sub type information	• NOTE: - Circuit O_T_PCV - • Pressure control valve control circuit short circuit to power	• Refer to the electrical circuit diagrams and check pressure control valve circuit for short circuit to power • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P009E-00	Fuel Pressure Relief Control Performance/Stuck Off - No sub type information	• NOTE: - Circuit O_T_PCV - • Pressure control valve power stage excess temperature • Pressure control valve control circuit short circuit to ground, short circuit to power, open circuit, high resistance	• Refer to the electrical circuit diagrams and check pressure control valve circuit for short circuit to ground, short circuit to power, open circuit, high resistance
P00AF-75	Turbo charger/Supercharger Boost Control A Module Performance - Emergency position not reachable	• NOTE: - Circuit I_F_BPA - • Variable geometry turbocharger actuator vane circuit short circuit to ground, short circuit to power, open circuit, high resistance • Variable geometry turbocharger actuator vane failure	• Refer to the electrical circuit diagrams and check variable geometry turbocharger actuator vane circuit for short circuit to ground, short circuit to power, open circuit, high resistance • Check and install new variable geometry turbocharger actuator vane as required. 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
P0100-00	Mass or Volume Air Flow A Circuit - No sub type information	• Mass air flow sensor signal circuit short circuit to ground, short circuit to power, open circuit, high resistance • Mass air flow sensor internal failure	• Using the manufacturer approved diagnostic system perform the (Turbo, exhaust gas recirculation and air path dynamic test) routine • Refer to the electrical circuit diagrams and check mass air flow sensor circuit - I_F_AMS2 - For short circuit to ground, short circuit to power, open circuit, high resistance
P0102-21	Mass or Volume Air Flow A Circuit Low - Signal amplitude < minimum	• Air flow pulse width modulated raw signal above upper limit	• Refer to the electrical circuit diagrams and check connections are secure and wiring integrity • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0102-26	Mass or Volume Air Flow A Circuit Low - Signal rate of change below threshold	• Air flow pulse width modulated corrected signal above upper limit	• Refer to the electrical circuit diagrams and check connections are secure and wiring integrity • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0103-22	Mass or Volume Air Flow A Circuit High - Signal amplitude > maximum	• Mass air flow / inlet air temperature sensor short circuit to power • Mass air flow / inlet air temperature sensor internal failure	• Using the manufacturer approved diagnostic system perform the (Turbo, exhaust gas recirculation and air path dynamic test) routine • Refer to the electrical circuit diagrams and check mass air flow / inlet air temperature sensor circuit - I_F_AMS2 - For short circuit to power
P0103-27	Mass or Volume Air Flow A Circuit High - Signal rate of change above threshold	• Air flow pulse width modulated corrected signal above upper limit	• Refer to the electrical circuit diagrams and check connections are secure and wiring integrity • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0112-00	Intake Air Temperature Sensor 1 Circuit Low - No sub type information	• NOTE: - Circuit I_R_IATS3 - • Mass air flow intake air temperature sensor circuit short circuit to ground	• Refer to the electrical circuit diagrams and check the mass air flow intake air temperature sensor circuit for short circuit to ground • Carry out the pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
P0113-00	Intake Air Temperature Sensor 1 Circuit High - No sub type information	• NOTE: - Circuit I_R_IATS3 - • Mass air flow intake air temperature sensor circuit short circuit to power	• Refer to the electrical circuit diagrams and check the mass air flow intake air temperature sensor circuit for short circuit to power

General Information - Diagnostic Trouble Code (DTC) Index I6 3.2L Petrol, DTC: Engine Control Module (ECM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If diagnostic trouble codes are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the Electronic engine control system, refer to the relevant Description and Operation section in the workshop manual. For additional information, refer to: [Electronic Engine Controls](#) (303-14A Electronic Engine Controls - I6 3.2L Petrol, Description and Operation).

Powertrain control module petrol (PCMP) SI6 petrol engine

DTC	Description	Possible Cause	Action
B1024-00	Start control unit - No sub type information	• Starter relay signal circuit: short circuit to ground • Starter relay signal circuit: short circuit to power • Starter relay signal circuit: open circuit • Starter relay fault	• Check the starter relay and circuits. Refer to the electrical guides. Install a new relay as necessary
B1024-82	Start control unit - Alive/sequence counter incorrect/not updated	• Controller area network (CAN) circuit: open circuit • CAN circuit: short circuit to ground • CAN circuit: short circuit to power	• Check the CAN circuit. Refer to the electrical guides. Rectify as necessary
B1024-86	Start control unit - Signal invalid	• Controller area network (CAN) circuit: open circuit • CAN circuit: short circuit to ground • CAN circuit: short circuit to power	• Check the CAN circuit. Refer to the electrical guides. Rectify as necessary
B10A2-68	Crash input - Event information	• Event information • The control module has registered that the vehicle has been in a collision	• Clear the DTC. Check/rectify any damage resulting from the collision
P0011-00	Intake (A) camshaft position timing - Over-advanced (bank 1) - No sub type information	• Poor engine oil quality/condition • Variable valve timing (VVT) solenoid/circuit fault • VVT unit fault	• Check for related DTC's. Check the engine oil quality/condition. Check the VVT solenoid and circuits. Refer to the electrical guides. Install a new VVT unit as required
P0012-00	Intake (A) camshaft position timing - Over-retarded (bank 1) - No sub type information	• Poor engine oil quality/condition • Low engine oil pressure • Variable valve timing (VVT) solenoid/circuit fault • VVT unit fault	• Check for related DTC's. Check the engine oil quality/condition. Check the engine oil pressure. Check the VVT solenoid and circuits. Refer to the electrical guides. Install a new VVT unit as required
P0012-68	Intake (A) camshaft position timing - Over-retarded (bank 1) - Event information	• Poor engine oil quality/condition • Low engine oil pressure • Variable valve timing (VVT) unit fault - camshaft reset valve	• Check the engine oil quality/condition. Check the engine oil pressure. Check the VVT unit. Install a new VVT unit as required
P0016-00	Crankshaft position - Camshaft position correlation - Bank 1 sensor A - No sub type information	• Poor engine oil quality • Camshaft inlet sensor incorrectly installed • Crankshaft position sensor incorrectly installed	• Check the engine oil quality/condition • Refer to the relevant sections of the workshop manual and check the camshaft inlet sensor for correct installation, check the crankshaft position sensor for correct

DTC	Description	Possible Cause	Action
		● Camshaft inlet sensor, short circuit to ground, short circuit to power, open circuit, high resistance ● Camshaft inlet sensor air-gap to target rotor greater than specification ● Excessive run out on target rotor ● Loose variable valve timing actuator chain drive or tensioners ● Damaged, worn timing chain	installation ● Refer to electrical circuit diagrams and check the camshaft inlet sensor circuit for short circuit to ground, short circuit to power, open circuit, high resistance ● Refer to the relevant sections of the workshop manual and check the camshaft inlet sensor for correct air-gap to target rotor spacing, check target run out is to specification, check variable valve timing actuator chain drive or tensioners are operating to specification
P0018-00	Crankshaft position - Camshaft position correlation - Bank 2 sensor A - No sub type information	● Poor engine oil quality/condition ● Incorrectly adjusted camshafts ● Damaged (worn) timing chain ● Variable valve timing (VVT) solenoid/circuit fault ● VVT unit fault	● Check the engine oil quality/condition. Check the camshaft timing and chain. Rectify as necessary. Check the VVT solenoid and circuits. Refer to the electrical guides Install a new VVT unit as required
P001A-00	Intake (A) cam profile control circuit/open (bank 1) - No sub type information	● Camshaft profile control circuit: open circuit ● Camshaft profile control circuit: short circuit to ground ● Camshaft profile actuator fault	● Check the camshaft profile actuator and circuits. Refer to the electrical guides. Rectify as necessary
P001B-00	Intake (A) cam profile control circuit low (bank 1) - No sub type information	● Camshaft profile control circuit: open circuit ● Camshaft profile control circuit: short circuit to ground ● Camshaft profile actuator fault	● Check the camshaft profile actuator and circuits. Refer to the electrical guides. Rectify as necessary
P001C-00	Intake (A) camshaft profile control circuit high (bank 1) - No sub type information	● Camshaft profile control circuit: short circuit to power ● Camshaft profile actuator fault	● Check the camshaft profile actuator and circuits. Refer to the electrical guides. Rectify as necessary
P001D-00	Intake (A) cam profile control circuit/open (bank 2) - No sub type information	● Camshaft profile control circuit: open circuit ● Camshaft profile control circuit: short circuit to ground ● Camshaft profile actuator fault	● Check the camshaft profile actuator and circuits. Refer to the electrical guides. Rectify as necessary
P001E-00	Intake (A) camshaft profile control circuit low (bank 2) - No sub type information	● Camshaft profile control circuit: open circuit ● Camshaft profile control circuit: short circuit to ground ● Camshaft profile actuator fault	● Check the camshaft profile actuator and circuits. Refer to the electrical guides. Rectify as necessary
P001F-00	Intake (A) camshaft profile control circuit high (bank 2) - No sub type information	● Camshaft profile control circuit: short circuit to power ● Camshaft profile actuator fault	● Check the camshaft profile actuator and circuits. Refer to the electrical guides. Rectify as necessary
P0021-00	Intake (A) camshaft position timing over advanced (bank 2) - No sub type information	● Poor engine oil quality/condition ● Variable valve timing (VVT) solenoid/circuit fault ● VVT unit fault	● Check for related DTC's. Check the engine oil quality/condition. Check the VVT solenoid and circuits. Refer to the electrical guides. Install a new VVT unit as required
P0022-00	Intake (A) camshaft position timing over retarded (bank 2) - No sub type information	● Poor engine oil quality/condition ● Low engine oil pressure ● Variable valve timing (VVT) solenoid/circuit fault ● VVT unit fault	● Check for related DTC's. Check the engine oil quality/condition. Check the engine oil pressure. Check the VVT solenoid and circuits. Refer to the electrical guides. Install a new VVT unit as required
P0031-00	HO2S Heater control circuit low (bank 1, sensor 1) - No sub type information	● HO2S heater control circuit: short circuit to ground ● HO2S heater control circuit: open circuit ● HO2S fault	● Check the HO2S and circuits. Refer to the electrical guides. Install a new sensor as required

General Information - Diagnostic Trouble Code (DTC) Index DTC: Front Controls Display Interface Module (FCDIM) - Front Integrated Control Panel

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the front display interface system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Audio System](#) (415-01 Information and Entertainment System, Description and Operation).

Front Control Display Interface Module (FCDIM) (high level display front)

DTC	Description	Possible Cause	Action
U1A01-15	Communications link	Navigation module to High Level Display Front communications link circuit - short to power, open circuit	Refer to electrical circuit diagrams and check Navigation Module to High Level Display Front communications link circuit for short to power, open circuit
U1A4B-48	Control module microprocessor 'B'	Supervision software failure	Install a new HLDF. For additional information, refer to: Video Display (415-01 Information and Entertainment System, Removal and Installation).
U3000-48	Control module	Supervision software failure	Install a new HLDF. For additional information, refer to: Video Display (415-01 Information and Entertainment System, Removal and Installation).
U3000-4B	Control module	Over temperature	Check for additional DTCs and refer to DTC Index. Check/monitor system for re-occurrence
U3000-55	Control module	Incorrect Car Configuration File data received	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U3000-87	Control module	Missing message	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing). Check information and entertainment module for Car Configuration File and MOST network DTCs and refer to relevant DTC Index. Carry out MOST/CAN network tests using the manufacturer approved diagnostic system
U3000-98	Control module	Component or system over temperature	Check for additional DTCs and refer to DTC Index. Check/monitor system for re-occurrence
U3003-16	Battery voltage	Circuit voltage below threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U3003-17	Battery voltage	Circuit voltage above threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index DTC: Headlamp Control Module (HCM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

For additional information, refer to: [Exterior Lighting](#) (417-01 Exterior Lighting, Description and Operation).

Adaptive Front Lighting System (AFS) Control Module

DTC	Description	Possible Cause	Action
B1041-04	Leveling Control - System Internal Failures	Module internal failure	Suspect Adaptive Front Lighting System (AFS) Control Module internal fault. Replace as required, refer to the new module/component installation note at the top of the DTC Index
B1041-54	Leveling Control - Missing Calibration	- NOTE: This DTC will normally be logged when a new module has been installed. - Leveling sensor calibration routine not carried out	NOTE: Sensor calibration routine must be carried out with the vehicle unladen. Calibrate the Headlamp Leveling sensors using the manufacturer approved diagnostic system, carry the out routine 'Headlamp Control Module System Calibration' from the 'Module programming and configuration - Setup and Configuration - Lighting'
B1087-83	LIN Bus "A" - Value of signal protection calculation incorrect	- LIN Bus circuit fault - No communication on the LIN Bus - LIN bus EMC interference	NOTE: This circuit uses shielded cable Refer to the electrical circuit diagrams and check the LIN Bus circuit for harness damage
B1087-86	LIN Bus "A" - Signal Invalid	- LIN Bus circuit fault - No communication on the LIN Bus - LIN bus EMC interference	NOTE: This circuit uses shielded cable Refer to the electrical circuit diagrams and check the LIN Bus circuit for harness damage
B1087-88	LIN Bus "A" - Bus Off	- LIN Bus circuit fault - No communication on the LIN Bus	NOTE: This circuit uses shielded cable Refer to the electrical circuit diagrams and check the LIN Bus circuit for harness damage
B10AE-11	Headlamp Leveling Motor - Circuit short to ground	Headlamp Leveling Motor control circuit short to ground	Refer to the electrical circuit diagrams and check Headlamp Leveling Motor control circuit for short to ground
B10AE-12	Headlamp Leveling Motor - Circuit short to battery	Headlamp Leveling Motor control circuit short to power	Refer to the electrical circuit diagrams and check Headlamp Leveling Motor control circuit for short to power
B10AE-64	Headlamp Leveling Motor - Signal plausibility failure	Signal plausibility failure (voltage out of range)	Refer to the electrical circuit diagrams and check Headlamp Leveling Motor circuits for failure. Disconnect one headlamp connector, clear DTC and re-test. If DTC cleared, suspect Adaptive Front Lighting System (AFS) Control Module or circuits to the disconnected side of the failure. If DTC remains, reconnect first headlamp and disconnect second, clear DTC and re-test. If DTC cleared, suspect Adaptive Front Lighting System (AFS) Control Module or circuits to the disconnected side of the failure. If DTC remains, suspect common circuits of the failure. Refer to the electrical circuit diagrams and check as required
B1A59-11	Sensor 5 Volt Supply - Circuit short to ground	Headlamp Leveling Sensor 5 volt supply circuit short to ground	Refer to electrical circuit diagrams and check Headlamp Leveling Sensor 5 volt supply circuit for short to ground
B1A59-12	Sensor 5 Volt Supply - General Electrical Failure	Headlamp Leveling Sensor 5 volt supply circuit short to power	Refer to electrical circuit diagrams and check Headlamp Leveling Sensor 5 volt supply circuit for short to power

DTC	Description	Possible Cause	Action
B1D64-01	Left Headlamp Swivelling Motor - General Electrical Failure	- Internal Headlamp Motor Fault - Internal Headlamp Circuit Fault	Using the manufacturer approved diagnostic system perform an On Demand Self Test, look for any errors in movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). Refer to the electrical circuit diagrams and check for circuit fault between the Adaptive Front Lighting System (AFS) Control Module and the Headlamp Swivelling Motor. If no mechanical or circuit faults are evident, suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1D64-87	Left Headlamp Swivelling Motor - Missing message	Missing message	Using the manufacturer approved diagnostic system perform an On Demand Self Test, look for any errors in movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). Refer to the electrical circuit diagrams and check for circuit fault between the Adaptive Front Lighting System (AFS) Control Module and the Headlamp Swivelling Motor. If no mechanical or circuit faults are evident, suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1D65-01	Right Headlamp Swivelling Motor - General electrical failure	- Internal Headlamp Motor Fault - Internal Headlamp Circuit Fault	Using the manufacturer approved diagnostic system perform an On Demand Self Test, look for any errors in movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). Refer to the electrical circuit diagrams and check for circuit fault between the Adaptive Front Lighting System (AFS) Control Module and the Headlamp Swivelling Motor. If no mechanical or circuit faults are evident, suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1D65-87	Right Headlamp Swivelling Motor - Missing message	Missing message	Using the manufacturer approved diagnostic system perform an On Demand Self Test, look for any errors in movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). Refer to the electrical circuit diagrams and check for circuit fault between the Adaptive Front Lighting System (AFS) Control Module and the Headlamp Swivelling Motor. If no mechanical or circuit faults are evident, suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1D68-00	Left Headlamp Swivelling Feedback Sensor - No sub type information	- Internal Headlamp Sensor Fault - Internal Headlamp Circuit Fault	Using the manufacturer approved diagnostic system perform an On Demand Self Test, look for any errors in movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). Refer to the electrical circuit diagrams and check for circuit fault between the Adaptive Front Lighting System (AFS) Control Module and the Headlamp Swivelling Feedback Sensor. If no mechanical or circuit faults are evident, suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
B1D69-00	Right Headlamp Swivelling Feedback Sensor - No sub type information	- Internal Headlamp Sensor Fault - Internal Headlamp Circuit Fault	Using the manufacturer approved diagnostic system perform an On Demand Self Test, look for any errors in movement (compare with other headlamp) and visually inspect the lamp for internal damage or dislocation (ball joints out). Refer to the electrical circuit diagrams and check for circuit fault between the Adaptive Front Lighting System (AFS) Control Module and the Headlamp Swivelling Feedback Sensor. If no mechanical or circuit faults are evident, suspect headlamp internal fault, replace as required. Refer to the new module/component installation note at the top of the DTC Index
C1A03-12	Left Front Height Sensor - Circuit short to battery	Left Front Height Sensor circuit short to power	Refer to the electrical circuit diagrams, and check Left Front Height Sensor circuit for short to power
C1A03-14	Left Front Height Sensor - Circuit short to ground or open	Left Front Height Sensor circuit short to ground or open circuit	Refer to the electrical circuit diagrams, and check Left Front Height Sensor circuit for short to ground or open circuit
C1A05-12	Left Rear Height Sensor - Circuit short to battery	Left Rear Height Sensor circuit short to power	Refer to the electrical circuit diagrams, and check Left Rear Height Sensor circuit for short to power
C1A05-14	Left Rear Height Sensor - Circuit short to ground or open	Left Rear Height Sensor circuit short to ground or open circuit	Refer to the electrical circuit diagrams, and check Left Rear Height Sensor circuit for short to ground or open circuit
U0001-88	High Speed CAN Communication Bus - Bus off	- CAN Bus Off - CAN Bus Circuit fault	Check other modules for related DTCs. Carry out the CAN Network Integrity test using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
U0101-00	Lost communication with TCM - No sub type information	- Lost communication with the Transmission Control Module - CAN network fault	Check the Transmission Control Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Transmission Control Module
U0121-00	Lost communication with Anti-lock Brake System (ABS) Control Module - No sub type information	- Lost communication with the Anti-lock Brake System Module - CAN network fault	Check the Anti-lock Brake System Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Anti-lock Brake System Module
U0126-00	Lost communication with Steering Angle Sensor Module - No sub type information	- Lost communication with the Steering Angle Sensor Module - CAN network fault	Check the Steering Angle Sensor Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Steering Angle Sensor Module
U0140-00	Lost communication with Body Control Module - No sub type information	- Lost communication with the Central Junction Box - CAN network fault	Check the Central Junction Box for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Central Junction Box
U0300-00	Internal Control Module Software Incompatibility - No sub type information	Car Configuration File (CCF) information incompatible to the Adaptive Front Lighting System (AFS) Control Module	• NOTE: The Car Configuration File (CCF) parameters required are (Vehicle type)(Headlamp type)(Gearbox type) and (Dayrunning light) Re-configure the Car Configuration File (CCF) as required using the manufacturer approved diagnostic system. Clear DTC and re-test. If the DTC remains suspect the Adaptive Front Lighting System (AFS) Control Module, refer to the new module installation note at the top of the DTC Index
U0402-00	Invalid Data Received From Transmission Control Module - No sub type information	- Invalid Data Received from the Transmission Control Module - Transmission component fault	Check the Transmission Control Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Transmission Control Module
U0415-00	Invalid Data Received From Anti-Lock Brake System (ABS) Control Module - No sub type information	- Invalid data received from Anti-lock Brake System Module - Anti-lock Brake System Module component fault	Check the Anti-lock Brake System Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Anti-lock Brake System Module
U0422-00	Invalid data from Body Control Module - No sub type information	- Invalid signal from the Central Junction Box - Central Junction Box fault	Check the Central Junction Box for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Central Junction Box
U0428-00	Invalid Data Received From Steering Angle Sensor Module - No sub type information	- Invalid Data Received from the Steering Angle Sensor Module - Steering Angle Sensor Module fault	Check the Steering Angle Sensor Module for stored DTCs. Using the manufacturer approved diagnostic system, complete the CAN Network Integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Adaptive Front Lighting System (AFS) Control Module and the Steering Angle Sensor
U2100-00	Initial Configuration Not Complete - No sub type information	Car Configuration File (CCF) information not received completely	• NOTE: The Car Configuration File (CCF) parameters required are (Vehicle type)(Headlamp type)(Gearbox type) and (Dayrunning light) Re-configure the Car Configuration File (CCF) as required using the manufacturer approved diagnostic system. Clear DTC and re-test. If the DTC remains suspect the Adaptive Front Lighting System (AFS) Control Module, refer to the new module installation note at the top of the DTC Index
U2101-00	Control Module Configuration Incompatible - No sub type information	Car Configuration File (CCF) information incompatible to Adaptive Front Lighting System (AFS) Control Module	Check the correct Adaptive Front Lighting System (AFS) Control Module is installed to vehicle specification. Refit original or replace the module as required. Refer to the new module/component installation note at the top of the DTC Index
U3003-16	Battery Voltage - Circuit voltage below threshold	The power supply to the Module has been below 9 Volts for more than 1000 milliseconds	Suspect Battery or Charging fault. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section. Clear the DTC, cycle ignition state to off then on, if DTC returns refer to the electrical circuit diagrams and check power and ground circuit to the Adaptive Front Lighting System (AFS) Control Module

