



AP-3.8

Transaction File – TR

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DOCUMENT STATUS

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1.0	4 July 2024	NPRA	New document. Content from old doc. 4.3, cleaned up and clarified. Rectified inconsistencies.

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1 PREFACE

1.1 Description

The Transaction File (TR) is generated at the Charging Point and periodically transferred to AutoPASS HUB. Each qualified passage¹ in a Charging Point will create a record in the Transaction File.

EN15509 is the only OBE protocol supported by the TR-file. The format is the same whether the passage is for an OBE passage or a video passage.

The body lines end with a Line Feed only. The footer ends without a Line Feed character.

1.2 Format Versions

This file format is specific to AutoPASS. It remains unchanged from the original AutoPASS format definition.

¹ «Qualified Passage» means a passage with a vehicle that shall normally be charged, without considering possible exemptions.

1.3 File Name Generation

The file name format is:

```
tr000000_YYYYMMDDhhmmPPP_SS.str
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- 000000 – Operator ID (unique identification of the toll system)
- YYYY – Year
- MM – Month (01-12)
- DD – Day (01-31)
- hh – Hour (00-23)
- mm – Minute (00-59)
- PPP – Charging Point ID (001-999)
- SS – Sequence Number of the Transaction File from each CP (00-99)

Hour & Minute (hhmm) means the hour and minute when the transaction file was created, given in local Norwegian time. Daylight savings time is to be observed.

“.str” means Sorted Transactions.

The Sequence Number is incremented for each transaction file produced from the CP. It is reset to 0 after 99. The Sequence Numbers shall increment also over midnight, i.e. it does not reset to 0 for the start of the next day.

1.4 Data Formats

1.4.1 Character Set

The ISO/IEC 8859-1 character set is to be used. See [Table 5 - Valid Characters for LPN](#). Non-Latin characters shall be mapped into this character set according to [Table 6 – Mapping of Non-Latin Characters for LPN](#).

1.4.2 Time Stamp Format

All time stamps in the file body shall be given in local Norwegian time. Daylight savings time is to be observed.

The format of the time stamp is YYYYMMDDhhmmssddd, where:

- YYYY – Year
- MM – Month (01-12)
- DD – Day (01-31)
- hh – Hour (00-23)
- mm – Minute (00-59)
- ss – Second (00-59)
- ddd – Decimal Second (000-999)

2 TRANSACTION FILE FORMAT

2.1 File Header

There is no file header.

2.2 Body

This format description is to be used for OBE passages as well as for video passages.

Name	Number of Char.	Type of value	Begin	End	Definition	Origin	Adjusted	Mandatory or Optional	Value if Nothing	Padding
Charging point	3	Numeric	1	3	Charging point ID.	CP-config	Right	Mandatory	n/a	Zeros
Direction	1	Numeric	4	4	Direction of passage is being used in road charging and gives information whether the passage was inbound or outbound of the area which is subject to fees. A single passage in open systems is marked as: 0 = Inbound 1 = Outbound	CP-config	Right	Mandatory	n/a	Zeros
Lane	2	Numeric	5	6	ID of the lane where the passage took place.	CP-config	Right	Mandatory	n/a	Zeros
Blank	1	AlphaN	7	7	Blank	CP			Blank	
Time	17	Numeric	8	24	The time of the passage in local time. The format is YYYYMMDDhhmmssddd. 20010115102430123 means January 15, 2001, at 10:24:30.123. In normal operating conditions, this is the time of the detection of the vehicle.	CP	Right	Mandatory	n/a	Zeros
DST	3	AlphaN	25	27	Standard indication of summertime (daylight saving time) described with 3 characters. If the time is adjusted for summertime, the value shall be "DST". Otherwise, blanks.	CP	Left	Mandatory	Blanks	n/a
Blank	1	AlphaN	28	28	Blank	CP			Blank	
