Raising an aircraft onto jacks, to allow functional checking of the undercarriage system. Describe the procedure including all safety requirements.
Aircraft Jacking Check the Maintenance Manual for the correct jacking equipment and procedures may be used for jacking the Aircraft to allow functional check of the undercarriage system. Jacking points are located in the wings and fuselage and other points are at the nose and main undercarriages.

Safety Considerations
Safety precautions and restrictions must be noted before and during the process of jacking as follows:

1) Check the Maintenance Manual for the position of the C.G. either well behind or in front of the main jacking points to bring the C.G, within safe limits. This includes checking the aircraft fuel state.

2) Check each jacking point load limit, caution not to exceed them, structural damage could occur.

3) Stressed panels to be installed as per Maintenance Manual.

4) Check the aircraft jacks for next servicing due date. Do not use any jack that is due for servicing. An accident, damage to aircraft and injure someone may occur.

5) Check the correct type of jack to be used and the serviceability of the jacks before use.

6) Aircraft jacking area roped off and warning signs or flags posted.

7) All jacking crews to be fully briefed on jacking procedures.

8) Enough jacking crews for the task.

9) All aircraft should normally be jacked inside a hangar. Jacking outside is permitted for larger aircraft provided they are positioned nose into wind, jacking surface is level and strong to support the weight and any special instructions stated in theAMM are observed.

10) Maximum wind speed stated for jacking outside to be observed. Brakes to be released, chocked fore and aft and undercarriage ground locks installed.

11) Earth cable connected to the earth point on the aircraft with sufficient length when aircraft is jacked.

The following terminology is used in the practical application of weight and balance control.

Maximum Weight. The maximum weight is the maximum authorized weight of the aircraft and its contents as listed in the specifications

Empty Weight. The empty weight of an aircraft includes all operating equipment that has a fixed location and is actually installed in the aircraft. It includes the weight of the airframe, powerplant, required equipment, optional and special equipment, fixed ballast, full engine coolant, hydraulic fluid, residual fuel, and oil

Negligible Weight Change is any change of one pound or less for aircraft whose weight empty is less than 5,000 pounds; two pounds or less for aircraft whose weight empty is more than 5,000 and 50,000 pounds

Useful Load. The useful load is the empty weight subtracted from the maximum weight of the aircraft. This load consists of the pilot, crew (if applicable), maximum oil, fuel, passengers, and baggage unless otherwise noted.

Weight Check. The weight check con*sists* of checking the sum of the weights of all items of useful load against the authorized useful load (maximum weight less empty weight) of the aircraft.

Datum. The datum is an imaginary vertical plane from which all horizontal measurements are taken for balance purposes with the aircraft in level flight attitude.

Arm (or Moment Arm). The arm (or moment arm) is the horizontal distance in inches from the datum to the c.g. of an item. The algebraic sign is plus (+) if measured aft of the datum, and minus (-) if measured forward of the datum.

Moment. The moment is the product of a weight multiplied by its arm. The moment of an item about the datum is obtained by multiplying the weight of the item by its horizontal distance from the datum

Center of Gravity. The c.g. is a point about which the nose-heavy and tail-heavy moments are exactly equal in magnitude. If the aircraft is suspended from the c.g., it will not have a tendency to pitch in either direction (nose up or down).

Empty Weight Center of Gravity. The empty weight c.g. is the c.g. of an aircraft in its empty weight condition, and is an essential part of the weight and balance record.

Empty Weight Center of Gravity Range. The empty weight c.g. range is determined so that the empty weight c.g. limits will not be exceeded under standard specifications loading arrangements.

Operating Center of Gravity Range. The operating c.g. range is the distance between the forward and rearward c.g. limits indicated in the pertinent Aircraft Specifications

Mean Aerodynamic Chord (MAC). The MAC is established by the manufacturer who defines its leading edge and its trailing edge in terms of inches from the datum. The c.g. location and various limits are then expressed in percentages of the chord.

Weighing Point. If the c.g. location is determined by weighing, it is necessary to obtain horizontal measurements between the points on the scale at which the aircraft's weight is concentrated.

Zero Fuel Weight. The maximum permissible weight of a loaded aircraft (passengers, crew, cargo, etc.) less its fuel is zero fuel weight. All weights in excess of maximum zero fuel weight must consist of usable fuel.

Minimum Fuel. The minimum fuel for balance purposes is 1/12 gallon per maximum-take-off horsepower (METO). Minimum fuel is the maximum amount of fuel which can be used in weight and balance computations when low fuel might adversely affect the most critical balance conditions. To determine the weight of fuel in pounds divide the METO horsepower by two.