DTC	Description	Possible Cause	Action
U3003-17	Battery Voltage - Circuit voltage above threshold	The power supply to the Module has been above 16 Volts for more than 1000 milliseconds	Suspect Charging fault. Check the battery condition and state of charge. Check the vehicle charging system. Refer to the relevant workshop manual section
U3003-62	Battery Voltage - Signal compare failure	Difference in battery voltage, of 2 volts or more, between the central broadcast voltage (via CAN Bus) and Adaptive Front Lighting System (AFS) Control Module	Check other modules for related stored DTCs. Refer to the electrical circuit diagrams and check power and ground voltages at the Adaptive Front Lighting System (AFS) Control Module

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General Information - Diagnostic Trouble Code (DTC) Index DTC: Heating Ventilation and Air Conditioning Control Module (HVAC)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTC's are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

For additional information, refer to: [Climate Control System](#) (412-00 Climate Control System - General Information, Diagnosis and Testing).

Heating ventilation and air conditioning control module (HVAC)

DTC	Description	Possible Cause	Action
B102E-09	Air quality sensor general failure information - Component failures	● Internal sensor fault	Install a new air quality sensor
B102E-11	Air quality sensor general electrical failures - Circuit short to ground	● Air quality sensor circuit - short to ground ● Incorrect climate control module installed	Refer to the electrical circuit diagrams and check air quality sensor circuit for short to ground. Install a new climate control module as required, refer to new module/component installation note at the top of the DTC Index
B102E-12	Air quality sensor general electrical failures - Circuit short to battery	● Air quality sensor circuit - short to power ● Air quality sensor - Open circuit	Refer to the electrical circuit diagrams and check air quality sensor circuit for short to power. Install a new air quality sensor as required
B1030-09	Left front seat heater general failure information - Component failures	● Seat heater module internal failure	Install a new seat heater module, refer to the new module/component installation note at the top of the DTC Index
B1030-4B	Left front seat heater system internal failures - Over temperature	● Seat heater module internal failure ● Sensor incorrect/no feedback	Clear DTC and re-test. If DTC remains install a new seat heater module, refer to the new module/component installation note at the top of the DTC Index. Install a new front seat heater mat
B1030-87	Left front seat heater bus signal/message failures - Missing message	● LIN bus circuit or seat heater module power supply circuit fault	Refer to the electrical circuit diagrams and check the front left seat heater module LIN Bus circuit, power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance
B1032-09	Right front seat heater general failure information - Component failures	● Seat heater module internal failure	Install a new seat heater module, refer to the new module/component installation note at the top of the DTC Index
B1032-4B	Right front seat heater system internal failures - Over temperature	● Seat heater module internal failure ● Sensor incorrect/no feedback	Clear DTC and re-test. If DTC remains install a new seat heater module, refer to the new module/component installation note at the top of the DTC Index. Install a new front seat heater mat
B1032-87	Right front seat heater bus signal/message failures - Missing message	● LIN Bus circuit or seat heater module power supply circuit fault	Refer to the electrical circuit diagrams and check the front right seat heater module LIN Bus circuit, power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance
B1034-01	Left front seat heater element general failure information - General electrical failure	● Element damaged, open circuit	Refer to the electrical circuit diagrams and check the left front seat heater element circuit for open circuit
B1035-01	Left rear seat heater element general failure information - General electrical failure	● Element damaged, open circuit	This DTC will only log in validation mode. No help text required
B1036-01	Right front seat heater element general failure information - General electrical failure	● Element damaged, open circuit	Refer to the electrical circuit diagrams and check front right seat heater element circuit for open circuit

DTC	Description	Possible Cause	Action
B1038-01	Left front seat heater sensor general failure information - General electrical failure	● Sensor damaged, open circuit	Refer to the electrical circuit diagrams and check front left seat heater sensor circuit for open circuit
B103A-01	Right front seat heater sensor general failure information - General electrical failure	● Sensor damaged, open circuit	Refer to the electrical circuit diagrams and check front right seat heater sensor circuit for open circuit
B105A-11	Cabin temperature sensor fan general electrical failures - Circuit short to ground	● In-vehicle temperature sensor circuit - short to ground	Refer to the electrical circuit diagrams and check In-vehicle temperature sensor circuit for short to ground
B105A-15	Cabin temperature sensor fan general electrical failures - Circuit short to battery or open	● In-vehicle temperature sensor circuit - short to power or open circuit	Refer to the electrical circuit diagrams and check In-vehicle temperature sensor for short to power or open circuit
B105A-71	Cabin temperature sensor fan general electrical failures - Actuator stuck	● Fan jammed or broken	Remove obstruction from fan. Install new sensor as required
B1081-09	Left temperature damper motor general failure information - Component failures	● Internal failure	Install a new actuator as required
B1081-77	Left temperature damper motor mechanical failures - Commanded position not reachable	● Obstruction in flap movement ● Range greater than expected default	Clear obstruction from flap. Using manufacturer approved diagnostic system check relevant datalogger signals to read motor range and compare defaults. Execute LIN calibration run using manufacturer approved diagnostic system
B1081-87	Left temperature damper motor bus signal/message failures - Missing message	● LIN Bus fault ● Actuator fault	Refer to the electrical circuit diagrams and check the left air temperature door motor LIN Bus circuit, power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance. Install a new actuator as required
B1082-09	Right temperature damper motor general failure information - Component failures	● Internal failure	Install a new actuator as required
B1082-77	Right temperature damper motor mechanical failures - Commanded position not reachable	● Obstruction in flap movement ● Range greater than expected default	Clear obstruction from flap. Using manufacturer approved diagnostic system check relevant datalogger signals to read motor range and compare defaults. Execute LIN calibration run using manufacturer approved diagnostic system
B1082-87	Right temperature damper motor bus signal/message failures - Missing message	● LIN Bus fault ● Actuator fault	Refer to the electrical circuit diagrams and check the right air temperature door motor LIN Bus circuit, power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance
B1083-09	Recirculation damper motor general failure Information - Component failures	● Internal failure	Install new actuator as required
B1083-77	Recirculation damper motor mechanical failures - Commanded position not reachable	● Obstruction in flap movement ● Range greater than expected default	Clear obstruction from flap. Using manufacturer approved diagnostic system check relevant datalogger signals to read motor range and compare defaults. Execute LIN calibration run using manufacturer approved diagnostic system
B1083-87	Recirculation damper motor bus signal/message failures - Missing message	● LIN Bus fault ● Actuator fault	Refer to the electrical circuit diagrams and check the air intake door motor LIN Bus circuit, power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance
B1085-09	Defroster damper motor general failure - Information component failures	● Internal failure	Install new actuator as required
B1085-77	Defroster damper motor mechanical failures - Commanded position not reachable	● Obstruction in flap movement ● Range greater than expected default	Clear obstruction from flap. Clear the DTC and retest. If the problem persists, remove the defrost vent/register blend door actuator and check the blend flap operation
B1085-87	Defroster damper motor bus signal/message failures - Missing message	● LIN Bus fault ● Actuator fault	Refer to the electrical circuit diagrams and check the screen air distribution door motor LIN Bus circuit, power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance
B1086-09	Air distribution damper motor general failure - Information component failures	● Internal failure	Install a new actuator as required

DTC	Description	Possible Cause	Action
B1086-77	Air distribution damper motor mechanical failures - Commanded position not reachable	- Obstruction in flap movement - Range greater than expected default	Clear obstruction from flap. Clear the DTC and retest. If the problem persists, remove the defrost vent/register blend door actuator and check the blend flap operation
B1086-87	Air distribution damper motor bus signal/message failures - Missing message	- LIN Bus fault - Actuator fault	Refer to the electrical circuit diagrams and check the face/feet air distribution door motor LIN Bus circuit, power and ground supply circuits for short circuit to ground, short circuit to power, open circuit, high resistance
B1087-4A	LIN bus A system internal failures - Incorrect component installed	- Incorrect module installed - Incorrect car configuration data being transmitted	Ensure correct module is installed. Check and correct car configuration file using manufacturer approved diagnostic system
B1087-54	LIN bus A system programming failures - Missing calibration	LIN systems calibration routine failed	Run LIN systems calibration routine and clear DTC using manufacturer approved diagnostic system
B1087-83	LIN bus A bus signal/message failures - Value of signal protection calculation incorrect	Possible fault with one or more LIN nodes	Clear DTC and monitor for re-occurrence
B1087-86	LIN bus A bus signal/message failures - Signal invalid	Incorrect stepper motor/s installed	Run LIN Arbitration routine using manufacturer approved diagnostic system. Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1087-88	LIN bus A bus signal/message failures - Bus off	LIN Bus A circuit - short to ground, power	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1088-4A	LIN bus B system internal failures - Incorrect component installed	- Incorrect module installed - Incorrect car configuration data being transmitted by central junction box	Ensure correct module is installed. Check and correct car configuration file using manufacturer approved diagnostic system
B1088-83	LIN bus B bus signal/message failures - Value of signal protection calculation incorrect	Possible fault with one or more LIN Nodes	Clear DTC and monitor for re-occurrence
B1088-86	LIN bus B bus signal/message failures - Signal invalid	Incorrect stepper motor/s installed	Run LIN Arbitration routine using manufacturer approved diagnostic system. Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1088-88	LIN bus B bus signal/message failures - Bus off	LIN Bus B circuit - short to ground, power	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B10B9-11	Blower control general electrical failures - Circuit short to ground	Blower Control circuit - short to ground	Refer to electrical circuit diagrams and check Blower Control circuit for short to ground
B10B9-12	Blower control general electrical failures - Circuit short to battery	Blower Control circuit - short to power	Refer to electrical circuit diagrams and check Blower Control circuit for short to power
B10B9-13	Blower control general electrical failures - Circuit open	Blower control circuit - open circuit	This DTC will only log in validation mode. No help text required
B1A61-11	Cabin temperature sensor general electrical failures - Circuit short to ground	In-vehicle temperature sensor circuit - short to ground	Refer to electrical circuit diagrams and check In-vehicle temperature sensor circuit for short to ground
B1A61-15	Cabin temperature sensor general electrical failures - Circuit short to battery or open	In-vehicle temperature sensor circuit - short to power or open circuit	Refer to electrical circuit diagrams and check In-vehicle temperature sensor circuit for short to power or open circuit
B1A69-09	Humidity sensor general failure information - Component failures	Internal sensor failure	Install a new rear view mirror/humidity sensor
B1A69-87	Humidity sensor bus signal/message failures - Missing message	Sensor disconnected, open circuit	Refer to the electrical circuit diagrams and check humidity sensor circuit for short circuit to ground, short circuit to power, open circuit
B1B71-11	Evaporator temperature sensor general electrical failures - Circuit short to ground	Evaporator temperature sensor circuit - short to ground	Refer to electrical circuit diagrams and check Evaporator temperature sensor circuit for short to ground
B1B71-15	Evaporator temperature sensor general electrical failures - Circuit short to battery or open	Evaporator temperature sensor circuit - short to power or open circuit	Refer to electrical circuit diagrams and check Evaporator temperature sensor circuit for short to power or open circuit
U0010-00	Medium speed CAN communication bus - No sub type information	Medium speed CAN bus off	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0140-00	Lost communication with central electronic module general failure information - No sub type information	Missing message	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
U0156-00	Lost communication with infotainment control module general failure information - No sub type information	● Missing message	Carry out CAN network integrity tests using the manufacturer approved diagnostic system
U0300-00	Internal control module software incompatibility general failure information - No sub type information	● Invalid configuration message is received	Re-configure the central junction box using the manufacturer approved diagnostic system. Clear the DTC and retest. If the DTC is still logged suspect the climate control module, refer to the new module/component installation note at the top of the DTC Index
U2002-23	Switch general signal failures - Signal stuck low	● Switch stuck	Check finisher around module for correct installation
U2101-00	Control module configuration incompatible general failure information - No sub type information	● Incorrect car configuration data being transmitted by central junction box	Check and correct car configuration file using manufacturer approved diagnostic system
U3000-41	Control module system internal failures - General checksum error	● Internal micro controller error ● Checksum error	Install a new climate control module, refer to new module/component installation note at top of DTC Index
U3003-62	Battery voltage algorithm based failures - Signal compare failure	● Mis-match in battery voltage, of 2 volts or more, between climate control module and central junction box	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Infotainment Control Module (ICM) - High Line

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the infotainment control system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Audio System](#) (415-01 Information and Entertainment System, Description and Operation).

Infotainment Control Module (High Line) (ICM)

DTC	Description	Possible Cause	Action
B101C-11	Seek up switch	Seek up switch circuit - short to ground	Refer to electrical circuit diagrams and check seek up switch circuit for short to ground
B101D-11	Seek down switch	Seek down switch circuit - short to ground	Refer to electrical circuit diagrams and check seek down switch circuit for short to ground
B101F-11	Eject switch	Eject switch circuit - short to ground	Refer to electrical circuit diagrams and check eject switch circuit for short to ground
B1022-11	Audio On/Off switch	Audio On/Off switch circuit - short to ground	Refer to electrical circuit diagrams and check audio on/off switch circuit for short to ground
B104A-11	Button 1	Button 1 circuit - short to ground	Refer to electrical circuit diagrams and check Button 1 circuit for short to ground
B104B-11	Button 2	Button 2 circuit - short to ground	Refer to electrical circuit diagrams and check Button 2 circuit for short to ground
B104C-11	Button 3	Button 3 circuit - short to ground	Refer to electrical circuit diagrams and check Button 3 circuit for short to ground
B104D-11	Button 4	Button 4 circuit - short to ground	Refer to electrical circuit diagrams and check Button 4 circuit for short to ground
B104E-11	Button 5	Button 5 circuit - short to ground	Refer to electrical circuit diagrams and check Button 5 circuit for short to ground
B11A6-11	FM button	FM button circuit - short to ground	Refer to electrical circuit diagrams and check FM button circuit for short to ground
B11A7-11	AM button	AM button circuit - short to ground	Refer to electrical circuit diagrams and check AM button circuit for short to ground
B11A8-11	CD button	CD button circuit - short to ground	Refer to electrical circuit diagrams and check CD button circuit for short to ground
B11A9-11	Tone button	Tone button circuit - short to ground	Refer to electrical circuit diagrams and check tone button circuit for short to ground
B11AA-11	Skip up button	Skip up button circuit - short to ground	Refer to electrical circuit diagrams and check skip up button circuit for short to ground
B11AB-11	Skip down button	Skip down button circuit - short to ground	Refer to electrical circuit diagrams and check skip down button circuit for short to ground
B11AC-11	Enter button	Enter button circuit - short to ground	Refer to electrical circuit diagrams and check enter button circuit for short to ground
B11AD-11	Exit button	Exit button circuit - short to ground	Refer to electrical circuit diagrams and check exit button circuit for short to ground

