



RECALL ACTION

Recall Action
Number: P017

Brake Vacuum Assistance System	Publication No.:	P017
	Model:	Discovery 3/LR3 – EU4 Vehicles Only
	Model Year:	2006-2009
	VIN Range:	LA367110 – LA513325
	Model:	Range Rover Sport – EU4 Vehicles Only
	Model Year:	2006-2009
	VIN Range:	LS929086 – LS999999 LS100000 – LS215618
Date of Issue:		30 July 2009

To:	The National Sales Companies and Importers in: Australia, Bulgaria, Canary Islands, Costa Rica, Croatia, Cyprus, Czech Republic, Finland, Gibraltar, Hungary, Israel, Italy, Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, South Korea, Spain, Turkey and the Ukraine
For the Attention of:	The Managing Director
Copies To:	The Service/Aftersales Director/Manager The Parts Director/Manager

Related Information:	Specific vehicles in the VIN ranges LA412125 – LA487033, LS100008 – LS181999, LS980310 - LS999998 are eligible for Recall Action P008 and P016 (Russia only) which must be carried out at the same time as this Recall Action.
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RE: Brake Vacuum Assistance System

Dear Colleagues

A concern has been identified on the above vehicles where oil is collecting in the brake booster causing a progressive loss of brake assistance, resulting in hard brake pedal and increased stopping distances for the same pedal effort. Engine oil in the brake master cylinder will lead to a loss of one or both of the foundation brake system hydraulic brake circuits and therefore increased brake pedal travel, increased stopping distances and, in the event of both primary and secondary brake master cylinder seal failure, a total loss of service brakes.

Temporary sticking of the non-return valve leads to a temporary loss of vacuum assistance on the braking system. The hydraulic braking system itself remains fully functional. Once the valve has unstuck the booster vacuum is immediately restored, full braking assistance is available, and the brakes perform normally for the remainder of that drive cycle.

Action to be taken

Land Rover has taken the decision to recall affected vehicles and you will be required to replace the brake booster vacuum pipe and check for oil in the brake booster. Where oil is detected in the brake booster, the brake booster and if necessary master cylinder will be replaced. For the workshop procedure see Appendix 1.

You are requested to contact owners of affected vehicles, following procedures that are appropriate to your market and as required by local legislation; requesting that the owner contact their nearest dealer, as soon as possible, to arrange for the vacuum pipe and valve to be replaced. A sample customer letter is attached as Appendix 2; the letter should be adapted to the requirements of your market.



Dealers are reminded that they should not sell vehicles identified as affected by a safety recall until such time as the safety recall has been successfully completed on affected vehicles.

Please check DDW to ensure that the vehicle is affected by this Recall Action prior to undertaking any rework action. DDW will be updated to reflect only those vehicles affected. Should you require a listing of the affected vehicles, please contact the Land Rover Field Actions team by e-mail at jlrcamp@jaguarlandrover.com. All overseas requests should be forwarded via the National Sales Company/Regional Office only.

At the time of confirming a booking for vehicle repair, please ensure you check DDW and that all outstanding Field Service Actions are identified to ensure the correct parts are available and adequate workshop time is allocated for repairs to be completed at one visit.

For information purposes, a Technical Question and Answer document is attached as Appendix 3.

Parts Information

The parts from Table 1 should be ordered from Land Rover Parts in the normal manner.

Table 1

Part No.	Description	Drive	Model	Variant	Qty
LR014528	Master Cylinder Kit	LHD	Both	All	1
LR014527	Master Cylinder Kit	RHD	Both	All	1
SJJ500090	Brake Booster Kit	Both	Discovery	All	1
SJJ500070	Brake Booster Kit	Both	RRS	Without Brembo Brakes	1
SJJ500080	Brake Booster Kit	Both	RRS	With Brembo Brakes	1
SIJ500040	Brake Fluid – 1Ltr	Both	Both	All	1
LR018674	Brake Booster Vacuum Pipe	LHD	Both	EU4	1
LR018673	Brake Booster Vacuum Pipe	RHD	Both	EU4	1

