-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- **2210621** **-Session-1991-92**
-Superclass- **XS**

-Title- **STEERING SYSTEMS: HEAVY VEHICLE 1**

-DESCRIPTION-

Purpose

This module is designed to develop the knowledge and skills required to remove, refit and adjust heavy vehicle manual and assisted steering systems. It is aimed at those intending to pursue a career in the vehicle repair industry.

This module is also designed to complement RTITB module HV240B and will provide the student with the necessary knowledge and skills to prepare for skills tests.

It should be noted that adequate supporting industrial experience will also be necessary.

Preferred Entry Level

Modules numbered 94370 through to 94379 inclusive

Outcomes

The student should:

1. identify steering system components;
2. explain the purpose of steering geometry;
3. remove and refit steering system components.

Assessment Procedures

Acceptable performance in this module will be satisfactory achievement of all the performance criteria specified for each outcome.

The following abbreviations are used below:

PC Performance Criteria
IA Instrument of Assessment

Note: The Outcomes and PCs are mandatory and cannot be altered. The IA may be altered by arrangement with SQA. (Where a range of performance is indicated, this should be regarded as an extension of the PCs and is therefore mandatory.)

OUTCOME 1 IDENTIFY STEERING SYSTEM COMPONENTS

PCs

(a) The identification of components of a beam-axle steering layout is correct in terms of name, function and specific location within the system.
(b) The identification of components of a manual steering system is correct in terms of name, function and specific location within the system.
(c) The identification of components of an assisted steering system is correct in terms of name, function and specific location within the system.

IA Objective Test.

The student will be presented with an objective test to test the recall of knowledge relating to the identification of steering system components.

The objective test could take the form of a matching exercise or short answer questions.

The test will consist of 9 items allocated as follows:

(a)	beam - axle steering system	- 3
(b)	manual steering system	- 3
(c)	assisted steering system	- 3

Satisfactory achievement of the Outcome will be based on all the Performance Criteria being met. This will be demonstrated by the student producing 9 correct responses in total, 3 from each of (a), (b) and (c) in relation to name, function and specific location. The student should identify different components in each of (a), (b) and (c). In total 9 components should be identified.

OUTCOME 2 EXPLAIN THE PURPOSES OF STEERING GEOMETRY

PCs

(a) The explanation of the importance of front wheel alignment is correct in terms of tyre wear and vehicle handling.
(b) The explanation of the Ackermann Principle is correct in terms of vehicle cornering and tyre scrub.
(c) The explanation of the methods by which self-centring steering is obtained is correct in terms of vehicle handling.

IA Objective Test

The student will be presented with an objective test to test the recall of knowledge relating to the purposes of steering geometry.

The test could take the form of a matching exercise or short answer questions.

The test will consist of 10 questions allocated as follows:

(a)	Ackerman Principle	- 2
	front wheel alignment	- 2
(b)	camber	- 1
	king pin inclination (KPI)	- 1
	dished wheel	- 1
(c)	centre point steering	- 1
	self-centring steering	- 1
	castor	- 1

Satisfactory achievement of the Outcome will be based on all the Performance Criteria being met. This will be demonstrated by the student producing 4 correct responses from (a) and 2 correct responses from each of (b) and (c) above.

OUTCOME 3 REMOVE AND REFIT STEERING COMPONENTS

PCs

(a) The procedures followed for the removal of steering system components are in accordance with the procedures outlined in appropriate technical data corresponding to the vehicle.

(b) The procedures followed for the refitting of steering system components are in accordance with the procedures outlined in appropriate technical data corresponding to the vehicle.

IA Practical Exercise

The student will be presented with a series of practical exercises in a workshop environment to test the application of knowledge and skills involved in removing and refitting a range of steering system components.

Each student will undertake 7 items from (a), 6 items from (b) and 2 items from (c) from the following list.

Remove and refit:

(a) (i) steering column and bushes;
(ii) steering universal joint;
(iii) manual steering box;

(iv) king pin and bushes;
(v) drop arm(s);
(vi) track rod end and ball joints;
(vii) drag link(s);

(b) Power steering:

(i) box;
(ii) reservoir;
(iii) filter;
(iv) pipes;
(v) pump;
(vi) ram.

(c) (i) steering wheel;
(ii) steering column lock;
(iii) rack and pinion assembly;
(iv) repack front hubs.

Satisfactory achievement of the Outcome will be based on all the Performance Criteria being met. This will be demonstrated by the student correctly removing and refitting all items listed above.

The following sections of the descriptor are offered as guidance.
They are not mandatory.

CONTENT/CONTEXT

Safety regulations, safe working practices and procedures should be observed at all times.

Corresponding to Outcomes 1-3:

This module should be taught in the context most suited to the student's particular needs.

This module is intended to give the student an understanding of the reasons for servicing of vehicle steering systems, as a means of promoting vehicle safety, prolonging operational life and maintaining to original specification.

SUGGESTED LEARNING AND TEACHING APPROACHES

This module should be undertaken in a service workshop environment with an adequate range of vehicles and components to be covered. The student should have access to service information, special tools and equipment for the satisfactory performance of the practical exercise.

A suitable checklist should be used to record the student's performance in the practical exercise.

09/02/98 JH/CD