

Current proposal for J1979-2 First Frame Escape Sequence

5-12-20

ISO 15765-2/ISO 15765-4 2016 version

- SingleFrame
- For unsegmented messages with $CAN_DL \leq 8$, the message length is embedded in lower nibble of the only PCI byte (Byte #1).
- ...
- SingleFrame (SF)
- shall be used to support the transmission of messages that can fit in a single CAN frame.

- FirstFrame
- A FirstFrame (FF) shall only be used to support the transmission of messages that cannot fit in a single
- CAN frame, i.e. segmented messages. The FirstFrame of a segmented message is encoded as a
- FirstFrame (FF). On receipt of a FirstFrame (FF), the receiving network layer entity shall start
- assembling the segmented message. For segmented messages with a message length > 4095 , the
- *FirstFrame escape sequence* shall be used where the lower nibble of the first PCI byte (Byte #1) is set
- to 0000_2 and the 2nd PCI byte (Byte #2) is set to zero. The message length is embedded in the
- following four bytes (Byte #3 .. Byte #6, MSB first).

9 Transport protocol layer

The requirements of ISO 15765-2 are applicable for legislated OBD purposes with the exception that CAN FD is not allowed. In addition, the FirstFrame escape sequence is only allowed when ISO 14229-1 UDS services are used for legislated OBD.

Table view of different Frame types – ISO 15765-2

Table 9 — Summary of N_PCI bytes

N_PDU name	N_PCI bytes						
	Byte #1		Byte #2	Byte #3	Byte #4	Byte #5	Byte #6
	Bits 7 - 4	Bits 3 - 0					
SingleFrame (SF) (CAN_DL ≤ 8)	0000 ₂	SF_DL	—	—	—	—	—
SingleFrame (SF) (CAN_DL > 8) ^a	0000 ₂	0000 ₂	SF_DL	—	—	—	—
FirstFrame (FF) (FF_DL ≤ 4 095)	0001 ₂	FF_DL		—	—	—	—
FirstFrame (FF) (FF_DL > 4 095) ^b	0001 ₂	0000 ₂	0000 0000 ₂	FF_DL			
ConsecutiveFrame (CF)	0010 ₂	SN	—	—	—	—	—
FlowControl (FC)	0011 ₂	FS	BS	ST _{min}	N/A	N/A	N/A

^a Messages with CAN_DL > 8 shall use an escape sequence where the lower nibble of Byte #1 is set to 0 (invalid length). This signifies to the network layer that the value of SF_DL is determined based on the next byte in the frame (Byte #2). As CAN_DL is defined to be greater than 8, this definition is only valid for CAN FD type frames.

^b Messages larger than 4 095 bytes shall use an escape sequence where the lower nibble of Byte #1 and all bits in Byte #2 are set to 0 (invalid length). This signifies to the network layer that the value of FF_DL is determined based on the next 32 bits in the frame (Byte #3 is the MSB and Byte #6 the LSB).