DTC	Description	Possible Cause	Action
B11AE-11	Menu button	Menu button circuit - short to ground	Refer to electrical circuit diagrams and check menu button circuit for short to ground
B11AF-11	Phone button	Phone button circuit - short to ground	Refer to electrical circuit diagrams and check phone button circuit for short to ground
B11B0-11	Scan button	Scan button circuit - short to ground	Refer to electrical circuit diagrams and check scan button circuit for short to ground
B11B1-11	Auto button	Auto button circuit - short to ground	Refer to electrical circuit diagrams and check auto button circuit for short to ground
B11B3-11	Button 6	Button 6 circuit - short to ground	Refer to electrical circuit diagrams and check button 6 circuit for short to ground
B11B4-11	Button 7	Button 7 circuit - short to ground	Refer to electrical circuit diagrams and check button 7 circuit for short to ground
B11B5-11	Button 8	Button 8 circuit - short to ground	Refer to electrical circuit diagrams and check button 8 circuit for short to ground
B11B6-11	Button 9	Button 9 circuit - short to ground	Refer to electrical circuit diagrams and check button 9 circuit for short to ground
B1A59-49	Sensor 5 volt supply	Internal electronic failure	Install a new information and entertainment module, refer to the new module/component installation note at the top of the DTC Index
B1D21-15	Remote control switch	Remote control switch circuit - short to power, open circuit	Refer to electrical circuit diagrams and check remote control switch circuit for short to power, open circuit
U0010-00	Medium speed CAN communication Bus	Bus Off	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0127-00	Lost communications with tire pressure monitor system module	Lost communications	Carry out CAN Network integrity tests using manufacturer approved diagnostic system. Check CJB for DTCs and refer to relevant DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
U0140-00	Lost communications with CJB	Lost communications	Carry out CAN Network integrity tests using manufacturer approved diagnostic system. Check CJB for DTCs and refer to relevant DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
U0142-00	Lost communication with body control module 'B'	Lost communications	Carry out CAN Network integrity tests using manufacturer approved diagnostic system. Check CJB for DTCs and refer to relevant DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
U0155-00	Lost communication with instrument cluster	Lost communications	Carry out CAN Network integrity tests using manufacturer approved diagnostic system. Check instrument cluster for DTCs and refer to relevant DTC Index. For additional information, refer to: Instrument Cluster (413-01 Instrument Cluster, Diagnosis and Testing).
U0159-00	Lost communications with park assist control module 'A'	Lost communications	Carry out CAN Network integrity tests using manufacturer approved diagnostic system. Check parking aid module for DTCs and refer to relevant DTC Index. For additional information, refer to: Parking Aid (413-13 Parking Aid, Diagnosis and Testing).
U0164-00	Lost communication with climate control module	Lost communications	Carry out CAN Network integrity tests using manufacturer approved diagnostic system. Check climate control module for DTCs and refer to relevant DTC Index. For additional information, refer to: Climate Control System (412-00 Climate Control System - General Information, Diagnosis and Testing).
U0184-00	Lost communication with radio	Lost communications	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0186-00	Lost communications with audio amplifier 'A'	Lost communications	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

DTC	Description	Possible Cause	Action
U0193-00	Lost communications with digital audio control module 'A'	Lost communications	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0197-00	Lost communications with telephone control module	Lost communications	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0199-00	Lost communications with DDM	Lost communications	Carry out MOST Network integrity tests using manufacturer approved diagnostic system. Check DDM for DTCs and refer to relevant DTC Index below
U0200-00	Lost communications with PDM	Lost communications	Carry out MOST Network integrity tests using manufacturer approved diagnostic system. Check PDM for DTCs and refer to relevant DTC Index below
U0214-00	Lost communications with remote function actuation	Lost communications	Carry out CAN Network integrity tests using manufacturer approved diagnostic system. Check remote keyless entry module for DTCs and refer to relevant DTC Index below
U0245-00	Lost communications with entertainment control module - front	Lost communications	Carry out MOST Network integrity tests GO to Pinpoint Test ??. . Check for additional DTCs and refer to relevant DTC Index
U0256-00	Lost communications with front controls interface module	Lost communications	Carry out MOST Network integrity tests GO to Pinpoint Test ??. . Check for additional DTCs and refer to relevant DTC Index
U0257-00	Lost communications with front controls/display interface module	Lost communications	Carry out MOST Network integrity tests GO to Pinpoint Test ??. . Check for additional DTCs and refer to relevant DTC Index
U0300-00	Internal control module software incompatibility	Incorrect software	Check software level is correct to hardware level
U0300-51	Internal control module software incompatibility	Not programmed	Download the correct level of software using the manufacturer approved diagnostic system
U3000-55	Control module	Incorrect car configuration data received	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U3000-87	Control module	Missing message	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing). Check information and entertainment module for Car Configuration File and MOST network DTCs and refer to relevant DTC Index. Carry out MOST/CAN network tests using the manufacturer approved diagnostic system
U3002-81	Vehicle Identification Number	Incorrect VIN stored and locked (module previously installed to other vehicle)	Ensure correct component is installed to vehicle
U3003-62	Battery voltage	Mis-match in battery voltage, of 2 volts or more, between information and entertainment control module and CJB	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Infotainment Control Module (ICM) - Low Line

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the infotainment control system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Audio System](#) (415-01 Information and Entertainment System, Description and Operation).

Infotainment control module (low line) (ICM)

DTC	Description	Possible Cause	Action
B1A00-16	Control module	Supply voltage low	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A01-01	Speaker #1	Left front speaker circuit - short circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A01-13	Speaker #1	Left front speaker circuit - open circuit	Refer to the electrical circuit diagrams and check left front speaker circuit for open circuit
B1A02-01	Speaker #2	Right front speaker circuit - short circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A02-13	Speaker #2	Right front speaker circuit - open circuit	Refer to electrical circuit diagrams and check right front speaker circuit for open circuit
B1A03-01	Speaker #3	Left rear speaker circuit - short circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A03-13	Speaker #3	Left rear speaker circuit - open circuit	Refer to electrical circuit diagrams and check left rear speaker circuit for open circuit
B1A04-01	Speaker #4	Right rear speaker circuit - short circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1A04-13	Speaker #4	Right rear speaker circuit - open circuit	Refer to electrical circuit diagrams and check right rear speaker circuit for open circuit
B1A56-14	Antenna	Antenna circuit - short to ground, open circuit	Refer to electrical circuit diagrams and check antenna circuit for short ground, open circuit
B1D19-96	Compact disc unit	Component internal failure	Install a new compact disc unit, refer to the new module/component installation note at the top of the DTC Index. For additional information, refer to: Audio Unit (415-01 Information and Entertainment System, Removal and Installation).
B1D19-98	Compact disc unit	Compact disc unit over temperature	Check for additional DTCs and refer to DTC Index, check/monitor system for re-occurrence
B1D20-91	Head unit	Head unit below temperature	Check for additional DTCs and refer to DTC Index, check/monitor system for re-occurrence
B1D20-98	Head unit	Head unit over temperature	Check for DTCs and refer to DTC Index, check/monitor system for re-occurrence
B1D21-11	Remote control switch	Remote control switch circuit - short to ground	Refer to electrical circuit diagrams and check remote control switch circuit for short to ground

DTC	Description	Possible Cause	Action
B1D21-13	Remote control switch	Remote control switch circuit - open circuit	Refer to electrical circuit diagrams and check remote control switch circuit for open circuit
U0010-87	Medium speed CAN communications Bus	Missing message	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0010-88	Medium Speed CAN Communication Bus	Bus Off	Carry out CAN network integrity tests using the manufacturer approved diagnostic system
U0073-88	Control module communication Bus 'A' off	Bus Off	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0300-55	Internal control module software incompatibility	- Incorrect Car Configuration File - Incorrect component installed	Check/amend Car Configuration File using manufacturer approved diagnostic system. Install correct component
U1A03-87	Car Configuration Parameter	Missing message	Check/amend the Car Configuration File using the manufacturer approved diagnostic system. Carry out CAN network integrity tests using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Instrument Cluster (IPC)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the instrument cluster system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Instrument Cluster](#) (413-01 Instrument Cluster, Description and Operation).

Instrument cluster control module (IPC)

DTC	Description	Possible Cause	Action
B1184-62	Steering Column Lock Output	Signal compare failure	Check steering lock power from CJB. Check CJB for DTCs and refer to relevant DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
B1A14-96	RCM Warning Lamp	Light Emitting Diode (LED) failure	Install a new instrument cluster. For additional information, refer to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). Refer to the new module/component installation note at the top of the DTC Index
B1A84-41	Car Configuration Data	Flash download checksum error	Install latest available level of software using the manufacturer approved diagnostic system
B1A84-81	Car Configuration Data	Invalid Car Configuration data received	Check/amend Car Configuration File using manufacturer approved diagnostic system
C2002-62	Odometer Tampered	DTC set when one or more stored odometer value does not match	Clear DTC, cycle ignition and re-test
U0010-87	Medium Speed CAN Communication Bus	Multiple loss of CAN data to other systems	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0010-88	Medium Speed CAN Communication Bus	Break in connection to bus	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0140-08	Lost Communication With Body Control Module	No messages received from CJB for greater than timeout period	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0208-08	Lost Communication With "Seat Control Module A"	No messages received from DSM for greater than timeout period	Check DSM for DTCs and refer to relevant DTC Index. For additional information, refer to: Seats (501-10 Seating, Diagnosis and Testing). Carry out CAN Network integrity tests using the manufacturer approved diagnostic system
U0300-62	Internal Control Module Software Incompatibility	Configuration data received is different from the stored data	Check correct instrument cluster is installed
U3000-46	Control Module	EEPROM write error	Check power and ground circuits to the instrument cluster, clear DTC and re-test. If DTC remains, install a new instrument cluster. For additional information, refer to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). Refer to the new module/component installation note at the top of the DTC Index

DTC	Description	Possible Cause	Action
U3000-48	Control Module	Internal application software error detected	Check power and ground circuits to the instrument cluster, clear DTC and re-test. If DTC remains, install a new instrument cluster. For additional information, refer to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). Refer to the new module/component installation note at the top of the DTC Index
U3000-4B	Control Module	Internal over temperature	Check for additional DTCs and refer to DTC Index, clear DTC and re-test/monitor condition for re-occurrence
U3003-17	Battery Voltage	Circuit voltage above threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index DTC: Navigation Control Module (NAV)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the navigation system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Navigation System](#) (415-01 Information and Entertainment System, Description and Operation).

Navigation Control Module (NCV)

DTC	Description	Possible Cause	Action
B1A89-11	Satellite antenna	GPS antenna circuit - short to ground	Refer to electrical circuit diagrams and check GPS antenna circuit for short to ground
B1A89-13	Satellite antenna	GPS antenna circuit - open circuit	Refer to electrical circuit diagrams and check GPS antenna circuit for open circuit
B1A89-1B	GPS module	GPS receiver error	Install a new multimedia module. For additional information, refer to: Navigation System Digital Versatile Disc (DVD) Unit (415-01 Information and Entertainment System, Removal and Installation).
B1D55-14	Antenna #2 circuit	TMC/VICS antenna circuit - open circuit	• NOTE: Ignore this DTC on vehicles with an E*, D* or C* suffix module part number If a fault is identified with the TMC system, refer to electrical circuit diagrams and check TMC/VICS antenna circuit for open circuit
B1D56-14	Antenna #3 circuit	VICS beacon antenna circuit - open circuit	Refer to electrical circuit diagrams and check VICS beacon antenna circuit for open circuit
U2005-31	Control module	Missing vehicle speed message	Check information and entertainment module for MOST network error DTCs and refer to relevant DTC Index. Carry out MOST network tests using manufacturer approved diagnostic system
U3000-49	Control module	Internal failure	Install a new multimedia module. For additional information, refer to: Navigation System Digital Versatile Disc (DVD) Unit (415-01 Information and Entertainment System, Removal and Installation).
U3000-55	Control module	Incorrect Car Configuration File data received	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U3000-87	Control module	Missing message	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing). Check information and entertainment module for Car Configuration File and MOST network DTCs and refer to relevant DTC Index. Carry out MOST/CAN network tests using the manufacturer approved diagnostic system
U3000-98	Control module	Component or system over temperature	Check for additional DTCs and refer to relevant DTC Index. Check/monitor system for re-occurrence
U3003-16	Battery voltage	Circuit voltage below threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U3003-17	Battery voltage	Circuit voltage above threshold	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index DTC: Occupant Classification System (OCS)

Description and Operation



CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

- **NOTE:** If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- **NOTE:** Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- **NOTE:** When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- **NOTE:** Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- **NOTE:** If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the occupant classification system, refer to the relevant Description and Operation section in the workshop manual. For additional information, refer to: [Air Bag and Safety Belt Pretensioner Supplemental Restraint System \(SRS\)](#) (501-20B Supplemental Restraint System, Description and Operation).

Occupant Classification System (OCS)

DTC	Description	Possible Cause	Action
B1193-53	Crash Event Storage Full and Locked - deactivated	Crash event occurred	Clear diagnostic trouble code and re-test
B1A54-01	Occupant Belt Tension Sensor - General Electrical Failure	General electrical failure	Clear diagnostic trouble code and re-test. If the problem persists, check and install a new safety belt tension sensor as required. 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
B1A54-02	Occupant Belt Tension Sensor - General signal failure	General signal failure	Refer to the electrical circuit diagrams and check safety belt tension and mat pressure sensor circuits for short to each other
B1A54-11	Occupant Belt Tension Sensor - circuit short to ground	Safety belt tension sensor voltage reference or signal circuit - short to ground	Refer to the electrical circuit diagrams and check safety belt tension sensor voltage reference and signal circuits for short to ground
B1A54-12	Occupant Belt Tension Sensor - circuit short to battery	Safety belt tension sensor voltage reference or signal circuit - short to power	Refer to the electrical circuit diagrams and check safety belt tension sensor voltage reference and signal circuits for short to power
B1A54-13	Occupant Belt Tension Sensor - circuit open	Safety belt tension sensor voltage reference or signal circuit - open circuit	Refer to the electrical circuit diagrams and check safety belt tension sensor voltage reference and signal circuits for open circuit
B1A62-02	Pressure Sensor - General signal failure	General signal failure	Refer to the electrical circuit diagrams and check safety belt tension and mat pressure sensor circuits for short to each other
B1A62-11	Pressure Sensor - circuit short to ground	Mat pressure sensor voltage reference or signal circuits - short to ground	Refer to the electrical circuit diagrams and check mat pressure sensor voltage reference and signal circuits for short to ground
B1A62-12	Pressure Sensor - circuit short to battery	Mat pressure sensor voltage reference, ground or signal circuits - short to power	Refer to the electrical circuit diagrams and check mat pressure sensor voltage reference, ground and signal circuits for short to power

DTC	Description	Possible Cause	Action
B1A62-13	Pressure Sensor - circuit open	Mat pressure sensor voltage reference or signal circuit - open circuit	Refer to the electrical circuit diagrams and check mat pressure sensor voltage reference and signal circuits for open circuit
B1A62-7B	Pressure Sensor - low fluid level	Low fluid level - bladder damaged	Check and install new bladder as required. 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
U0001-88	High Speed CAN Communication Bus - Bus off	Bus off	Refer to the electrical circuit diagrams and check CAN network for short, open circuit. Carry out the CAN network integrity test using the manufacturer approved diagnostic system
U0151-00	Lost Communication With Restraints Control Module - no sub type information	Restraints control module missing message	Refer to the electrical circuit diagrams and check power and ground supplies to restraints control module. Carry out CAN network integrity test using the manufacturer approved diagnostic system
U0300-00	Internal Control Module Software Incompatibility - no sub type information	Master car configuration file ID does not correspond	Check correct occupancy seat module is installed for vehicle specification. Check auxiliary junction box for related diagnostic trouble codes and refer to relevant diagnostic trouble code index
U2016-51	Control Module Main Software - not programmed	Main software not programmed	Check and install a new occupancy seat module as required. 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
U201A-51	Control Module Main Calibration Data - not programmed	Main calibration data not programmed	Check and install a new occupancy seat module as required. 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
U3000-04	Control Module - System Internal Failures	Occupancy seat module internal electronic failure	Check and install a new occupancy seat module as required. 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
U3000-54	Control Module - missing calibration	This diagnostic trouble code is set if a 'calibrate occupancy seat module empty seat offset' routine is requested and fails due to one of the pre-conditions to execute the routine	Check the following criteria have all been achieved: Ignition status set to RUN/START. Verify seat is always empty after power-up before re-zero is requested. The occupancy seat module has gone through the seat assembly plant calibration. No collision event received from the restraints control module during the current ignition cycle. No faults present in the current ignition cycle. The trigger message for calibrate empty seat offset has been received from the diagnostic tool. Occupancy seat module has enough time to begin classification. Temperature is between 6C (42F) and 36C (97F)
U3003-16	Battery Voltage - circuit voltage below threshold	Circuit voltage below threshold	Check battery is in fully charged and serviceable condition. Check integrity of charging system
U3003-17	Battery Voltage - circuit voltage above threshold	Circuit voltage above threshold	Check battery is in fully charged and serviceable condition. Check integrity of charging system

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Rear Differential Control Module (RDCM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the rear differential system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Rear Drive Axle and Differential](#) (205-02 Rear Drive Axle/Differential, Description and Operation).

DTC	Description	Possible Cause	Action
P0560-17	System Voltage - circuit voltage above threshold	• Differential Electronic Module (DEM) supply circuit voltage above threshold	• Check vehicle battery and charging system, repair as required. Refer to the relevant section in the workshop manual. Refer to the electrical circuit diagrams and check the power and ground supply circuits to the Differential Electronic Module (DEM). Clear the DTC and re-test.
P0602-54	Powertrain Control Module Programming Error - missing calibration	• Differential Electronic Module (DEM) programming error • Differential Electronic Module (DEM) internal failure	• Using the manufacturer approved diagnostic system check and install latest level of software to the Differential Electronic Module (DEM). Clear the DTC and re-test. • Check and install a new Differential Electronic Module (DEM) as required. 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.
P0607-49	Control Module Performance - internal electronic failure	• Differential Electronic Module (DEM) internal failure	• Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0666-11	PCM / ECM / TCM Internal Temperature Sensor Circuit - circuit short to ground	• Differential Electronic Module (DEM) internal failure	• Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0666-15	PCM / ECM / TCM Internal Temperature Sensor Circuit - circuit short to battery or open	• Differential Electronic Module (DEM) internal failure	• Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0667-27	PCM / ECM / TCM Internal Temperature Sensor Range/Performance - signal rate of change above threshold - signal rate of change above threshold	• Differential Electronic Module (DEM) internal failure	• Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0748-14	Pressure Control Solenoid A Electrical - circuit short to ground or open	• Differential Electronic Module (DEM) internal failure	• Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. Refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to

DTC	Description	Possible Cause	Action
			the installation of a new module/component.
P0748-1D	Pressure Control Solenoid A Electrical - circuit current out of range	Differential Electronic Module (DEM) internal failure	Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0932-11	Hydraulic Pressure Sensor Circuit - circuit short to ground	- Internal oil pressure sensor connector fault - Internal oil pressure sensor failure - Differential Electronic Module (DEM) internal failure	- Remove the Differential Electronic Module (DEM) and check the internal oil pressure sensor connection. Repair as required. - Check and install a new internal oil pressure sensor as required. - Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0932-15	Hydraulic Pressure Sensor Circuit - circuit short to battery or open	- Internal oil pressure sensor connector fault - Internal oil pressure sensor failure - Differential Electronic Module (DEM) internal failure	- Remove the Differential Electronic Module (DEM) and check the internal oil pressure sensor connection. Repair as required. - Check and install a new internal oil pressure sensor as required. - Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0937-11	Hydraulic Oil Temperature Sensor Circuit - circuit short to ground	- Internal oil temperature sensor connector fault - Internal oil temperature sensor failure - Differential Electronic Module (DEM) internal failure	- Remove the Differential Electronic Module (DEM) and check the internal oil temperature sensor connection. Repair as required. - Check and install a new internal oil temperature sensor as required. - Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0937-15	Hydraulic Oil Temperature Sensor Circuit - circuit short to battery or open	- Internal oil temperature sensor connector fault - Internal oil temperature sensor failure - Differential Electronic Module (DEM) internal failure	- Remove the Differential Electronic Module (DEM) and check the internal oil temperature sensor connection. Repair as required. - Check and install a new internal oil temperature sensor as required. - Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0938-27	Hydraulic Oil Temperature Sensor Range/Performance-signal rate of change above threshold	- Internal oil temperature sensor connector fault - Internal oil temperature sensor failure - Differential Electronic Module (DEM) internal failure	- Remove the Differential Electronic Module (DEM) and check the internal oil temperature sensor connection. Repair as required. - Check and install a new internal oil temperature sensor as required. - Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P0961-62	Pressure Control Solenoid A Control Circuit Range/Performance - signal compare failure	- Differential Electronic Module (DEM) internal failure - Differential coupling assembly failure	- Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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. - Clear the DTC and re-test. Check and install a new differential coupling assembly as required. 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.

