higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# MARKING GUIDELINE

## NATIONAL CERTIFICATE

## DIESEL TRADE THEORY N2

## 25 November 2024

**This marking guideline consists of 6 pages.**

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## QUESTION 1

1.1 1.1.1 D
1.1.2 A
1.1.3 C
1.1.4 B
1.1.5 C
1.1.6 D

(6 × 1) (6)

1.2 1.2.1 True
1.2.2 True
1.2.3 True
1.2.4 False
1.2.5 True
1.2.6 True
1.2.7 False
1.2.8 True
1.2.9 False

(9 × 1) (9)

1.3 1.3.1 B
1.3.2 A
1.3.3 D
1.3.4 C
1.3.5 I
1.3.6 E
1.3.7 F

(7 × 1) (7)
**[22]**

## QUESTION 2

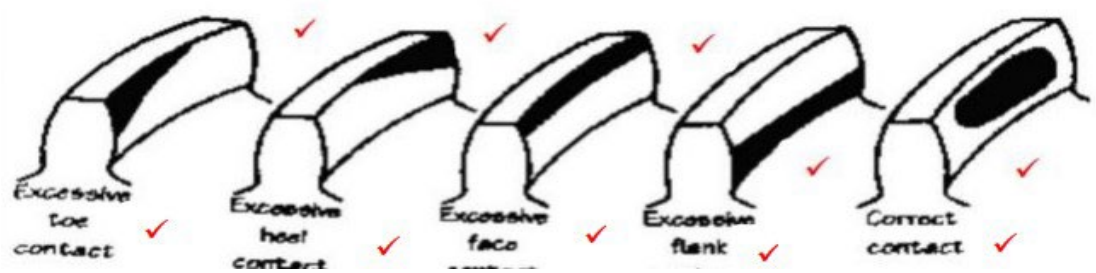
2.1 2.1.1
- To provide a permanent gear reduction.
- An increase in torque on the drive shaft due to this gear reduction.
- Provide drive from prop shaft through a right angle (90°) to the drive shaft. (Any 2 × 1)

2.1.2
- It allows drive shafts to turn at different speed when cornering.
- It delivers equal amounts of torque to each road wheel, irrespectively of their relative speeds of rotation. (Any 2 × 1)

(2 × 2) (4)

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2.2




(10)

2.3
- Spring, shock absorber.
- Torsion bar, control arm, ball joints.
- Steering knuckle. (Any 2 × 1) (2)

2.4
- CV joint are Smoother in operation, in front wheel drives CV joint transmit torque at constant velocity, also compensate for steering action on turns.
- Universal joint links two drive shaft that are not in-line with each other, on rear wheel drive to accommodate the change in alignment between gearbox and drive wheels, universal joint is used. (2)

2.5 Four CV joints. (1)

2.6 Slip joint allows a variation in length of a prop shaft without interfering with the torque transmission. (1)

**[20]**

**QUESTION 3**

3.1
- Worm and wheel
- Cam and peg
- Screw and nut
- Recrculating ball type
- Rack and pinion (Any 2 × 1) (2)

3.2
- Caster angle
- Camber angle
- Toe in or toe out
- King pin or steering axis inclination angle
- Included angle
- Ackerman angle (Any 5 × 1) (5)

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3.3
- Check wheel bearings play, check all torsion bars stabiles.
- Check suspension and steering parts front and rear: ball joints, control arm, bushings, strut mountings and rubbers.
- Check wheel tracking when vehicle drive straight along.
- Check tyres for bulging uneven tyre wear or any damages.
- Spin the wheels and check for bent rims, dragging brakes and loose wheel nuts or lugs.
- Tie-rod ends, steering box play and whether secure on chassis.
- Check kerb mass also curb height and compare with manufactures specification. (Any 6 × 1) (6)

3.4 3.4.1
A – Sector shaft gear
B – Worm shaft
C – Ball guides
D – Worm
E – Ball and nut
F – Sector shaft (6)

3.4.2 Worm and nut with recirculating balls (1)
**[20]**

**QUESTION 4**

4.1 Improves the efficiency of the braking system✓ by increasing the braking force at the drum or disc with a relatively less force applied on the brake pedal.✓ (2)

4.2
A – main port
B – brake fluid in secondary reservoir
C – compenstating ports
D – filler plug/vent
E – brake fluid in primary reservoir
F – connecting rod between pedal and master cylinder (6)

4.3 4.3.1
- Air in the system
- Brake shoe need adjustment
- Brake drum cracked (Any 2 × 1)

