

Equipment Specification

Title	Test Equipment Interface
Equipment purpose	Data transfer to/from MOT Testing System (MTS)
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1. Introduction

1.1. This specification details the method of transfer and the specific data sets required for the transfer of MOT information from connectable test lane equipment in use at VTS premises.

2. Scope

2.1. Connectable test lane equipment which is unable to be connected to the MTS system will no longer be approved for use in the MOT scheme.

2.2. Connectable test lane equipment is defined as: -

Equipment Type	Required Data Set
Roller Brake Tester Class IV,V,VII	BrakeTestResult (RBT)
Decelerometer	BrakeTestResult (Decel)

3. Purpose

3.1. To enable manufacturers of connectable test lane equipment to comply with the requirements of the MTS system in the transfer of MOT data to the MTS system.

4. Requirements

4.1. General

4.1.1. Connectable test lane equipment must be able to communicate with 'MOT Testing Service' (MTS), receiving test and vehicle information from, and transmitting test result to, the MTS System using the Test Equipment Interface Specifications found in the accompanying Annexes.

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4.1.2. Before any equipment is put into service using the interface for MOT testing purposes, proof of compliance with the equipment interface specification will be provided by a system of 'Type Approval' of the interface and arrangements to ensure that equipment supplied to the market conforms to the type approved master.

4.2. Equipment shall:

4.2.1. receive test and vehicle information from, and transmit test results to the MTS System;

4.2.2. meet with all appropriate data transmission requirements in Annex 10.

4.3. Technical

4.3.1. The MTS test equipment interface consists of an Internet of Things (IoT) application programming interface (API) provided by Amazon Web Services (AWS) using their IoT Core service.

4.3.2. In order to connect to this API, the equipment will require an X.509 client certificate, which is issued by DVSA. These certificates are issued to the authorised site owner and are unique for each client.

4.3.3. Each client will be issued with the appropriate client certificates and a file containing the following properties: -

Property Name	Property Description
clientEndpoint	The URL of the MTS IoT service endpoint you connect to
clientId	A unique identifier for each client
certificateFile	The filename of the X.509 public certificate
privateKeyFile	The filename of the X.509 private key
siteNumber	The VTS site number for the site
topicPrefix	The prefix to the topic name

4.3.4. The IoT API makes use of two IoT Topics, one for inbound messages and another for outbound. There are one set of topics per site and all clients subscribe to and therefore receive all messages sent from MTS. The names of the topics are composed of the values from the properties above

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Topic Name	Topic Description
[<i>topicPrefix</i>]/in/[<i>siteNumber</i>]	Inbound messages to client from MTS
[<i>topicPrefix</i>]/out/[<i>siteNumber</i>]	Outbound messages from client to MTS

5. Operation Instructions

- 5.1. When the MOT test begins a WorkOrderRequest with a workOrderState of NEW will be published to the site's Inbound topic.
- 5.2. This WorkOrderRequest will be received by all connected equipment.
- 5.3. Once the relevant measurement has been performed each piece of equipment should formulate the appropriate WorkOrderResponse containing the measured results for that part of the MOT test.
- 5.4. The WorkOrderResponse should then be published to the Outbound topic. The WorkOrderResponses from each piece of equipment may be combined or sent individually.
- 5.5. When the MOT test has concluded a WorkOrder status message will be sent containing the workOrderState of COMPLETE. This may be used by the client to conclude the equipment test.
- 5.6. If the MOT test is aborted a WorkOrder status message will be sent containing the workOrderState of CANCELLED. This may be used by the client to conclude the equipment test.
- 5.7. If the client was not connected to the Inbound topic when MTS sent the WorkOrderRequest, this will be resent when the client connects.
- 5.8. When the client connects all WorkOrders that are currently in the NEW state i.e. the test is in progress, will be resent. The client should expect that if there are multiple connections such as when network connectivity is interrupted, then multiple [duplicate] WorkOrderRequests may be received for the same test.