DTC	Description	Possible Cause	Action
P1889-12	Oil Pressure Pump Performance -circuit short to battery	- Oil pressure feeder pump circuit short to power - Oil pressure feeder pump internal failure - Differential Electronic Module (DEM) internal failure	- Refer to the electrical circuit diagrams and check oil pressure feeder pump circuit for short to power. - Clear the DTC and re-test. Check and install a new oil pressure feeder pump as required. 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. - Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P1889-14	Oil Pressure Pump Performance- circuit short to ground or open	- Oil pressure feeder pump circuit short to ground, open circuit - Oil pressure feeder pump internal failure - Differential Electronic Module (DEM) internal failure	- Refer to the electrical circuit diagrams and check oil pressure feeder pump circuit for short to ground, open circuit. - Clear the DTC and re-test. Check and install a new oil pressure feeder pump as required. 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. - Clear the DTC and re-test. Check and install a new Differential Electronic Module (DEM) as required. 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.
P1889-49	Oil Pressure Pump Performance - internal electronic failure	Oil pressure feeder pump internal failure	Clear the DTC and re-test. Check and install a new oil pressure feeder pump as required. 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.
P1889-74	Oil Pressure Pump Performance - actuator slipping	- Oil pressure feeder pump harness short to ground, short to power, open circuit - Oil pressure feeder pump internal failure - Differential coupling assembly failure	- Refer to the electrical circuit diagrams and check oil pressure feeder pump harness for short to ground, short to power, open circuit. - Clear the DTC and re-test. Check and install a new oil pressure feeder pump as required. 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. - Clear the DTC and re-test. Check and install a new differential coupling assembly as required. 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.
P188A-68	Differential Oil Temperature Too High/Too Low - event information	- Differential oil temperature too high - Internal oil temperature sensor connector fault - Internal oil temperature sensor connector fault - Differential Electronic Module (DEM) internal failure - Differential coupling assembly failure	- Allow differential coupling assembly to cool. Consider the ambient temperature. Clear the DTC and re-test. - Remove the Differential Electronic Module (DEM) and check the internal oil temperature sensor connection. Repair as required. - Check and install a new internal oil temperature sensor as required. - Check and install a new Differential Electronic Module (DEM) as required. 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. - Clear the DTC and re-test. Check and install a new differential coupling assembly as required. 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.
U0001-00	High Speed CAN Communication Bus - no sub type information	High speed CAN communication bus short to ground, short to power, open circuit	Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network for short to ground, short to power, open circuit.

DTC	Description	Possible Cause	Action
U0100-00	Lost Communication With ECM/PCM "A" - no sub type information	Lost communication with Engine Control Module (ECM)	Refer to the electrical circuit diagrams and check the power and ground circuits to the Engine Control Module (ECM). Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the All Terrain Control Module (ATCM) and Differential Electronic Module (DEM).
U0121-00	Lost Communication With Anti-Lock Brake System (ABS) Control Module - no sub type information	Lost communication with Anti-Lock Brake System (ABS) module	Refer to the electrical circuit diagrams and check the power and ground circuits to the Anti-Lock Brake System (ABS) module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the All Terrain Control Module (ATCM) and Differential Electronic Module (DEM).
U0138-00	Lost Communication with All Terrain Control Module - no sub type information	Lost communication with All Terrain Control Module (ATCM)	Refer to the electrical circuit diagrams and check the power and ground circuits to the All Terrain Control Module (ATCM). Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the All Terrain Control Module (ATCM) and Differential Electronic Module (DEM).
U0140-00	Lost Communication With Body Control Module - no sub type information	Lost communication with Central Junction Box (CJB)	Refer to the electrical circuit diagrams and check the power and ground circuits to the Central Junction Box (CJB). Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box (CJB) and Differential Electronic Module (DEM).
U0300-00	Internal Control Module Software Incompatibility - no sub type information	- High speed CAN communication bus circuit problem - Invalid configuration message is received	- Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network to the Differential Electronic Module (DEM). - Refer to the electrical circuit diagrams and check the power and ground circuits to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN network between the Central Junction Box (CJB) and Differential Electronic Module (DEM). Clear the DTC and re-test.
U0300-4A	Internal Control Module Software Incompatibility - incorrect component installed	- Differential Electronic Module (DEM) missing calibration, corrupt software - Incorrect Differential Electronic Module (DEM) installed to vehicle	- Using the manufacturer approved diagnostic system check and install latest relevant level of software to the Differential Electronic Module (DEM). Clear the DTC and re-test. - Check and ensure the correct Differential Electronic Module (DEM) is installed. Check and install a new Differential Electronic Module (DEM) as required. 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.
U0401-68	Invalid Data Received From ECM/PCM - event information	Invalid data received	Check Engine Control Module (ECM) for related DTCs and refer to the relevant DTC Index. Clear the DTC and re-test.
U0415-00	Invalid Data Received From Anti-Lock Brake System (ABS) Control Module - no sub type information	Invalid data received from Anti-Lock Braking System (ABS) module	Check Anti Lock Braking System (ABS) module for related DTCs and refer to the relevant DTC Index. Clear the DTC and re-test.
U0418-68	Invalid Data Received From Brake System Control Module - event information	Invalid data received from Anti-Lock Braking System (ABS) module	Check Anti Lock Braking System (ABS) module for related DTCs and refer to the relevant DTC Index. Clear the DTC and re-test.

DTC	Description	Possible Cause	Action
U2101-00	Control Module Configuration Incompatible - no sub type information	Car Configuration File (CCF) data parameter incorrect	Using the manufacturer approved diagnostic system check and up-date the Car Configuration File (CCF) as required. Clear the DTC and re-test.
U3002-81	Vehicle Identification Number- invalid serial data received	Incorrect Differential Electronic Module (DEM) installed to vehicle	Check and ensure the correct Differential Electronic Module (DEM) is installed. Check and install a new Differential Electronic Module (DEM) as required. 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.
U3003-62	Battery Voltage - signal compare failure	Mis-match in battery voltage, between the Central Junction Box (CJB) and Differential Electronic Module (DEM), of 2 volts or more	Refer to the electrical circuit diagrams and check the power and ground circuits to the Differential Electronic Module (DEM). Refer to the electrical circuit diagrams and check the power and ground circuits to the Central Junction Box (CJB).

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Parking Aid Module (PAM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the parking assist control system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Parking Aid](#) (413-13 Parking Aid, Description and Operation).

Parking assist control module (PAM)

DTC	Description	Possible Cause	Action
B1B36-01	Front right outer sensor	• Front right outer sensor signal circuit - short to ground, open circuit • Front right outer sensor power supply circuit - open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1B36-12	Front right outer sensor	• Front right outer sensor signal circuit - short to power	Refer to electrical circuit diagrams and check front right outer sensor signal circuit for short to power
B1B36-96	Front right outer sensor	• Front right outer sensor ground circuit - open circuit • Front right outer sensor internal failure	Refer to electrical circuit diagrams and check front right outer sensor ground circuit for open circuit. Install new sensor as necessary. For additional information, refer to: Front Outer Parking Aid Sensor (413-13 Parking Aid, Removal and Installation).
B1B38-01	Front right inner sensor	• Front right inner sensor signal circuit - short to ground, open circuit • Front right inner sensor power supply circuit - open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1B38-12	Front right inner sensor	• Front right inner sensor signal circuit - short to power	Refer to electrical circuit diagrams and check front right inner sensor signal circuit for short to power
B1B38-96	Front right inner sensor	• Front right inner sensor ground circuit - open circuit • Front right inner sensor internal failure	Refer to electrical circuit diagrams and check front right inner sensor ground circuit for open circuit. Install new sensor as necessary. For additional information, refer to: Front Inner Parking Aid Sensor (413-13 Parking Aid, Removal and Installation).
B1B40-01	Front left outer sensor	• Front left outer sensor signal circuit - short to ground, open circuit • Front left outer sensor power supply circuit - open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1B40-12	Front left outer sensor	• Front left outer sensor signal circuit - short to power	Refer to electrical circuit diagrams and check front left outer sensor signal circuit for short to power
B1B40-96	Front left outer sensor	• Front left outer sensor ground circuit - open circuit • Front left outer sensor internal failure	Refer to electrical circuit diagrams and check front left outer sensor ground circuit for open circuit. Install new sensor as necessary. For additional information, refer to: Front Outer Parking Aid Sensor (413-13 Parking Aid, Removal and Installation).

DTC	Description	Possible Cause	Action
B1B42-01	Front left inner sensor	- Front left inner sensor signal circuit - short to ground, open circuit - Front left inner sensor power supply circuit - open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1B42-12	Front left inner sensor	Front left inner sensor signal circuit - short to power	Refer to electrical circuit diagrams and check front left inner sensor signal circuit for short to power
B1B42-96	Front left inner sensor	- Front left inner sensor ground circuit - open circuit - Front left inner sensor internal failure	Refer to electrical circuit diagrams and check front left inner sensor ground circuit for open circuit. Install new sensor as necessary. For additional information, refer to: Front Inner Parking Aid Sensor (413-13 Parking Aid, Removal and Installation).
B1B44-01	Rear right outer sensor	- Rear right outer sensor signal circuit - short to ground, open circuit - Rear right outer sensor power supply circuit - open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1B44-12	Rear right outer sensor	Rear right outer sensor signal circuit - short to power	Refer to electrical circuit diagrams and check rear right outer sensor signal circuit for short to power
B1B44-96	Rear right outer sensor	- Rear right outer sensor ground circuit - open circuit - Rear right outer sensor internal failure	Refer to electrical circuit diagrams and check rear right outer sensor ground circuit for open circuit. Install new sensor as necessary. For additional information, refer to: Rear Outer Parking Aid Sensor (413-13 Parking Aid, Removal and Installation).
B1B46-01	Rear right inner sensor	- Rear right inner sensor signal circuit - short to ground, open circuit - Rear right inner sensor power supply circuit - open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1B46-12	Rear right inner sensor	Rear right inner sensor signal circuit - short to power	Refer to electrical circuit diagrams and check rear right inner sensor signal circuit for short to power
B1B46-96	Rear right inner sensor	- Rear right inner sensor ground circuit - open circuit - Rear right inner sensor internal failure	Refer to electrical circuit diagrams and check rear right inner sensor ground circuit for open circuit. Install new sensor as necessary. For additional information, refer to: Rear Inner Parking Aid Sensor (413-13 Parking Aid, Removal and Installation).
B1B48-01	Rear left outer sensor	- Rear left outer sensor signal circuit - short to ground, open circuit - Rear left outer sensor power supply circuit - open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1B48-12	Rear left outer sensor	Rear left outer sensor signal circuit - short to power	Refer to electrical circuit diagrams and check rear left outer sensor signal circuit for short to power
B1B48-96	Rear left outer sensor	- Rear left outer sensor ground circuit - open circuit - Rear left outer sensor internal failure	Refer to electrical circuit diagrams and check rear left outer sensor ground circuit for open circuit. Install new sensor as necessary. For additional information, refer to: Rear Outer Parking Aid Sensor (413-13 Parking Aid, Removal and Installation).
B1B50-01	Rear left inner sensor	- Rear left inner sensor signal circuit - short to ground, open circuit - Rear left inner sensor power supply circuit - open circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1B50-12	Rear left inner sensor	Rear left inner sensor signal circuit - short to power	Refer to electrical circuit diagrams and check rear left inner sensor signal circuit for short to power
B1B50-96	Rear left inner sensor	- Rear left inner sensor ground circuit - open circuit - Rear left inner sensor internal failure	Refer to electrical circuit diagrams and check rear left inner sensor ground circuit for open circuit. Install new sensor as necessary. For additional information, refer to: Rear Inner Parking Aid Sensor (413-13 Parking Aid, Removal and Installation).

DTC	Description	Possible Cause	Action
B1B54-11	Parking aid status LED	Parking aid status LED - short to ground (detected if driven only)	Refer to the electrical circuit diagrams and test status LED circuit for short to ground
B1B54-12	Parking aid status LED	Parking aid status LED - short to power (detected if not driven only)	Refer to the electrical circuit diagrams and test status LED circuit for short to power
B1B57-11	Front sensors power supply circuit	Front sensors power supply circuit - short to ground	Refer to the electrical circuit diagrams and test front sensor power supply circuit for short to ground
B1B58-11	Rear sensors power supply circuit	Rear sensors power supply circuit - short to ground	Refer to the electrical circuit diagrams and test rear sensor power supply circuit for short to ground
B1C30-73	Disable switch	- Disable switch stuck closed - Disable switch circuit - short circuit	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
U0010-00	Medium speed CAN communication Bus	Medium speed CAN communication Bus	Carry out the associated pinpoint test using the manufacturer approved diagnostic system
U0073-00	Control module communication Bus "A" Off	Control module communication Bus "A" Off	Carry out the associated pinpoint test using the manufacturer approved diagnostic system
U0140-00	Lost communication with CJB	Logged when subscribed CAN message missing from CJB	Carry out the associated pinpoint test using the manufacturer approved diagnostic system
U0252-00	Lost communication with trailer module	Logged when subscribed message missing from trailer module	Check trailer module for DTCs and refer to DTC Index
U0300-00	Internal control module software incompatibility	CJB car configuration data is not compatible with the parking aid module	Re-configure the CJB using the manufacturer approved diagnostic system. Clear DTCs and re-test. If DTC still logged, install a new parking aid module. Refer to the new module installation note at the top of the DTC Index
U0422-00	Invalid data received from CJB	Logged when subscribed CAN message invalid from CJB	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
U2100-00	Initial configuration not complete	No configuration has been previously set	Re-configure CJB using manufacturer approved diagnostic tool, clear DTC and re-test. If DTC remains check CAN network. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
U2101-00	Control module configuration incompatible	Data sent from CJB is invalid	Re-configure CJB using manufacturer approved diagnostic tool, clear DTC and re-test. If DTC remains check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
U3000-49	Control module	Internal control module failure	Install a new parking aid control module, refer to the new module installation note at the top of the DTC Index
U3003-16	Battery voltage	Circuit voltage below threshold	Carry out the associated pinpoint test using the manufacturer approved diagnostic system
U3003-17	Battery voltage	Circuit voltage above threshold	Carry out the associated pinpoint test using the manufacturer approved diagnostic system
U3003-62	Battery voltage	Mis-match in battery voltage, of 2 volts or more, between parking aid module and CJB	Carry out the associated pinpoint test using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index **DTC: Restraints Control Module (RCM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the restraints control system, refer to the relevant Description and Operation section in the workshop manual. For additional information, refer to: (501-20B Supplemental Restraint System)

[Air Bag and Safety Belt Pretensioner Supplemental Restraint System \(SRS\)](#) (Description and Operation),
[Air Bag and Safety Belt Pretensioner Supplemental Restraint System \(SRS\)](#) (Description and Operation).

Restraints Control Module (RCM)

DTC	Description	Possible Cause	Action
B0001-11	Driver Frontal Stage 1 Deployment Control - Circuit short to ground	Driver's airbag ignitor stage 1 circuit short circuit to ground	Refer to electrical circuit diagrams and check driver's airbag ignitor (stage 1) circuit for short circuit to ground
B0001-12	Driver Frontal Stage 1 Deployment Control - Circuit short to battery	Driver's airbag ignitor stage 1 circuit short circuit to power	Refer to electrical circuit diagrams and check driver's airbag ignitor (stage 1) circuit for short circuit to power
B0001-13	Driver Frontal Stage 1 Deployment Control - Circuit open	Driver's airbag ignitor stage 1 circuit open circuit	Refer to electrical circuit diagrams and check driver's airbag ignitor (stage 1) circuit for open circuit
B0001-19	Driver Frontal Stage 1 Deployment Control - Circuit current above threshold	Driver's airbag ignitor stage 1 circuit current above threshold	Refer to electrical circuit diagrams and check driver's airbag ignitor (stage 1) circuit for swapped pins or cross coupling between two firing lines
B0001-1A	Driver Frontal Stage 1 Deployment Control - Circuit resistance below threshold	Driver's airbag ignitor stage 1 circuit resistance below threshold	Refer to electrical circuit diagrams and check driver's airbag ignitor (stage 1) circuit for short circuit between both lines to ignitor
B0001-95	Driver Frontal Stage 1 Deployment Control - Incorrect assembly	Driver's airbag ignitor (stage 1) incorrect assembly	- Check driver's airbag ignitor (stage 1) installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0002-11	Driver Frontal Stage 2 Deployment Control - Circuit short to ground	Driver's airbag ignitor (stage 2) circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's airbag ignitor (stage 2) circuit for short circuit to ground
B0002-12	Driver Frontal Stage 2 Deployment Control - Circuit short to battery	Driver's airbag ignitor (stage 2) circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's airbag ignitor (stage 2) circuit for short circuit to power
B0002-13	Driver Frontal Stage 2 Deployment Control - Circuit open	Driver's airbag ignitor stage 2 circuit open circuit	Refer to electrical circuit diagrams and check driver's airbag ignitor (stage 2) circuit for open circuit
B0002-19	Driver Frontal Stage 2 Deployment Control - Circuit current above threshold	Driver's airbag ignitor stage 2 circuit current above threshold	Refer to electrical circuit diagrams and check driver's airbag ignitor (stage 2) circuit for swapped pins or cross coupling between two firing lines
B0002-1A	Driver Frontal Stage 2 Deployment Control - Circuit resistance below threshold	Driver's airbag ignitor stage 2 circuit resistance below threshold	Refer to electrical circuit diagrams and check driver's airbag ignitor (stage 2) circuit for short circuit between both lines to ignitor

