

TO: FCA CORPORATION
INVESTIGATION REPORT FOR JL EHPS PUMP for performance verification
REPORT NUMBER: [REDACTED]
ISSUE DATE: Aug 22th, 2023

SUBJECT: Investigation report JL EHPS Pump for performance verification
EHPS Pump Profile:

Part No.: 68247930AD
Model: 2019 JEEP WRANGLER UNLIMITED SAHARA
Serial No.: [REDACTED]
VIN: [REDACTED]
Vehicle build date: 02/09/2019
Part Mfg Date: 09/22/2018

Claim:

Claim Number [REDACTED]
Odometer: 84000KM(52195M)

Concern : PERFORM PRE DELIVERY INSPECTION

Cause : PDI

Corrective Action : PERFORMED PRE DELIVERY INSPECTION

Customer's original complaint quoted as followed.

While driving at 80km/h every warning light possible came on in the vehicle. Service abs, service, traction, service gear shifter, etc. The speedometer and tachometer also went to zero as the Jeep was travelling. Along with these the power steering failed and the Jeep started surging. After 3 trips to the dealer (they could not find an issue the first two times, and this same scenario happened to us 2 more times) they determined that it was the Power Steering Module. This car is less than 4 years old and could have caused a serious incident while travelling at 80km/h. This is a result of faulty/ sub-standard parts and not wear and tear. Even after we finally get this Jeep back from being repaired I will not feel safe for my wife and kids to be driving it at highway speeds, what if it happens again? As a side note, at the dealership they had another Jeep Wrangler there with the exact same problem. Please investigate this, I should not have a \$3100 repair bill for inferior parts.

Findings:

1) Visual Inspection:



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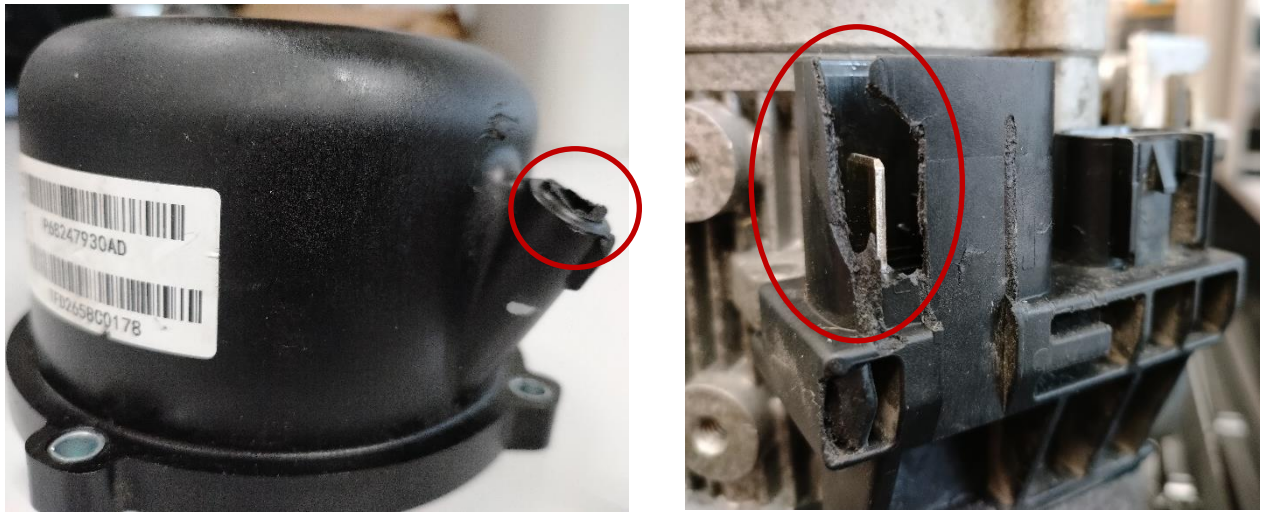


Fig 1. EHPS and Connector, Oil inlet Condition While Receiving

Appearance on the Pump:

Part Checked	Result	Remarks
1) Reservoir	O.K	Reservoir is O.K
2) Motor Housing	O.K	Motor housing is O.K
3) Controller Cover	O.K	Controller cover is O.K
4) Vent	NOK	Oil inlet is broken
5) Bracket	O.K	Bracket is O.K
6) Connector port	NOK	Power Supply Housing is broken

2) Function Test:

2.1 CAN communication:

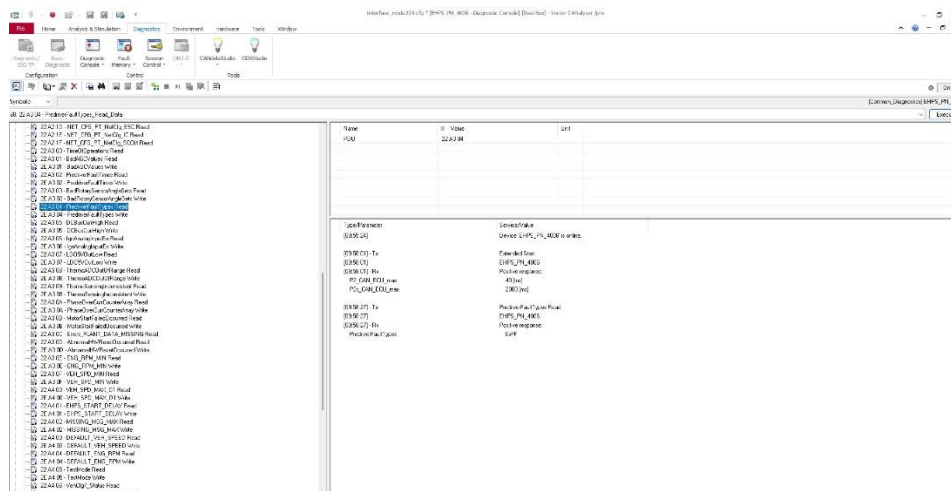


Fig 3. CAN Communication -Pre Driver Read

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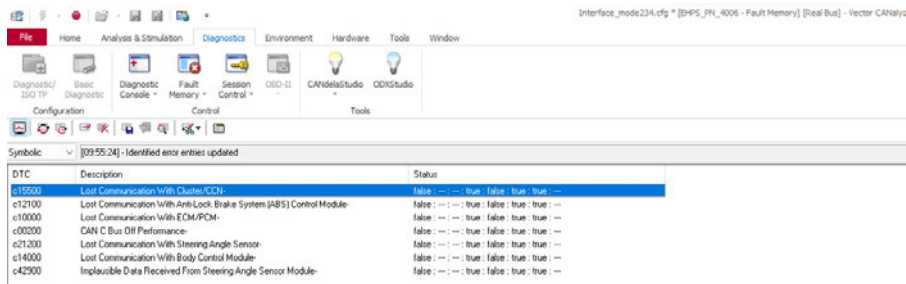


Fig 4. CAN Communication – Confirmed DTC List.



DTC Raw Data.docx

Summary Module lists has CAN Communication failure.

	Cluster DTC=C15500	ABS DTC=C12100	ECM/PCM DTC=C1000	CAN C Bus off performance DCT=C0020	Steering angel sensor DTC=C21200	BCM DTC=C1400	Implausible data from Steering Angle Sensor Data DTC =42900
Original Odometer value	7214	7214	7214	7514	7214	7214	7214
Most Recent Odometer Value	7503	7503	7548	7504	754B	724A	7201

RESULT: Based on the table, it indicates there was a problem with CAN bus. The “CAN Bus off “DTC was confirmed, which should be the root cause of CAN Bus Failure.

2.3 Performance Test:

Pressure (bar)	Parameters	Specification	Pre-Sale	Post Sale	Comments
20 ± 2	Pump Speed (rpm)	5960 ± 100	5958	5960	OK
	Current (A)	≤ 110	53.18	54.5	OK
	Flow Rate (L/min)	≥ 9.05	9.9	10.33	OK
50 ± 2	Pump Speed (rpm)	4510 ± 100	4509	4509	OK
	Current (A)	≤ 110	71.95	71	OK
	Flow Rate (L/min)	≥ 6.85	7.35	7.37	OK
70 ± 2	Pump Speed (rpm)	3390 ± 100	3389	3389	OK
	Current (A)	≤ 110	69.15	69.3	OK
	Flow Rate (L/min)	≥ 5.15	5.34	5.4	OK

Note: Dare Auto managed to implement EOL test by swapping the oil reservoir, given the fact oil inlet on returned pump was damaged.

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The screenshot shows a software window titled "DataInquire_SingleTest.vi". It contains several input fields for test details:

- 试件编号 (Part Number): [REDACTED]
- 试验日期 (Test Date): 2023/8/14 11:16
- 试验员 (Operator): Admin
- 试验温度 (Test Temperature): 44.2 °C
- 结果列表 (Result List): [REDACTED]

 Below these fields is a section titled "性能测试 Performance Test" with a sub-section "1 压力-流量测试 Press—Flow Test". This section contains a table with the following data:

设定压力 (bar) Setting Press	20.0 ± 2.0	50.0 ± 2.0	70.0 ± 2.0	
设定速度 (rpm) Setting Speed	5960 rpm	4510 rpm	3390 rpm	
压力 (bar) pressure (bar)	19.9	49.7	69.5	
速度 (rpm) Speed (rpm)	5960	4509	3389	
电流 (A) Current (A)	54.5	71	69.3	
流量 (L/min) Flow (L/min)	10.33	7.37	5.4	

 Below the table is a section for "2 噪声测试 Noise Test". To the left of the screenshot, there is a small Excel icon and the text "Pre-Sale P-Q .xls".

Result: Based on the pressure (P), flow rate (Q) and current result in the above test, post-sale result are still in the acceptable range for all the three cases. The flow rate for the pump is within the specification under all pressure conditions (20bar, 50bar and 70bar) and no problem is found.

3) Reproduce the failure

N/A

4) Root cause Analysis

N/A

5) Corrective Actions

N/A

6) Conclusion:

Pump has good CAN communication and passed the performance test (P-Q test). The flow rate for the pump is within the specification under all pressure conditions (20bar, 50bar and 70bar).

It is TNF-Trouble Not Found