Assessment Requirements

Unit MET01K – Knowledge of Removing and Fitting Vehicle Mechanical Components

Content:

The identification and operation of:

a. Engine Cooling Systems
b. Exhaust
c. Fuel
d. Supplementary Restraint Systems
e. Suspension - with no Electronic Control
f. In vehicle entertainment – Audio only
g. Electro-Mechanical Locking
h. Air Conditioning – Evacuation, Re-gas and Oil of System, RRR of Dryer, Condenser & Pipe Work, Legislation around Refrigerant Handling
i. Engines components
j. Drivelines and Hubs
k. Final Drive Assemblies
l. Steering components
m. Braking components
n. Tow Bars

The specific manufacturers and workshop procedures for the removal, renewal and replacement of components and systems.

a. The procedure and methods used to remove and fit exhaust systems addressing the following:
    i. oxygen / gas sensors (explain why hammers or pneumatic tools should not be used)
    ii. catalytic converters (explain why hammers or pneumatic tools should not be used)
    iii. mounting systems
    iv. seals and gaskets
    v. alignment
b. The procedure for the removal and fitting of brake system components:
    i. fluid
    ii. callipers
    iii. discs
    iv. drums
    v. cables
    vi. pipes and hoses
c. Suspension systems and specific procedures relating to:
    i. coil spring (McPherson strut)
    ii. air
    iii. hydrolastic
    iv. leaf spring
    v. torsion bar
d. The procedure for the removal and fitting of interior items:
    i. seats (including pre-tensioner)
    ii. In Car Entertainment (I.C.E). systems – audio only
    iii. Supplementary Restraint System (S.R.S). systems deployed and un-deployed
e. The procedure for the removal and fitting of security devices:
    i. mechanical locks
    ii. electro-mechanical locks
    iii. electronic ‘drop glass’ systems (note: glass will not be easily movable when door is removed)

iv. mechanical 'drop glass' systems

f. The procedure for the removal and fitting of cooling system components
   i. radiator and cowlings
   ii. cooling fans
   iii. drive belts
   iv. pipes, hoses and sensors
   v. air locks and bleeding techniques

g. The system components for power and non power steering and the removal / renewal and fitting of them.

h. The procedure for the removal of fuel tanks.

i. The procedure for the removal and fitting of transmission systems
   i. operating mechanisms; pedal and lever, mechanical systems, cable
   ii. clutch components; pressure plate, centre plate, release bearing
   iii. hydraulic system; master cylinder, slave cylinder, hydraulic pipes
   iv. gearboxes
   v. propshafts
   vi. drive shafts
   vii. universal joints
   viii. sliding couplings
   ix. constant velocity joints

j. The reasons for using flexible couplings and sliding joints in transmissions systems.

k. The reason for using constant velocity joints in drive shafts incorporating steering mechanisms.

l. The importance of using approved parts, components and procedures:
   i. operation
   ii. warranty

Techniques and tools to carry out operational checks

a. Equipment and process of checking and steering geometry:
   i. skid plates
   ii. two wheel alignment tracking gauges
   iii. four wheel alignment tracking gauges
   iv. castor
   v. camber
   vi. K.P.I.
   vii. toe-in / out

b. The tools and processes for checking fluid levels / pressures:
   i. cooling system (pressure, level, thermostat operation, cooling fan operation and antifreeze protection level)
   ii. steering, engine, transmission and braking systems
   iii. tyre pressures
   iv. tyre types and sizes relating to the mixing of tyres of different construction type

Procedures to prevent damage to the vehicle, components and contents when removing, storing and refitting components

a. The methods that can be used to protect undamaged items to ensure they are removed and refitted without causing unnecessary damage:

b. The procedures for the correct storage of vehicle contents.

c. The process for the reporting of extra damage and items that may have broken when removed or refitted.

Types of clips and fixings

a. The following types of clips and identify reasons and limitations for their use:
   i. speed

ii. 'c'
iii. 'd'
iv. 'j' type captive nut
v. 'r'
vi. 'u' type captive nut
vii. cable clip
viii. trim clips

b. The following types of fixings and identify reasons and limitations for their use:
i. pop rivet
ii. plastic rivet
iii. plastic capture nut
iv. nut and bolt
v. shoulder bolt
vi. 'Nyloc' type nuts
vii. washers
viii. 'Spring' type washers
ix. self tapping screws and bolts
x. quick release plastic trim fastenings
xi. trim tapes
xii. adhesives and sealers

The processes involved when carrying out quality checks

a. Items that may have been 'workshop' soiled and describe processes for rectifying:
i. door cards
ii. seats
iii. carpets
iv. boot and bonnet trims

b. Methods for checking gaps.
i. The process for checking and aligning components

Mechanical Components

a. Road Wheels
b. Engine Cooling Systems
c. Exhaust
d. Fuel
e. Supplementary Restraint Systems
f. Suspension with no Electronic Control
g. In vehicle entertainment – Audio only
h. Central locking systems
i. Air Conditioning – Evacuation, Re-gas and Oil of System, RRR of Dryer, Condenser & Pipe Work, Legislation around Refrigerant Handling
j. External Engine components
k. Drivelines and Hubs
l. Final Drive Assemblies
m. Steering components
n. Braking components
o. Tow Bars