

ALEX'S GARAGE

WL

Welcome Wendy !

Here are your results:

Wendy Liston

2008 Land Rover LR2

View Notes15

Current Recommendations

Please approve these additional services:

\$524.60 +tax

OIL LEAK REPAIR: Vacuum pump assembly update replacement and cleaning

See Details Approved by phone

Past Recommendations

Outstanding services still pending your approval:

\$489.16 +tax

Rear brake service

See Details Declined by Wendy

Jump to Grand Total

Work Order

The following services are already in progress:

1. Address battery draw\$287.50

Vehicle would not start. Customer has been unhooking the battery when parking
LABOR

initial inspections and observations

continued diagnosis and observations/ testing

extended diagnosis: close-circuit current-draw testing and sleep-mode circuit/s
isolation

INSPECTIONS

battery negative terminal loose on arrival.

test battery on arrival. ...OK. @ ~94% static charge capacity

dated from 9/2019

Tighten battery terminal as needed and attempt starting...OK. drove into workshop
area.

"CHECK ENGINE" warning light flashing while moving into workshop

[pending fault scan]. SEE NOTES < detailed info w/ attached screen shot.

Charging system check at idle. OK *~14V DC)

noted: power locking system seeming inoperative.

no power lock activation via key-fob remote OK from driver lock-cylinder

CHECK: static current draw from battery after vehicle locked and in sleep-mode for
confirmation of suspected battery drain...

initial state. 0.100 to ~0.080mA draw continued 0.080mA draw after >30min (locked

via key-blade in driver door [THIS DOES NOT SEEM LIKE DRASTIC ENOUGH OF DRAW TO BE

DRAINING THE BATTERY WITHIN A MATTER OF DAYS. weeks, maybe]

parked vehicle outside of workshop for extended observation

will recheck for possible battery drain in a few days

came back after ~3.5 days and battery was completely drained

jump starter ok with booster pack and drove into workshop. Re-Charge battery as
needed

additional testing found 0.100mA - 0.080mA draw after vehicle locked and sleep mode.

after some extended observation and no development of excess battery draw; unlocked

and opened drivers door. then noticed {AFTERMARKET} Rear-view camera screen active

(ignition was not cycled on). ~1.2A draw at this time. Closed and locked

door...1.1Amp draw remained. Unplugged rear-view camera and draw dropped to ~0.320mA

it is suspect that the controller for aftermarket rear-view camera is intermittently

erroneously activating while vehicle is OFF

Total: \$287.50

2. Inspect fluid leak\$46.00

LABOR

INSPECTIONS

CONFIRMED: Leakage observed at underside engine area.

appears to be engine oil originating from above at rear of engine

Engine oil level / condition check on arrival. OK, full / clean.
Inspection determined oil leakage to originate at vacuum pump assembly.
UPDATE REPLACEMENT OF VACUUM PUMP ASSEMBLY + CLEANING RECOMMENDED
Total: \$46.00

3. DIAGNOSE: ROUGH RUNNING ON START-UP\$511.00

LABOR

extended diagnosis and repair: {upper} intake manifold-runner position-flap actuator replacement

PARTS

OEM Flap actuator unit, Intake Manifold (UPPER)

1.0 @ \$223.50

\$223.50

INSPECTIONS

initial performance check: smoke test & leak inspection. PASS / OK.

see notes

Performed conventional diagnosis and ignition system inspections...no cause of rough running malfunction could be immediately determined

Per Technical service bulletin: PCM programming issue is suspect cause of cold-start rough running

Performed PCM software reflash update programming and check for further possible cold-start rough-running symptom...

programming completed successfully. Rough running and intermittent misfire detection continues further diagnosis needed

Total: \$511.00

4. OIL LEAK REPAIR: Vacuum pump assembly update replacement and cleaning\$524.60

LABOR

Remove and replace vacuum pump assembly and associated mounting seal with new / updated

clean upper and lower engine areas of oil leakage accumulation after completion of repairs as needed for future inspections

PARTS

Peirburg OEM Vacuum pump assembly

1.0 @ \$365.60

\$365.60

HAZMATS AND FEES

shop supply, Chemical / cleaning

1.0 @ \$21.00

\$21.00

Total: \$524.60

Notes

\$ 524.60

+taxÂ OIL LEAK REPAIR: Vacuum pump assembly update replacement and cleaning

Approved by phoneSee Details

Matt C. | Alex's Garage

4/21/2020 03:41PM

Initial battery / electrical inspection:

battery tested OK on arrival at ~94%.

negative connection found to be loose and would not easily tighten up.
dry corrosion on terminal.

sprayed contact cleaner and re-secured connection as needed.

charging system output voltage OK at idle.

performed closed-circuit current-draw test..."ok" <0.100mAh after >30minutes (locked).

parked vehicle outside of workshop for further / extended observation.

