higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

NOVEMBER EXAMINATION

DIESEL TRADE THEORY N2

18 NOVEMBER 2016

This marking guideline consists of 6 pages.

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QUESTION 1

1.1

1.1.1 B
1.1.2 B
1.1.3 B
1.1.4 B
1.1.5 D (5)

1.2 A adjusting screw lock nut/lock nut
B Adjusting screw
C Spring
D Spindle/shaft
E Needle valve
F Body/casing/housing (6)

1.3

1.3.1 A cylinder balance test is carried out to determine if all cylinders are firing. (1)

1.3.2 Opening pressure test or pop test is carried out to determine if the injector is opening at the recommended pressure (1)

1.3.3 Back leakage test is carried out to determine if there is no wear between the needle valve and its holder which may affect the opening pressure (1)

1.3.4 Spray pattern test is carried out to determine if the hole or holes in the injector tip of the nozzle are not blocked and give the correct spray pattern (1)

1.3.5 Dry seat test is carried out to determine if seals are not worn and seals properly during operation of the injector without dribbling. (1)

1.4 Single hole
Multihole
Pintle
Pintaux✓ (4)

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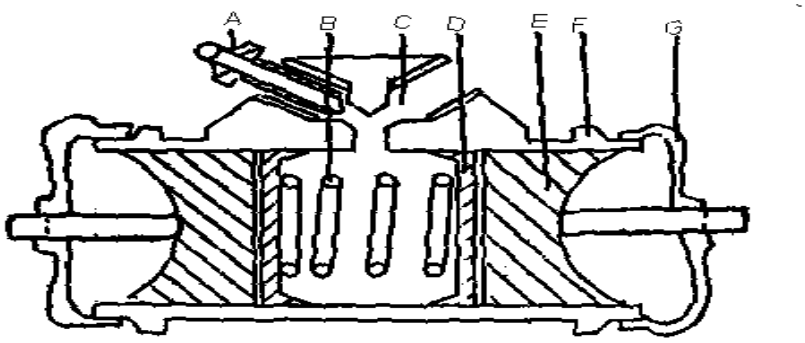
QUESTION 2

2.1



ONE MARK FOR ACCURACY

A Bleeding nipple
B Piston return spring
C Intake pipe
D Rubber washers
E Piston
F Casing
G Dust cover *(ONE MARK FOR NEATNESS)* (8)

2.2 When brakes are applied, the force on the brake drum will cause it to become oval, causing brake shudder.
The brake drums can crack when brakes are applied, causing brake failure. (2)

2.3 It is that property of brake fluid✓ which enables it to absorb moisture in the brake system.✓ (2)

2.4
- Water is absorbed by the brake fluid and can cause rust in the brake system.
- Sludge forms in the brake fluid due to residue which can cause blockages or lessen the amount of brake fluid passing through the system.
- Additives in brake fluid get used up over time, decreasing the ability of brake fluid not to freeze at very low temperatures or to boil at very high temperatures, thus decreasing the efficiency of the brake fluid.

(Any Other Relevant Answer) (3)

2.5
- Jack up the wheels to be adjusted to enable them to be turned by hand.
- Adjust each lining by means of an adjuster.
- Adjust against the drum until the wheel cannot be turned by hand.
- Loosen the adjuster until the wheel can be turned by hand.
- Remember each wheel consists of two linings to be adjusted. (5)

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QUESTION 3

3.1
A Differential housing/housing/casing
B Preload-adjustment nut/adjusting nut/nut
C Pinion pilot bearing/bearing
D Pinion/pinion gear/gear
E Taper bearings/bearing (5)

3.2 To ensure that the pinion meshes at the correct depth on the crown wheel (2)

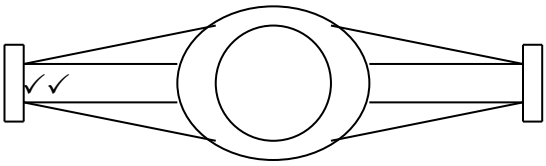
3.3 On the pinion shaft, between the flange and the bearing (2)

3.4 To ensure that the pinion does not move axially (2)

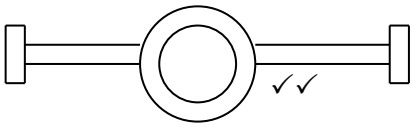
3.5 To ensure a reduction to enable the vehicle to pull away from rest (heavy loads).
To ensure a 90° drive from the pinion to the wheels. (2)

3.6

Built-up banjo-type differential housing



Banjo-type differential housing



ONE MARK FOR NEATNESS AND ACCURACY (5)

3.7
- It is more suitable to use on tandem rear-axle drives.
- The drive shaft is positioned further from the ground which enables the vehicle to move more freely on bumpy surfaces. (2)

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QUESTION 4

4.1
- It obtains a gear reduction to enable the vehicle to pull away from rest.
- It enables the vehicle to move at a high speed while the engine is rotating at low revolutions.
- It consists of a neutral gear which enables the engine and gearbox to disconnect from each other.
- It enables the vehicle to move backward while the engine is rotating.
- It enables the vehicle to increase torque by changing gears if so required by road conditions. *(Any Other Relevant Answers)* (5)

4.2
- Input shaft
- Cluster gear
- Reverse idler gear
- Synchro sleeve
- Synchro hub
- Main shaft/Output shaft (6)

4.3 It prevents two gears to be selected simultaneously. (1)

4.4
- Gears are more expensive to manufacture.
- They are less resistant to corrosion.
- Bearings must be fitted because of side thrust. (2)

(Any TWO \ Any Other Relevant Answers)

4.5 4.5.1
- Incorrect clutch adjustment
- Binding clutch cable or
- Worn or damaged synchroniser units
- Low gearbox oil level
- Engine idle speed too high
- Worn shafts, bearings, selector rods or forks inside the gearbox *(Any THREE \ Any Other Relevant Answers)*

4.5.2
- Misalignment between the gearbox and the engine
- Worn clutch pilot bearing
- Improper adjustment of the shaft linkage
- Worn synchroniser shift plate and springs
- Loose bolts holding the gearbox to the clutch housing or engine
- Worn or tapered gear teeth

(Any THREE \ Any Other Relevant Answers)

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QUESTION 5

5.1
- Make sure the vehicle is on a level surface.
- Make sure the vehicle has the recommended mass.
- Inspect the front suspension for worn tie rod ends or ball joints.
- Make sure that the front and rear wheels are in line.
- Make sure that the vehicle riding height is within specifications.
- Inspect tyres for wear. *(Any Other Relevant Answers)* (6)

5.2
- Cornering speed too high
- A low tyre inflation
- A mixed tyre arrangement
- Increasing the load at the rear (moving the centre of gravity towards the rear) *(Any THREE \ Any Other Relevant Answers)* (3)

5.3
- End float of inner column
- End float of rocker shaft
- Backlash between the worm and gear (3)

5.4
- Relatively cheap to manufacture and maintain.
- Simple connections to axle and body.
- Can be easily up-rated by addition of leaves.

(Any TWO \ Any Other Relevant Answers) (2)

5.5

Hotchkiss Drive	Torque tube drive
Propeller shaft solid	Propeller shaft is hollow
Universal joints protect from dirt/water	U joints are exposed
Greater bending loads as it takes load	Transmit torque only, no loads

(6)

TOTAL: 100

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