Warranty Information

Table 2 – SROs

Description	Trans.	SRO	Time
Check/replace vacuum pipe	Both	70.50.89.30	0.3
Check oil in brake booster and master cylinder	Both	70.50.89.31	0.1
Replace brake booster	Manual	70.50.01	1.1
Replace brake booster	Automatic	70.50.01	0.8
Replace master cylinder and brake booster	Manual	70.50.89.28	1.5
Replace master cylinder and brake booster	Automatic	70.50.89.28	1.3
Diagnose oil in brake booster - insufficient oil, re-fit original booster and master cylinder	Manual	70.50.89.32	0.6
Diagnose oil in brake booster - insufficient oil, re-fit original booster and master cylinder	Automatic	70.50.89.32	0.3
Drive in/drive out	Both	02.02.02	0.2

Warranty claims should be submitted quoting program code **P017** together with option code X. In this instance it will also be necessary to quote the relevant SROs and parts from Tables 1 and 2.

NOTE: The option that contains the drive in/drive out allowance may only be claimed when the vehicle has been brought back into the workshop for this action alone to be undertaken.



Warranty claims should be submitted in accordance with the current Land Rover Warranty Policy and Procedures Manual and its amendments unless stated otherwise in this Recall Action.


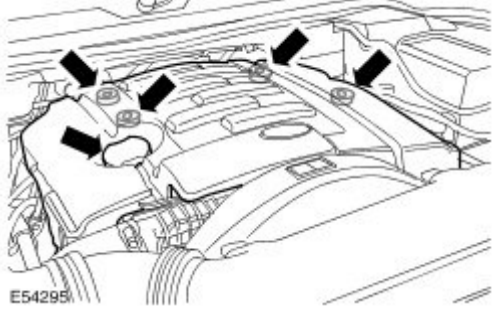
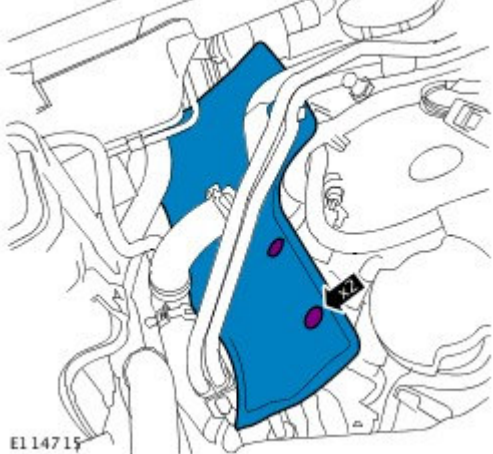

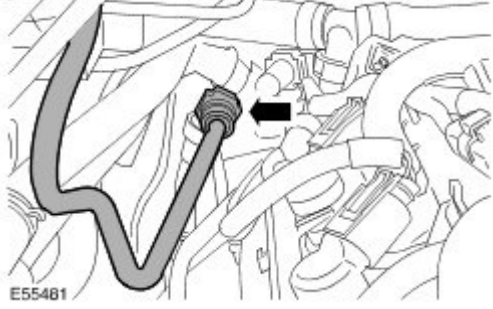

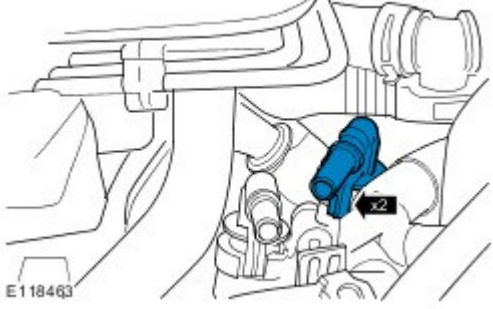
Yours faithfully

A handwritten signature in black ink, appearing to read "K Phelps".



