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SERVICE BRAKE OPERATION AND ELECTRONIC STABILITY CONTROL SYSTEMS

APPLICATION

This examination applies to all vehicles and trailers.

VEHICLES AND TRAILERS REQUIRED TO BE FITTED WITH ANTI-LOCK BRAKING SYSTEMS ARE: -

ITEM	TYPE OF VEHICLE	DATE
1	Motor vehicles with design GVW greater than 16000kg and authorised to tow a semi-trailer or a centre axle drawbar trailer with total design axle weights greater than 10000kgs or a drawbar trailer with design GVW greater than 10000kgs. (an O4 trailer)	First used on or after 13th April 1992
2	Coaches with a design GVW exceeding 12000kgs. And which do not have a load sensing valve.	First used on or after 1st April 1983 to 12th April 1992
3	Coaches with a design GVW exceeding 12000kgs.	First used on or after 13th April 1992
4	Motor vehicles with design GVW greater than 3500kg or with more than 8 passenger seats. And which do not have a load sensing valve.	First used on or after 1st April 1983 to 20th May 2004
5	Motor vehicles with design GVW greater than 3500kg or with more than 8 passenger seats	First used on or after 21st May 2004
6	Semi-trailers and centre axle drawbar trailers with a design total axle weight of more than 10000kg. And which do not have a load sensing valve.	Manufactured from 1st October 1982 to 12th October 1991
7	Semi-trailers and centre axle drawbar trailers with a design total axle weight of more than 10000kg.	Manufactured on or after 13th October 1991
8	Semi-trailers and centre axle drawbar trailers with a design total axle weight of more than 3500kg.	Manufactured on or after 21st May 2004
9	Drawbar trailers with a design GVW of more than 10000kg.	Manufactured on or after 13th October 1991
10	Drawbar trailers with a design GVW of more than 10000kg and which do not have a load sensing valve.	Manufactured from 1st October 1982 to 12th October 1991

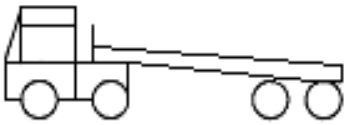
11	Drawbar trailers with a design GVW of more than 3500kg.	Manufactured on or after 21st May 2004

Note: Where only the year of manufacture is known, the date of manufacture should be taken to be the first day of that year.

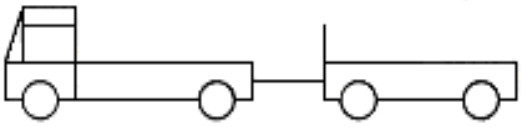
IDENTIFYING VEHICLES THAT FALL WITHIN ITEM 1 OF THE ABOVE TABLE

A little confusion has arisen from the term authorised to tow. This is where a vehicle has a manufacturer's plate fitted, displaying a Train Weight. The following should be used as a guide to clarify the situation for a vehicle first used between 13th April 1992 & 20th May 2004, and to determine if it is authorised to tow a trailer with a total design axle weight greater than 10000kgs

EXAMPLE 1



Semi-trailer or

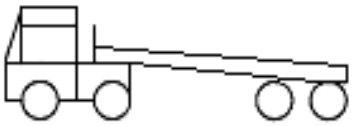


Rigid and Drawbar Trailer

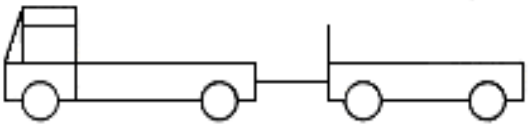
Drawing vehicle Design GVW 18000kg
GTW greater than 28000kg (GTW – GVW > 10000kg)

When the GVW is subtracted from the GTW (Design Weight) and the sum is greater than 10000kg then ABS is required. There is no requirement to have a tow hitch fitted.