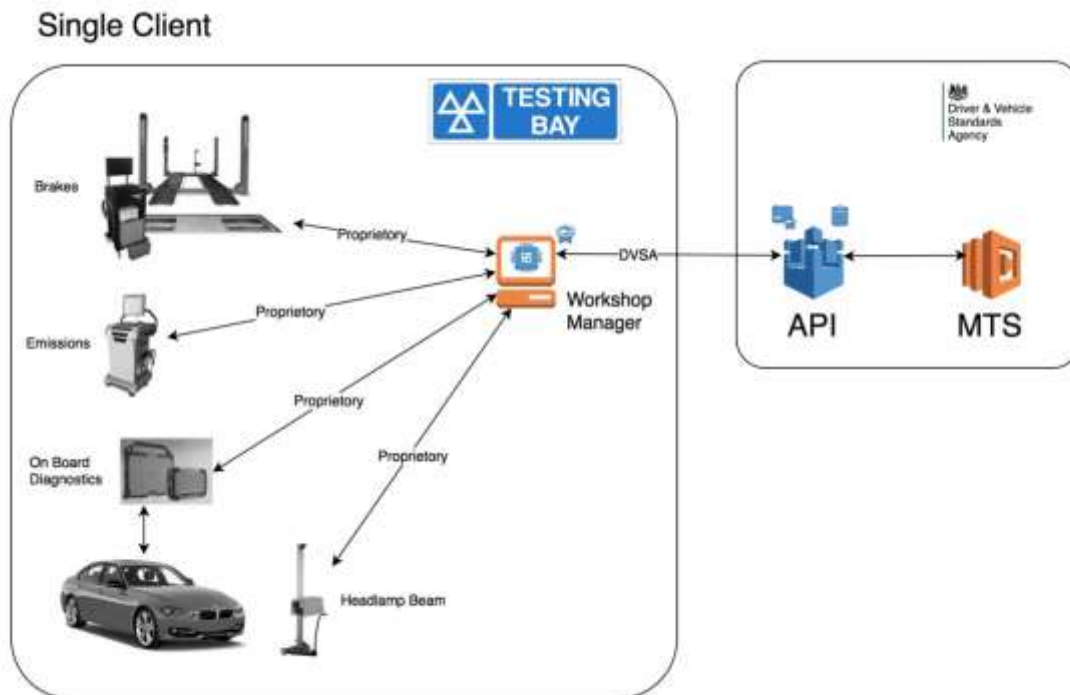
6. Method of Inspection – Vehicle Testing

- 6.1. Not Applicable.

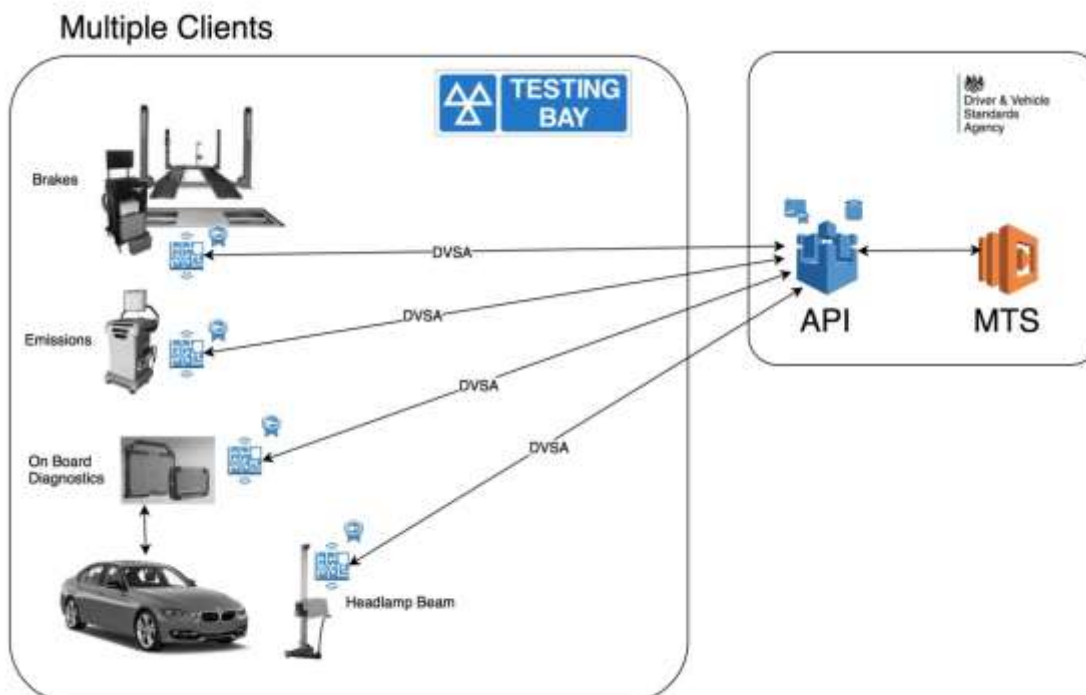
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7. Process Chart

7.1. There are two models anticipated for implementation as illustrated below. The first model uses a single client to communicate between MTS and each piece of connected test equipment.



The second model has multiple clients each connecting directly to MTS.