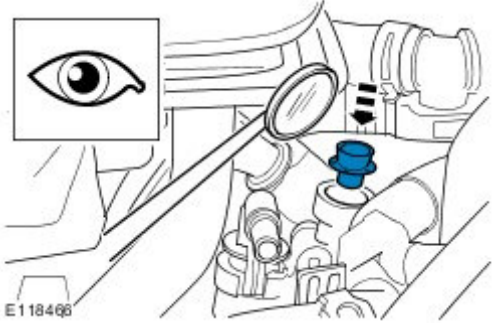




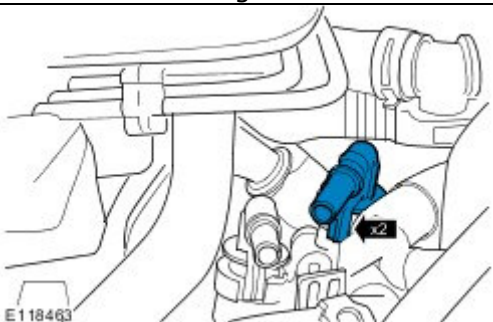
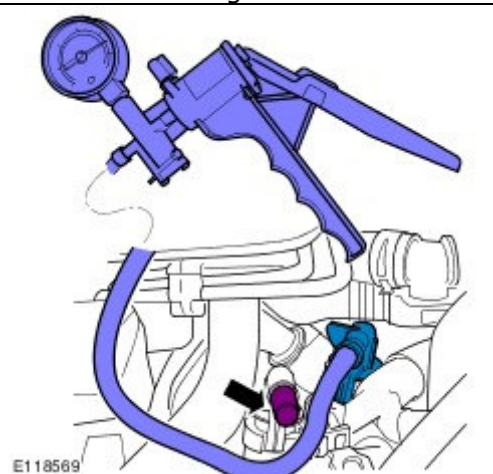


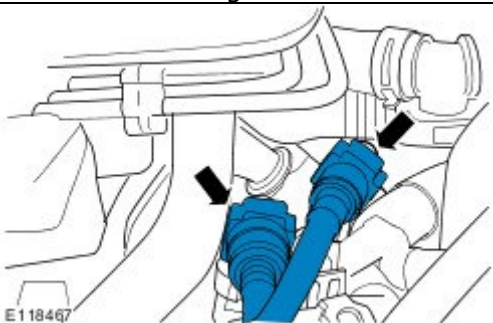
K Phelps
Director - Service Operations

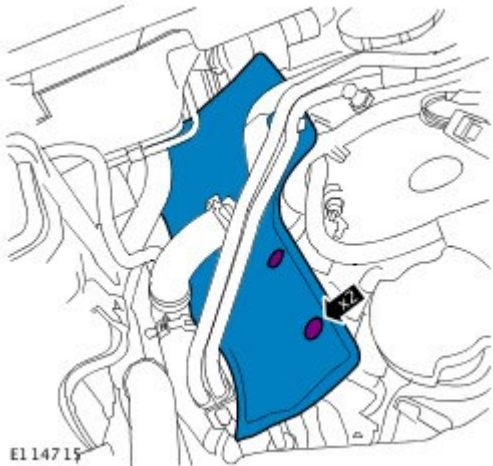
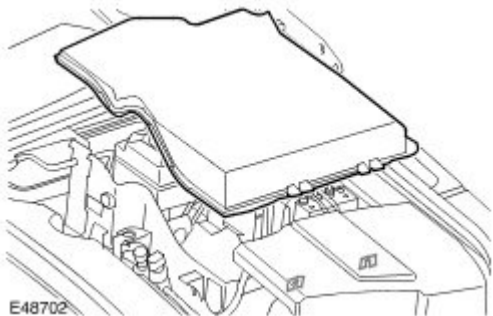
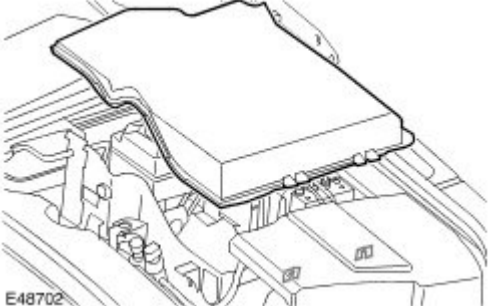
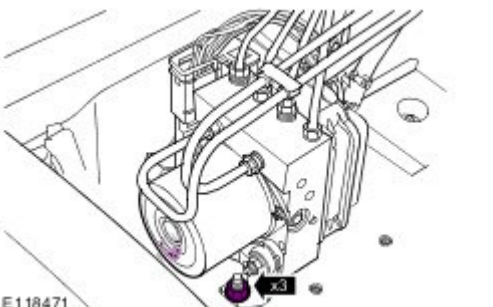
Attached **Appendix 1 – Workshop Procedure**
 Appendix 2 – Sample Customer Letter
 Appendix 3 – Technical Q & A

