

**[MT230E / MT235E]**

**ENGINE SERVICE MANUAL**

**BOOK II. Diagnosis System**



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## **DIAGNOSTIC SYSTEM**

The LS Tier4 diesel engine can be used with a diagnostic device (sold separately) to monitor the engine's operating condition and determine its malfunction. This diagnostic device consists of the communication module to connect a vehicle to a computer and the diagnosis program. For detailed information, refer to its user's manual.

COMPONENTS

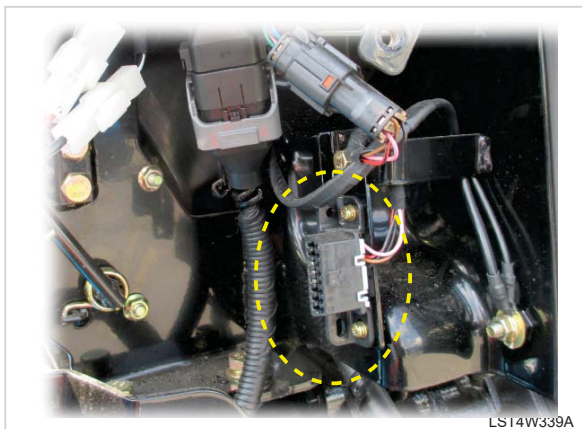
NO.	NAME	ILLUSTRATION
1	UVIM Communication Module	
2	OBDII Connector	
3	USB Cable	
4	Equipment Bag	
5	Install CD	

DIAGNOSTIC SYSTEM INSTALL LAYOUT



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DIAGNOSTIC CONNECTOR LOCATION OF VEHICLE



Error code table

NO.	Dashboard Fault Code	Fault Code	Warning Lamp		Title
			AMB	RED	
1	s629 F12	P060B		1 Hz	ADC Circuit Fault inside of ECU
2	s132 F31	P0100		Solid on	AMF Sensor Failure
3	s132 F00 s132 F01	P0101		Solid on	AMF plausibility fault
4	s132 F03	P0103		Solid on	AMF Sensor high fault
5	s132 F04	P0102		Solid on	AMF Sensor low fault
6	s637 F02	P0341	Solid on	Solid on	Cam signal drift fault
7	s637 F10	P0340	Solid on		Cam signal learn fault
8	s636 F02	P0371		Solid on	Crank signal early fault
9	s636 F02	P0374		Solid on	Crank signal lost fault
10	s636 F02	P0372		Solid on	Crank signal missing fault
11	s636 F02 s636 F11	P0335	Solid on	Solid on	Crank over speed / gap lost fault
12	s108 F03	P2229		Solid on	Atmospheric pressure sensor high fault
13	s108 F04	P2228		Solid on	Atmospheric pressure sensor low fault
14	s168 F03	P0563	Solid on		Battery voltage high fault
15	s168 F04	P0562	Solid on		Battery voltage low fault
16	s651 F31	P0262		Solid on	Injector 1 resistance high fault
17	s653 F31	P0268		Solid on	Injector 2 resistance high fault
18	s654 F31	P0271		Solid on	Injector 3 resistance high fault
19	s652 F31	P0265		Solid on	Injector 4 resistance high fault
20	s651 F31	P0261		Solid on	Injector 1 resistance low fault
21	s653 F31	P0267		Solid on	Injector 2 resistance low fault
22	s654 F31	P0270		Solid on	Injector 3 resistance low fault
23	s652 F31	P0264		Solid on	Injector 4 resistance low fault
24	s630 F11	P0602		2 Hz	Injector code fault
25	s110 F02	P0116		Solid on	Coolant sensor plausibility fault
26	s110 F02	P0119		Solid on	Coolant sensor gradient fault
27	s110 F03	P0118		Solid on	Coolant sensor high fault
28	s110 F04	P0117		Solid on	Coolant sensor low fault
29	s110 F04	P0115		Solid on	Coolant sensor fault (global)
30	s3253 F07	P224A	Solid on		DP sensor leak detected
31	s3253 F11	P1453	Solid on		DP sensor tube Clamped
32	s3253 F11	P1452	Solid on		DP sensor tube inverted
33	s3253 F02	P2453	Solid on		DP sensor plausibility fault

