

Fuel Pump Current Waveform Test 2007 Honda Accord SE 4CYL

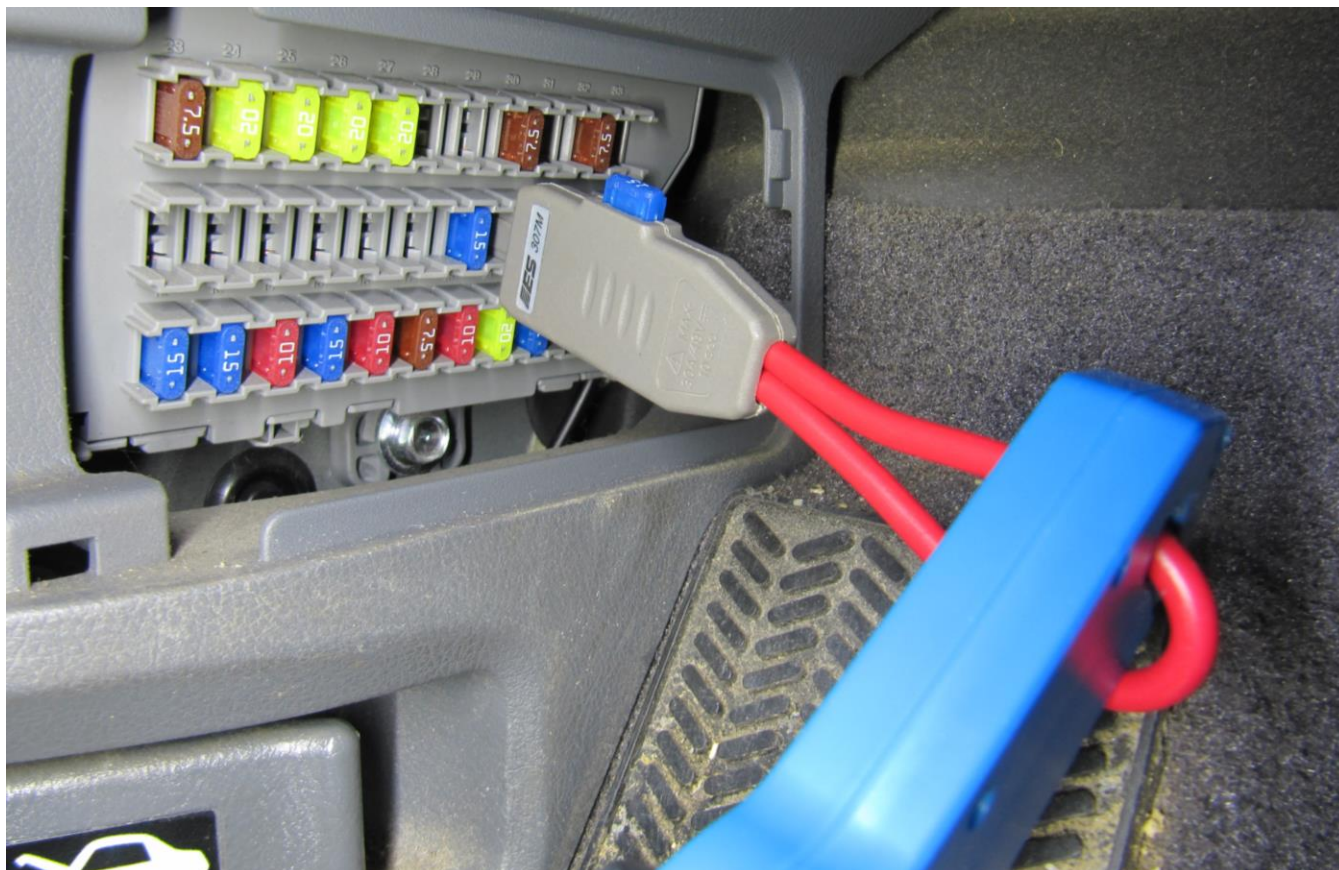
Using a current clamp and a cheap scope, it is quick and easy to monitor the fuel pump current to gauge the overall health of the fuel pump. The fuel pump is powered through Fuse #19 in the under-dash fuse panel:

HOLDER LOCATED ON SIDE OF FUSE BOX						(7.5A)	(H/MIRROR)				
23	24	25	26	27	28	29	30	31	32	33	
7.5A	(20A)	(20A)	20A	20A	(20A)		7.5A		7.5A		
IGP	P/W RR-L	P/W RR-R	P/W AS	P/W DR	SUNROOF		A/C		ACC		
12	13	14	15	16	17	18	19	20	21	22	
(7.5A)	(20A)	(20A)	(20A)	(20A)	(20A)	15A	15A	7.5A	7.5A	10A	
RR FOG	AS P/SEAT (REC)	DR P/SEAT (SLIDE)	H/SEAT	DR P/SEAT (REC)	AS P/SEAT (SLIDE)	ACG	FUEL PUMP	WASHER	METER	SRS	
1	2	3	4	5	6	7	8	9	10	11	
(15A)	15A	(10A)	15A	10A	7.5A	10A	(20A)	15A	7.5A	30A	
DBW	IG COIL	DAY LIGHT	LAF	RADIO	INTR LIGHT	BACK UP	DOOR LOCK	FR ACC SOCKET	OPDS	WIPER	

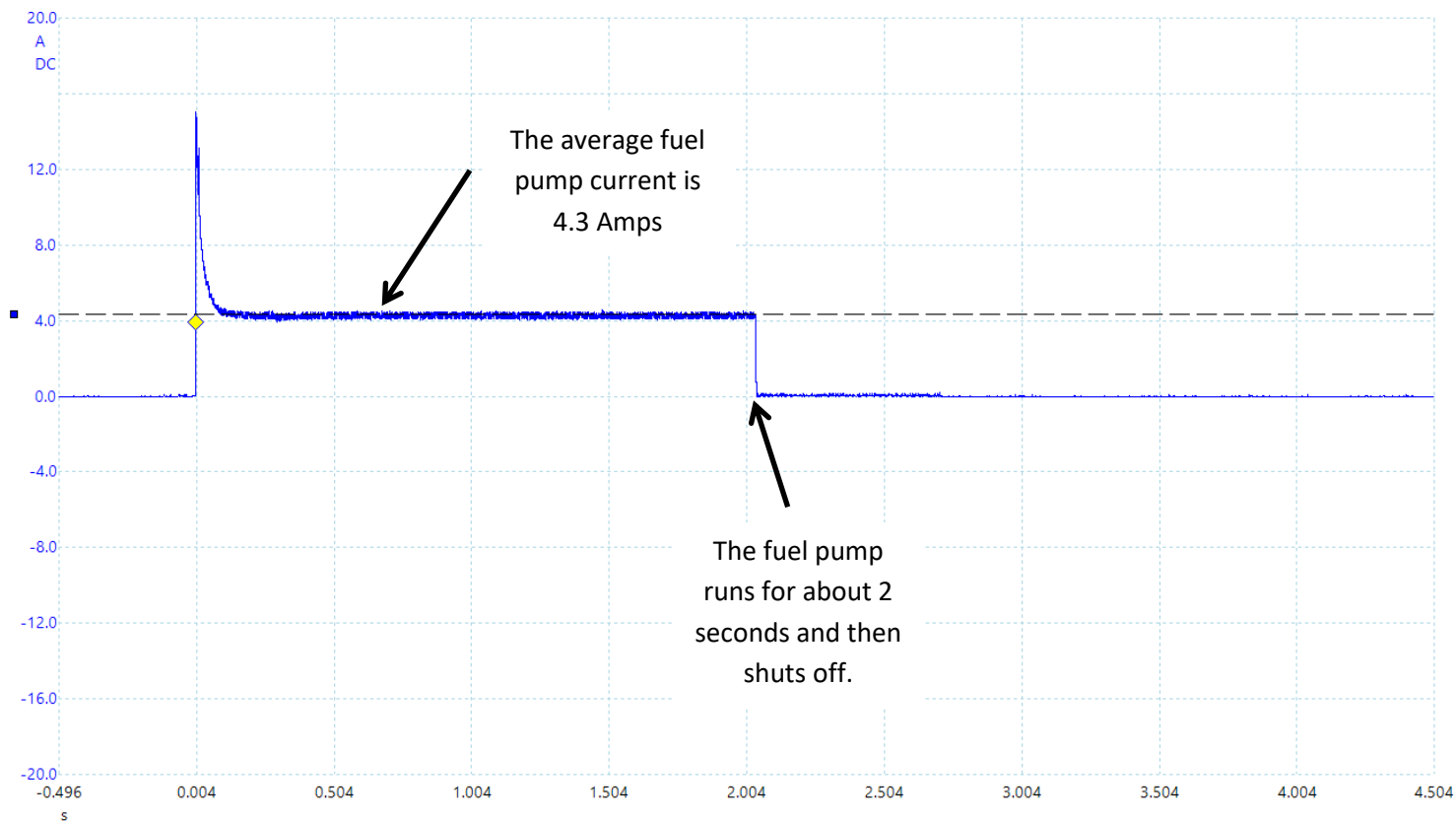
ALWAYS REPLACE WITH A NEW FUSE OF THE SAME AMPERAGE RATING.