EXAMPLE 2



Semi-trailer or



Rigid and Drawbar Trailer

Drawing vehicle Design GVW 18000kg
GTW equal to 28000kg or less (GTW – GVW < 10000kg)

Anti-lock brakes may be required if:

- the drawing hitch is rated at more than 10000kg, or
- the tractor is presented for test with a semi-trailer which has Total Axle Weight Greater than 10000kg, or

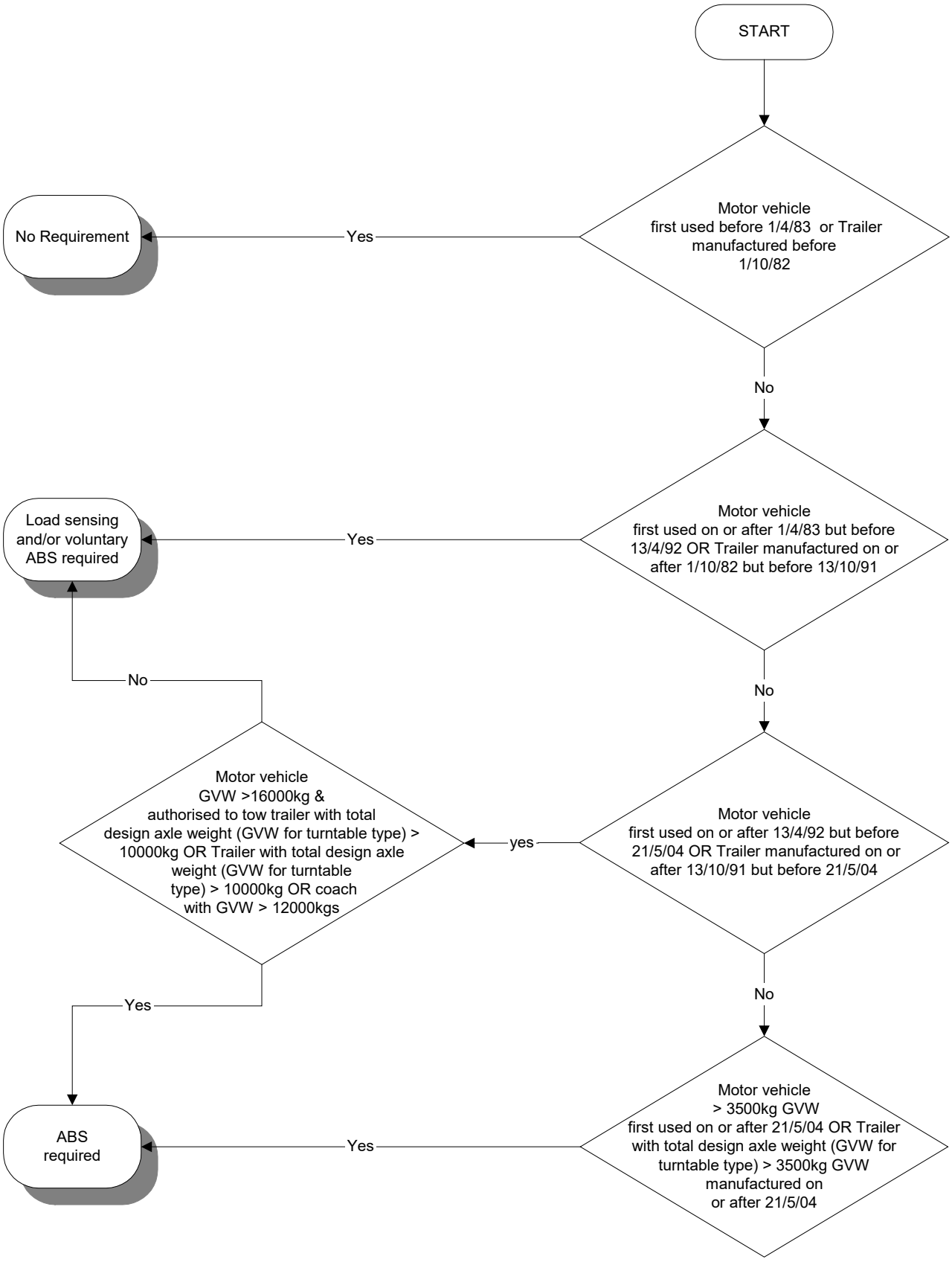
- the drawing vehicle is presented for test with a full drawbar trailer (turntable type) that has GVW greater than 10000kg

Note:
The tow hitch should have a manufacturer's identification plate showing the hitch capacity, although if missing it is not a reason for failure.

ABS EXEMPT VEHICLES

A public works vehicle which has a maximum design weight not exceeding 7500kg and is specifically designed for use and used solely for the purpose of street cleansing.