NO.	Dashboard Fault Code	Fault Code	Warning Lamp		Title
			AMB	RED	
34	s3253 F03	P2455	Solid on		DP sensor high fault
35	s3253 F04	P2454	Solid on		DP sensor low fault
36	s173 F31	P242A	Solid on		DPF In temp sensor fault
37	s173 F03	P242D	Solid on		DPF In temp sensor high fault
38	s173 F04	P242C	Solid on		DPF In temp sensor low fault
39	s173 F02	P242E	Solid on		DPF In temp sensor noise fault
40	s173 F02	P242B	Solid on		DPF In temp sensor plausibility fault
41	s81 F00	P2458	2 Hz		DPF overload fault
42	s81 F07	P2463		2 Hz	DPF plugged fault
43	s81 F11	P242F		1 Hz	DPF regeneration error
44	s1485 F07 s1485 F11	P0685	Solid on or 2 Hz		Main relay fault
45	s27 F10 s27 F31	P0C18		Solid on or 1 Hz	Failure during
46	s27 F08	P0404		1 Hz	EGR position control fault
47	s27 F02	P0402		Solid on	EGR airflow error too high
48	s27 F02	P0401		Solid on	EGR airflow error too low
49	s27 F03	P0406		Solid on	EGR position sensor high fault
50	s27 F04	P0405		Solid on	EGR position sensor low fault
51	s27 F02	P046D		Solid on	EGR position sensor noise fault
52	s27 F03 s27 F04 s27 F05 s27 F11 s27 F16	P0403		Solid on	EGR H-Bridge driver fault
53	s1221 F11	P061B		2 Hz	ECU-Zero Torque Monitoring fault
54	s1221 F11	P1606	Solid on		ECU-Supplementary fault 1
55	s1221 F11	P1607	Solid on		ECU-Supplementary fault 2
56	s1221 F11	P1611	Solid on		ECU-injetor drive disable fail fault
57	s1221 F11	P16D6	Solid on		ECU-engine speed fault
58	s1221 F11	P160C		2 Hz	ECU-engine off fault
59	s1221 F11	P1978	Solid on		ECU-ESC Time out fault
60	s1221 F11	P1612	Solid on		ECU-injetor drive disable fault
61	s1221 F11	P16D8	Solid on		ECU-Pedal monitoring fault
62	s1221 F11	P1602	Solid on		ECU-Processor Code Fault
63	s1221 F11	P1601	Solid on		ECU-Processor Data Fault
64	s1221 F11	P1604	Solid on		ECU-Processor RAM Fault
65	s1221 F11	P162B	Solid on		ECU-injetor drive lock fail fault

NO.	Dashboard Fault Code	Fault Code	Warning Lamp		Title
			AMB	RED	
66	s1221 F11	P1620	Solid on		ECU-L2 trip fault
67	s1221 F11	P1621	Solid on		ECU-L3 trip fault
68	s1221 F11	P1622	Solid on		ECU-ECU reset fail fault
69	s1221 F11	P1623	Solid on		ECU-injection locking fault
70	s1221 F11	P1624		2 Hz	ECU-Nominal mode fault
71	s1221 F11	P160E	2 Hz		ECU-Hand pedal fault
72	s1221 F11	P160D		2 Hz	ECU-Foot pedal fault
73	s1221 F11	P1625	Solid on		ECU-Background Flow Check failure
74	s1221 F11	P1626	Solid on		ECU-Background Cycle Check failure
75	s1221 F11	P1627	Solid on		ECU-Program Flow check failure
76	s1221 F11	P1628	Solid on		ECU-Program Flow cycle check
77	s1221 F11	P1630	Solid on		ECU-Pulse check bank error
78	s1221 F11	P1631	Solid on		ECU-Pulse check injector code correction error
79	s1221 F11	P1632	Solid on		ECU-Pulse check injector number error
80	s1221 F11	P1633	Solid on		ECU-Pulse check fuel quantity error
81	s1221 F11	P1634	Solid on		ECU-Pulse check injection number error
82	s1221 F11	P1635	Solid on		ECU-Pulse check TOFF error
83	s1221 F11	P1636	Solid on		ECU-Pulse check TON error
84	s1221 F11	P1637	Solid on		ECU-Pulse check tooth error
85	s1221 F11	P1638	Solid on		ECU-Pulse check injection type error
86	s1221 F11	P1660	Solid on		ECU-L1/L2 pulses comparison fault 1
87	s1221 F11	P1661	Solid on		ECU-L1/L2 pulses comparison fault 2
88	s1221 F11	P1662	Solid on		ECU-injection lock fail after a power latch
89	s1221 F11	P1663	Solid on		ECU-Reset fail after a power latch
90	s1221 F11	P160B	Solid on		ECU-QADC multiplexor fault
91	s1221 F11	P1690	Solid on		ECU-QADC slope high fault
92	s1221 F11	P1691	Solid on		ECU-QADC slope low fault
93	s1221 F11	P1692	Solid on		ECU-QST timeout fault
94	s1221 F11	P16D2		2 Hz	ECU-Reduced torque mode fault
95	s1221 F11	P1219		2 Hz	ECU-ECU Software Monitoring fault
96	s173 F00	P2428		Solid on	Exhaust over temperature fault
97	s731 F11	P0325	Solid on		Accelerometer 1 fault
98	s731 F11	P0330	Solid on		Accelerometer 2 fault
99	s1612 F05 s1612 F06 s1612 F11	P062E	1 Hz	Solid on	Injector Bank 1 fault

