

ISO 15765-3:2004-10 (E)

Road vehicles - Diagnostics on Controller Area Networks (CAN) - Part 3: Implementation of unified diagnostic services (UDS on CAN)

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms, definitions and abbreviated terms	2
4	Conventions	2
5	Unified diagnostic services (UDS) applicability to OSI model	2
6	Application and session layers	2
6.1	Application layer services	2
6.2	Application layer protocol	2
6.3	Application layer and diagnostic session management timing	2
6.3.1	General	2
6.3.2	Application layer timing parameter definitions	4
6.3.3	Session layer timing parameter definitions	6
6.3.4	Client and server timer resource requirements	6
6.3.5	Detailed timing parameter descriptions	9
6.3.6	Error handling	27
7	Network layer interface	29
7.1	General information	29
7.2	FlowControl N_PCI parameter definition	29
7.3	Mapping of A_PDU onto N_PDU for message transmission	29
7.4	Mapping of N_PDU onto A_PDU for message reception	29
8	Standardized diagnostic CAN identifiers	30
8.1	Legislated 11 bit OBD CAN identifiers	30
8.2	Legislated 29 bit OBD CAN identifiers	30
8.3	Enhanced diagnostics 29 bit CAN identifiers	30
8.3.1	General information	30
8.3.2	Structure of 29 bit CAN identifier	31
8.3.3	Structure of address	33
8.3.4	Message retrieval	35
8.3.5	Routing	36
9	Diagnostic services implementation	40
9.1	Unified diagnostic services overview	40
9.2	Diagnostic and communication control functional unit	42
9.2.1	DiagnosticSessionControl (10 hex) service	42
9.2.2	ECUReset (11 hex) service	42
9.2.3	SecurityAccess (27 hex) service	43
9.2.4	CommunicationControl (28 hex) service	43
9.2.5	TesterPresent (3E hex) service	43
9.2.6	SecuredDataTransmission (84 hex) service	44
9.2.7	ControlDTCSetting (85 hex) service	44

9.2.8	ResponseOnEvent (86 hex) service	44
9.2.9	LinkControl (87 hex) service	47
9.3	Data transmission functional unit	47
9.3.1	ReadDataByIdentifier (22 hex) service	47
9.3.2	ReadMemoryByAddress (23 hex) service	47
9.3.3	ReadScalingDataByIdentifier(24 hex) service	48
9.3.4	ReadDataByPeriodicIdentifier (2A hex) service	48
9.3.5	DynamicallyDefineDataIdentifier (2C hex) service	54
9.3.6	WriteDataByIdentifier (2E hex) service	54
9.3.7	WriteMemoryByAddress (3D hex) service	54
9.4	Stored data transmission functional unit	54
9.4.1	ReadDTCInformation (19 hex) service	54
9.4.2	ClearDiagnosticInformation (14 hex) service	56
9.5	Input/Output control functional unit	56
9.5.1	InputOutputControlByIdentifier (2F hex) service	56
9.6	Remote activation of routine functional unit	56
9.6.1	RoutineControl (31 hex) service	56
9.7	Upload/Download functional unit	57
9.7.1	RequestDownload (34 hex) service	57
9.7.2	RequestUpload (35 hex) service	57
9.7.3	TransferData (36 hex) service	57
9.7.4	RequestTransferExit (37 hex) service	57
10	Non-volatile server memory programming process	58
10.1	General information	58
10.2	Detailed programming sequence	61
10.2.1	Programming phase #1 -- Download of application software and/or application data	61
10.2.2	Programming phase #2 -- Server configuration	66
10.3	Server reprogramming requirements	69
10.3.1	Programmable servers and their categories	69
10.3.2	Requirements for all servers to support programming	70
10.3.3	Requirements for programmable servers to support programming	70
10.3.4	Software, data identification and fingerprints	74
10.3.5	Server routine access	77
10.4	Non-volatile server memory programming message flow examples	78
10.4.1	General information	78
10.4.2	Programming phase #1 -- Pre-Programming step	78
10.4.3	Programming phase #1 -- Programming step	79
10.4.4	Programming phase #1 -- Post-Programming step	86
	Annex A (normative) Network configuration dataIdentifier definitions	87
	Bibliography	92