

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-	0074451	-Session-1987-88
-Superclass-	XR	

-Title-	MOTOR CYCLE CONSTRUCTION 1: FRAMES, STEERING AND SUSPENSION
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-DESCRIPTION-

Type and Purpose	A <u>specialist</u> module which is designed for motor cycle mechanics who are dealing with the construction and repair of frames, steering and suspension.
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Preferred Entry Level	64002 Fundamentals of Technology: Mechanical 64020 Assembly Skills 64050 Introduction to Materials 64410 Engineering Systems 1: Machines and 64416 Component Mounting and Vibration Control Mechanisms
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Learning Outcomes	The student should: <ol style="list-style-type: none">1. know frame construction and design features;2. know the factors which create and influence stress in motor cycle frames;3. check frame alignment using an appropriate method;4. service and adjust steering systems;5. service and adjust suspension systems;6. know the construction and methods of attachment of sidecars and their effects on machine behaviour.
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Content/ Context	<p>Safety regulations and safe working practices and procedures should be observed at all times.</p> <p><u>Corresponding to Learning Outcomes 1-6:</u></p> <ol style="list-style-type: none"> 1. Frame types: cradle, spine, duplex, monocoque, tubular, pressed steel, composite and casting applications of construction. 2. Stress induced by acceleration, braking, cornering and loading. Effects of fitting fairings and carriers. Stress relieving by gussets, welds, lugs. Mounting of components including anti-vibration measures. 3. Checks of frame alignment by triangulation, drop test, straight edges, ties, etc. Comparison with manufactured data. Simple frame re-alignment, e.g. head-stock deflection. 4. Meaning of wheelbase, rake, trail. Effects on steering of suspension movement, tyre size and loading. Steering head bearing construction and adjustment. Fork yokes, steering dampers and swinging arm assemblies. Periodic maintenance of steering systems. Common steering faults. 5. Spring medium, coil, torsion bar, rubber, pneumatic. Safe handling of pressurised gas and compressed spring systems. Front suspension by telescopic, leading, and trailing link forks. Rear suspension systems by progressive rate, cantilever. Suspension assembly and adjustment. Single and two-way damping; adjustment of spring and damping characteristics to suit load and conditions. Common suspension faults. 6. Sidecar construction: monocoque and chassis. Use of wood, metal and g.r.p. Clamps and mounting lugs. <p>Effects on machine stability and braking.</p> <p>Meaning of toe-in, lean-out, sidecar wheel lead, track.</p>
Suggested Learning and Teaching Approaches	<hr/> <p>This module should be taught in a workshop situation using complete machines to give students the opportunity to observe, dismantle and re-assemble.</p> <p>Measurements and adjustments should be carried out with reference to the relevant data.</p>

Certain elements of Learning Outcomes 2 and 4 will require a more formal teaching approach owing to the diversity of types and applications. But this should be supported by visual material to show constructions not available.

Students should work in pairs with frequent changes in pairings to provide maximum experience from the available resources. Safe working practices in the working environment should be allied with the importance of consideration for the machine user's safety.

Assessment
Procedures

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

Where cutting scores are stated these are intended to be guidance. The precise cutting score for a test will depend on the difficulty of the test and will have to be decided by the Tutor aided by the Assessor.

The following abbreviations are used below:

LO Learning Outcomes
IA Instrument of Assessment
PC Performance Criteria

LO1 IA Written/Graphics exercise involving the following types of frames:

- (i) cradle;
- (ii) spine;
- (iii) duplex;
- (iv) monocoque;
- (v) tubular;
- (vi) pressed steel;
- (vii) composite;
- (viii) casting.

PC The student satisfactorily:

- (a) identifies six different types of frame construction;
- (b) compares the design features of six different frames.

LO2 IA Written/Graphics exercise.

PC The student satisfactorily identifies the factors creating stress in a frame. Cutting score 80%

- LO3 IA Practical exercise used in conjunction with an observation checklist involving checking the alignment of a frame by an appropriate method.
- PC The student:
- (a) checks all dimensions;
 - (b) ensures all checks are accurately made;
 - (c) accurately compares with standards where appropriate;
 - (d) wears all necessary safety clothing and equipment;
 - (e) behaves in a manner appropriate to the working environment;
 - (f) uses tools and equipment safely.
- LO4 IA Practical exercise used in conjunction with an observation checklist.
- PC The student:
- (a) identifies motor cycle steering system components;
 - (b) completes a service schedule on one steering system in accordance with manufacturers' recommendations;
 - (c) wears all necessary safety clothing equipment;
 - (d) behaves in a manner appropriate to the working environment;
 - (e) uses tools and equipment safely.
- LO5 IA Practical exercise used in conjunction with an observation checklist.
- PC The student:
- (a) identifies motor cycle suspension system components;
 - (b) completes a service schedule on one suspension system in accordance with manufacturers' recommendations;

- (c) wears all necessary safety clothing and equipment;
 - (d) behaves in a manner appropriate to the working environment;
 - (e) uses tools and equipment safely.
- LO6 IA Written/Graphics exercise.
- PC The student:
- (a) identifies two sidecar constructions;
 - (b) identifies two methods of attaching sidecars;
 - (c) describes the influence of sidecars on motor cycle behaviour;
 - (d) wears all necessary safety clothing and equipment;
 - (e) behaves in a manner appropriate to the working environment;
 - (f) uses tools and equipment safely.