higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

DIESEL TRADE THEORY N2

4 APRIL 2018

This marking guideline consists of 6 pages.

QUESTION 1

1.1
A Swinging shackle
B Leaf spring
C U-bolts
D Bump stop
E Fixed shackle
F Chassis/Vehicle body/Frame (6)

1.2 Relatively cheap to manufacture and maintain
Simple connection to the axle and the body
Can easily be uprated by adding extra leaves
(ANY OTHER RELEVANT ANSWER) (3)

1.3 Keeps the suspension from continuing to bounce
Smoothens the ride of the vehicle
Prevents excessive wear of components
Controls wheel hop for good road holding
(ANY OTHER RELEVANT ANSWER/ANY THREE) (3)

1.4 Worn shock absorbers
Incorrect wheel alignment settings
Wheel imbalance
Worn steering linkages, ball joints and suspension bushes
Over- and under inflation of tyres
Broken spring or bent stub axle
(Any 3 × 1) (3)

1.5
1.5.1 True
1.5.2 True
1.5.3 False
1.5.4 False
1.5.5 False
(5 × 1) (5)
[20]

QUESTION 2

2.1
A Breather
B Bypass port
C Seal
D Primary piston
E To the front brakes
F Secondary piston (6)

2.2 The primary piston slides forward and pushes the secondary piston forward.✓ This action creates a pressure in the front and rear circuits.✓ The secondary piston slides completely forward in the cylinder.✓ This pressure forces the check valve to open.✓ The primary piston provides hydraulic pressure for both brake assemblies.✓ (5)
(ANY OTHER RELEVANT ANSWER)

2.3
Resistant to freezing
Resistant to evaporation
A high boiling point
No detrimental effect on rubbers
Resistant to clogging
Free of acids
Lubricates moving parts
Low viscosity
Hygroscopic
(ANY FIVE ANY OTHER RELEVANT ANSWER) (5)

2.4
Greater heat dissipation
Cleaner disc surface
Simple construction and easy to service
Self-adjusting
(*ANY OTHER RELEVANT ANSWERS*) (4)
[20]

QUESTION 3

3.1
A Crown wheel
B Sun gear
C Drive shaft/Half shaft
D Planetary gear
E Differential cage/Housing/Carrier
F Pinion shaft (6)

3.2 Provides a final, permanent gear reduction
Transmits drive at right angles to the road wheels (2)
(ANY OTHER RELEVANT ANSWER)

3.3 Spur gears
Spiral bevel gears
Hypoid gears
Worm and wheel
Helical gears (5)

3.4 The vehicle cannot move forward when one wheel is stuck in the mud or on a slippery surface. (1)

3.5
3.5.1 B
3.5.2 C
3.5.3 G
3.5.4 F
3.5.5 D
3.5.6 A
(6 × 1) (6)
[20]

QUESTION 4

4.1 Assists in straight line stability by providing self-centring action
Turns the vehicle in different directions
Enables the driver to feel the straight-ahead position
Provides control of front wheel direction
Maintains the correct amount of effort needed to turn the front wheels
Transmits real feel to the driver's hands
Absorbs most of the shocks going to the steering wheel as the tyres hit bumps and holes on the road
Allows for suspension action to take place
(*ANY THREE/ANY OTHER RELEVANT ANSWER*) (3)

4.2 Ensures that the vehicle can be handled safely at high speeds
Minimises excessive tyre wear
Obtains maximum fuel economy
For good road holding and safety when driving the vehicle
Reduces hard steering, steering wandering, noise and pulling to one side
(*ANY THREE/ANY OTHER RELEVANT ANSWER*) (3)

4.3 4.3.1 Out-of-balance weights are evenly distributed about the axis of rotation in a single plane✓ so that the wheel comes to rest in any position.✓ (2)
(ANY OTHER RELEVANT ANSWER)

4.3.2 All centrifugal forces acting✓ on unbalanced weights cancel out during rotation.✓ (2)
(ANY OTHER RELEVANT ANSWER)

4.4 4.4.1 D
4.5.2 D
4.4.3 D
4.4.4 C
4.4.5 D
4.4.6 B
4.4.7 D
4.4.8 C
4.4.9 A
4.4.10 B
(10 × 1) (10)
[20]

QUESTION 5

5.1
A High-pressure fuel line
B Injector
C Leak-off pipe
D Fuel injection pump
E Fuel feed pump
F Filter (6)

5.2 Pressurised fuel from the pump flows into the inlet of the injector nozzle.✓ Fuel flows down the passage into the pressure chamber.✓ The pressurised fuel in the pressure chamber forces the needle off its seat and overcomes the spring pressure.✓ This allows fuel into the combustion chamber in an atomised form.✓ Fuel that leaks passes the needle and returns to the fuel tank.✓

(ANY OTHER RELEVANT ANSWER) (5)

5.3 Delivers fuel into the combustion chamber in an atomised form
Forms part of the combustion chamber (2)

5.4 Forms a tight seal
Absorbs heat
Prevents the needle from touching the piston crown

(ANY OTHER RELEVANT ANSWER) (3)

5.5 5.5.1 Worn valve
Nozzle cap nut NOT tightened correctly
Dirt between the needle and the seat (Any 2 × 1) (2)

5.5.2 Faulty fitting, for example excessive tightening of holder
Poor cooling (2)
[20]

TOTAL: 100