

higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

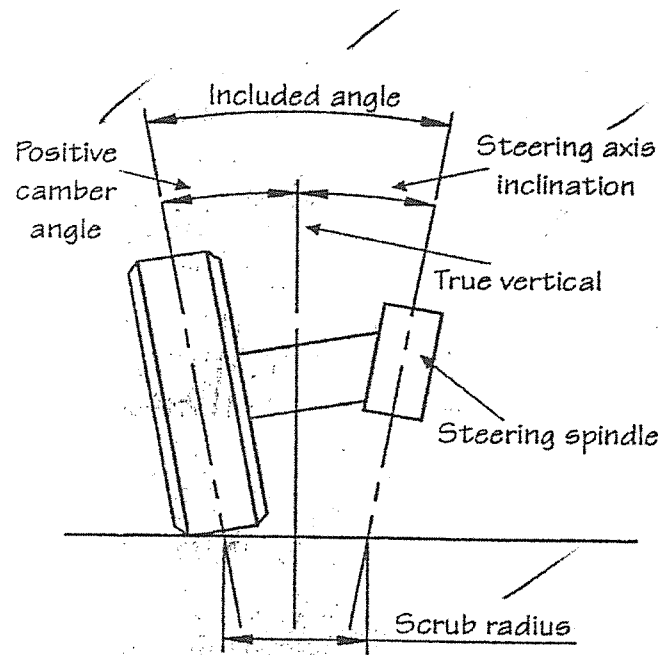
MARKING GUIDELINE

NATIONAL CERTIFICATE
APRIL EXAMINATION
MOTOR TRADE THEORY N2
17 APRIL 2015

This marking guideline consists of 6 pages.

QUESTION 1

1.1

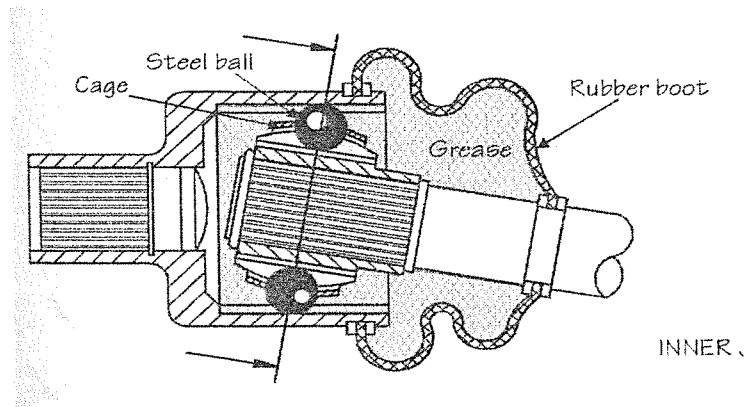


(4 × 2) (8)

- 1.2
- Relatively cheap to manufacture and maintain
 - Can be easily uprated by adding leaves
 - Simple connections to axle and body
 - Used to carry abnormal/heavy weight
- (4 × 1) (4)
- 1.3
- Mechanically simple in design
 - Can be used both in front or rear
 - Takes less space and does not cause much camber variation (Any 2 × 1) (2)
- 1.4
- It prevents tyre wear on inner and outer tread.
 - Makes steering effort easier for driver by placing weight of vehicle at inner of steering knuckle. (2)
- 1.5
- More level ride can be obtained. More comfortable for passengers.
 - Engine and gearbox can be mounted lower and to the front.
 - Softer springs can be used. Improved steering. (Any 3 × 1) (3)
- 1.6 Nitrogen (1)
- [20]**

QUESTION 2

2.1



(8)

2.2

- It provides a permanent gear reduction.
- It transfers the drive through 90 degrees from propeller shaft to drive shafts.
- It provides a final drive. (Any 2 × 1)

(2)

2.3

Power goes to wheel of least resistance, therefore when one wheel is on loose gravel or mud, power will go to that wheel causing it to freewheel and have no traction.

(3)

2.4

- No lubrication is required
- Vibration reduced
- It absorbs torsional vibration and shock
- Not affected by dust and grit or water

(4)