SDA-CO

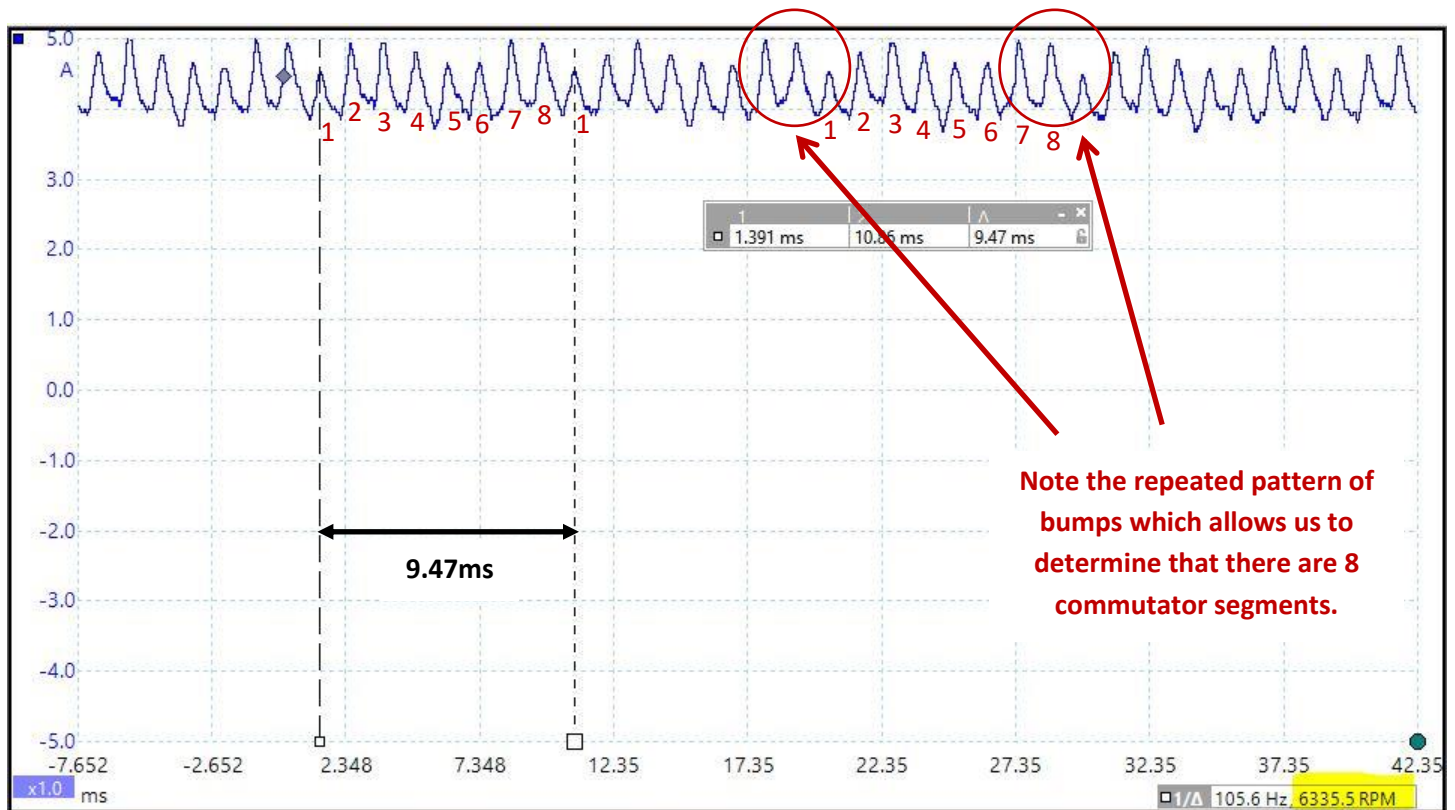
Insert a current loop into the Fuse 19 location and attach a current clamp:



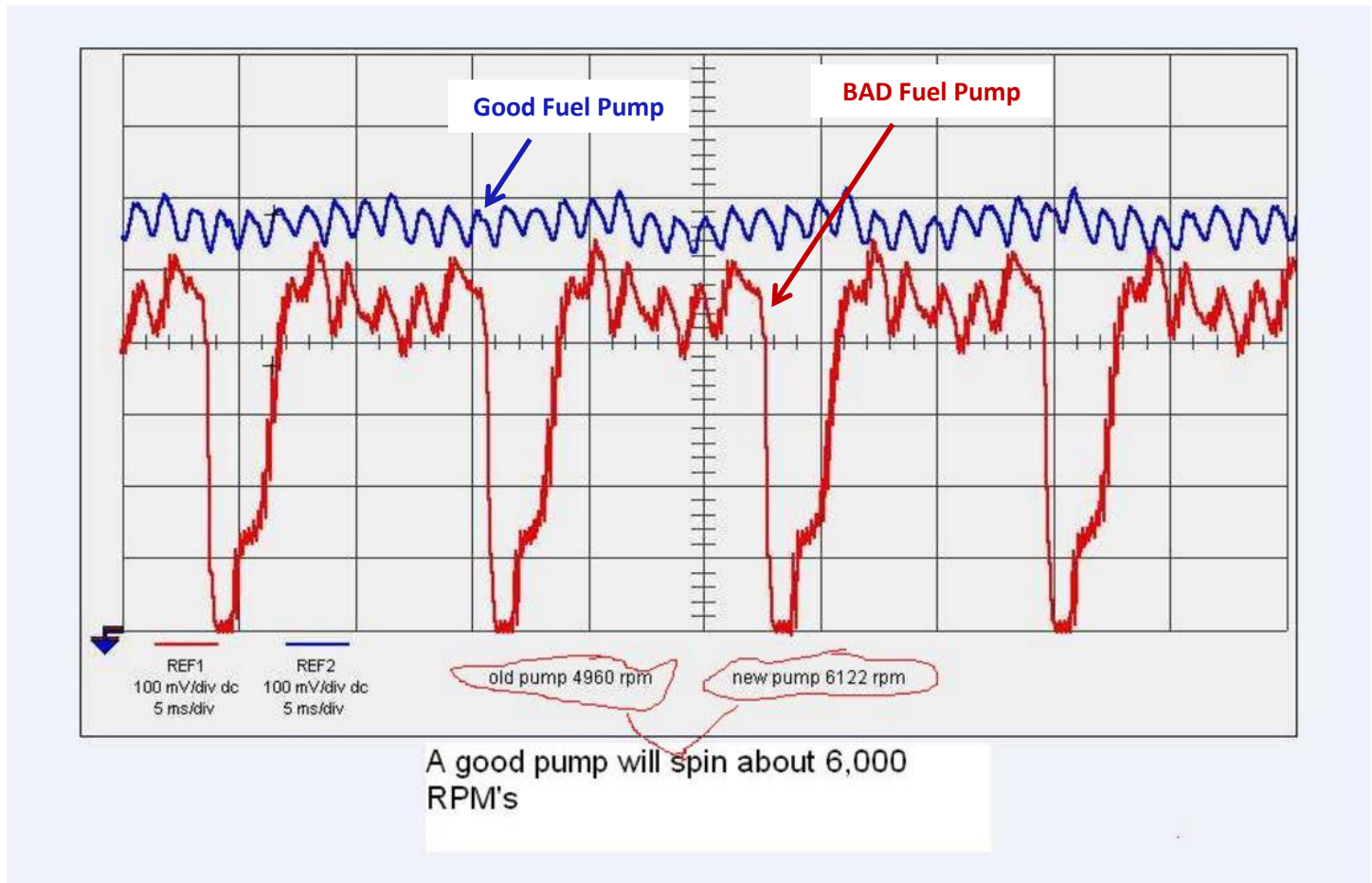
Turn the key to the ON position which activates the fuel pump to pressurize the fuel in the fuel line:



Next, the speed of the fuel pump can be determined by zooming in on the steady state current waveform. Each commutator segment results in a “bump” in the current drawn by the pump. In order to determine the speed of the pump, we need to know the number of commutator ring segments in the fuel pump motor. Usually, this can be determined by looking for a repeating pattern in the current waveform (slight variations in the commutator segments give rise to slight differences in current between the segments). In this case, there appear to be 8 commutator segments (which in fact is a pretty common number). The fuel pump speed can then be determined by measuring the time (T) for one full rotation of the armature (8 segments). The speed in RPM can then be calculated as $60/T$. In this case, $T=9.47\text{ms}$ and the pump speed is $60/9.47\text{ms} = 6335\text{ RPM}$.



A failing fuel pump will often have a “drop-outs” where the current will fall to zero during portions of the cycle with bad commutator segments as shown by the red waveform below (from justanswer.com):



In summary, by comparing the:

- Average Current Draw (4.3 Amps)
- Pump Speed (6335 RPM)
- Current Waveform Shape (uniform even bumps)

to the known good values, a marginal or failing fuel pump can be quickly diagnosed. A few additional resources:

Great diagnostic video showing current waveforms for a bad and replacement fuel pump:

https://www.youtube.com/watch?v=mR6ws-T_ONw

Two articles on fuel pump current waveform analysis:

https://www.motor.com/magazinepdfs/032003_12.pdf

<http://autolabscopediagnostics.com/fuelpump.htm>