Matt C. | Alex's Garage

4/21/2020 04:40PM

NOTED: engine running rough on start up. two separate times, while moving into and out of workshop. "Check Engine" malfunction indicator light FLASHING.

Attached screen shot. current PCM faults stored.
Cleared fault memory at this time.

Engine running smooth after initial warm-up phases. "check engine" light stayed OFF.

Matt C. | Alex's Garage
4/21/2020 04:42PM

after some extended observation and no development of excess battery draw; unlocked and opened drivers door.

then noticed {AFTERMARKET} Rear-view camera screen active (ignition was not cycled on). ~1.2A draw at this time.

Closed and locked door...1.1Amp draw remained.

Unplugged rear-view camera and draw dropped to ~0.320mA

it is suspect that the controller for aftermarket rear-view camera is intermittently erroneously activating while vehicle is OFF

Matt C. | Alex's Garage
4/30/2020 02:41PM

Attached pic. Bypassed fuse found while trying to isolate 0.330mA draw

Pulled 15amp fuse (F19 in passenger fuse panel. for "seat adjustment. suppose to be 5amp) and draw drop by ~0.130mA

Matt C. | Alex's Garage
5/1/2020 12:37PM

closed circuit current draw on fuse F26 (tan/5Amp) for "diagnostic socket. there is nothing plugged in to diagnostic socket.

draw drops by .020mA.

Matt C. | Alex's Garage
5/1/2020 01:12PM

additional extended observation of closer-circuit current draw:

fuse F1 (5amp) in passenger fuse panel for "rain sensor" w/ by-pass for inverter supply to aftermarket "dash -cam" rear-view mirror UNPLUGGED.

VEHICLE ENTERED SLEEP MODE AFTER ~30 MINUTES WITH CURRENT DRAW <0.080mAmps. "normal".

essentially, confirmation that the aftermarket dash-cam rear-view mirror electronics are source of battery drain

Matt C. | Alex's Garage
5/1/2020 02:09PM

ensure battery state-of charge: @ 100% (803CCA or 800 rating)

DASH CAM POWER SUPPLY FUSE HAS BEEN LEFT UNPLUGGED.

reconnect battery and move vehicle out of workshop for over-weekend battery retention observation test.

recheck starting and battery state on Monday/Tuesday

Matt C. | Alex's Garage
5/1/2020 02:11PM

CHECK: Engine starting after sitting 3+ days. OK.

engine started without hesitation of starter or battery.

drove into workshop area.

ROUGH RUNNING ON START-UP CONTINUES.

Matt C. | Alex's Garage
5/5/2020 10:42AM

Rough running diagnosis notes:

smoke test intake air system and inspect for possible leaking related to rough running condition.

0.040 orifice leak test PASS / OK.

Minor leaking observed at intake boot on throttle body (lower forward engine area). inconsequential.

And

leakage from area of vacuum pump. Correlated to known issue as noted during oil leak inspection (see above notes)

Matt C. | Alex's Garage

5/5/2020 10:44AM

re scan engine management system for current fault codes related to rough running condition....attached screen shot.

clear fault memory at this time and run engine for observation of misfire detection data-stream

active misfires indicated at cylinder #2.

Remove spark plug for inspection

and

swap ignition coil #2 to position #4, respectively.

run engine for further misfire detection observation....active misfire detection for cylinder #2 continues

Matt C. | Alex's Garage

5/5/2020 11:00AM

Relative compression comparison for cylinders #2 and #4. OK ~180PSI +/- 10psi.

Misfire detection for cylinders #2 (and intermittently #3) continues during initial start-up.

engine runs smooth after ~ 1 minute at idle.

Matt C. | Alex's Garage

5/5/2020 11:23AM

^ PCM programming issue is suspect.

correlated to stored fault code P050B "cold start ignition timing performance" malfunction.

Pending technical consultation: PCM reprogramming MAY resolve this issue

PER Manufacture TSB:

"Situation:

During a cold-start, the engine may experience a poor idle condition with the possibility of Diagnostic Trouble Codes (DTC) P050B / P050E and P061A being stored in the Engine Control Module (ECM). This may be caused by the engine target idle speed calculation being too low.

Action:

In the event of a customer concern of the above, refer to the Repair Procedure outlined below to update the ECM software.

Matt C. | Alex's Garage

5/5/2020 12:48PM

performed PCM update

Matt C. | Alex's Garage

5/5/2020 02:25PM

^rough running issue persistent.

further diagnosis determined: upper intake manifold runner-flap actuator is jammed open.

Causing excess intake air induction at idle.

Attempted to remove actuator...very difficult due to jamming (stuck open. wedged inside manifold). Extracted flap actuator as needed for replacement with new.

Matt C. | Alex's Garage
5/7/2020 01:55PM

Publish

Approved Grand Total

Expected total price including approvals, supplies, and sales tax \$1369.10

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