Appendix 1 – Workshop Procedure

Item	Description	
	Brake Booster Non-Return valve	
1	<p>CAUTION:  To avoid dirt or contamination entering the brake vacuum system ensure that prior to disconnection of the brake vacuum pipe and during the non return valve replacement the area around the brake vacuum pump is clean and clear of any debris.</p> <p>Pump the brake pedal until the brake vacuum assistance is exhausted.</p>	
2	<p>Remove the engine cover (see Fig. 1).</p> <ul style="list-style-type: none"> • Remove the oil filler cap. • Release the 4 clips. 	 <p>E54295</p>
Fig. 1		
3	<p>Remove the fuel injector sound proofing (see Fig. 2).</p>	 <p>E114715</p>
Fig. 2		
4	<p>CAUTION:  Always plug any open connections to prevent contamination.</p> <p>Disconnect the brake booster vacuum line from the brake vacuum pump (see Fig. 3).</p>	 <p>E55481</p>
Fig. 3		
5	<p>CAUTION:  Failure to follow this instruction may cause damage to the vehicle.</p> <p>Remove and discard the brake vacuum pump upper inlet valve spigot (see Fig. 4).</p> <ul style="list-style-type: none"> • Release the 2 clips. 	 <p>E118463</p>
Fig. 4		

6	Remove and discard the brake vacuum pump inlet valve spring, ball and washer (see Fig. 5).	<p>E118464</p>
Fig. 5		
7	Remove the auxiliary battery cover. <ul style="list-style-type: none"> • Release the 2 clips (see Fig. 6). 	<p>E48702</p>
Fig. 6		
8	Disconnect the brake booster vacuum hose from the brake booster (see Fig. 7). <ul style="list-style-type: none"> • Check for presence of oil in one way valve. • If no oil presence in the one way valve, carry out steps 9 to 18 and release the vehicle. • If oil is present in the one way valve, carry on from step 19. 	<p>E118473</p>
Fig. 7		
Install		
9	<p>CAUTION: Using a mirror ensure the correct orientation of the spring.</p> <p>CAUTION: Failure to follow this instruction may cause damage to the vehicle.</p> <p>CAUTION: If new components are damaged when installing a new valve kit must be used.</p> Install the brake vacuum pump inlet valve spring (see Fig. 8).	<p>E118465</p>
Fig. 8		

10	<p>CAUTION:  Using a mirror ensure the correct orientation of the spring.</p> <p>CAUTION:  Failure to follow this instruction may cause damage to the vehicle.</p> <p>Install the new brake vacuum pump inlet flat valve and washer (see Fig. 9).</p>	 <p style="text-align: center;">Fig. 9</p>
11	<p>CAUTION:  Make sure the O-ring is securely fitted to the spigot.</p> <p>CAUTION:  Do not use excess force when fitting inlet valve spigot.</p> <p>CAUTION:  Using a mirror make sure the spigot is securely fitted and undamaged.</p> <p>CAUTION:  Failure to follow this instruction may cause damage to the vehicle.</p> <p>NOTE: An audible click is heard when the clips are fully latched.</p> <p>Install the new brake vacuum pump inlet valve spigot (see Fig. 10).</p> <ul style="list-style-type: none"> Secure with the clips. 	 <p style="text-align: center;">Fig. 10</p>
12	<p>NOTE: Connect the vacuum gauge to the valve and run the engine for 5 seconds. The gauge should maintain vacuum for at least 5 seconds with the engine not running. If the vacuum is not maintained the valve has been fitted incorrectly.</p> <p>Check the operation of the valve using a suitable vacuum gauge (see Fig. 11).</p> <ul style="list-style-type: none"> Using a suitable cap blank off lower spigot. 	 <p style="text-align: center;">Fig. 11</p>
13	<p>CAUTION:  Always plug any open connections to prevent contamination.</p> <p>CAUTION:  Make sure that a new component is installed.</p> <p>Connect the 2 new brake booster vacuum lines to the brake vacuum pump (see Fig. 12).</p>	 <p style="text-align: center;">Fig. 12</p>

14	Install the injector sound proofing (see Fig. 13).	
		Fig. 13
15	Install the engine cover.	
16	Connect the brake booster vacuum hose.	
17	Install the cover(see Fig. 14).	
		Fig. 14
18	Start engine and check the brake booster operation.	
		Check for oil in the brake servo and master cylinder
		All vehicles
19	Pump the brake pedal until the brake vacuum assistance is exhausted.	
20	Remove the auxiliary battery cover (see Fig. 15). <ul style="list-style-type: none"> Release the two clips. 	
		Fig. 15
21	If installed, remove the auxiliary battery.	
22	Release the anti-lock brake system modulator (see Fig. 16). <ul style="list-style-type: none"> Remove the three nuts. Release the brake tubes from the clip. 	
		Fig. 16
23	Disconnect the low brake fluid warning indicator switch electrical connector.	