DTC	Description	Possible Cause	Action
B0002-95	Driver Frontal Stage 2 Deployment Control - Incorrect assembly	Driver's airbag ignitor (stage 2) incorrect assembly	- Check driver's airbag ignitor (stage 2) installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0004-11	Driver Knee Bolster Deployment Control - Circuit short to ground	Driver's knee bolster ignitor circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's knee bolster ignitor circuit for short circuit to ground
B0004-12	Driver Knee Bolster Deployment Control - Circuit short to battery	Driver's knee bolster ignitor circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's knee bolster ignitor circuit for short circuit to power
B0004-13	Driver Knee Bolster Deployment Control - Circuit open	Driver's knee bolster ignitor circuit open circuit	Refer to the electrical circuit diagrams and check driver's knee bolster ignitor circuit for open circuit
B0004-19	Driver Knee Bolster Deployment Control - Circuit current above threshold	Driver's knee bolster ignitor circuit current above threshold	Refer to electrical circuit diagrams and check driver's knee bolster ignitor circuit for swapped pins or cross coupling between two firing lines
B0004-1A	Driver Knee Bolster Deployment Control - Circuit resistance below threshold	Driver's knee bolster ignitor circuit resistance below threshold	Refer to electrical circuit diagrams and check driver's knee bolster ignitor circuit for short circuit between both lines to ignitor
B0004-95	Driver Knee Bolster Deployment Control - Incorrect assembly	Driver's knee bolster ignitor incorrect assembly	- Check driver's knee bolster ignitor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0005-11	Collapsible Steering Column Deployment Control - Circuit short to ground	Collapsible steering column circuit short circuit to ground	Refer to the electrical circuit diagrams and check collapsible steering column circuit for short circuit to ground
B0005-12	Collapsible Steering Column Deployment Control - Circuit short to battery	Collapsible steering column circuit short circuit to power	Refer to the electrical circuit diagrams and check collapsible steering column circuit for short circuit to power
B0005-13	Collapsible Steering Column Deployment Control - Circuit open	Collapsible steering column circuit open circuit	Refer to the electrical circuit diagrams and check collapsible steering column circuit for open circuit
B0005-19	Collapsible Steering Column Deployment Control - Circuit current above threshold	Collapsible steering column circuit current above threshold	Refer to electrical circuit diagrams and check collapsible steering column circuit for swapped pins or cross coupling between two firing lines
B0005-1A	Collapsible Steering Column Deployment Control - Circuit resistance below threshold	Collapsible steering column circuit resistance below threshold	Refer to electrical circuit diagrams and check collapsible steering column circuit for short circuit between both lines to deployable device
B0005-95	Collapsible Steering Column Deployment Control - Incorrect assembly	Collapsible steering column incorrect assembly	- Check collapsible steering column installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0010-11	Passenger Frontal Stage 1 Deployment Control - Circuit short to ground	Front passenger's airbag ignitor (stage 1) circuit short circuit to ground	Refer to the electrical circuit diagrams and check front passenger's airbag ignitor (stage 1) circuit for short circuit to ground
B0010-12	Passenger Frontal Stage 1 Deployment Control - Circuit short to battery	Front passenger's airbag ignitor (stage 1) circuit short circuit to power	Refer to the electrical circuit diagrams and check front passenger's airbag ignitor (stage 1) circuit for short circuit to power
B0010-13	Passenger Frontal Stage 1 Deployment Control - Circuit open	Front passenger's airbag ignitor (stage 1) circuit open circuit	Refer to the electrical circuit diagrams and check front passenger's airbag ignitor (stage 1) circuit for open circuit
B0010-19	Passenger Frontal Stage 1 Deployment Control - Circuit current above threshold	Front passenger's airbag ignitor (stage 1) circuit current above threshold	Refer to electrical circuit diagrams and check front passenger's airbag ignitor (stage 1) circuit for swapped pins or cross coupling between two firing lines
B0010-1A	Passenger Frontal Stage 1 Deployment Control - Circuit resistance below threshold	Front passenger's airbag ignitor (stage 1) circuit resistance below threshold	Refer to electrical circuit diagrams and check front passenger's airbag ignitor (stage 1) circuit for short circuit between both lines to ignitor

DTC	Description	Possible Cause	Action
B0010-95	Passenger Frontal Stage 1 Deployment Control - Incorrect assembly	Front passenger's airbag ignitor (stage 1) incorrect assembly	- Check front passenger's airbag ignitor (stage 1) installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0011-11	Passenger Frontal Stage 2 Deployment Control - Circuit short to ground	Front passenger's airbag ignitor (stage 2) circuit short circuit to ground	Refer to the electrical circuit diagrams and check front passenger's airbag ignitor (stage 2) circuit for short circuit to ground
B0011-12	Passenger Frontal Stage 2 Deployment Control - Circuit short to battery	Front passenger's airbag ignitor (stage 2) circuit short circuit to power	Refer to the electrical circuit diagrams and check front passenger's airbag ignitor (stage 2) circuit for short circuit to power
B0011-13	Passenger Frontal Stage 2 Deployment Control - Circuit open	Front passenger's airbag ignitor (stage 2) circuit open circuit	Refer to the electrical circuit diagrams and check front passenger's airbag ignitor (stage 2) circuit for open circuit
B0011-19	Passenger Frontal Stage 2 Deployment Control - Circuit current above threshold	Front passenger's airbag ignitor (stage 2) circuit current above threshold	Refer to electrical circuit diagrams and check front passenger's airbag ignitor (stage 2) circuit for swapped pins or cross coupling between two firing lines
B0011-1A	Passenger Frontal Stage 2 Deployment Control - Circuit resistance below threshold	Front passenger's airbag ignitor (stage 2) circuit resistance below threshold	Refer to electrical circuit diagrams and check front passenger's airbag ignitor (stage 2) circuit for short circuit between both lines to ignitor
B0011-95	Passenger Frontal Stage 2 Deployment Control - Incorrect assembly	Front passenger's airbag ignitor (stage 2) incorrect assembly	- Check front passenger's airbag ignitor (stage 2) installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0050-11	Driver Seatbelt Sensor - Circuit short to ground	Driver's seatbelt switch circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's seatbelt switch circuit for short circuit to ground
B0050-12	Driver Seatbelt Sensor - Circuit short to battery	Driver's seatbelt switch circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's seatbelt switch circuit for short circuit to power
B0050-13	Driver Seatbelt Sensor - Circuit open	Driver's seatbelt switch circuit open circuit	Refer to the electrical circuit diagrams and check driver's seatbelt switch circuit for open circuit
B0050-19	Driver Seatbelt Sensor - Circuit current above threshold	Driver's seatbelt switch circuit current above threshold	Refer to electrical circuit diagrams and check driver's seatbelt switch circuit for swapped pins or cross coupling between two firing lines
B0050-1E	Driver Seatbelt Sensor - Circuit resistance out of range	Driver's seatbelt switch circuit resistance out of range	Refer to the electrical circuit diagrams and check driver's seatbelt sensor for resistance out of range
B0050-95	Driver Seatbelt Sensor - Incorrect assembly	Driver's seatbelt sensor incorrect assembly	- Check front driver's seatbelt sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0052-11	Passenger Seatbelt Sensor - Circuit short to ground	Passenger's seatbelt switch circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's seatbelt switch circuit for short circuit to ground
B0052-12	Passenger Seatbelt Sensor - Circuit short to battery	Passenger's seatbelt switch circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's seatbelt switch circuit for short circuit to power
B0052-13	Passenger Seatbelt Sensor - Circuit open	Passenger's seatbelt switch circuit open circuit	Refer to the electrical circuit diagrams and check passenger's seatbelt switch circuit for open circuit
B0052-19	Passenger Seatbelt Sensor - Circuit current above threshold	Passenger's seatbelt switch circuit current above threshold	Refer to electrical circuit diagrams and check passenger's seatbelt switch circuit for swapped pins or cross coupling between two firing lines
B0052-1E	Passenger Seatbelt Sensor - Circuit resistance out of range	Passenger's seatbelt switch circuit resistance out of range	Refer to the electrical circuit diagrams and check passenger's seatbelt sensor for resistance out of range

DTC	Description	Possible Cause	Action
B0052-95	Passenger Seatbelt Sensor - Incorrect assembly	Passenger's seatbelt sensor incorrect assembly	- Check front passenger's seatbelt sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0070-11	Driver Seatbelt Pretensioner Deployment Control - Circuit short to ground	Driver's seatbelt pretensioner ignitor circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's seatbelt pretensioner ignitor circuit for short circuit to ground
B0070-12	Driver Seatbelt Pretensioner Deployment Control - Circuit short to battery	Driver's seatbelt pretensioner ignitor circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's seatbelt pretensioner ignitor circuit for short circuit to power
B0070-13	Driver Seatbelt Pretensioner Deployment Control - Circuit open	Driver's seatbelt pretensioner ignitor circuit open circuit	Refer to the electrical circuit diagrams and check driver's seatbelt pretensioner ignitor circuit for open circuit
B0070-19	Driver Seatbelt Pretensioner Deployment Control - Circuit current above threshold	Driver's seatbelt pretensioner ignitor circuit current above threshold	Refer to electrical circuit diagrams and check driver's seatbelt pretensioner ignitor circuit for swapped pins or cross coupling between two firing lines
B0070-1A	Driver Seatbelt Pretensioner Deployment Control - Circuit resistance below threshold	Driver's seatbelt pretensioner ignitor circuit resistance below threshold	Refer to electrical circuit diagrams and check driver's seatbelt pretensioner ignitor circuit for short circuit between both lines to ignitor
B0070-95	Driver Seatbelt Pretensioner Deployment Control - Incorrect assembly	Driver's seatbelt pretensioner ignitor incorrect assembly	- Check front driver's seatbelt pretensioner ignitor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0072-11	Passenger Seatbelt Pretensioner Deployment Control - Circuit short to ground	Passenger's seatbelt pretensioner ignitor circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's seatbelt pretensioner ignitor circuit for short circuit to ground
B0072-12	Passenger Seatbelt Pretensioner Deployment Control - Circuit short to battery	Passenger's seatbelt pretensioner ignitor circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's seatbelt pretensioner ignitor circuit for short circuit to power
B0072-13	Passenger Seatbelt Pretensioner Deployment Control - Circuit open	Passenger's seatbelt pretensioner ignitor circuit open circuit	Refer to the electrical circuit diagrams and check passenger's seatbelt pretensioner ignitor circuit for open circuit
B0072-19	Passenger Seatbelt Pretensioner Deployment Control - Circuit current above threshold	Passenger's seatbelt pretensioner ignitor circuit current above threshold	Refer to electrical circuit diagrams and check passenger's seatbelt pretensioner ignitor circuit for swapped pins or cross coupling between two firing lines
B0072-1A	Passenger Seatbelt Pretensioner Deployment Control - Circuit resistance below threshold	Passenger's seatbelt pretensioner ignitor circuit resistance below threshold	Refer to electrical circuit diagrams and check passenger's seatbelt pretensioner ignitor circuit for short circuit between both lines to ignitor
B0072-95	Passenger Seatbelt Pretensioner Deployment Control - Incorrect assembly	Passenger's seatbelt pretensioner ignitor incorrect assembly	- Check front passenger's seatbelt pretensioner ignitor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0080-11	Driver Seatbelt Load Limiter Deployment Control - Circuit short to ground	Driver's safety belt retractor circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's safety belt retractor circuit for short circuit to ground
B0080-12	Driver Seatbelt Load Limiter Deployment Control - Circuit short to battery	Driver's safety belt retractor circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's safety belt retractor circuit for short circuit to power
B0080-13	Driver Seatbelt Load Limiter Deployment Control - Circuit open	Driver's safety belt retractor circuit open circuit	Refer to the electrical circuit diagrams and check driver's safety belt retractor circuit for open circuit
B0080-19	Driver Seatbelt Load Limiter Deployment Control - Circuit current above threshold	Driver's safety belt retractor circuit current above threshold	Refer to electrical circuit diagrams and check driver's safety belt retractor circuit for swapped pins or cross coupling between two firing lines

DTC	Description	Possible Cause	Action
B0080-1A	Driver Seatbelt Load Limiter Deployment Control - Circuit resistance below threshold	Driver's safety belt retractor circuit resistance below threshold	Refer to electrical circuit diagrams and check driver's safety belt retractor circuit for short circuit between both lines to ignitor
B0080-95	Driver Seatbelt Load Limiter Deployment Control - Incorrect assembly	Driver's safety belt retractor incorrect assembly	- Check driver's safety belt retractor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B0082-11	Passenger Seatbelt Load Limiter Deployment Control - Circuit short to ground	Passenger's safety belt retractor circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's safety belt retractor circuit for short circuit to ground
B0082-12	Passenger Seatbelt Load Limiter Deployment Control - Circuit short to battery	Passenger's safety belt retractor circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's safety belt retractor circuit for short circuit to power
B0082-13	Passenger Seatbelt Load Limiter Deployment Control - Circuit open	Passenger's safety belt retractor circuit open circuit	Refer to the electrical circuit diagrams and check passenger's safety belt retractor circuit for open circuit
B0082-19	Passenger Seatbelt Load Limiter Deployment Control - Circuit current above threshold	Passenger's safety belt retractor circuit current above threshold	Refer to electrical circuit diagrams and check passenger's safety belt retractor circuit for swapped pins or cross coupling between two firing lines
B0082-1A	Passenger Seatbelt Load Limiter Deployment Control - Circuit resistance below threshold	Passenger's safety belt retractor circuit resistance below threshold	Refer to electrical circuit diagrams and check passenger's safety belt retractor circuit for short circuit between both lines to ignitor
B0082-95	Passenger Seatbelt Load Limiter Deployment Control - Incorrect assembly	Passenger's safety belt retractor incorrect assembly	- Check passenger's safety belt retractor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B00B5-11	Driver Seat Track Position Restraints Sensor - Circuit short to ground	Driver's seat position sensor circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's seat position sensor circuit for short circuit to ground
B00B5-12	Driver Seat Track Position Restraints Sensor - Circuit short to battery	Driver's seat position sensor circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's seat position sensor circuit for short circuit to power
B00B5-13	Driver Seat Track Position Restraints Sensor - Circuit open	Driver's seat position sensor circuit open circuit	Refer to the electrical circuit diagrams and check driver's seat position sensor circuit for open circuit
B00B5-19	Driver Seat Track Position Restraints Sensor - Circuit current above threshold	Driver's seat position sensor circuit current above threshold	Refer to electrical circuit diagrams and check driver's seat position sensor circuit for swapped pins or cross coupling between two firing lines
B00B5-1E	Driver Seat Track Position Restraints Sensor - Circuit resistance out of range	Driver's seat position sensor circuit resistance out of range	Refer to the electrical circuit diagrams and check driver's seat position sensor for resistance out of range
B00B5-95	Driver Seat Track Position Restraints Sensor - Incorrect assembly	Driver's seat position sensor incorrect assembly	- Check driver's seat position sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B00D2-68	Restraint System Malfunction Indicator 1 - Event information	Restraint system events information	- Refer to electrical circuit diagrams and check for instrument cluster internal fault - 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
B00D2-95	Restraint System Malfunction Indicator 1 - Incorrect assembly	Restraint system incorrect assembly	- Using the manufacturer approved diagnostic system check and install latest relevant level of software to the restraints control module - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required

DTC	Description	Possible Cause	Action
B00D5-12	Restraint System Passenger Disable Indicator - Circuit short to battery	Passenger's airbag disable lamp circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's airbag disable lamp circuit for short circuit to power
B00D5-14	Restraint System Passenger Disable Indicator - Circuit short to ground or open	Passenger's airbag disable lamp circuit short circuit to ground, open circuit, high resistance	Refer to the electrical circuit diagrams and check passenger's airbag disable lamp circuit for short circuit to ground, open circuit, high resistance
B00D5-95	Restraint System Passenger Disable Indicator - Incorrect assembly	Passenger's airbag disable lamp incorrect assembly	- Check passenger's airbag disable lamp installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B00DF-24	Passenger Restraints Disable Switch - Signal stuck high	Passenger's restraints disable switch stuck or internal failure	Refer to the electrical circuit diagrams and check passenger's restraints disable switch
B00DF-55	Passenger Restraints Disable Switch - Not configured	Passenger's restraints disable switch not configured	Refer to the electrical circuit diagrams and check passenger's restraints disable switch
B00DF-64	Passenger Restraints Disable Switch - Signal plausibility failure	Passenger's restraints disable switch configuration error	Refer to the electrical circuit diagrams and check passenger's restraints disable switch
B10FD-11	Drivers Side Peripheral Acceleration Sensor - Circuit short to ground	Driver's front side impact sensor circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's front side impact sensor circuit for short circuit to ground
B10FD-12	Drivers Side Peripheral Acceleration Sensor - Circuit short to battery	Driver's front side impact sensor circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's front side impact sensor circuit for short circuit to power
B10FD-19	Drivers Side Peripheral Acceleration Sensor - Circuit current above threshold	Driver's front side impact sensor circuit current above threshold	Refer to electrical circuit diagrams and check driver's front side impact sensor circuit for swapped pins or cross coupling between two firing lines
B10FD-4A	Drivers Side Peripheral Acceleration Sensor - Incorrect component installed	Driver's front side impact sensor incorrect component installed	- Restraints control module detected a miss-match between the hardware fitted and what is expected - Check correct driver's front side impact sensor installed
B10FD-87	Drivers Side Peripheral Acceleration Sensor - Missing message	- Driver's front side impact sensor circuit open circuit - Driver's front side impact sensor internal fault	Refer to electrical circuit diagrams and check driver's front side impact sensor circuit for communication fault
B10FD-95	Drivers Side Peripheral Acceleration Sensor - Incorrect assembly	Driver's front side impact sensor incorrect assembly	- Check driver's front side impact sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B10FD-96	Drivers Side Peripheral Acceleration Sensor - Component internal failure	Driver's front side impact sensor internal fault	Refer to electrical circuit diagrams and check driver's front side impact sensor
B10FE-11	Passenger Side Peripheral Acceleration Sensor - Circuit short to ground	Passenger's front side impact sensor circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's front side impact sensor circuit for short circuit to ground
B10FE-12	Passenger Side Peripheral Acceleration Sensor - Circuit short to battery	Passenger's front side impact sensor circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's front side impact sensor circuit for short circuit to power
B10FE-19	Passenger Side Peripheral Acceleration Sensor - Circuit current above threshold	Passenger's front side impact sensor circuit current above threshold	Refer to electrical circuit diagrams and check passenger's front side impact sensor circuit for swapped pins or cross coupling between two firing lines
B10FE-4A	Passenger Side Peripheral Acceleration Sensor - Incorrect component installed	Passenger's front side impact sensor incorrect component installed	- Restraints control module detected a miss-match between the hardware fitted and what is expected - Check correct passenger's front side impact sensor installed
B10FE-87	Passenger Side Peripheral Acceleration Sensor - Missing message	- Passenger's front side impact sensor circuit open circuit - Passenger's front side impact sensor internal	Refer to electrical circuit diagrams and check passenger's front side impact sensor circuit for communication fault