Signal code	2	Numeric	29	30	See AP-1.4, "AutoPASS Processing of Signal Codes" for the definition of the signal codes.	CP	Right	Mandatory	n/a	Zeros
Vehicle Class	2	Numeric	31	32	Always "00"	CP	Right	Mandatory	n/a	Zeros
TagStatusFlag	2	Numeric	33	34	Always "00"	CP	Right	Mandatory	n/a	Zeros
Blank	1	AlphaN	35	35	Blank	CP			Blank	
CountryCode	4	Numeric	36	39	Country code. Character 1-4 of PAN. (Norway=9578) See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Right	Mandatory for OBE	Zeros	n/a
IssuerIdentifier	4	Numeric	40	43	Character 5-8 of PAN, Attribute 32 Code which identifies the Issuer of the OBE. Every Issuer of OBE has its own code. Together with the CountryCode the Issuer is uniquely identified. OBE Issuer Identifier as registered by standardisation body See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Right	Mandatory for OBE	Zeros	n/a
ServiceNumber	11	Numeric	44	54	Character 9-x of PAN, Attribute 32 (if PAN less than 19 characters spaces are filled in rightmost positions) The ServiceNumber, according to ISO 14816 indicate "ServiceCode" and "UniqueNumber". See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Left	Mandatory for OBE	Zeros	Blanks

Name	Number of Char.	Type of value	Begin	End	Definition	Origin	Adjusted	Mandatory or Optional	Value if Nothing	Padding
Key Generation	1	Numeric	55	55	Legacy parameter. Not in use.	CP	Right		Zero	Zeros
Contract Provider	6	AlphaN	56	61	E.g. 30C00B (30C = NO (Norway), 00B = National TSP ID)	OBE	Left	Mandatory for OBE	Zeros	n/a
Level of security	2	Numeric	62	63	Shall only be 01 for approved OBE in AutoPASS.	AIT	Right	Mandatory for OBE	Zeros	Zeros
Transaction Type	1	Numeric	64	64	1 if EN15509 OBE.	CP	Right	Mandatory for OBE	Zero	n/a
Authentication result, TC (RSE)	1	Numeric	65	65	0 if not checked or no OBE reading, 1 if checked and OK, 2 if checked and failed	CP	Right	Mandatory	n/a	n/a
OBE authenticator, TSP	8	AlphaN	66	73	MAC for TSP authentication as returned by the OBE. See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Left	Mandatory for OBE	Zeros	Zeros
Contract authenticator	8	AlphaN	74	81	Not used in AutoPASS. To be filled with zeros.	CP	Left		Zeros	n/a
RNRSE, TSP	8	AlphaN	82	89	Random number used by the OBE during TSP authentication calculations, Hex representation	CP	Left	Mandatory for OBE	Zeros	Zeros
KEYREF for TSP key	3	Numeric	90	92	Reference to the key used during calculation of the TSP Authenticator	AIT	Right	Mandatory for OBE	Zeros	n/a
OBE Status	5	Numeric	93	97	Flag which gives the status of the battery voltage and attempts to move the OBE. See Table 2 – OBE Status (Flag Code)	OBE	Right	Mandatory for OBE	Zeros	Zeros
TransactionCounter	5	Numeric	98	102	A counter in the OBE that the RSE shall be incremented by 1 for every passage. If the counter reaches the maximum value (65535), it will start over again from 1. See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Right	Mandatory for OBE	Zeros	Zeros
Filler	30	Numeric	103	132	Not in use	CP			Zeros	
SignalLevel	3	Numeric	133	135	Information on OBE performance (000-999). May be used to compare individual OBE performance over time.	OBE	Right	Mandatory for OBE	Zeros	Zeros
Filler	5	Numeric	136	140	Not in use	CP	Right	Mandatory	n/a	Zeros
Blank	1	AlphaN	141	141	Blank	CP			Blank	
SeqValidPayment	10	Numeric	142	151	Not in use	CP	Right	Optional	Zeros	Zeros
SeqEntryDetection	10	Numeric	152	161	Sequential counter giving the number of vehicles detected. This counter is generated in the CPE, and the value is sent to AutoPASS Core for reconciliation. The counter increases by 1 for each valid passage.	CP	Right	Mandatory	n/a	Zeros
SeqEnforced	10	Numeric	162	171	Not in use	CP	Right	Optional	Zeros	Zeros