CAUTION: Brake fluid will damage paint finished surfaces. If spilled,

	<p>immediately remove the fluid and clean the area with water. Position an absorbent cloth to collect fluid spillage.</p>	
	Vehicles with manual transmission	
24	<p>Disconnect the clutch master cylinder supply line (see Fig. 17).</p> <ul style="list-style-type: none"> Using a suitable cap blank off the supply line. 	
		Fig. 17
	All vehicles	
25	<p>CAUTION: Make sure the wings and trim panels are covered and protected, failure to follow this instruction may result in damage to the vehicle.</p> <p>CAUTION: Make sure that excessive force is not used. Failure to follow this instruction may result in damage to the vehicle.</p> <p>Displace the master cylinder (see Fig. 18).</p> <ul style="list-style-type: none"> Remove the two nuts. Check for oil deposit on master cylinder push rod. 	
		Fig. 18
26	<p>Check for oil ingress in brake booster (see Fig. 19).</p> <ul style="list-style-type: none"> Using a suitable white cable tie check for oil ingress. If oil on the master cylinder push rod, install a new master cylinder (See (GTR), Workshop Procedure, section: 206-06). If oil is in the brake booster, install a new brake booster (See (GTR), Workshop Procedure, section: 206-07). If no oil in the brake booster and master cylinder, carry on from step 27. 	
		Fig. 19
	All vehicles	
27	<p>CAUTION: Make sure the master cylinder is correctly aligned. Install the brake master cylinder.</p> <ul style="list-style-type: none"> Tighten the nuts to 26 Nm (19 lb.ft). 	
28	<p>Secure the anti-lock brake system modulator.</p> <ul style="list-style-type: none"> Install the three nuts. Secure the brake tubes to the clip. 	
	Vehicles with manual transmission	
29	<p>Connect the clutch master cylinder supply line.</p> <ul style="list-style-type: none"> Remove cap. 	



	All vehicles
30	Connect the low brake fluid warning indicator switch electrical connector.
31	If installed, install the auxiliary battery.
	Vehicles with manual transmission
32	Bleed the clutch system (see Global Technical Reference (GTR), Workshop Procedure, section: 308-00).
	All vehicles
33	Start engine and check the brake booster operation.



Appendix 2 – Sample Customer Letter

Name
Address line 1
Address line 2
Address line 3
Post Code

Vehicle Identification Number (VIN): ??????
Registration Number: ???????

Date: Month/Year

IMPORTANT

2006 to 2009 Model Year Discovery 3/LR3 and Range Rover Sport Vehicles

SAFETY RELATED RECALLS

Subject: Brake Vacuum Assistance System

Dear Sir/Madam

Land Rover is undertaking a free of charge Safety Recall (Program Number P017) to owners of 2006 to 2009 model year Discovery 3/LR3 and Range Rover Sport vehicles.

Reason for these program;

Depending upon its age, Land Rover has identified that your vehicle may experience one of two issues associated with the brake vacuum assistance system.

Vehicles produced between - November 2005 and April 2007 (LA367110-LA440000 and LS929086-LS117000)

Oil may migrate from the engine driven vacuum pump and collect in the brake booster. This may cause a progressive loss of brake assistance, resulting in hard brake pedal and increased stopping distances for the same pedal effort.

In extreme cases, engine oil may migrate from the brake booster to the brake master cylinder which may lead to a loss of one or both of the foundation brake system hydraulic brake circuits. This therefore, may lead to increased brake pedal travel, increased stopping distances and, in the event of both primary and secondary brake master cylinder seal failure, a total loss of service brakes.

Vehicles produced between May 2007 and June 2009 (LA440001-LA513325 and LS117001-LS215618)

Your vehicle may experience a temporary sticking of the vacuum non-return valve in the brake assistance vacuum pump mounted on the engine. This may lead to a temporary loss of vacuum assistance on the braking system. This can result in increased pedal efforts after the first 3 or 4 applications of the brake pedal after initial engine start for a period of no more than 60 seconds. The hydraulic braking system itself remains fully functional. Once the valve has unstuck the booster vacuum is immediately restored, full braking assistance is available, and the brakes perform normally for the remainder of that drive cycle.