NO.	Dashboard Fault Code	Fault Code	Warning Lamp		Title
			AMB	RED	
100	s651 F05 s651 F06	P0201		Solid on	Injector 1 Circuit fault
101	s653 F05 s653 F06	P0203		Solid on	Injector 2 Circuit fault
102	s654 F05 s654 F06	P0204		Solid on	Injector 3 Circuit fault
103	s652 F05 s652 F06	P0202		Solid on	Injector 4 Circuit fault
104	s675 F03 s675 F05 s675 F06 s675 F31	P2687	Solid on		Fuel Heater Driver fault
105	s174 F02	P0201		Solid on	Fuel temp sensor gradient fault
106	s174 F03	P0183		Solid on	Fuel temp sensor high fault
107	s174 F03	P0182		Solid on	Fuel temp sensor low fault
108	s676 F05	P0380	Solid on		GP relay open circuit fault
109	s676 F04	P0383	Solid on		GP relay short circuit to ground fault
110	s676 F03	P0384	Solid on		GP relay short circuit to source fault
111	s1076 F31	P0254		Solid on	IMV current trim drift fault
112	s157 F11 s1076 F03 s1076 F04 s1076 F16 s1076 F18	P0002		Solid on or 1 Hz	IMV control fault
113	s1076 F03	P0004		1 Hz	IMV control feedback high fault
114	s1076 F04	P0003		Solid on	IMV control feedback low fault
115	s1076 F05	P0001		1 Hz	IMV driver signal open circuit fault
116	s172 F02	P0074		Solid on	Inlet Air Temp sensor signal gradient fault
117	s172 F03	P0073		Solid on	Inlet Air Temp sensor signal high fault
118	s172 F04	P0072		Solid on	Inlet Air Temp sensor signal low fault
119	s5202 F31	U0140	Solid on		CAN message Time-out fault
120	s106 F03 s106 F04	P0106		Solid on	Intake Manifold Absolute Pressure sensor signal drift fault
121	s106 F03	P0108		Solid on	Intake Manifold Absolute Pressure sensor signal high fault
122	s106 F04	P0107		Solid on	Intake Manifold Absolute Pressure sensor signal low fault
123	s0651 F31	P029B	Solid on		Injector 1 MDP value low fault
124	s653 F31	P02A3	Solid on		Injector 2 MDP value low fault
125	s654 F31	P02A7	Solid on		Injector 3 MDP value low fault