SeqLCTransaction	10	Numeric	172	181	Sequential counter giving the number of transactions sent from the CPE. This counter is generated in the CPE, and is the value sent to the AutoPASS Core for reconciliation. The counter increases by 1 every time CPE sends a transaction.	CP	Right	Mandatory	n/a	Zeros

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Name	Number of Char.	Type of value	Begin	End	Definition	Origin	Adjusted	Mandatory or Optional	Value if Nothing	Padding
SeqVideoPicture	10	Numeric	182	191	Sequential counter of the pictures sent from the CPE to AutoPASS Core. (The CPE generates a set of pictures for every passage, but the pictures are not to be sent to AP Core for all transactions. See AP-1.4.) This counter is generated by the CPE, and the value is sent to AP Core for reconciliation. The counter increments by 1 for every set of pictures that is sent to AP Core. This counter shall also be used as the sequence number in the picture filename. For transactions where images are not to be sent from the CPE, no data shall be given and the value shall not be incremented.	CP	Right	Mandatory	Zeros	Zeros
Blank	1	AlphaN	192	192	Blank	CP			Blank	
Filler	49	Numeric	193	241	Not in use	CP			Zeros	
Blank	1	AlphaN	242	242	Blank	CP			Blank	
SignalCodeBitmap	8	Numeric	243	250	Not In use	CP	Right		Zeros	
Blank	1	AlphaN	251	251	Blank	CP			Blank	
LaneMode	2	Numeric	252	253	Always 01. 08 is used for some older CPs for lane in the opposite direction of the charging direction.	CP	Right	Mandatory	n/a	Zero
LightSignalCode	2	Numeric	254	255	Not in use	CP	Right		Zeros	Zeros
Blank	1	AlphaN	256	256	Blank	CP			Blank	
MMI Signal Code	2	Numeric	257	258	The feedback the user received at the time of passage. See Table 3 - MMI Signal Codes	CP	Right	Mandatory for OBE	Zeros	n/a
Filler	8	Numeric	259	266	Not in use	CP			Zeros	
ValidationFile	40	AlphaN	267	306	The full file name of OBU Status file used for validation of EFC passages. The file name shall be stated for all passages, also for non-OBE passages.	OBUStatusFile	Left	Mandatory	n/a	Blanks
ClassificationType	1	Numeric	307	307	Not in use	CP			Zero	
MeasuredLenght	5	Numeric	308	312	Not in use	CP			Zeros	
MeasuredWeight	5	Numeric	313	317	Not in use	CP			Zeros	
NumberOfAxels	1	Numeric	318	318	Not in use	CP			Zero	
VehicleSpecialClassification	2	Numeric	319	320	The first digit is the trailer bit. 0=No Trailer. 1=Trailer. The second digit may give the AutoPASS Ferry Class.	CP	Left	Mandatory	n/a	Zeros
Filler	3	Numeric	321	323	Not in use	CP			Zeros	
MeasuredWidth	5	Numeric	324	328	In cm	CP	Right	Mandatory	n/a	Zeros
MeasuredHeight	5	Numeric	329	333	In cm	CP	Right	Mandatory	n/a	Zeros
OtherClassificationData	10	AlphaN	334	343	Not in use	CP			Blanks	
LPNFront	10	AlphaN	344	353	This is the Licence Plate Number as read by the ANPR processes. No spaces or separators are allowed in between the characters.	CP	Left	Mandatory	Blanks	Blanks
NationLPNFront	3	AlphaN	354	356	This is the nationality of the Licence Plate Number as read by the ANPR processes. The nationality of the Licence Plate number is according ISO 3166-1-Alpha-2 code elements. DK = Denmark, NO = Norway, SE = Sweden etc. http://www.iso.org/iso/english_country_names_and_code_elements	CP	Left	Mandatory	Blanks	Blanks

Name	Number of Char.	Type of value	Begin	End	Definition	Origin	Adjusted	Mandatory or Optional	Value if Nothing	Padding
OCRConfidenceFront	3	Numeric	357	359	The ANPR process produces a confidence levels of the LPN reading. The measure is given in % as an integer between 0 and 100. The exact values will depend on each supplier's implementation.	CP	Right	Mandatory	Zeros	Zeros
OCRGroupFront	1	Numeric	360	360	The ANPR process produces a category code: 0 = No ANPR result 1 = Successful/confident reading 2 = ANPR result of low confidence	CP	Right	Mandatory	n/a	Zeros
LPNRear	10	AlphaN	361	370	See LPNFront	CP	Left	Mandatory	Blanks	Blanks
NationLPNRear	3	AlphaN	371	373	See: NationLPNFront	CP	Left	Mandatory	n/a	Blanks