Load Sensing and ABS Requirements for Motor Vehicles and Trailers Over 3500kgs Gross



PROCEDURE AND STANDARDS

Air pressure systems and vacuum systems with reservoirs.

- With reservoir at maximum pressure or vacuum, fully depress the pedal and note the change in gauge readings to see if they give indications of a leak in the system.

Hydraulic systems (other than full power systems).

- Fully depress the pedal and keep it depressed under steady pressure. Check for sponginess and whether the pedal creeps down under full pressure.

Note:
For some brake systems a small amount of creep may be due to elasticity in the brake components.

Brake systems assisted by engine vacuum.

- Deplete the vacuum, partly depress the pedal, start the engine, and check if the pedal can be felt to dip.

Full power hydraulic systems.

- Check that the system pressure is maintained when the brakes are off and the engine is stopped. Loss of pressure will be indicated by the operation of the low pressure warning device (warning light or appearance of semaphore "flag" device).

Anti-lock braking systems (ABS) and Electronic Braking System (EBS).

- Check whether the vehicle is required to be fitted with anti-lock brakes.
- Check the anti-lock warning lamp sequence of operation.
- Check for the presence of The ISO 7638 connection, which must be fitted to trailers with ABS manufactured on or after 21st May 2004 and motor vehicles first used on or after 21st May 2004

NON – TOWING VEHICLES

For non-towing vehicles, when the ignition is switched on, a single ABS/EBS warning lamp on the dashboard will go through one of the following sequences:

1. Lamp comes on and goes out within a few seconds.
2. Lamp comes on and will remain on until the vehicle is driven over a nominal speed of between 7 and 10 km/h.
3. Lamp comes on, goes out after a few seconds, after a few more seconds comes back on and will remain on until the vehicle is driven over a nominal speed of between 7 and 10km/h.

TOWING VEHICLES

Before checking any warning lamps ensure that all electrical connections between the vehicle and trailer are being used, i.e. power **should** be taken from the ISO 7638 connection but may take a feed from the 24N (stop lamp Susie) and 24S (fog lamp Susie) as back up power. For towing vehicles there are generally four arrangements of warning lamp:

1. One warning lamp on the vehicle dashboard and one warning lamp on the trailer.
2. Two warning lamps on the vehicle dashboard, one for the vehicle and one for the trailer.
3. There are two warning lamps on the vehicle dashboard, one for the vehicle and one for the trailer and an additional information lamp on the dashboard that advises the driver he is towing a non-ABS/EBS trailer.
4. Two information lamps on the dashboard, one for the vehicle, one for the trailer and one common warning lamp.

The ABS warning light sequence for a trailer should be checked where possible on the dash of the drawing vehicle.

Trailers fitted with Electronic Controlled Air Suspension (ECAS) often have a warning lamp fitted on the headboard of the trailer; care should be taken not to confuse this with a trailer ABS warning lamp.

For testing purposes the vehicle/trailer should be driven above 10km/h to extinguish all warning lamps on the dash, with ISO 7638 connected. If there is no provision for an ISO 7638 connection on the trailer, the ABS system is relying on stop lamp power, the footbrake must be applied to provide power to the system. In this case there must be a warning lamp fitted to the trailer and must extinguish when driven above 10km/h with the footbrake applied i.e. Drive the vehicle above 10 km/h, apply and hold foot brake sufficiently to activate stop lights. Observe warning lamp sequence.

Where a vehicle/trailer has been driven over 10km/h and the warning lamp has not extinguished, this should be recorded as a Reason for Failure 5c. If only an **information lamp** remains illuminated this is not a reason for rejection.

If a warning lamp has not extinguished during the drive, the examiner must identify whether the fault is in drawing vehicle or the trailer. In most cases the warning lamps are clearly marked, but where a common lamp is used for both the drawing vehicle and trailer or where there are two lamps that cannot be distinguished, the ISO lead must be removed. If the removal of the lead extinguishes the warning lamp, the examiner can assume there is a

defect on the trailer. If the warning lamp does not extinguish with the removal of the ISO cable then there must be a fault in the drawing vehicle, and therefore it is not a suitable vehicle for presenting the trailer for test, i.e. Reason for Failure 5e.