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8. Approval Process

8.1. Application for approval to be made to the Garage Equipment Association (GEA). The Driver and Vehicle Standards Agency (DVSA) is responsible for the management of the statutory annual testing of all vehicles in accordance with the Motor Vehicle (Tests) Regulations 1981, as amended, and where applicable, with the Goods Vehicle (Plating and Testing) Regulations 1988, as amended. DVSA has responsibility for controlling the overall standard of the statutory annual test and within that duty; a procedure for the approval of test equipment suitable for statutory MOT testing has been established. The approval of authorised MOT testing equipment has been contracted out to the GEA. Documents detailing the procedure to be followed by manufacturers who wish to gain approval of test equipment intended to be used for statutory MOT testing are held on the GEA website. Their contact details are also published there.

9. Evidential Requirements

9.1. Testing to be conducted by the approval engineer instructed by the GEA/DVSA in a simulated live environment to prove ability of product to send correctly packaged data to the MTS system.

10. Annex

10.1. Generic Data

10.1.1. WorkOrderRequest Data Set

WorkOrder (Request)

Field Name	Data Type	Description
siteNumber	String	VTs Site Number
testNumber	String	Unique MOT test number
vehicle	Vehicle	Details of the vehicle under test
workOrderState	String	NEW COMPLETE CANCELLED

10.1.2. Vehicle Data Set

Vehicle

Field Name	Data Type	Values
make	String	
model	String	

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vrn	String	
vin	String	
firstRegistrationDate	String	YYYY-MM-DD
fuelType	String	PETROL DIESEL
vehicleClass	String	4 5 7

10.2. Equipment Specific Data

10.2.1. BrakeTestResult Data Set

WorkOrder (Response)

Field Name	Data Type	Values
siteNumber	String	
testNumber	String	
vehicle	Vehicle	
brakeTestResult	BrakeTestResult	

10.2.2. Roller Brake Tester Data Set

BrakeTestResult (Roller Brake Tester)

Field Name	Data Type	Values
serviceBrakeTestType	String	ROLLER
parkingBrakeTestType	String	ROLLER
vehicleWeightType	String	PRESENTED MANUFACTURER
vehicleWeightKg	Number	
serviceBrakeEfforts	Array [BrakeEffort]	
parkingBrakeEfforts	Array [BrakeEffort]	

BrakeEffort (Roller Brake Tester)

Field Name	Data Type	Values
axleNumber	Number	1 – (number of axles)
nearside	Number	
nearsideLock	Boolean	true false
offside	Number	
offsideLock	Boolean	true false

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10.2.3. Decelerometer Data Set

BrakeTestResult (Decelerometer)

Field Name	Data Type	Values
serviceBrakeTestType	String	DECELEROMETER
parkingBrakeTestType	String	DECELEROMETER
serviceBrakeEfficiency	Number	
parkingBrakeEfficiency	Number	

10.3. Examples

The data set should be supplied in JSON format similar to the example below: -

WorkOrderRequest: -

```
{
  "siteNumber": "V123456",
  "testNumber": "1234567890",
  "vehicle": {
    "make": "Ford",
    "model": "Fiesta",
    "vrm": "ABC 123",
    "vin": "1234567890123456",
    "firstRegistrationDate": "2019-01-31",
    "fuelType": "PETROL",
    "vehicleClass": "4"},
  "workOrderState": "NEW"
}
```

WorkOrder Response (RBT): -

```
{
  "siteNumber": "V123456",
  "testNumber": "1234567890",
  "vehicle": {
    "make": "Ford",
    "model": "Fiesta",
    "vrm": "ABC 123",
    "vin": "1234567890123456",
    "firstRegistrationDate": "2010-01-31",
    "fuelType": "PETROL",
    "vehicleClass": "4"
  },
  "brakeTestResult": {
    "serviceBrakeTestType": "ROLLER",
    "parkingBrakeTestType": "ROLLER",
    "vehicleWeightType": "PRESENTED",
    "vehicleWeightKg": 1500,

```

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```
"serviceBrakeEfforts": [  
  {  
    "axleNumber": 1,  
    "nearside": 600,  
    "nearsideLock": false,  
    "offside": 600,  
    "offsideLock": false  
  },  
  {  
    "axleNumber": 2,  
    "nearside": 400,  
    "nearsideLock": false,  
    "offside": 400,  
    "offsideLock": false  
  }  
],  
"parkingBrakeEfforts": [  
  {  
    "axleNumber": 2,  
    "nearside": 300,  
    "nearsideLock": false,  
    "offside": 300,  
    "offsideLock": false  
  }  
]  
}
```

WorkOrder Response (Decelerometer): -

```
{  
  "siteNumber": "V123456",  
  "testNumber": "1234567890",  
  "brakeTestResult": {  
    "serviceBrakeTestType": "DECELEROMETER",  
    "parkingBrakeTestType": " DECELEROMETER ",  
    "serviceBrakeEfficiency": 80.3,  
    "parkingBrakeEfficiency ": 60.7 }  
}
```