OCRConfidenceRear	3	Numeric	374	376	See: OCRConfidenceFront	CP	Right	Mandatory	n/a	Zeros
OCRGroupRear	1	Numeric	377	377	See: OCRGroupFront	CP	Right	Mandatory	n/a	Zeros
LPNResultFrontandRear	10	AlphaN	378	387	The resulting LPN from the processing of the front and rear images (ANPR results and Confidence).	CP	Left	Mandatory	n/a	Blanks
NationLPNResultFrontandRear	3	AlphaN	388	390	The resulting nationality according to LPNResultFrontandRear.	CP	Left	Mandatory	n/a	Blanks
OCRConfResultFrontandRear	3	Numeric	391	393	The front/rear comparison process will produce a resulting confidence based on the individual confidences from the front and rear ANPR process.	CP	Right	Mandatory	n/a	Zeros
OCRGroupResultFrontandRear	1	Numeric	394	394	See: OCRGroupFront. To be defined by each supplier.	CP	Right	Mandatory	n/a	Zeros
Blank	1	AlphaN	395	395	Blank	CP			Blank	
LicencePlateNumber	34	AlphaN	396	429	Value from OBE. Not in use.	CP			Zeros	
VehicleClass	2	AlphaN	430	431	Value from OBE. Not in use.	CP			Zeros	
VehicleDimintions	6	AlphaN	432	437	Value from OBE. Not in use.	CP			Zeros	
VehicleAxels	4	AlphaN	438	441	Value from OBE. Not in use.	CP			Zeros	
VehicleWeightLimits	12	AlphaN	442	453	Value from OBE. Not in use.	CP			Zeros	
VehicleSpecificcharateristics	8	AlphaN	454	461	Value from OBE. Not in use.	CP			Zeros	
EquipmentOBUId	10	Numeric	462	471	As received from reading the OBE, attribute 24, EN 15509. Written as a decimal number. Set by the OBE manufacturer. See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Right	Mandatory for OBE	Zeros	Zeros
EquipmentStatus	4	AlphaN	472	475	As received from reading the OBE, attribute 26, EN 15509. Written as a hexa-decimal number. See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Left	Mandatory for OBE	Blanks	Blanks
TypeOfContract	4	Numeric	476	479	As received from reading the OBE, attribute 0, EN 15509. See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Right	Mandatory for OBE	Zeros	Zeros
ContextVersion	2	Numeric	480	481	As received from reading the OBE, attribute 0, EN 15509. See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Right	Mandatory for OBE	Zeros	Zeros
PaymentMeansExpireDate	4	Numeric	482	485	Value from OBE. Not in use.	CP			Zeros	
PaymentUsageControl	4	Numeric	486	489	Value from OBE. Not in use.	CP			Zeros	
OBUManufacturerId	5	Numeric	490	494	As received from reading the OBE (VST) See Table 1 – AutoPASS EN15509 DSRC Commands	OBE	Right	Mandatory for OBE	Zeros	Zeros

3 DSRC PROTOCOL COMMANDS

Table 1 – AutoPASS EN15509 DSRC Commands

VST							
OBE field	Attribute	Octet		Transaction File	Pos	Format	Remarks
EFC-ContextMark	0	1-3	→	ContractProvider	56-61		Pos 56-58: CountryCode: 0011 0000 1100 = 0x30C (NO)
							Pos 59-61: TSP Identifier: 0000 0000 1011 =0x00B (TSP No. 11)
							ContractProvider: 30C00B
		4-5	→	TypeOfContract	476-479	Hexadecimal	0000 0000 0000 0001 = 0x0001
							0000 0000 0001 0001 = 0x0011
		6	→	ContextVersion	480-481	Hexadecimal	0000 0010 = 02
ManufacturerId			→	OBUManufacturerId	490-494	Hexadecimal	0000 0000 0000 0010 1010 = 0x0002A
							0000 0000 0000 0100 0010 = 0x00042

GET_STAMPED.response								
OBE Field	Attribute	Octet		Transaction Field	Pos		Remarks	
Payment Means	32	1-3	→	CountryCode	36-39	Decimal	Personal Account Number (PAN) PAN = 9.578.XXXX.AAAAAA.L where MII = 9, 578 is country code for Norway and XXXX is the Toll Service Provider (Issuer) identifier as assigned by Standards Norway. Please observe that XXXX is 4 digits in line with 7812-1, A.5 National schemes using Issuer Identification Number (IIN) greater than 6 digits. AAAAAAA10 is the Individual Account Identification and L10 is the Check Digit. PAN is padded to achieve 10 octets.	
		4-5	→	IssuerIdentifier	40-43	Decimal		
		6-10	→	ServiceNumber	44-54	Decimal		