If a trailer does not have a warning light, this is acceptable provided that the drawing vehicle has a trailer warning light fitted in the cab.

If neither vehicle nor trailer has a warning light when presented for inspection, the trailer should be failed for not having a warning lamp, if it has no ISO 7638 connection and the trailer is manufactured before 1st May 2004. If however the trailer has an ISO 7638 connection **or** is manufactured on or after 1st May 2004, the trailer should be failed for not being presented with a suitable drawing vehicle for testing purposes, i.e. Reason for Failure 5e.

If there is provision on the vehicle and trailer for the ISO7638 lead and it is not fitted this should be failed under Reason for Failure 5d. However the presenter should be given the opportunity to connect a lead if it is available.

If a trailer has provision for the ISO7638 lead but is submitted for inspection coupled to a motor vehicle, which has no provision for the ISO7638 lead, the trailer should be failed under Reason for Failure 5e.

If the vehicle and trailer are fitted with 24N, 24S and ISO7638 connections they should all be used.

ABS/EBS/ESC equipped Motor vehicles fitted with ESC must have a separate amber/yellow MIL fitted apart from those used to signal EBS electronic faults. One lamp covers both the motor vehicle, and any trailer fitted with ESC towed.

The ESC lamp will be illuminated when the system is switched off or if a fault is present. It is not required to light up on system energisation, but if it does this is acceptable provided it then goes out after a short period or when the engine is started.

If the vehicle has a switch to manually disable the ESC function, it must not be possible for the switch to be left in the “off” position and the ESC function must be automatically reinstated every time the system is re-energised (ignition turned on.)

Electronic Stability Control Systems are commonly referred to as ESC, but may also be known as ESP/RSC etc. The dashboard warning lamp for these systems may take various forms and a vehicle should only be failed when the Examiner is certain that an illuminated lamp indicates an ESC malfunction.

Multifunctional MILs

Some type approved ABS/EBS/ESC systems, will only illuminate a MIL when the vehicle detects a fault. The MIL will not illuminate during its system energisation check, as it is often a multifunctional MIL, which may differ from the standard recognised MILs for ABS/EBS/ESC systems. If the multifunctional MIL remains on after energisation, the system affected will display a fault message in an information screen on the dashboard. This should be considered a reason for failure under 5b.

REASONS FOR FAILURE

		Deficiency Category
1.	Air pressure or vacuum systems gauge reading drops when pedal depressed indicating a leak in the system.	MAJOR
2.	Hydraulic systems (other than full power systems):	
	a. Pedal creeps down when depressed.	MAJOR
	b. Sponginess when pedal depressed.	MAJOR
3.		
	a. Servo unit defective or ineffective.	MAJOR
	b. Pedal does not dip when engine started, indicating lack of assistance for brake system assisted by engine vacuum.	MAJOR
4.	Full pressure hydraulic system is not maintained for 10 minutes when the brakes are off and the engine is stopped.	MAJOR
5.	Vehicle and trailers fitted with anti-lock brakes, EBS or ESC:	
	a. Anti-lock braking system not fitted on a vehicle or trailer on which it is a mandatory requirement.	MAJOR
	b. ABS/EBS/ESC warning lamp not operating or following the correct sequence.	MAJOR
	c. ABS/EBS/ESC warning lamp not extinguishing when vehicle/trailer is driven over 10km/h, indicating a fault.	MAJOR
	d. ISO7638 lead not fitted where required.	MAJOR
	e. Trailer not presented for inspection with compatible drawing vehicle.	MAJOR
	f. ISO7638 connection not fitted where required.	MAJOR
	g. A warning light not fitted or not visible to the driver.	MAJOR
	h. A defect that would obviously render the ABS inoperative.	MAJOR
	i. An ABS, EBS or ESC system component obviously missing or excessively damaged.	MAJOR
	j. ABS, EBS or ESC system wiring excessively damaged.	MAJOR

k.	An ABS, EBS or ESC system component inappropriately repaired or modified.	MAJOR
l.	An ESC system switch missing, insecure or faulty.	MAJOR
m.	An ESC system switch insecure or faulty or which does not allow automatic resetting of the ESC function to “on” at system energisation.	MAJOR