DTC	Description	Possible Cause	Action
		fault	
B10FE-95	Passenger Side Peripheral Acceleration Sensor - Incorrect assembly	Passenger's front side impact sensor incorrect assembly	- Check passenger's front side impact sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B10FE-96	Passenger Side Peripheral Acceleration Sensor - Component internal failure	Passenger's front side impact sensor internal fault	Refer to electrical circuit diagrams and check passenger's front side impact sensor
B1126-11	Drivers Side-Side Airbag Deployment Control - Circuit short to ground	Driver's side air bag circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's side air bag circuit for short circuit to ground
B1126-12	Drivers Side-Side Airbag Deployment Control - Circuit short to battery	Driver's side air bag circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's side air bag circuit for short circuit to power
B1126-13	Drivers Side-Side Airbag Deployment Control - Circuit open	Driver's side air bag circuit open circuit	Refer to the electrical circuit diagrams and check driver's side air bag circuit for open circuit
B1126-19	Drivers Side-Side Airbag Deployment Control - Circuit current above threshold	Driver's side air bag circuit current above threshold	Refer to electrical circuit diagrams and check driver's side air bag circuit for swapped pins or cross coupling between two firing lines
B1126-1A	Drivers Side-Side Airbag Deployment Control - Circuit resistance below threshold	Driver's side air bag circuit resistance below threshold	Refer to electrical circuit diagrams and driver's side air bag circuit for short circuit between both lines to air bag
B1126-95	Drivers Side-Side Airbag Deployment Control - Incorrect assembly	Driver's side air bag incorrect assembly	- Check driver's side air bag installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1127-11	Passengers Side-Side Airbag Deployment Control - Circuit short to ground	Passenger's side air bag circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's side air bag circuit for short circuit to ground
B1127-12	Passengers Side-Side Airbag Deployment Control - Circuit short to battery	Passenger's side air bag circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's side air bag circuit for short circuit to power
B1127-13	Passengers Side-Side Airbag Deployment Control - Circuit open	Passenger's side air bag circuit open circuit	Refer to the electrical circuit diagrams and check passenger's side air bag circuit for open circuit
B1127-19	Passengers Side-Side Airbag Deployment Control - Circuit current above threshold	Passenger's side air bag circuit current above threshold	Refer to electrical circuit diagrams and check passenger's side air bag circuit for swapped pins or cross coupling between two firing lines
B1127-1A	Passengers Side-Side Airbag Deployment Control - Circuit resistance below threshold	Passenger's side air bag circuit resistance below threshold	Refer to electrical circuit diagrams and passenger's side air bag circuit for short circuit between both lines to side air bag
B1127-95	Passengers Side-Side Airbag Deployment Control - Incorrect assembly	Passenger's side air bag incorrect assembly	- Check passenger's side air bag installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1128-11	Drivers Side-Side Inflatable Curtain Deployment Control - Circuit short to ground	Driver's side curtain air bag circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's side curtain air bag circuit for short circuit to ground
B1128-12	Drivers Side-Side Inflatable Curtain Deployment Control - Circuit short to battery	Driver's side curtain air bag circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's side curtain air bag circuit for short circuit to power
B1128-13	Drivers Side-Side Inflatable Curtain Deployment Control - Circuit open	Driver's side curtain air bag circuit open circuit	Refer to the electrical circuit diagrams and check driver's side curtain air bag circuit for open circuit
B1128-19	Drivers Side-Side Inflatable Curtain Deployment Control - Circuit current above threshold	Driver's side curtain air bag circuit current above threshold	Refer to electrical circuit diagrams and driver's side curtain air bag circuit for swapped pins or cross coupling between two firing lines

DTC	Description	Possible Cause	Action
B1128-1A	Drivers Side-Side Inflatable Curtain Deployment Control - Circuit resistance below threshold	Driver's side curtain air bag circuit resistance below threshold	Refer to electrical circuit diagrams and driver's side curtain air bag circuit for short circuit between both lines to side curtain air bag
B1128-95	Drivers Side-Side Inflatable Curtain Deployment Control - Incorrect assembly	Driver's side curtain air bag incorrect assembly	- Check driver's side curtain air bag installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1129-11	Passengers Side-Side Inflatable Curtain Deployment Control - Circuit short to ground	Passenger's side curtain air bag circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's side curtain air bag circuit for short circuit to ground
B1129-12	Passengers Side-Side Inflatable Curtain Deployment Control - Circuit short to battery	Passenger's side curtain air bag circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's side curtain air bag circuit for short circuit to power
B1129-13	Passengers Side-Side Inflatable Curtain Deployment Control - Circuit open	Passenger's side curtain air bag circuit open circuit	Refer to the electrical circuit diagrams and check passenger's side curtain air bag circuit for open circuit
B1129-19	Passengers Side-Side Inflatable Curtain Deployment Control - Circuit current above threshold	Passenger's side curtain air bag circuit current above threshold	Refer to electrical circuit diagrams and check passenger's side curtain air bag circuit for swapped pins or cross coupling between two firing lines
B1129-1A	Passengers Side-Side Inflatable Curtain Deployment Control - Circuit resistance below threshold	Passenger's side curtain air bag circuit resistance below threshold	Refer to electrical circuit diagrams and passenger's side curtain air bag circuit for short circuit between both lines to side curtain air bag
B1129-95	Passengers Side-Side Inflatable Curtain Deployment Control - Incorrect assembly	Passenger's side curtain air bag incorrect assembly	- Check passenger's side curtain air bag installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1193-68	Crash Event Storage Full and Locked - Event information	Restraints control module crash event storage area full and locked	Read out the event data recorder and then 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
B1194-11	Driver Side Frontal Acceleration Sensor - Circuit short to ground	Driver's side front impact sensor circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's side front impact sensor circuit for short circuit to ground
B1194-12	Driver Side Frontal Acceleration Sensor - Circuit short to battery	Driver's side front impact sensor circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's side front impact sensor circuit for short circuit to power
B1194-19	Driver Side Frontal Acceleration Sensor - Circuit current above threshold	Driver's side front impact sensor circuit current above threshold	Refer to electrical circuit diagrams and driver's side front impact sensor circuit for swapped pins or cross coupling between two firing lines
B1194-4A	Driver Side Frontal Acceleration Sensor - Incorrect component installed	Driver's side front impact sensor incorrect component installed	- Restraints control module detected a miss-match between the hardware fitted and what is expected - Check correct driver's side front impact sensor installed
B1194-87	Driver Side Frontal Acceleration Sensor - Missing message	- Driver's side front impact sensor circuit open circuit - Driver's side front impact sensor internal fault	Refer to electrical circuit diagrams and driver's side front impact sensor for communication fault
B1194-95	Driver Side Frontal Acceleration Sensor - Incorrect assembly	Driver's side front impact sensor incorrect assembly	- Check driver's side front impact sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1194-96	Driver Side Frontal Acceleration Sensor - Component internal failure	Driver's side front impact sensor internal fault	Refer to electrical circuit diagrams and check driver's side front impact sensor
B1195-11	Passenger Side Frontal Acceleration Sensor - Circuit short to ground	Passenger's side front impact sensor circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's side front impact sensor circuit for short circuit to ground

DTC	Description	Possible Cause	Action
B1195-12	Passenger Side Frontal Acceleration Sensor - Circuit short to battery	Passenger's side front impact sensor circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's side front impact sensor circuit for short circuit to power
B1195-19	Passenger Side Frontal Acceleration Sensor - Circuit current above threshold	Passenger's side front impact sensor circuit current above threshold	Refer to electrical circuit diagrams and passenger's side front impact sensor circuit for swapped pins or cross coupling between two firing lines
B1195-4A	Passenger Side Frontal Acceleration Sensor - Incorrect component installed	Passenger's side front impact sensor incorrect component installed	- Restraints control module detected a miss-match between the hardware fitted and what is expected - Check correct passenger's side front impact sensor installed
B1195-87	Passenger Side Frontal Acceleration Sensor - Missing message	- Passenger's side front impact sensor circuit open circuit - Passenger's side front impact sensor internal fault	Refer to electrical circuit diagrams and passenger's side front impact sensor for communication fault
B1195-95	Passenger Side Frontal Acceleration Sensor - Incorrect assembly	Passenger's side front impact sensor incorrect assembly	- Check passenger's side front impact sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1195-96	Passenger Side Frontal Acceleration Sensor - Component internal failure	Passenger's side front impact sensor internal fault	Refer to electrical circuit diagrams and check passenger's side front impact sensor
B1196-11	Driver Side Second Row Peripheral Acceleration Sensor - Circuit short to ground	Driver's side rear side impact sensor circuit short circuit to ground	Refer to the electrical circuit diagrams and check driver's side rear side impact sensor circuit for short circuit to ground
B1196-12	Driver Side Second Row Peripheral Acceleration Sensor - Circuit short to battery	Driver's side rear side impact sensor circuit short circuit to power	Refer to the electrical circuit diagrams and check driver's side rear side impact sensor circuit for short circuit to power
B1196-19	Driver Side Second Row Peripheral Acceleration Sensor - Circuit current above threshold	Driver's side rear side impact sensor circuit current above threshold	Refer to electrical circuit diagrams and check driver's side rear side impact sensor circuit for swapped pins or cross coupling between two firing lines
B1196-4A	Driver Side Second Row Peripheral Acceleration Sensor - Incorrect component installed	Driver's side rear side impact sensor incorrect component installed	- Restraints control module detected a miss-match between the hardware fitted and what is expected - Check correct driver's side rear side impact sensor installed
B1196-87	Driver Side Second Row Peripheral Acceleration Sensor - Missing message	- Driver's side rear side impact sensor circuit open circuit - Driver's side rear side impact sensor internal fault	Refer to electrical circuit diagrams and check driver's side rear side impact sensor for communication fault
B1196-95	Driver Side Second Row Peripheral Acceleration Sensor - Incorrect assembly	Driver's side rear side impact sensor incorrect assembly	- Check driver's side rear side impact sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1196-96	Driver Side Second Row Peripheral Acceleration Sensor - Component internal failure	Driver's side rear side impact sensor internal fault	Refer to electrical circuit diagrams and check driver's side rear side impact sensor
B1197-11	Passenger Side Second Row Peripheral Acceleration Sensor - Circuit short to ground	Passenger's side rear side impact sensor circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's side rear side impact sensor circuit for short circuit to ground
B1197-12	Passenger Side Second Row Peripheral Acceleration Sensor - Circuit short to battery	Passenger's side rear side impact sensor circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's side rear side impact sensor circuit for short circuit to power
B1197-19	Passenger Side Second Row Peripheral Acceleration Sensor - Circuit current above threshold	Passenger's side rear side impact sensor circuit current above threshold	Refer to electrical circuit diagrams and check passenger's side rear side impact sensor circuit for swapped pins or cross coupling between two firing lines

DTC	Description	Possible Cause	Action
B1197-4A	Passenger Side Second Row Peripheral Acceleration Sensor - Incorrect component installed	Passenger's side rear side impact sensor incorrect component installed	- Restraints control module detected a miss-match between the hardware fitted and what is expected - Check correct passenger's side rear side impact sensor installed
B1197-87	Passenger Side Second Row Peripheral acceleration Sensor - Missing message	- Passenger's side rear side impact sensor circuit open circuit - Passenger's side rear side impact sensor internal fault	Refer to electrical circuit diagrams and check passenger's side rear side impact sensor for communication fault
B1197-95	Passenger Side Second Row Peripheral Acceleration Sensor - Incorrect assembly	Passenger's side rear side impact sensor incorrect assembly	- Check passenger's side rear side impact sensor installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1197-96	Passenger Side Second Row Peripheral Acceleration Sensor - Component internal failure	Passenger's side rear side impact sensor internal fault	Refer to electrical circuit diagrams and check passenger's side rear side impact sensor
B1A55-11	Crash Record Output - Circuit short to ground	Event signal circuit short circuit to ground	Refer to the electrical circuit diagrams and check event signal circuit for short circuit to ground
B1A55-12	Crash Record Output - Circuit short to battery	Event signal circuit short circuit to power	Refer to the electrical circuit diagrams and check event signal circuit for short circuit to power
B1D74-11	Passenger Airbag Cutoff Enable Switch - Circuit short to ground	Passenger's air bag deactivation switch circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's air bag deactivation switch circuit for short circuit to ground
B1D74-12	Passenger Airbag Cutoff Enable Switch - Circuit short to battery	Passenger's air bag deactivation switch circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's air bag deactivation switch circuit for short circuit to power
B1D74-13	Passenger Airbag Cutoff Enable Switch - Circuit open	Passenger's air bag deactivation switch circuit open circuit	Refer to the electrical circuit diagrams and check passenger's air bag deactivation switch circuit for open circuit
B1D74-19	Passenger Airbag Cutoff Enable Switch - Circuit current above threshold	Passenger's air bag deactivation switch circuit current above threshold	Refer to electrical circuit diagrams and check passenger's air bag deactivation switch circuit for swapped pins or cross coupling between two firing lines
B1D74-1E	Passenger Airbag Cutoff Enable Switch - Circuit resistance out of range	Passenger's air bag deactivation switch circuit resistance out of range	Refer to the electrical circuit diagrams and check passenger's air bag deactivation switch for resistance out of range
B1D74-95	Passenger Airbag Cutoff Enable Switch - Incorrect assembly	Passenger's air bag deactivation switch incorrect assembly	- Check passenger's air bag deactivation switch installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
B1D75-11	Passenger Airbag Cutoff Disable Switch - Circuit short to ground	Passenger's air bag deactivation switch circuit short circuit to ground	Refer to the electrical circuit diagrams and check passenger's air bag deactivation switch circuit for short circuit to ground
B1D75-12	Passenger Airbag Cutoff Disable Switch - Circuit short to battery	Passenger's air bag deactivation switch circuit short circuit to power	Refer to the electrical circuit diagrams and check passenger's air bag deactivation switch circuit for short circuit to power
B1D75-13	Passenger Airbag Cutoff Disable Switch - Circuit open	Passenger's air bag deactivation switch circuit open circuit	Refer to the electrical circuit diagrams and check passenger's air bag deactivation switch circuit for open circuit
B1D75-19	Passenger Airbag Cutoff Disable Switch - Circuit current above threshold	Passenger's air bag deactivation switch circuit current above threshold	Refer to electrical circuit diagrams and check passenger's air bag deactivation switch circuit for swapped pins or cross coupling between two firing lines

DTC	Description	Possible Cause	Action
B1D75-1E	Passenger Airbag Cutoff Disable Switch - Circuit resistance out of range	Passenger's air bag deactivation switch circuit resistance out of range	Refer to the electrical circuit diagrams and check passenger's air bag deactivation switch for resistance out of range
B1D75-95	Passenger Airbag Cutoff Disable Switch - Incorrect assembly	Passenger's air bag deactivation switch incorrect assembly	- Check passenger's air bag deactivation switch installed correctly - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required
U0001-88	High Speed CAN Communication Bus - Bus off	High speed CAN bus circuit fault	- Refer to the electrical circuit diagrams and check the power and ground connections to the module - Using the manufacturer approved diagnostic system, complete a CAN network integrity test - Refer to the electrical circuit diagrams and check the CAN network
U0140-00	Lost Communication With Body Control Module - No sub type information	Lost communication with body control module	- Refer to the electrical circuit diagrams and check the power and ground connections to the module - Using the manufacturer approved diagnostic system, complete a CAN network integrity test - Refer to the electrical circuit diagrams and check the CAN network between the restraints control module and body control module
U0154-00	Lost Communication With Restraints Occupant Classification System Module - No sub type information	Lost communication with restraints occupant classification system module	- Refer to the electrical circuit diagrams and check the power and ground connections to the module - Using the manufacturer approved diagnostic system, complete a CAN network integrity test - Refer to the electrical circuit diagrams and check the CAN network between the restraints control module and restraints occupant classification system module
U0300-00	Internal Control Module Software Incompatibility - No sub type information	Restraints control module is not configured correctly	Using the manufacturer approved diagnostic system check and install latest relevant level of software to the restraints control module
U0455-64	Invalid Data Received From Restraints Occupant Classification System Module - Signal plausibility failure	Restraints occupant classification system module configuration error	Using the manufacturer approved diagnostic system check and install latest relevant level of software to the restraints occupant classification module
U0455-92	Invalid Data Received From Restraints Occupant Classification System Module - Performance or incorrect operation	Restraints occupant classification system module internal failure	Refer to the electrical circuit diagrams and check for restraints occupant classification system module internal fault and check for stored DTCs
U0455-94	Invalid Data Received From Restraints Occupant Classification System Module - Unexpected operation	Restraints occupant classification system module unexpected operation	Using the manufacturer approved diagnostic system check and install latest relevant level of software to the restraints occupant classification module
U2100-00	Initial Configuration Not Complete - No sub type information	Restraints control module is not configured correctly	Using the manufacturer approved diagnostic system check and install latest relevant level of software to the restraints occupant classification module
U2101-00	Control Module Configuration Incompatible - No sub type information	Restraints control module is not configured correctly	- Using the manufacturer approved diagnostic system check and install latest relevant level of software to the restraints control module - Using the manufacturer approved diagnostic system check and up-date the car configuration file as required. Clear the DTC and re-test
U3000-49	Control Module - Internal electronic failure	Restraints control module internal electronic failure	- Restraints control module internal fault - 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

DTC	Description	Possible Cause	Action
U3003-62	Battery Voltage - Signal compare failure	● Restraints control module measured voltage is 2.5v lower than battery voltage	● Refer to the electrical circuit diagrams and check input voltage to the restraints control module compared to battery voltage
U3006-17	Control Module Input Power 'A' - Circuit voltage above threshold	● Restraints control module circuit supply voltage above threshold	● Refer to the electrical circuit diagrams and check for high input voltage to the restraints control module
U3006-68	Control Module Input Power 'A' - Event information	● Restraints control module circuit supply voltage below threshold	● Refer to the electrical circuit diagrams and check for low input voltage to the restraints control module
U3008-13	Control Module Ground 'A' - Circuit open	● Restraints control module ground supply open circuit	● Refer to the electrical circuit diagrams and check the ground supply for open circuit to the restraints control module

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General Information - Diagnostic Trouble Code (DTC) Index **DTC: Steering Angle Sensor Module (SASM)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the anti lock control stability system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Anti-Lock Control - Stability Assist](#) (206-09C Anti-Lock Control - Stability Assist, Description and Operation).

Steering Angle Sensor Module

DTC	Description	Possible Cause	Action
U0001-00	High Speed CAN Communication Bus General Failure Information No sub type information	• Bus Off	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
U0140-00	Lost Communication With Central electronic module General Failure Information No sub type information	• Lost communication with CJB	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system
U0300-00	Internal Control Module Software Incompatibility General Failure Information No sub type information	• CAN Bus fault • Loss of power to module • Incorrect component installed • Module internal failure	Carry out CAN network and power feed tests using manufacturer approved diagnostic system. Check correct steering wheel rotation sensor is installed. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-04	Control Module General Failure Information System Internal Failures	• CAN Bus fault • Loss of power to module • Incorrect component installed • Module internal failure	Carry out CAN network and power feed tests using manufacturer approved diagnostic system. Check correct steering wheel rotation sensor is installed. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-14	Control Module General Electrical Failures Circuit short to ground or open	• Loss of power to module • Module internal failure	Carry out power feed tests using manufacturer approved diagnostic system. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-1D	Control Module General Electrical Failures Circuit current out of range	• Loss of power to module • Module internal failure	Carry out power feed tests using manufacturer approved diagnostic system. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-44	Control Module System Internal Failures Data memory failure	• Module internal failure	Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-48	Control Module System Internal Failures Supervision software failure	• Module internal failure	Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-49	Control Module System Internal Failures Internal electronic failure	• Loss of power to module • Module internal failure	Carry out power feed tests using manufacturer approved diagnostic system. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-61	Control Module Algorithm Based Failures Signal calculation failure	• Steering wheel rotation sensor mis-aligned • Module internal failure	Check for correct installation of sensor. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.