4.3.2
- Uneven tyre pressure
- Blocked or pinched piping to one wheel
- Grease or brake fluid on the brake linings (Any 2 × 1)

4.3.3
- Hard brake linings
- Burnt or glazed brake linings
- Double self-energising shoe (Any 2 × 1)

(3 × 2) (6)

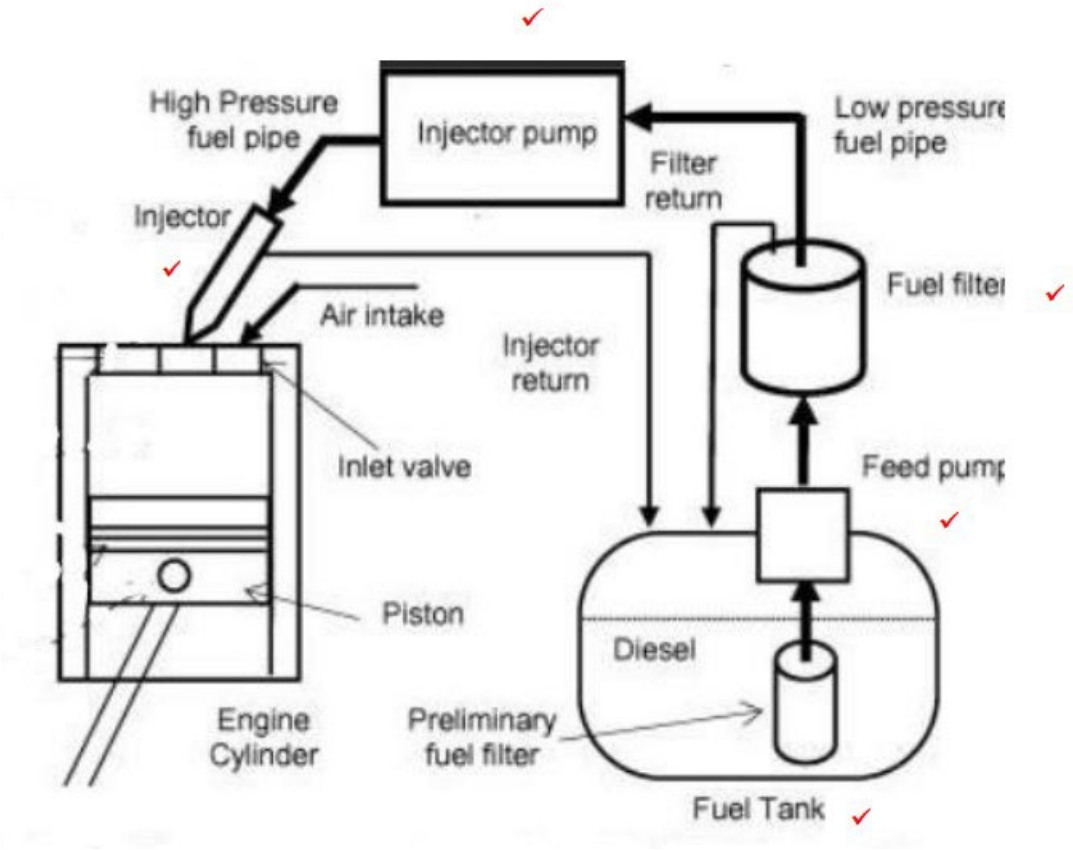
4.4
- Self-energising brake shoe assembly
- Double leading brake shoe assembly
- Double self-energising shoe (Any 2 × 1) (2)

4.5 Hygroscopic means that the brake fluid absorbs and retains moisture✓ that collects in the system due to heating and cooling down of the brake fluid.✓ (2)

**[18]**

**QUESTION 5**

5.1




(Award 1 mark for neat sketch) (6)

5.2
- Glow plugs are heating elements that warms the air in a pre-combustion chamber to help start a cold diesel engine.
- When the engine is cold and switch to an on position, large current flows from battery to glow plugs, in a few seconds the glow plug tip will heat to a dull red glow. (2)

5.3
- To inject fuel at high pressure into the combustion chamber.
- To atomise fuel at correct instant in the engine's operating cycle. (2)

5.4
- Mask design of inlet valve
- Inlet port tangential or tapered design
- Construction of the piston crown (Any 2 × 1) (2)

5.5
- Input shaft
- Cluster gear
- Third gear
- Synchro sleeve
- Synchro hub
- Main shaft (6)

5.6 Spur gear✓ and helical gear.✓ (2)
**[20]**

**TOTAL: 100**

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