What Land Rover and your dealer will do

Land Rover is carrying out voluntary recalls of the vehicles mentioned above. Land Rover Authorized Repairers will replace the brake booster vacuum pipe and check for oil in the brake booster. Where oil is detected in the brake booster, the brake booster and if necessary master cylinder will be replaced.

**How long will it take?**

The work will be carried out as quickly and efficiently as possible in order to minimize inconvenience to customers and is expected to take approximately 2 hours, although your dealer may need your vehicle for a longer time due to service scheduling requirements.

What we are asking you to do

Contact your preferred Land Rover dealer without delay. Provide the dealer with your Vehicle Identification Number (VIN) (located at the beginning of this letter) and vehicle registration number. Ask for a service date for Recall Program P017. If you do not have a servicing dealer, please access www.landrover.com for dealer addresses, maps and driving instructions.

When you bring your vehicle in to the dealer, please show this letter to the dealer. If you misplace this letter, your dealer will still do the work, free of charge.

If you no longer own the vehicle we would be grateful if you will complete the 'Change of Ownership' slip attached to this letter, returning the slip to Land Rover **immediately** in the enclosed 'Freepost' envelope. This will enable us to make contact with the new owner.

If you have concerns

If you experience any problems getting your vehicle repaired promptly and without charge, please contact your dealership's Service Manager for assistance.

If you have any queries or concerns that your local dealer cannot address, please contact Land Rover Customer Relationship Center (please enter telephone number) and one of our representatives will be happy to assist you.

This recall action is being undertaken in accordance with the legislative or industry requirements concerning vehicle defects. The authorities will closely monitor the response rate of this Recall Action.

We ask that you please treat this matter with the urgency it requires. Land Rover regrets any inconvenience this recall may cause and thanks you for your co-operation.

Yours sincerely

Customer Care Manager

Appendix 3 – Technical Q & A

<h1>Technical Q&A</h1>	
FOR USE ON INQUIRY	
Recall Land Rover P017	
Discovery 3 and Range Rover Sport TdV6 Only	

Main Message:

Land Rover has identified two concerns that affect the braking performance on its range Rover Sport and Discovery 3 TDV6 vehicles. Investigations have identified that the brake vacuum servo can become contaminated with engine oil migrating in to the brake booster or exhibit a sticking non return valve within the engine driven brake vacuum pump depending upon when the vehicle was built.

Oil Migration Condition

Customers have reported a reduction in braking assistance performance, and upon investigation dealer technicians report finding oil in the brake booster. When the engine is turned off the non-return valve in the vacuum pump does not in all cases seal. This allows engine oil to be sucked into the vacuum hose that feeds the brake booster (due to by-design residual depression in the brake booster feed hose). Oil may then migrate from the hose into the brake booster, which can lead to a reduction in brake assistance. Eventually the oil may migrate through the brake booster into the brake master cylinder where the main and primary & secondary pumping chamber seals may swell and could fail to seal.

Vehicles manufactured between November 2005 and April 2007 are at most risk of experiencing this condition. A modified vacuum pump was introduced in April 2007 to mitigate against this oil migration.

Valve Sticking Condition

The symptom has been identified as the brake vacuum pump not replenishing the vacuum in the brake booster for up to 60 seconds from engine-on, due to the pump non return valve "sticking" in the closed position. If the brake pedal is depressed typically 3-5 times within this time the brake booster vacuum becomes depleted and braking assistance is lost. Typically, within 60 seconds from engine-on the valve unsticks, the brake booster vacuum is restored and full braking assistance is available. Based on field reports, no further brake assistance symptoms are then experienced during that drive cycle.

Q1 Why is Land Rover recalling certain models?

A Oil collecting in the brake booster causes a progressive loss of brake assistance, resulting in hard brake pedal and increased stopping distances for the same pedal effort. Over time engine oil may migrate from the vacuum booster into the brake master cylinder which can lead to a loss of one or both of the foundation brake system hydraulic brake circuits and therefore increased brake pedal travel, increased stopping distances and, in the event of both primary and secondary brake master cylinder seal failure, a total loss of service brakes.