		11-12	→	PaymentMeansExpireDate	482-485			0000 0000 0000 0000
		13-14	→	PaymentUsageControl	486-489			0000 0000 0000 0000

GET.response							
OBE Field	Attribute	Octet		Transaction Field	Pos		Remarks
EquipmentOBUID	24	1-5	→	EquipmentOBUID	462-471	Decimal	0000 0100 Length indicator=4, 0000 0000 0000 0000 0000 0000 0000
EquipmentStatus	26	1-2	→	EquipmentStatus	472-475	Hexadecimal	LocalCoding : 0000 = 0
				TransactionCounter	98-102	Decimal	Transaction Counter: 0001 0000 1100 = 268
					472-475	Hexadecimal	Transaction Counter: 0001 0000 1100 = 0x10C

4 TABLES

4.1 OBE Status – Flag Code

Table 2 – OBE Status (Flag Code)

Code	Description	Flag
00001	Not defined in AutoPASS. Normally "0".	Bit 0
00002	Not defined in AutoPASS. Normally "0".	Bit 1
00004	Not defined in AutoPASS. Normally "0".	Bit 2
00008	Not defined in AutoPASS. Normally "0".	Bit 3
00016	Not defined in AutoPASS. Normally "0".	Bit 4
00032	Not defined in AutoPASS. Normally "0".	Bit 5
00064	Not defined in AutoPASS. Normally "0".	Bit 6
00128	Not defined in AutoPASS. Normally "0".	Bit 7
00256	Not defined in AutoPASS. Normally "0".	Bit 8
00512	Not defined in AutoPASS. Normally "0".	Bit 9
01024	Not defined in AutoPASS. Normally "0".	Bit 10
02048	Not defined in AutoPASS. Normally "0".	Bit 11
04096	Not defined in AutoPASS. Normally "0".	Bit 12
08192	Low battery voltage. Is set to "1" if low battery voltage is detected in the OBE.	Bit 13
16384	Not defined in AutoPASS. Normally "0".	Bit 14
32768	OBE moved.	Bit 15

4.2 MMI Signal Codes

Table 3 - MMI Signal Codes

Code	OBE MMI code	Description
30	0	OK
31	1	Not OK
32	2	Contact Service Provider
33	255 or none	No Signalling

4.3 AutoPASS Ferry Class

According to the AutoPASS regulations for ferry services.

Table 4 - AutoPASS Ferry Class

Code	Description
0	Unknown, default if not in use
1	Small vehicle length 0 – 6m
2	Medium vehicle length 6.01 – 8.00m
3	Large vehicle length 8.01 – 10.00m
4	Large vehicle length 10.01 – 12.50m
5	Large vehicle length 12.51 – 14.50m
6	Large vehicle length 14.51 – 17.50 m
7	Large vehicle length 17.51 – 19.50 m
8	Large vehicle length 19.51 – 22.00 m
9	Large vehicle length >22.00m

4.4 OBE Manufacturer Id

The international register of Manufacturer Ids can be found online:

<https://www.itsstandards.eu/registries/register-of-manufacturers-cs2/>

4.5 Valid Characters for LPN

Only the highlighted characters in Table 5 are valid characters for the LPN field of the transaction file.

Table 5 - Valid Characters for LPN

ISO/IEC 8859-1																
	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	Not in use															
1x	Not in use															
2x	SP	!	"	#	\$	%	&	'	()	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5x	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
6x	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7x	P	q	r	s	t	u	v	w	x	y	z	{		}	~	
8x	Not in use															
9x	Not in use															
Ax	NBSP	ı	ç	£	¤	¥	¦	§	¨	©	ª	«	¬	SHY	®	¯
Bx	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
Cx	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
Dx	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
Ex	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
Fx	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

4.6 Allowed Non-Latin Characters for LPN

Table 6 – Mapping of Non-Latin Characters for LPN

License Plate Character	Unicode Code Point	Mapped Latin1 Character
A to Z	U+0041to U+005A	not mapped
0 to 9	U+0030to U+0039	not mapped
Ä	U+00C4	not mapped
Ö	U+00D6	not mapped
Ü	U+00DC	not mapped
А	U+039B	a
Б	U+042A	b
С	U+010C	c
Д	U+0414	d
Е	U+0401	e
Э	U+042D	f
Г	U+0413	g
Ь	U+042C	h
Ч	U+0427	i
Й	U+0419	j
З	U+0417	k
Л	U+041B	l
Щ	U+0429	m
И	U+0418	n
Ф	U+0424	o
П	U+041F	p
Ы	U+042B	q
Я	U+042F	r
Š	U+0160	s
Ю	U+042E	t
Ц	U+0426	u
Б	U+0411	v
Ш	U+0428	w
Ж	U+0416	x
У	U+0423	y
Ž	U+017D	z
Ð	U+00D0	ä
Ć	U+0106	ù