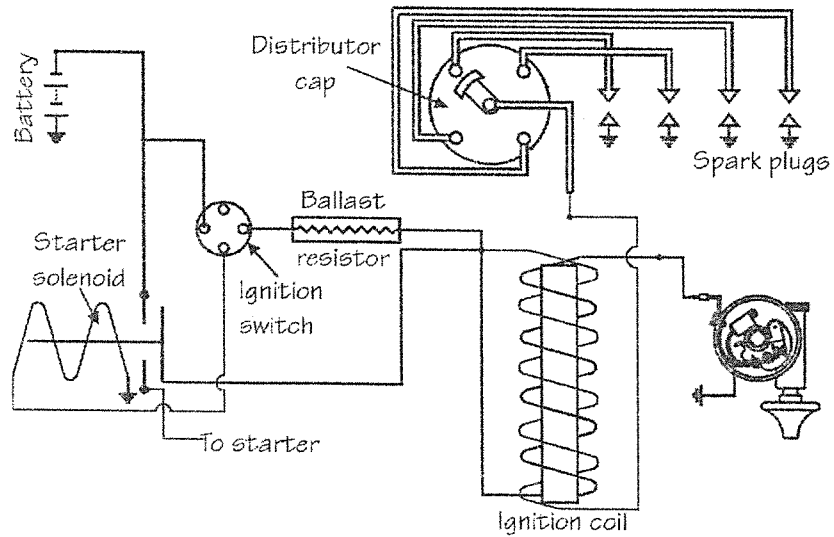
2.5

- Torsional rigidity in longer shaft takes longer to wind up than shorter shaft.
- Steering can pull to one side.
- On hard acceleration torque oversteer can occur.
- Vibration on longer shaft. (Any 3 × 1)

(3)
[20]

QUESTION 3

3.1



(10)

- 3.2
- The ballast resistor is designed to reduce voltage at low engine speeds and to increase the voltage at high engine speeds.
 - Prevents burning of points at low speed by reducing current.

3.3 3.3.1 Power valve provides a variable high-speed mixture strength in an economical manner.

3.3.2 Provides a stream of fuel to accommodate sudden acceleration and thereby mixes with air rushing in. (2 × 2) (4)

- 3.4
- Adjustment of rocker arm or cam
 - Add or remove gasket/spacer between pump and engine

- 3.5
- Fast idle or choke adjustment
 - Gas analysis/CO adjustment
 - Idle adjustment on butterfly
- (Any 2 × 1) (2)
[20]

QUESTION 4

- | | | | | |
|-------------|-------|---|---------|-----|
| 4.1 | 4.1.1 | Advantages of Spur Gears <ul style="list-style-type: none"> • Mechanical efficiency is high • Relatively cheap to manufacture • Reduced side thrust | | |
| | 4.1.2 | Disadvantages of Spur Gears <ul style="list-style-type: none"> • Gears are noisy in operation • Gears have to be stationary when engaging them | (2 × 2) | (4) |
| 4.2 | | <ul style="list-style-type: none"> • Input shaft • Cluster shaft • Cluster reverse gear • Reverse idler gear • Main reverse gear • Output shaft | (6 × 1) | (6) |
| 4.3 | | <ul style="list-style-type: none"> • Incorrect clutch adjustment • Worn or damaged synchroniser units • Engine idle speed too high • Worn shaft, bearings, selector rods or forks | (4 × 1) | (4) |
| 4.4 | | <ul style="list-style-type: none"> • To prevent two gears being selected at the same time • Holds the selector in position to prevent gears jumping out of mesh | | (3) |
| 4.5 | | <ul style="list-style-type: none"> • It synchronises the speed of the gears prior to selection • Allows for changing of gears without grating • Double declutching is not necessary | (3 × 1) | (3) |
| [20] | | | | |

QUESTION 5

- | | | | |
|-----|---|-------------|-----|
| 5.1 | <ul style="list-style-type: none"> • Hydraulic system of front and rear wheels are completely separated. • Two pistons automatically compensate for unequal displacement of brake fluid. • Failure of either front or rear will not affect the other failure on either front or rear is easily noticed by driver due to increase in pedal travel | (Any 3 × 1) | (3) |
| 5.2 | The function of the compensator is to allow each wheel actuator to receive an equal pull force. | | (2) |
| 5.3 | <ul style="list-style-type: none"> • Floating disc-brake calliper • Fixed calliper | (2 × 1) | (2) |

- 5.4 When changing brake pads, the fluid immediately behind the piston of the calliper will have to be pushed back to accommodate the new thicker pads. This displacement of brake fluid will return to the reservoir and if already full, brake fluid will overflow into the engine compartment/body. Checking of the level of brake fluid allows us to take corrective action to avoid spillage. (4)
- 5.5
- Not free to move in relation to the disc
 - Severe vibrations can result with slight run-out of disc
 - More heavy and expensive (3 × 1) (3)
- 5.6
- 5.6.1
- Brake master cylinder
 - Wheel cylinders
 - Hand brake (3 × 1) (3)
- 5.6.2 Brake master-cylinder – Converts foot pedal force to a hydraulic pressure within brake system by means of cylinder and piston.
Wheel cylinders Converts hydraulic pressure force acting on brake shoes.
Drum brake – Consists of two brake shoes that are forced outwards against drum to bring vehicle to stop or slow it down.
(Any 3 × 1) (3)
- TOTAL: 100**
- [20]**