Temporary sticking of the non-return valve (NRV) leads to a temporary loss of vacuum assistance on the braking system, typically 60 seconds, on initial engine start up, the problem is most prevalent when vehicles have been left parked overnight in near-freezing weather (-5 to +5 degrees centigrade). The hydraulic braking system itself remains fully functional. Once the valve has unstuck the booster vacuum is immediately restored, full braking assistance is available, and the brakes perform normally for the remainder of that drive cycle.

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- Q2 Can you tell me more about what is wrong with the vehicles?**
A The brake vacuum system becomes contaminated with engine oil leading to reduced performance, and in severe cases further migration of the oil into the master cylinder can lead to seal damage which in the event of both primary and secondary brake master cylinder seal failure, leads to a total loss of service brakes.
- For the sticking NRV condition the valve within the vacuum pump sticks to its seat preventing a supply of vacuum to the booster for a period of up to 60 seconds. This lack of vacuum for a very short time can lead to a hard brake pedal and increased pedal effort to stop the vehicle in the same distance as normal.
- Q3 Does this recall affect vehicle safety?**
A In the event that the brake booster becomes contaminated with engine oil the customer will notice a harder brake pedal and increased stopping distance for the same pedal effect, the customer will notice the need for greater pedal effort in order to stop in the required distance. If the oil has damaged the brake master cylinder seals, the customer may experience loss of one or both braking circuits. With the sticking NRV foundation (hydraulic) brakes remain fully functional, however, the customer may perceive that the brake performance is significantly reduced due to the increased pedal efforts required to slow the vehicle down.
- Q4 Has Land Rover received many complaints?**
A To date there have been a significant number of field reports and customer complaints relating to these two conditions.
- Q5 Have there been any accidents or injuries?**
A There have been 9 minor accidents reported to Land Rover where one of these conditions allegedly led to the accident. Land Rover is unaware of any allegations of injury in relation to these concerns.
- Q6 How was the condition discovered?**
A These conditions were both reported to Land Rover by dealers from around the world. Customers have reported a reduction in braking assistance performance, and upon investigation dealer technician's report finding oil in the brake booster or temporary sticking NRV's.
- Q7 What has Land Rover done in production?**
A A revised vacuum pump was introduced into production with an internal vent to minimize the brake booster oil ingress to an acceptable level in April 2007. The specification of engine that utilized this later specification vacuum pump that exhibited a sticking NRV is no longer in production.
- Q8 What will authorized repairers do to the vehicles?**
A Authorized repairers will fit a modified vacuum pipe with an additional connection to the vacuum pump secondary outlet port, a revised NRV within the vacuum pump and an additional vacuum NRV at the highest point in the vacuum pipe. For vehicles which are at risk from the oil migration concern, authorized repairers will also inspect the brake booster and master cylinder for signs of oil contamination and replace affected components as necessary.
- Q9 Which vehicles are affected by this recall?**
A Discovery 3 and Range Rover Sport 2006 – 2009 MY with TdV6 engines.
- Q10 Are parts available to rework vehicles?**
A Parts will be available by the time the customer receive their letters.
- Q11 How much will the recall cost Land Rover?**
A Cost is never a factor in Land Rover's decisions to recall vehicles.
- Q12 How do I know if my Discovery/Range Rover Sport is affected?**
A All owners of potentially affected vehicles will receive a letter shortly inviting them to contact a Land Rover authorized repairer for the work to be carried out.
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Q13 Can customers check their own vehicles?

A There are some indications in relation to oil migration of the concern being present. These include increased brake pedal effort to get the same degree of deceleration and harder than normal brake pedal feel. Some customers have also reported hearing a 'bubbling' or 'boiling' type noise when braking, caused by oil in the brake booster. Land Rover recommends that if any customer has a concern with the brake performance of their vehicle that they contact their authorized repairer immediately to seek further guidance.

Q14 How long does it take for the car to be inspected and repaired?

A The work to be carried out is expected to be completed in approximately 2 hours. Due to dealer schedules, vehicles may be required for longer.

Q15 Can I continue to drive my vehicle safely until it has been recalled?

A Customers can continue to drive their vehicles providing that there is no detectable reduction in braking performance. Should the customer have any concern that the braking system performance is reduced they should contact their authorized repairer immediately for further guidance.

Note: Please ensure that any Press enquiries are referred to the Land Rover Public Affairs office.