DTC	Description	Possible Cause	Action
U3000-62	Control Module Algorithm Based Failures Signal compare failure	- Steering wheel rotation sensor mis-aligned - Module internal failure	Check for correct installation of sensor. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-64	Control Module Algorithm Based Failures Signal plausibility failure	- Steering wheel rotation sensor mis-aligned - Module internal failure	Check for correct installation of sensor. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-81	Control Module Bus Signal / Message Failures Invalid serial data received	- Loss of power to module - CAN Bus fault - Module internal failure	Carry out CAN network and power feed tests using manufacturer approved diagnostic system. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3000-87	Control Module Bus Signal / Message Failures Missing message	- Loss of power to module - CAN Bus fault - Missing module	Carry out CAN network and power feed tests using manufacturer approved diagnostic system. Check for missing modules on CAN network
U3000-92	Control Module Component Failures Performance or incorrect operation	- Steering wheel rotation sensor mis-aligned - Module internal failure	Check for correct installation of sensor. Install a new steering wheel rotation sensor as required, refer to new module/component installation note at the top of the DTC Index.
U3003-62	Battery Voltage Algorithm Based Failures Signal compare failure	Mis-match in battery voltage, of 2 volts or more, between CJB and steering wheel rotation sensor module	Carry out the pinpoint tests associated to this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Satellite Digital Audio Radio System Module (SARM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the satellite radio system, refer to the relevant Description and Operation section in the workshop manual.

For additional information, refer to: [Audio System](#) (415-01 Information and Entertainment System, Description and Operation).

Satellite Radio Module (SRM)

DTC	Description	Possible Cause	Action
B1A89-11	Satellite antenna	SDARS antenna circuit - short to ground	Refer to electrical circuit diagrams and check SDARS antenna circuit for short to ground
B1A89-12	Satellite antenna	SDARS antenna circuit - short to power	Refer to electrical circuit diagrams and check SDARS antenna circuit for short to power
B1A89-13	Satellite antenna	SDARS antenna circuit - open circuit	Refer to electrical circuit diagrams and check SDARS antenna circuit for open circuit
U3000-04	Control module	System internal failure	Install a new satellite radio module. For additional information, refer to: Satellite Radio Tuner (415-01 Information and Entertainment System, Removal and Installation).
U3000-4A	Control module	Incorrect component installed	Install a new satellite radio module. For additional information, refer to: Satellite Radio Tuner (415-01 Information and Entertainment System, Removal and Installation). or Re-configure the satellite radio module using the manufacturer approved diagnostic system
U3000-55	Control module	Incorrect Car Configuration File data received	Check/up-date Car Configuration File using manufacturer approved diagnostic system
U3000-87	Control module	Missing message	Check CJB for DTCs and refer to DTC Index. For additional information, refer to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing). Check information and entertainment module for Car Configuration File and MOST network DTCs and refer to relevant DTC Index. Carry out MOST/CAN network tests using the manufacturer approved diagnostic system
U3000-98	Control module	Component or system over temperature	Check for additional DTCs and refer to relevant DTC Index. Check/monitor system for re-occurrence
U3003-62	Battery voltage	Mis-match in battery voltage, of 2 volts or more, between satellite radio module and CJB	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) IndexDTC: Transmission Control Module (TCM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the transmission control system, refer to the relevant Description and Operation section in the workshop manual. For additional information, refer to: [Transmission Description](#) (307-01 Automatic Transmission/Transaxle, Description and Operation).

Transmission control module (TCM)

DTC	Description	Possible Cause	Action
P0218-68	Transmission fluid overtemperature condition	• Transmission fluid level low • Transmission fluid cooler/hoses are obstructed/damaged/blocked. • Mechanical fault in the transmission	Check the transmission fluid level and condition. Check the transmission fluid cooler/hoses for signs of obstruction/damage/blockage. Rectify as necessary. Refer to the warranty policy and procedures manual if the transmission is suspect.
P0500-00	Vehicle speed sensor A (output shaft speed sensor)	• Vehicle speed sensor A circuit: short circuit to ground • Vehicle speed sensor A circuit: open circuit • Vehicle speed sensor A fault	Check the vehicle speed sensor A and circuits. Refer to the electrical guides. Rectify as necessary.
P056-100	System voltage unstable	• Battery fault • Charging system fault	Check the battery and charging systems. Refer to the electrical guides. Rectify as necessary.
P0562-00	System voltage low	• Battery fault • Charging system fault	
P0601-00	Internal control module memory checksum error	• Internal transmission control module (TCM) fault	Reconfigure the module using the approved diagnostic system.
P0603-00	Internal control module keep alive memory (KAM) error	• Internal transmission control module (TCM) fault	Refer to the warranty policy and procedures manual if the TCM is suspect.
P0604-00	Internal control module random access memory (RAM) error	• Internal transmission control module (TCM) fault	
P0605-00	Internal control module read only memory (ROM) error	• Internal transmission control module (TCM) fault	
P0614-00	Engine control module (ECM)/transmission control module (TCM) incompatible	• Incorrect software in TCM	Reconfigure the module using the approved diagnostic system.
P062F-00	Internal control module electrically erasable programmable read only memory (EEPROM) error	• Internal transmission control module (TCM) fault	Refer to the warranty policy and procedures manual if the TCM is suspect.
P0705-00	Transmission range sensor A circuit (PRNDL input)	• Incorrect adjustment of the gear selector lever cable • Incorrect adjustment of the gear position sensor • Internal transmission control module (TCM) fault	Check the adjustment of the gear selector lever cable and sensor. For additional information, refer to: Selector Lever Cable Adjustment (307-05 Automatic Transmission/Transaxle External Controls, General Procedures). Refer to the warranty policy and procedures manual if the TCM is suspect.
P0706-00	Transmission range sensor A circuit range/performance	• Incorrect adjustment of the gear selector lever cable • Incorrect adjustment of the gear position sensor • Internal transmission control module (TCM) fault	Check the adjustment of the gear selector lever cable. For additional information, refer to: Selector Lever Cable Adjustment (307-05 Automatic Transmission/Transaxle External Controls, General Procedures). Refer to the warranty policy and procedures manual if the TCM is suspect.

DTC	Description	Possible Cause	Action
		module (TCM) fault	General Procedures). Calibrate the gear position sensor using the approved diagnostic system. Refer to the warranty policy and procedures manual if the TCM is suspect.
P0709-00	Transmission range sensor A circuit intermittent	- Incorrect adjustment of the gear selector lever cable - Incorrect adjustment of the gear position sensor - Internal transmission control module (TCM) fault	
P0711-00	Transmission fluid temperature sensor A circuit range/performance	- Transmission fluid temperature sensor circuit: high resistance in terminals - Transmission fluid temperature sensor fault	Check the transmission fluid temperature sensor and circuits. Refer to the electrical guides. Rectify as necessary.
P0712-00	Transmission fluid temperature sensor A circuit low	- Transmission fluid temperature sensor circuit: short circuit to ground - Transmission fluid temperature sensor circuit: open circuit	
P0713-00	Transmission fluid temperature sensor A circuit high	Transmission fluid temperature sensor circuit: short circuit to power	
P0715-00	Turbine/Input shaft speed (ISS) sensor A circuit	Transmission ISS circuit: short circuit to power	Check the transmission ISS sensor and circuits. Refer to the electrical guides. Install a new ISS sensor as necessary. For additional information, refer to: (307-01 Automatic Transmission/Transaxle) Input Shaft Speed (ISS) Sensor - I6 3.2L Petrol (Removal and Installation), Input Shaft Speed (ISS) Sensor - TD4 2.2L Diesel (Removal and Installation).
P0716-00	Turbine/Input shaft speed (ISS) sensor A circuit range/performance	- Transmission ISS sensor circuit: high resistance in terminals - Transmission ISS sensor fault	
P0718-00	Turbine/input shaft speed (ISS) sensor A circuit intermittent	- Transmission ISS sensor circuit: intermittent high resistance in terminals - Transmission ISS sensor fault	
P0720-00	Output shaft speed (OSS) sensor circuit (vehicle speed sensor A circuit)	OSS sensor circuit: short circuit to power	Check the transmission OSS sensor and circuits. Refer to the electrical guides. Rectify as necessary.
P0721-00	Output shaft speed (OSS) sensor circuit (vehicle speed sensor A circuit) range/performance	- The wheel radius does not agree with the wheel radius programmed in the car configuration file - OSS sensor not installed correctly - OSS sensor circuit: high resistance in terminals - OSS sensor fault	Check that the correct wheels and tires are installed. Check the transmission OSS sensor for correct installation. Check the OSS sensor and circuits. Refer to the electrical guides. Rectify as necessary.
P0722-00	Output shaft speed (OSS) sensor circuit (vehicle speed sensor A circuit) no signal	- OSS sensor circuit: high resistance in terminals - OSS sensor circuit: open circuit - OSS sensor circuit: short circuit to ground - OSS sensor fault - Internal transmission control module (TCM) fault	Check the transmission OSS sensor and circuits. Refer to the electrical guides. Rectify as necessary. Refer to the warranty policy and procedures manual if the TCM is suspect.
P0723-00	Output shaft speed (OSS) sensor circuit (vehicle speed sensor A circuit) intermittent	- OSS sensor not installed correctly - OSS sensor circuit: intermittent high resistance in terminals - OSS sensor fault - Internal transmission control module (TCM) fault	Check the transmission OSS sensor for correct installation. Check the OSS sensor and circuits. Refer to the electrical guides. Rectify as necessary. Refer to the warranty policy and procedures manual if the TCM is suspect.
P0725-00	Engine speed input circuit	- Controller area network (CAN) circuit: open circuit - CAN circuit: short circuit to ground - CAN module fault	Carry out a complete vehicle read for CAN related DTCs. Rectify as necessary.
P0729-00	Gear 6 incorrect ratio	- Contact resistance in the terminals - Solenoid regulating incorrectly - Mechanical fault in transmission - transmission components worn and	Carry out a complete read for related engine torque DTCs. Check transmission fluid level and condition. Refer to the warranty policy and procedures manual if the transmission is suspect.

DTC	Description	Possible Cause	Action
		causing slip or system pressure too low	
P0730-00	Incorrect gear ratio	Internal malfunction of the transmission	Refer to the warranty policy and procedures manual if the transmission is suspect.
P0730-95	Incorrect gear ratio - incorrect assembly	Incorrect final gear installed	Check transmission units part numbers. Refer to the warranty policy and procedures manual if the transmission is suspect.
P0731-00	Gear 1 incorrect ratio	- Contact resistance in the terminals - Solenoid regulating incorrectly - Mechanical fault in transmission - transmission components worn and causing slip or system pressure too low	Carry out a complete read for related engine torque DTCs. Check transmission fluid level and condition. Refer to the warranty policy and procedures manual if the transmission is suspect.
P0732-00	Gear 2 incorrect ratio	- Contact resistance in the terminals - Solenoid regulating incorrectly - Mechanical fault in transmission - transmission components worn and causing slip or system pressure too low	
P0733-00	Gear 3 incorrect ratio	- Contact resistance in the terminals - Solenoid regulating incorrectly - Mechanical fault in transmission - transmission components worn and causing slip or system pressure too low	
P0734-00	Gear 4 incorrect ratio	- Contact resistance in the terminals - Solenoid regulating incorrectly - Mechanical fault in transmission - transmission components worn and causing slip or system pressure too low	
P0735-00	Gear 5 incorrect ratio	- Contact resistance in the terminals - Solenoid regulating incorrectly - Mechanical fault in transmission - transmission components worn and causing slip or system pressure too low	
P0736-00	Reverse gear incorrect ratio	- Internal malfunction in the transmission control system - Mechanical fault in transmission. Transmission components worn and causing slip or system pressure too low - Fluid level low/condition poor	
P073D-00	Unable to engage neutral	- Contact resistance in the terminals - Solenoids stuck in the on/off position. - Mechanical fault in the transmission	Check transmission fluid level and condition. Refer to the warranty policy and procedures manual if the transmission is suspect.
P073E-64	Unable to engage reverse	- Contact resistance in the terminals - Solenoids stuck in the on/off position. - Mechanical fault in the transmission	

DTC	Description	Possible Cause	Action
P073F-00	Unable to engage gear 1	● Contact resistance in the terminals ● Solenoids stuck in the on/off position. ● Mechanical fault in the transmission	
P0741-00	Torque converter clutch solenoid circuit performance/stuck off	● Contact resistance in the terminals ● Torque converter clutch lock up control solenoid (SLU) circuit: short circuit to ground ● Torque converter clutch lock up control solenoid (SLU) circuit: short circuit to power ● Torque converter clutch lock up control solenoid (SLU) circuit: open circuit ● Torque converter clutch lock up solenoid (SLU) stuck in off position ● Internal transmission control module (TCM) fault	Refer to the warranty policy and procedures manual if the transmission or the TCM is suspect.
P0742-00	Torque converter clutch solenoid circuit stuck on	● Contact resistance in the terminals ● Torque converter clutch lock up control solenoid (SLU) circuit: short circuit to ground ● Torque converter clutch lock up control solenoid (SLU) circuit: short circuit to power ● Torque converter clutch lock up control solenoid (SLU) circuit: open circuit ● Torque converter clutch lock up solenoid (SLU) stuck in on position ● Internal transmission control module (TCM) fault	
P0744-68	Torque converter clutch solenoid circuit intermittent	● Engine stalled ● Mechanical fault in engine	
P074A-00	Unable to engage gear 2	● Contact resistance in the terminals ● Solenoids stuck in the on/off position ● Mechanical fault in the transmission	Check transmission fluid level and condition. Refer to the warranty policy and procedures manual if the transmission is suspect.
P074B-00	Unable to engage gear 3	● Contact resistance in the terminals ● Solenoids stuck in the on/off position ● Mechanical fault in the transmission	
P074C-00	Unable to engage gear 4	● Contact resistance in the terminals ● Solenoids stuck in the on/off position ● Mechanical fault in the transmission	
P074D-00	Unable to engage gear 5	● Contact resistance in the terminals ● Solenoids stuck in the on/off position ● Mechanical fault in the transmission	
P074E-00	Unable to engage gear 6	● Contact resistance in the terminals ● Solenoids stuck in the on/off position ● Mechanical fault in the transmission	
P0777-00	Pressure control solenoid B stuck on	● Shift solenoid No. 2 stuck in the on position	

DTC	Description	Possible Cause	Action
P0814-42	Transmission range display circuit - general memory failure	- Internal transmission control module (TCM) fault - Internal gear selector module (GSM) fault	Refer to the warranty policy and procedures manual if a module is suspect.
P0814-49	Transmission range display circuit - internal electronic failure	- Internal transmission control module (TCM) fault - Internal gear selector module (GSM) fault	
P0817-11	Starter disable circuit open	- Start lock output control circuit: short circuit to ground - Start lock output control circuit: open circuit	Check the starter disable circuits. Refer to the electrical guides. Rectify as necessary.
P0817-12	Starter disable circuit open	Start lock output control circuit: short circuit to power	
P081C-49	Park input circuit - internal electronic failure	- Internal transmission control module (TCM) fault - Internal gear selector module (GSM) fault	Refer to the warranty policy and procedures manual if a module is suspect.
P0826-01	Up and down switch circuit	- Internal transmission control module (TCM) fault - Internal gear selector module (GSM) fault	Refer to the warranty policy and procedures manual if a module is suspect.
P085A-00	Gear shift module B communication circuit	Local interconnect network (LIN) circuit fault between the gear selector module (GSM) and transmission control module (TCM)	Check the local interconnect network (LIN) circuits. Refer to the electrical guides. Rectify as necessary.
P0860-11	Gear shift module A communication circuit	Local interconnect network (LIN) circuit fault between the gear selector module (GSM) and transmission control module (TCM)	Check the local interconnect network (LIN) circuits. Refer to the electrical guides. Rectify as necessary.
P0860-12	Gear shift module A communication circuit	Local interconnect network (LIN) circuit fault between the gear selector module (GSM) and transmission control module (TCM)	
P0860-13	Gear shift module A communication circuit	Local interconnect network (LIN) circuit fault between the gear selector module (GSM) and transmission control module (TCM)	
P0860-87	Gear shift module A communication circuit - missing message	Local interconnect network (LIN) circuit fault between the gear selector module (GSM) and transmission control module (TCM)	
P0885-13	Transmission control module (TCM) power relay control circuit open	- TCM power relay control circuit: open circuit - TCM power relay fault	Check the TCM relay and circuits. Refer to the electrical guides. Rectify as necessary.
P0886-11	Transmission control module (TCM) power relay control circuit low	- TCM power relay control circuit: short circuit to ground - TCM power relay fault	
P0894-68	Transmission component slipping	- Transmission fluid level low - Mechanical fault in the transmission	Carry out a complete read for related DTCs. Rectify as necessary. Check the transmission fluid level and condition. Rectify as necessary. Refer to the warranty policy and procedures manual if the transmission is suspect.
P0895-00	Shift time too short	- Internal transmission control fault (TCM) - Hydraulic fault in the transmission	Refer to the warranty policy and procedures manual if the transmission or a module is suspect.
P0896-00	Shift time too long	- Internal transmission control fault (TCM) - Hydraulic fault in the transmission	

DTC	Description	Possible Cause	Action
P0897-09	Transmission fluid deteriorated	Transmission fluid no longer serviceable	Drain and refill the transmission with fresh fluid. For additional information, refer to: (307-01 Automatic Transmission/Transaxle) Transmission Fluid Drain and Refill - I6 3.2L Petrol (General Procedures), Transmission Fluid Drain and Refill - TD4 2.2L Diesel (General Procedures).
P0928-13	Gear shift lock solenoid circuit open	- Gear shift lock solenoid circuit: open circuit - Gear shift lock solenoid fault	Check the gear shift lock solenoid and circuits. Refer to the electrical guides. Rectify as necessary.
P0930-11	Gear shift lock solenoid circuit low	- Gear shift lock solenoid circuit: short circuit to ground - Gear shift lock solenoid fault	
P0931-12	Gear shift lock solenoid circuit high	- Gear shift lock solenoid circuit: short circuit to power - Gear shift lock solenoid fault	
P0960-00	Pressure control solenoid A control circuit open	- Line pressure control solenoid (SLT) circuit: short circuit to ground - Line pressure control solenoid (SLT) circuit: open circuit - Line pressure control solenoid (SLT) fault	Refer to the warranty policy and procedures manual if the transmission is suspect.
P0961-00	Pressure control solenoid A control circuit range/performance	- Line pressure control solenoid (SLT) circuit: short circuit to ground - Line pressure control solenoid (SLT) circuit: open circuit - Line pressure control solenoid (SLT) circuit: short circuit to power - Line pressure control solenoid (SLT) fault	
P0963-00	Pressure control solenoid A control circuit high	- Line pressure control solenoid (SLT) circuit: short circuit to power - Line pressure control solenoid (SLT) fault	
P0964-00	Pressure control solenoid B control circuit open	- Torque converter clutch lock up control solenoid (SLU) circuit: short circuit to ground - Torque converter clutch lock up control solenoid (SLU) circuit: open circuit - Torque converter clutch lock up control solenoid (SLU) fault	Refer to the warranty policy and procedures manual if the transmission is suspect.
P0965-00	Pressure control solenoid B control circuit range/performance	- Torque converter clutch lock up control solenoid (SLU) circuit: short circuit to ground - Torque converter clutch lock up control solenoid (SLU) circuit: open circuit - Torque converter clutch lock up control solenoid (SLU) circuit: short circuit to power - Torque converter clutch lock up control solenoid (SLU) fault	
P0967-00	Pressure control solenoid B control circuit high	- Torque converter clutch lock up control solenoid (SLU) circuit: short circuit to power - Torque converter clutch lock up control solenoid (SLU) fault	
P0969-00	Pressure control solenoid C control circuit range/performance	- C2 Pressure control solenoid (SLC2) circuit: short circuit to ground - C2 Pressure control solenoid (SLC2) circuit: open circuit - C2 Pressure control solenoid	Refer to the warranty policy and procedures manual if the transmission is suspect.