Full Oil. The full oil is the quantity of oil shown in the Aircraft Specifications or TCDS as oilcapacity. Use full oil as the quantity of oil when making the loaded weight and balance computations.

Tare. The weight of chocks, blocks, stands, etc., used when weighing aircraft is called tare and is included in the scale readings. Tare is deducted from the scale reading at each respective weighing point when tare is involved, to obtain the actual aircraft weight.

are shown in figure 10-1.

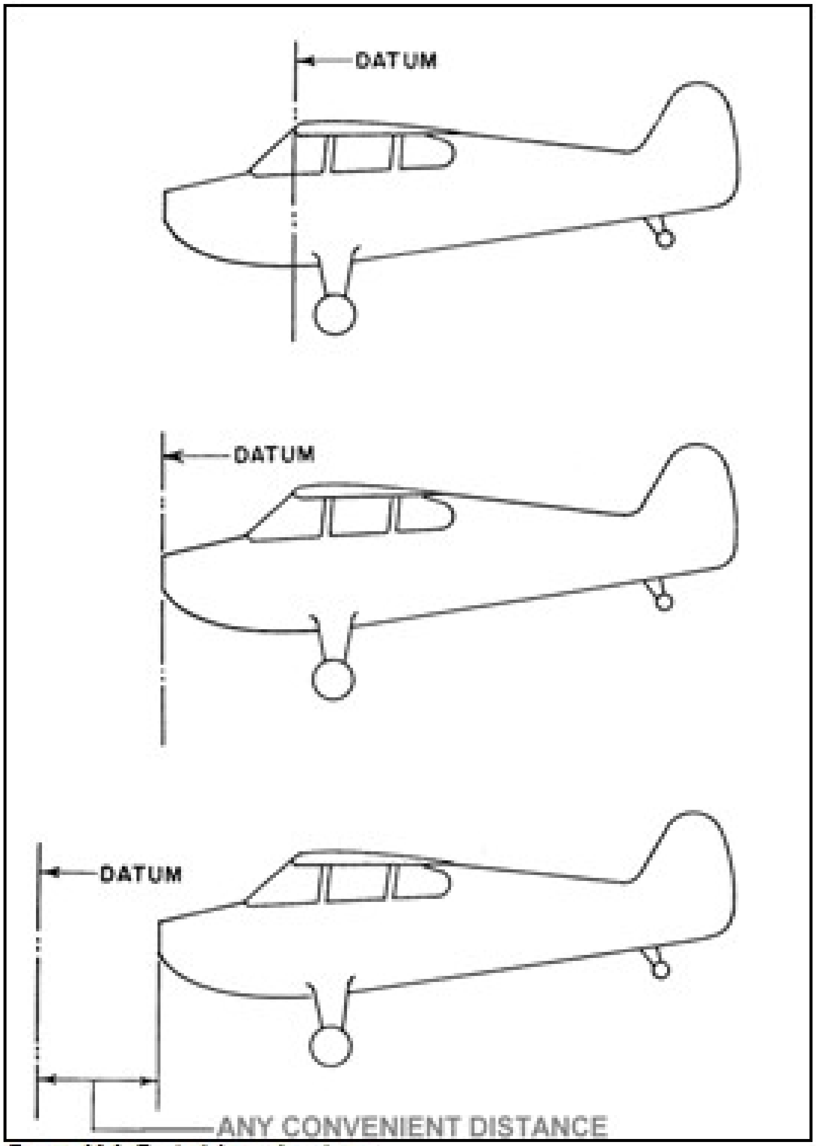

FIGURE 10-1. Typical datum locations.

WEIGHING PROCEDURES

Accepted procedures when weighing an aircraft are:
a. Remove excessive dirt, grease, moisture, etc., from the aircraft before weighing.
b. Weigh the aircraft inside a closed building to prevent error in scale reading due to wind.
c. Determine the empty weight c. g. by placing the aircraft in a level flight attitude.
d. Have all items of equipment that are included in the certificated empty weight report installed in the aircraft when weighing. These items of equipment are a part of the current weight and balance report.
e. The scales should have a current calibration before weighing begins. Zero and use the scales in accordance with the scale manufacturer's instructions. Platform scales and suitable support for the aircraft, if necessary, are usually placed under the wheels of a landplane, the keel of a seaplane float, or the skis of a ski plane. Other structural locations capable of supporting the aircraft, such as jack pads, may be used. Clearly indicate these points and the alternate equipment used in the weight and balance report.
f. Drain the fuel system until the quantity indicator reads *zero* or until the tanks are empty with the aircraft in level flight attitude, unless otherwise noted in the TCDS or Aircraft Specifications. The amount of fuel remaining in the tank, lines, and engine is termed residual fuel and is to be included in the empty weight. In special cases, the aircraft may be weighed with full fuel in tanks provided a definite means of determining the exact weight of the fuel is available.
g. The oil system should be filled to the quantity noted in the TCDS or Aircraft Specifications. When weighed with full oil, actual empty weight equals the actual recorded weight less the weight of the oil in the oil tank(oil weight= oil capacity in gallons x 7.5 pounds). Indicate on all weight and balance reports whether weights include full oil or oil drained. (
h. Do not set brakes while taking scale reading.
i. Note any tare reading when the aircraft is removed from the scales.