FF escape sequence – requirement's and open points

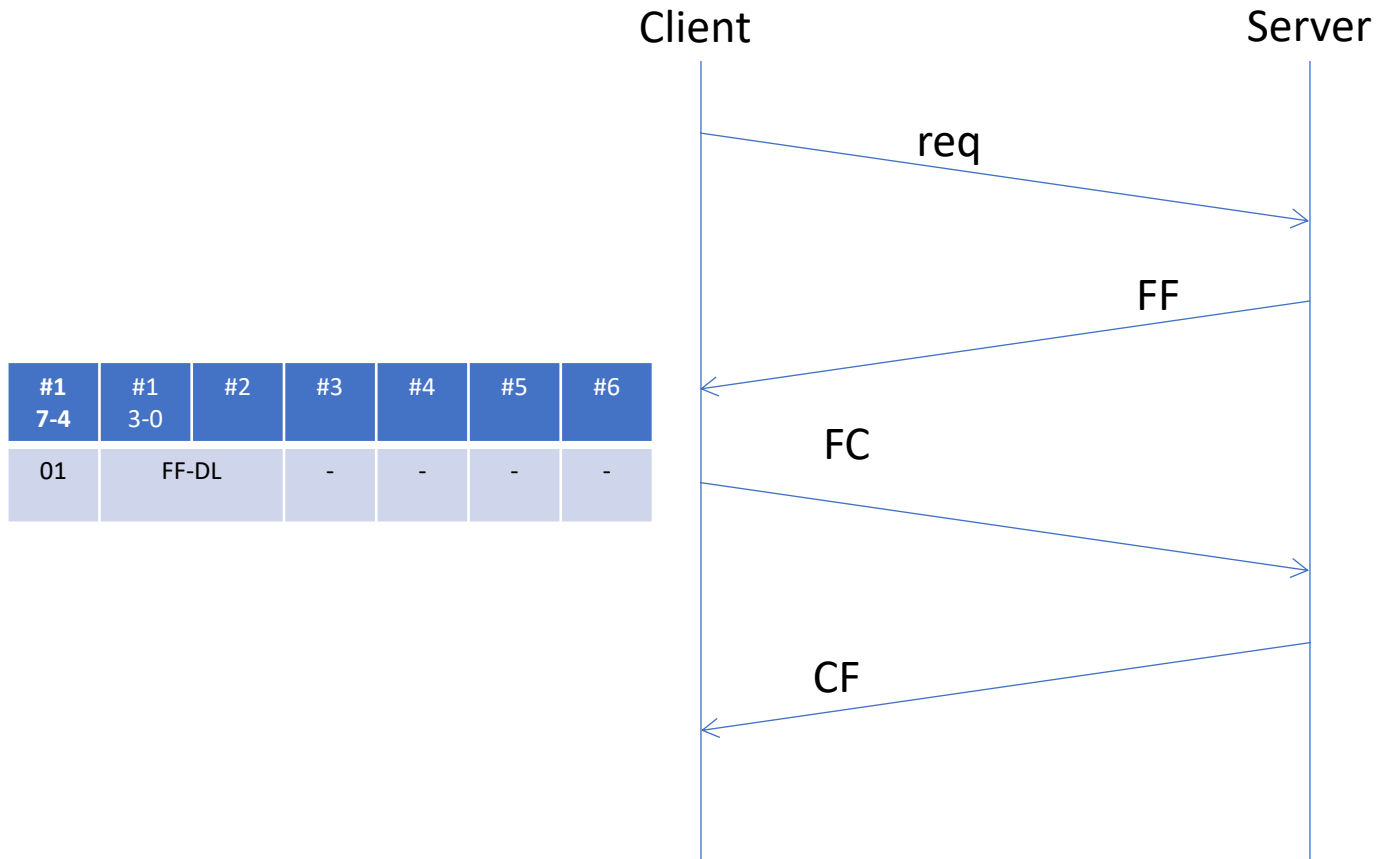
- If it is agreed for introduction of J1979-2 then all Clients and Server must support it.
- It is only used when message > 4k on DoCAN.
- If a Client does not support it (violating requirements) then it will see no response from the ECU
- And should re-send the latest request. (with delay?).
- It is difficult to detect which Clients do not support it.
- If Server not support it, it will send an Negative Response Code 0x14.

- Recommendation: Mandatory for Server and Clients.

