

## JAGUAR X300 – Servotronic Notes ( compiled from notes of a Volvo owner and myself )

A 2004 Volvo S60 has similar ZF speed sensitive steering system controlled by a Servotronic module (PSCM) and a solenoid (transducer) mounted on the rack. Failure of this system is indicated by a lack of power assistance, especially at idle speeds when parking.

The issue with the Volvo turned out to be a clogged oil screen on the transducer at the steering rack. A delicate operation to remove but can be done. The Jaguar has the same transducer, Jaguar part JLM 12142. I note transducer also has the following part nos. ZF 7039 442 102 or 111. BMW 32411134770. It indicates 6v max. & 08mA.

The Jaguar PSCM fitted to the XJR is LNA2100CB (V12 & sports suspension) however it's no longer available new, only the standard X300 PSCM LNA2100BB appears to be available new at approx. \$500. Obtaining a second-hand module that works like new may be a challenge.

The vehicle speed signal, BLUE wire (Jag wiring) changes with vehicle speed and is a PWM Hz signal taken from the instrument cluster and inputs to the module.

Jaguar wiring diagram show - 16kph (10mph) = 20Hz : 32kph (20mph) = 40Hz

Basically 0.8kph = 1Hz

My understanding is that this signal is converted in the module to an output voltage to the transducer between approx. 7 volts down to approx. 3 volts.

According to the wiring diagram, with ignition on readings at the transducer wires (red neg. & slate positive)

should be - Red 2v @ idle decreasing with speed

Slate 9v @ idle increasing with speed

testing has shown this is incorrect, the voltage at the slate wire actually decreases with speed. Jaguar's own workshop manual 10.1 Steering system description states - “At very low speeds, eg when parking, a low speed signal is delivered to the PSCM .

Correspondingly, maximum current (700 to 800mA) is supplied from the PSCM so that the steering rack transducer is activated to the closed position. At moderate driving speeds, the signal is received by the PSCM and is transmitted, as a decreased proportional electric current value to the transducer“

In simple terms, low current to the transducer gives less assistance, heavy steering. The usual default situation when either the PSCM or transducer fail. With maximum current to the transducer at low speeds/idle we have maximum assistance, light steering. Jaguar info states 700/800 mA at idle.

ZF info indicates the maximum current is 854mA decreasing with speed down to 15mA. Readings taken on my Jaguar revealed transducer resistance 8.5 ohms (Jaguar indicates if value below 7.5 +/- to replace) A spare transducer on hand also showed 8.2 ohms.

On the Volvo, monitoring the module voltage to the transducer revealed -

Idle speed (Max. assistance) 7.8v

40 Hz (32kph) 5v

80Hz (64kp) 4.7v

120Hz (96k) 4.5v

160Hz (128k) 4.3v

As previously mentioned, voltage to the transducer reduces with speed.

Jaguar wiring for the module is -

Pin 15 - Ignition supply white/purple

Pin 31 - Earth Black

Pin V - Speed signal Blue

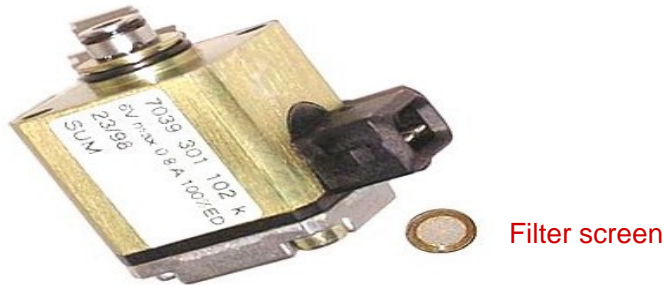
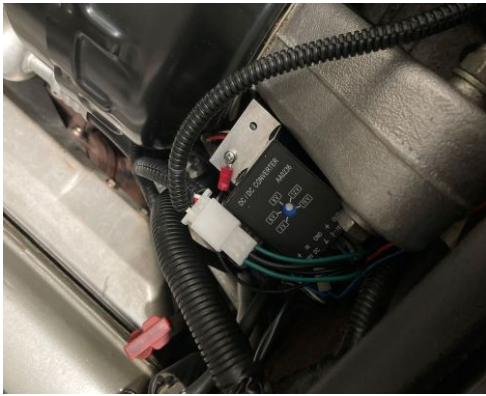
Pin W1 - Positive to Transducer Slate

Pin W2 – Negative to transducer Red

Note – This module has 6 pins, later modules have 9 pins.

My current solution to the module failure is to connect a new lead to the transducer connected directly to a DC-to-DC reducer which I have set at 7 volts. See attached photo. This has resulted in acceptable steering for parking & satisfactory feel at speed. Actual measured input to the transducer is 6.9 v and 850mA and I can increase or decrease this voltage to suit.

12v ignition feed has been taken from the front right hand fuse box on an ignition-controlled circuit.



### SERVOTRONIC Module testing

(12.8v to module)

Speed signal Hz	Transducer pin 2 slate		Transducer pin 1 red	
	Jag LNA2100CB Volts	Volvo 30658312 Volts	Jag Volts	Volvo Volts
1	6.99	7.14	0.43	0.43
10 (8kph)	5.41	5.62	0.33	0.34
20 (16kph)	4.82	5.38	0.3	0.33
40 (32kph)	4	4.86	0.25	0.29
80 ( 64 kph)	3.18	4.12	0.19	0.25
12.8 volts to module	12.19		0	

no speed signal  
or transducer  
connected.