NO.	Dashboard Fault Code	Fault Code	Warning Lamp		Title
			AMB	RED	
126	s652 F31	P029F	Solid on		Injector 4 MDP value low fault
127	s654 F31	P1311		Solid on	no MDP updates occur fault 1
128	s654 F31	P1303		Solid on	no MDP updates occur fault 2
129	s651 F31	P029A	Solid on		Injector drift fault detection on Injector 1
130	s653 F31	P02A2	Solid on		Injector drift fault detection on Injector 2
131	s654 F31	P02A6	Solid on		Injector drift fault detection on Injector 3
132	s652 F31	P029E	Solid on		Injector drift fault detection on Injector 4
133	s630 F02	P0605	Solid on		ECU memory integrity fault - code
134	s630 F02	P0603	Solid on		ECU memory integrity fault - data / calibration
135	s630 F02	P0604	Solid on		ECU memory integrity fault - RAM
136	s94 F11	P0088		1 Hz	Rail pressure control fault
137	s630 F11	P062F		1 Hz	ECU non volatile memory fault
138	s91 F31	P2135		1 Hz	Foot Pedal Correlation track 1 over track 2 fault
139	s91 F31	P060D		1 Hz	Foot pedal signal fault
140	s91 F31	P0120		1 Hz	Foot pedal signal track 1 fault
141	s91 F31	P0220		1 Hz	Foot pedal signal track 2 fault
142	s29 F31	P2138		1 Hz	Hand Pedal Correlation track 1 over track 2 fault
143	s29 F31	P060E		1 Hz	Hand pedal signal fault
144	s29 F31	P2120		1 Hz	Hand pedal signal track 1 fault
145	s29 F31	P2125		1 Hz	Hand pedal signal track 2 fault
146	s157 F03 s157 F04 s157 F11 s157 F31	P0191		1 Hz	Rail Pressure sensor fault(global)
147	s157 F01	P0093		1 Hz	Rail Pressure Sensor signal drop fault
148	s157 F02	P0190		1 Hz	Rail Pressure Sensor signal grad fault
149	s157 F03	P0193		1 Hz	Rail Pressure Sensor signal high fault
150	s157 F04	P0192		1 Hz	Rail Pressure Sensor signal low fault
151	s157 F10	P0087		Solid on	Rail Pressure build normal fault
152	s157 F11	P0089		1 Hz	Rail Pressure Control Error During 'RVD-Only' control
153	s677 F31	P0615	Solid on		Starter motor relay global driver fault
154	s677 F03 s677 F05	P0617	Solid on		Starter motor control relay - short Circuit to Ground detected
155	s677 F04	P0616	Solid on		Starter motor control relay - short Open Circuit/Short Circuit to battery detected
156	s105 F03	P0113		Solid on	Intake Manifold Temp sensor high fault
157	s105 F04	P0112		Solid on	Intake Manifold temp sensor low fault

NO.	Dashboard Fault Code	Fault Code	Warning Lamp		Title
			AMB	RED	
158	s105 F02	P0114		Solid on	Intake Manifold temp sensor noise fault
159	s105 F02	P0111		Solid on	Intake Manifold temp sensor plausability fault
160	s51 F07	P02E1	Solid on		ACV control fault
161	s51 F03	P02E9	Solid on		ACV positio signal signal high fault
162	s51 F04	P02E8	Solid on		ACV position signal low fault
163	s51 F11	P02EB	Solid on		ACV driver fault(curret)
164	s51 F05	P02E0	Solid on		ACV driver open circuit
165	s51 F16 s51 F18	P02FA	Solid on		ACV driverr fault(etc)
166	s51 F04	P02E2	Solid on		ACV driver short circuit to Ground
167	s51 F03	P02E3	Solid on		ACV driver short circuit to Battery
168	s51 F10	P02E7	Solid on		ACV learning position fault
169	s1180 F31	P0544		Solid on	Exhaust Manifold temp fault
170	s1180 F03	P0546		Solid on	Exhaust Manifold temp sensor high fault
171	s1180 F04	P0545		Solid on	Exhaust Manifold temp sensor low fault
172	s1180 F02	P2081		Solid on	Exhaust Manifold temp sensor noise fault
173	s1180 F02	P2080		Solid on	Exhaust Manifold temp sensor plausability fault
174	s1079 F11	P0641		1 Hz	ECU Internal 5V Supply 1 fault
175	s1080 F11	P0651		1 Hz	ECU Internal 5V Supply 2 fault
176	s1080 F11	P0697		1 Hz	ECU Internal 5V Supply 2 auxillary fault
177	s97 F03	P2264		Solid on	Water in fuel sensor fault
178	s97 F02 s97 F11	P2269	Solid on	Solid on	Water in fuel detect
179	s100 F02	P0522		2 Hz	Engine oil pressure fault

- When malfunction occurs, the warning lamp and a SPN (Suspect Parameter Number) are displayed on the instrument cluster.
- Connect the diagnostic device to the vehicle to check for a DTC(Diagnostic Trouble Codes), and inspect the vehicle according to the corresponding repair procedure.
- To use this diagnosis function, park the vehicle in a safe place in advance and connect the diagnostic device.