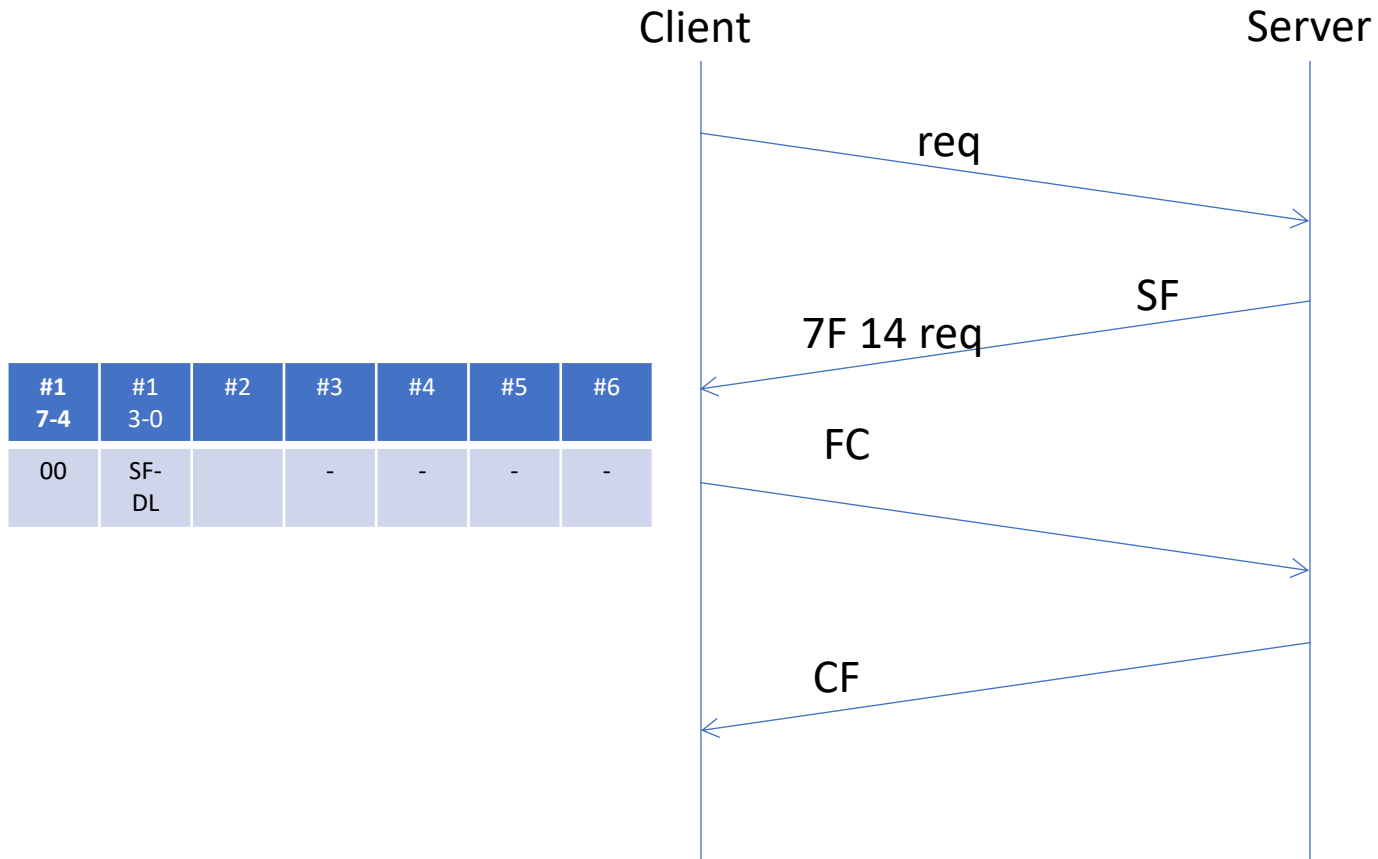
- Open points:
- NRC 0x14 is no longer required. Do we really need to keep it in SAE J1979-2? We don't have a allowed use case, and sending of NRC 0x14 will against the standard.
- FF esc sequences allows up to 4GB messages,
- but 8/16/32KB will probable be the practical limit (supporting up to 2000/4000/8000 DTCs). Should be a requirement for minimum size in SAE J1979-2 and J1978-2? What happen if the size increase with Number of DTCs or new functionality?