DTC	Description	Possible Cause	Action
		(SLC2) circuit: short circuit to power • C2 Pressure control solenoid (SLC2) fault	
P0970-00	Pressure control solenoid C control circuit low	• C2 Pressure control solenoid (SLC2) circuit: short circuit to ground • C2 Pressure control solenoid (SLC2) circuit: open circuit • C2 Pressure control solenoid (SLC2) fault	
P0971-00	Pressure control solenoid C control circuit high	• C2 Pressure control solenoid (SLC2) circuit: short circuit to power • C2 Pressure control solenoid (SLC2) fault	
P0973-00	Shift solenoid A control circuit low	• Shift solenoid No. 1 circuit: short circuit to ground • Shift solenoid No. 1 circuit: open circuit • Shift solenoid No. 1 fault	Refer to the warranty policy and procedures manual if the transmission is suspect.
P0974-00	Shift solenoid A control circuit high	• Shift solenoid No. 1 circuit: short circuit to power • Shift solenoid No. 1 fault	
P0976-00	Shift solenoid B control circuit low	• Shift solenoid No. 2 circuit: short circuit to ground • Shift solenoid No. 2 circuit: open circuit • Shift solenoid No. 2 fault	Refer to the warranty policy and procedures manual if the transmission is suspect.
P0977-00	Shift solenoid B control circuit high	• Shift solenoid No. 2 circuit: short circuit to power • Shift solenoid No. 2 fault	
P1783-68	Transmission overtemperature condition	• Transmission fluid level low • Transmission fluid cooler/hoses are obstructed/damaged/blocked. • Mechanical fault in the transmission • The transmission has been exposed to high load and high ambient temperature.	Check the transmission fluid level and condition. Check the transmission fluid cooler/hoses for signs of obstruction/damage/blockage. Rectify as necessary. Refer to the warranty policy and procedures manual if the transmission is suspect.
P1799-00	Controller area network (CAN) transmission control module (TCM)/anti-lock brake system (ABS) circuit malfunction	• CAN circuit fault (between ABS module (brake control module(BCM)) and TCM • ABS (BCM) module fault	Check the CAN circuits. Refer to the electrical guides. Rectify as necessary. Refer to the warranty policy and procedures manual if the ABS module (BCM) is suspect.
P2158-00	Vehicle Speed Sensor B (input shaft speed sensor (ISS))	• ISS sensor circuit: short circuit to ground • ISS sensor circuit: short circuit to power • ISS sensor circuit: open circuit • ISS sensor fault	Check the ISS sensor and circuits. Refer to the electrical guides. Install a new ISS sensor as necessary. For additional information, refer to: Input Shaft Speed (ISS) Sensor - I6 3.2L Petrol (307-01 Automatic Transmission/Transaxle, Removal and Installation) / Input Shaft Speed (ISS) Sensor - TD4 2.2L Diesel (307-01 Automatic Transmission/Transaxle, Removal and Installation).
P2719-00	Pressure control solenoid D control circuit range/performance	• Pressure control solenoid (SLC3) circuit: short circuit to ground • Pressure control solenoid (SLC3) circuit: open circuit • Pressure control solenoid (SLC3) circuit: short circuit to power • Pressure control solenoid (SLC3) fault	Refer to the warranty policy and procedures manual if the transmission is suspect.
P2720-00	Pressure control solenoid D control circuit low	• Pressure control solenoid (SLC3) circuit: short circuit to ground • Pressure control solenoid (SLC3) circuit: open circuit • Pressure control solenoid (SLC3) fault	

DTC	Description	Possible Cause	Action
P2721-00	Pressure control solenoid D control circuit high	- Pressure control solenoid (SLC3) circuit: short circuit to power - Pressure control solenoid (SLC3) fault	Refer to the warranty policy and procedures manual if the transmission is suspect.
P2728-00	Pressure control solenoid E control circuit range/performance	- Pressure control solenoid (SLB1) circuit: short circuit to ground - Pressure control solenoid (SLB1) circuit: open circuit - Pressure control solenoid (SLB1) circuit: short circuit to power - Pressure control solenoid (SLB1) fault	
P2729-00	Pressure control solenoid E control circuit low	- Pressure control solenoid (SLB1) circuit: short circuit to ground - Pressure control solenoid (SLB1) circuit: open circuit - Pressure control solenoid (SLB1) fault	
P2730-00	Pressure control solenoid E control circuit high	- Pressure control solenoid (SLB1) circuit: short circuit to power - Pressure control solenoid (SLB1) fault	
P2733-00	Pressure control solenoid F stuck on	- SLC1 solenoid has jammed - Mechanical faults in transmission	Refer to the warranty policy and procedures manual if the transmission is suspect.
P2737-00	Pressure control solenoid F control circuit range/performance	- Pressure control solenoid (SLC1) circuit: short circuit to ground - Pressure control solenoid (SLC1) circuit: open circuit - Pressure control solenoid (SLC1) circuit: short circuit to power - Pressure control solenoid (SLC1) fault	
P2738-00	Pressure control solenoid F control circuit low	- Pressure control solenoid (SLC1) circuit: short circuit to ground - Pressure control solenoid (SLC1) circuit: open circuit - Pressure control solenoid (SLC1) fault	
P2739-00	Pressure control solenoid F control circuit high	- Pressure control solenoid (SLC1) circuit: short circuit to power - Pressure control solenoid (SLC1) fault	
P2783-68	Torque converter temperature too high	- Transmission fluid level low - Transmission fluid cooler/hoses are obstructed/damaged/blocked. - Mechanical fault in the transmission - The transmission has been exposed to extreme load and high ambient temperature	Check the transmission fluid level and condition. Check the transmission fluid cooler/hoses for signs of obstruction/damage/blockage. Rectify as necessary. Refer to the warranty policy and procedures manual if the transmission is suspect.
P2787-68	Clutch temperature too high	- Transmission fluid level low - Transmission fluid cooler/hoses are obstructed/damaged/blocked. - Mechanical fault in the transmission - The transmission has been exposed to extreme load and high ambient temperature	Check the transmission fluid level and condition. Check the transmission fluid cooler/hoses for signs of obstruction/damage/blockage. Rectify as necessary. Refer to the warranty policy and procedures manual if the transmission is suspect.

DTC	Description	Possible Cause	Action
P2800-00	Transmission range sensor B circuit (PRNDL input)	- Incorrect adjustment of the gear selector lever cable - Internal transmission control module (TCM) fault	Check that the gear selector lever cable is correctly adjusted. For additional information, refer to: Selector Lever Cable Adjustment (307-05 Automatic Transmission/Transaxle External Controls, General Procedures). Refer to the warranty policy and procedures manual if the TCM is suspect
P2801-00	Transmission range sensor B circuit range/performance	- Incorrect adjustment of the gear selector lever cable - Internal transmission control module (TCM) fault	
P2805-00	Transmission range sensor A/B correlation	- Incorrect adjustment of the gear selector lever cable - Internal transmission control module (TCM) fault	
U0001-00	High speed controller area network (CAN) communication bus	- CAN circuit: open circuit - CAN circuit: short circuit to each other - CAN circuit: short circuit to power - CAN control module failure	Carry out a complete vehicle read for DTCs indicating a CAN or module fault. Rectify as necessary. Refer to the warranty policy and procedures manual if a module is suspect.
U0100-00	Lost communication with ECM "A"	- CAN circuit: open circuit - CAN circuit: short circuit to each other - CAN circuit: short circuit to power - CAN control module failure	Carry out a complete vehicle read for DTCs indicating a CAN or module fault. Rectify as necessary. Refer to the warranty policy and procedures manual if a module is suspect.
U0121-00	Controller area network (CAN) transmission control module (TCM)/anti-lock brake system (ABS) circuit malfunction no communication	- CAN circuit: open circuit - CAN circuit: short circuit to each other - CAN circuit: short circuit to power - CAN control module failure	Carry out a complete vehicle read for DTCs indicating a CAN or module fault. Rectify as necessary. Refer to the warranty policy and procedures manual if a module is suspect.
U0300-00	Internal control module software incompatibility	- Incorrect controller area network (CAN) configuration ID - incorrect hardware/software level	Check that the modules are correct for the vehicle and that the correct level of software is installed. Reconfigure the CAN system using the approved diagnostic system.
U0401-00	Invalid data received from engine control module (ECM)	Incorrect signal from the ECM	Carry out a complete vehicle read for DTCs indicating a controller area network (CAN) or ECM fault. Rectify as necessary. Refer to the warranty policy and procedures manual if the ECM is suspect.
U0415-00	Invalid data received from the anti-lock brake system (ABS) control module	- The engine control module (ECM) has the wrong code for the immobilizer - The ABS module (brake control module (BCM)) has the wrong code for the immobilizer - Transmission control module (TCM) fault	Reprogramme the modules as necessary. Refer to the warranty policy and procedures manual if a module is suspect.
U2100-00	Initial configuration not complete	- Controller area network (CAN) circuit fault - Initial central configuration has never been sent	Check for other controller area network (CAN) DTCs or apparently unrelated customer complaints. Carry out a complete vehicle DTC read. Check the CAN circuits. Refer to the electrical guides. Rectify as necessary. Clear the DTCs and test for normal operation. Check correct central car configuration software is installed. Reprogramme the module as necessary.
U2101-00	Control module configuration incompatible	Central car configuration parameter missing or corrupted	Check correct central car configuration software is installed. Reprogramme the module as necessary.
U2023-00	Engine torque signal	- Controller area network (CAN) circuit (between engine control module (ECM) and transmission control module (TCM)): open circuit - CAN circuit (between ECM and TCM): short circuit - CAN module fault	Carry out a complete read for related DTCs. Rectify as necessary. Check the CAN circuits. Refer to the electrical guides. Rectify as necessary.
U2105-11	Switch pack signal "A"	- Shift lock solenoid circuit fault: short circuit to ground - Gear selector module (GSM) fault	Check the GSM and circuits. Refer to the electrical guides. Rectify as necessary. Refer to the warranty policy and procedures manual if the GSM is suspect.

DTC	Description	Possible Cause	Action
U2105-12	Switch pack signal "A"	● Shift lock solenoid circuit fault: short circuit to power ● Gear selector module (GSM) fault	
U3003-62	Battery voltage	● Mis-match in voltage between battery and the transmission control module (TCM) - difference greater than 2 volts	Check the power supply circuit to the TCM. Refer to the electrical guides. Rectify as necessary.

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General Information - Diagnostic Trouble Code (DTC) IndexDTC: Trailer Module (TRM)

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the trailer module system, refer to the relevant Description and Operation section in the workshop manual. For additional information, refer to: [Exterior Lighting](#) (417-01 Exterior Lighting, Description and Operation).

Trailer module (TRM)

DTC	Description	Possible Cause	Action
C111A-11	Right Stop Lamp General Electrical Failures Circuit short to ground	Right stop lamp circuit - short to ground	Refer to electrical circuit diagrams and check right stop lamp circuit for short to ground
C111A-12	Right Stop Lamp General Electrical Failures Circuit short to battery	Right stop lamp circuit - short to power	Refer to electrical circuit diagrams and check right stop lamp circuit for short to power
C111B-11	Left Stop Lamp General Electrical Failures Circuit short to ground	Left stop lamp circuit - short to ground	Refer to electrical circuit diagrams and check left stop lamp circuit for short to ground
C111B-12	Left Stop Lamp General Electrical Failures Circuit short to battery	Left stop lamp circuit - short to power	Refer to electrical circuit diagrams and check left stop lamp circuit for short to power
C1120-11	Reversing lamp General Electrical Failures Circuit short to ground	Reverse lamp circuit - short to ground	Refer to electrical circuit diagrams and check reverse lamp circuit for short to ground
C1120-12	Reversing lamp General Electrical Failures Circuit short to battery	Reverse lamp circuit - short to power	Refer to electrical circuit diagrams and check reverse lamp circuit for short to power
C1126-11	Position Lamps General Electrical Failures Circuit short to ground	Position lamp circuit - short to ground	Refer to electrical circuit diagrams and check position lamp circuit for short to ground
C1126-12	Position Lamps General Electrical Failures Circuit short to battery	Position lamp circuit - short to power	Refer to electrical circuit diagrams and check position lamp circuit for short to power
B1102-62	Trailer stop lamp Algorithm Based Failures Signal compare failure	Input signal stop lamp from wire is inconsistent with CAN message	Check CJB for additional related DTCs and refer to relevant DTC Index. Carry out CAN network integrity tests using the manufacturer approved diagnostic system
B1A79-11	Rear Fog Lamp Circuit General Electrical Failures Circuit short to ground	Rear fog lamp circuit - short to ground	Refer to electrical circuit diagrams and check rear fog lamp circuit for short to ground
B1A79-12	Rear Fog Lamp Circuit General Electrical Failures Circuit short to battery	Rear fog lamp circuit - short to power	Refer to electrical circuit diagrams and check rear fog lamp circuit for short to power
B1D06-11	Left Turn Indicator General Electrical Failures Circuit short to ground	Left turn indicator lamp circuit - short to ground	Refer to electrical circuit diagrams and check left turn indicator lamp circuit for short to ground
B1D06-12	Left Turn Indicator General Electrical Failures Circuit short to battery	Left turn indicator lamp circuit - short to power	Refer to electrical circuit diagrams and check left turn indicator lamp circuit for short to power
B1D07-11	Right Turn Indicator General Electrical Failures Circuit short to ground	Right turn indicator lamp circuit - short to ground	Refer to electrical circuit diagrams and check right turn indicator lamp circuit for short to ground
B1D07-12	Right Turn Indicator General Electrical Failures Circuit short to battery	Right turn indicator lamp circuit - short to power	Refer to electrical circuit diagrams and check right turn indicator lamp circuit for short to power

DTC	Description	Possible Cause	Action
U0010-88	Medium Speed CAN Communication Bus Signal / Message Failures Bus off	Bus Off	Carry out CAN network integrity tests using the manufacturer approved diagnostic system
U0140-87	Lost Communication With Central electronic module Bus Signal / Message Failures Missing message	Missing message	Check CJB for DTCs and refer to the relevant DTC Index.
U0300-00	Internal Control Module Software Incompatibility General Failure Information No sub type information	Invalid configuration message is received	Re-configure the CJB using the manufacturer approved diagnostic system. Clear the DTC and retest. If the DTC is still logged suspect the trailer module, refer to the new module installation note at the top of the DTC Index
U0422-68	Invalid Data Received From Central electronic module Algorithm Based Failures	Event information	Check for additional related DTCs and refer to the relevant DTC Index
U1A03-81	Car Config Parameter Bus Signal / Message Failures	Invalid serial data received	Check/amend Car Configuration File (CCF) as required using the manufacturer approved diagnostic system. Carry out CAN network integrity tests using the manufacturer approved diagnostic system
U2100-51	Control Module Not Configured System Programming Failures	Not programmed	Install latest available level of software using the manufacturer approved diagnostic system. Check/amend Car Configuration File (CCF) as required using the manufacturer approved diagnostic system
U3000-42	Control Module System Internal Failures General memory failure	RAM or EEPROM memory test failed	Install a new module, refer to the new module/component installation note at the top of the DTC Index
U3000-51	Control Module System Programming Failures	Not programmed	Install latest available level of software using the manufacturer approved diagnostic system. Check/amend Car Configuration File (CCF) as required using the manufacturer approved diagnostic system
U3003-62	Battery Voltage Algorithm Based Failures Signal compare failure	Difference in battery voltage, of 2 volts more, between trailer module and CJB	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system

General Information - Diagnostic Trouble Code (DTC) Index **DTC: High Definition Radio Module (HDR)**

Description and Operation

- NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.
- NOTE: Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).
- NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.
- NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.
- NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

Description And Operation

For a detailed description of the cellular phone system, refer to the relevant Description and Operation section in the workshop manual. For additional information, refer to: [Audio System](#) (415-01 Information and Entertainment System, Description and Operation).

Digital Audio Control Module C (DACMC)

DTC	Description	Possible Cause	Action
B1A56-02	Antenna - general signal failure	Antenna general signal failure	Refer to the electrical guides and check the IBOC radio module circuit and the antenna for short to power, open circuit, high resistance. Clear the diagnostic trouble code and retest. If the diagnostic trouble code persists, check and install a new IBOC radio module, as required. 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
B1A56-11	Antenna - circuit short to ground	IBOC radio module or antenna circuit short to ground	Refer to the electrical guides and check the IBOC radio module circuit and the antenna for short circuit to ground
B1A56-12	Antenna - circuit short to battery	IBOC radio module or antenna circuit short to power	Refer to the electrical guides and check the IBOC radio module circuit and the antenna for short circuit to power
B1A56-13	Antenna - circuit open	IBOC radio module or antenna circuit open circuit	Refer to the electrical guides and check the IBOC radio module circuit and the antenna for open circuit
U200D-14	Control Module Output Power A - circuit short to ground or open	IBOC radio module power supply circuit short to ground or open circuit	Refer to the electrical guides and check the IBOC radio module diversity power circuit for short to ground, open circuit
U3000-04	Control Module - system internal failures	IBOC radio module internal failure	Renew the IBOC radio module
U3000-4A	Control Module - incorrect component installed	IBOC radio module internal incorrect component installed - The module has been installed to a vehicle not configured to accept it	Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module
U3000-55	Control Module - not configured	IBOC radio module not configured correctly	Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module
U3000-87	Control Module - missing message	Missing message	Using the manufacturer approved diagnostic system select the vehicle configuration main menu, select configure existing modules menu and program the module
U3000-98	Control Module - component or system over temperature	IBOC radio module component or system over temperature	Consider moving the IBOC radio module to prevent unit overheating. Cool the vehicle interior down by ensuring it is in the shade and have the A/C on cool. When cool, clear the diagnostic trouble code and retest
U3003-62	Battery Voltage - signal compare failure	Mismatch in battery voltage of 2 volts or more for longer than 1 minute, between the measured battery voltage at the IBOC radio module and the battery voltage signal sent from the rear junction box	Refer to the electrical guides and check that power supply voltage at IBOC radio module and rear junction box is not different by more than 2 volts. Rectify as required