Helicopter Flight Controls. The various helicop-ter controls are explained in the following p aragraphs.

a.Cyclic Pitch Control. The cyclic pitch control changes the tilt of the main rotor for control about the longitudinal axis (roll) and lateral axis (pitch). It acts through a mechanical linkage, as shown in figure 3-4, to increase the pitch of the retreating blade and decrease the pitch of the advancing blade on each cycle of rotation.

b.Collective Pitch Control. The collective pitch control, as shown in figure3-5, varies the lift of the main rotor by increasing or decreasing the pitch of all blade sat the same time. Raising the collective pitch control increases the pitch of the blades, thereby increasing the lift. Lowering the control decreases the pitch of the blades, causing a loss of lift. Collective pitch control isalso used in coordination with cyclic pitch control to regu-late the airspeed of the helicopter.

c.Swashplate. The swash plate assembly trans-mits movement of the flight controls to the main rotor blades. Refer to the applicable maintenance manual for unique features of a swashplate on a specific aircraft.

d.Throttle Control. The throttle control is mounted on the collective pitch grip, and is operated by rotating the motor cycleype grip. Rotating the grip outboard increases rpm, and rotating it inboard decreases rpm.

e.Torque Control. Torque control provides for movement about the vertical axis (yaw). This movement is controlled by the directional--control pedals in the cockpit.

Main Rotor Assemblies.

Rigid, semirigid, and fully articulated rotor assemblies are described in thefollowing paragraphs.*a.Semi--Rigid Rotor.* In a semgid rotor system, the rotor blades are rigidly interconnected to the hub, butthe hub is free to tilt and rock with respect to the rotorshaft. In this system, only two--bladed rotors are used. The rotor flaps as a unit, that is, as one blade flaps up, theother blade flaps down an equal amount.

b.Fully Articulated Rotor. Fully articulated rotorsystems permit individual movement of the blades from the hub in both a vertical and horizontal plane. The hingepoints and direction of motion around each hinge are shown in figure 3-6.*(1)Blade flapping.* The rotor blades are at-tached to the rotor hub by a horizontal hinge which per-mits the blades to move in a vertical plane, and flap upor down, as they rotate, as shown in figure 3-8. In forward flight and assuming that the blade--pitch angle remains constant, the increased lift on the advancing blade willcause the blade to flap up, decreasing the angle of attackbecause the relative wind will change from a horizontaldirection to a more downward direction. The decreased lift on the retreating blade will cause the blade to flap down, increasing the angle of attack down, increasing the angle of attack

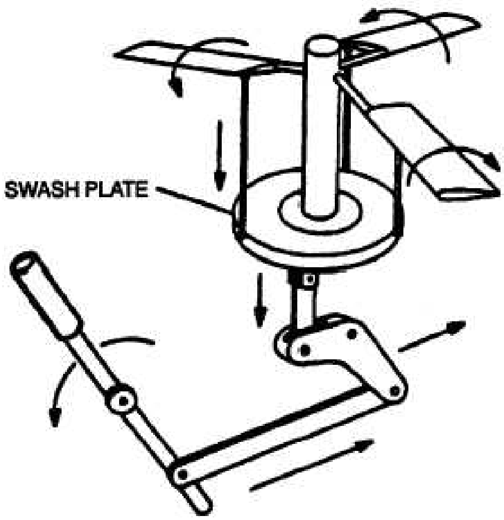

Figure 3-4. Cyclic Pitch Control.

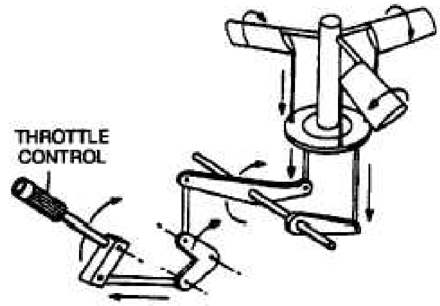

Figure 3-5. Collective Pitch Control.