ISO 15765-2/ISO 15765-4

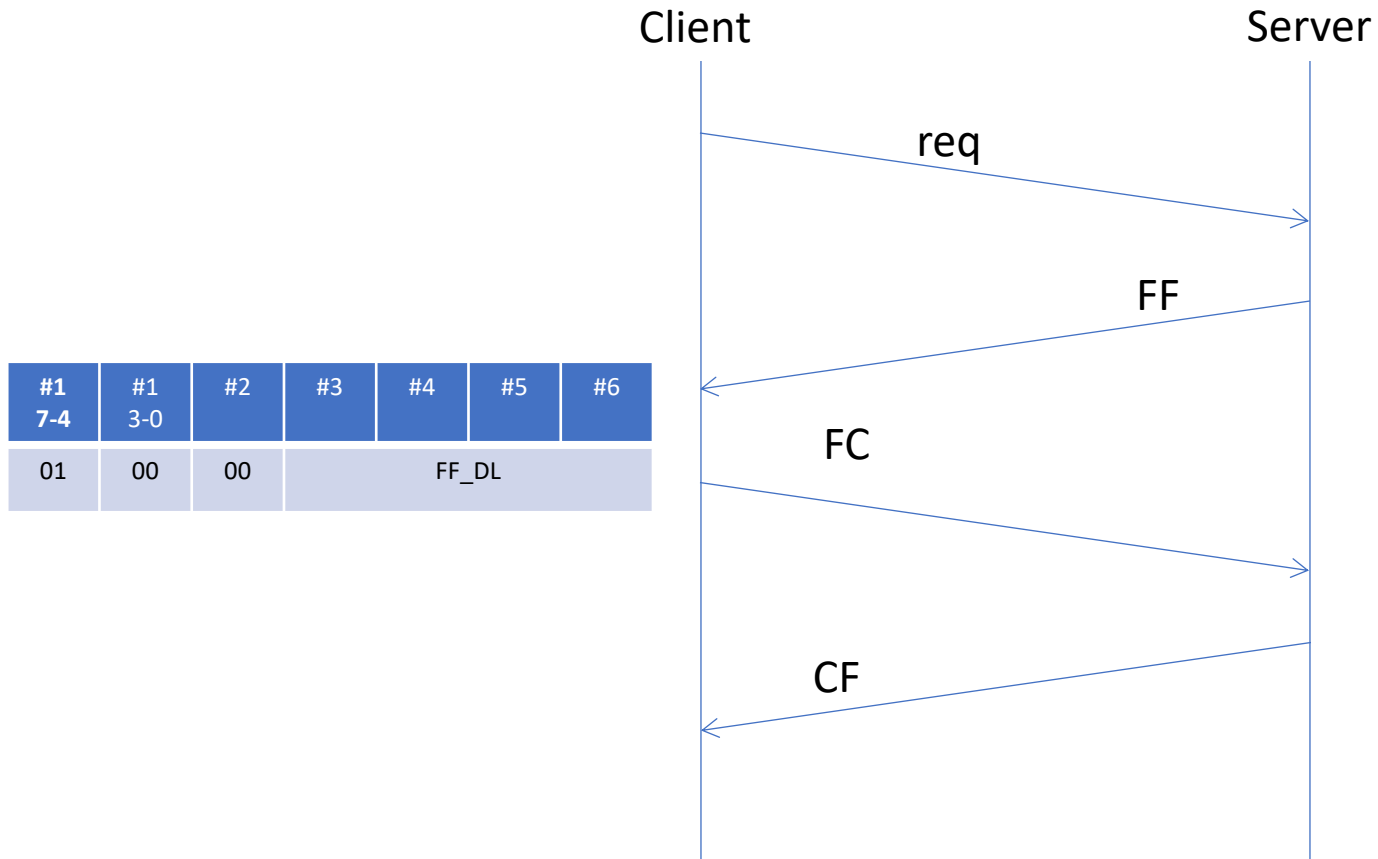
#1 < 4k



#2 >4k NRC 14 - escape sequence is not supported from Server



ISO 15765-2/ISO 15765-4 #3 >4k FirstFrame escape sequence is supported from Server and Client

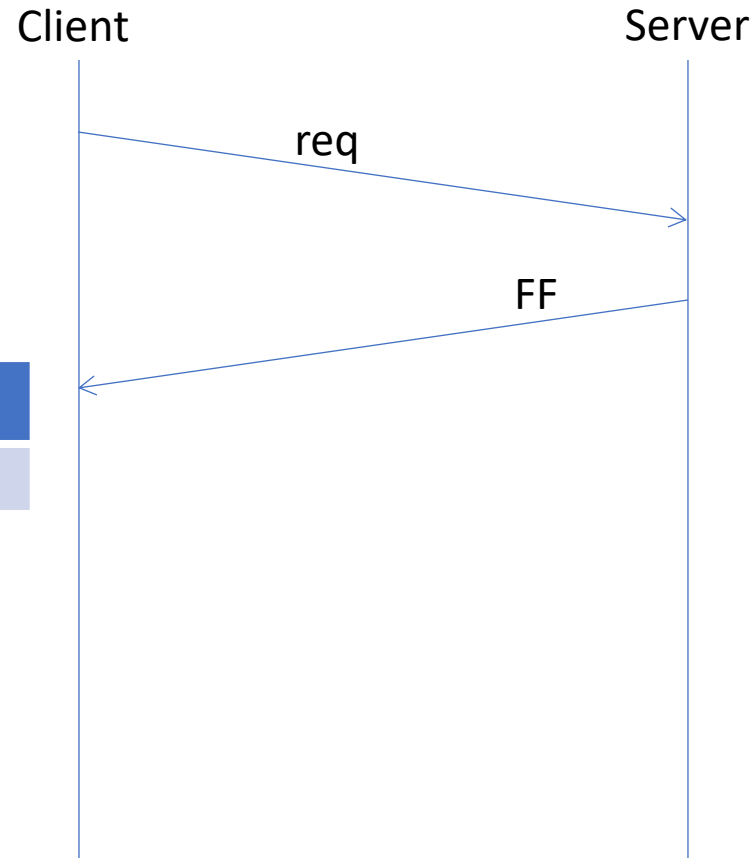


4GB is possible but 8/16/32KB* is more probable.

*have to be defined from industry

sequence #4 >4k Client not supporting FF escape sequence

#1 7-4	#1 3-0	#2	#3	#4	#5	#6
01	00	00	FF_DL			



Message is dropped.
Application will see no response