REVISION LOG

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VERSION	EFFECTIVE DATE	DESCRIPTION OF REVISION(S)
001	2016.01	Module creation and release.
002	2016.08	Format update and minor content revisions.
003	2019.10	Refined content sequencing to Appendix 1.
003.1	2021.10	Corrected description of file types (Submodule 7, pages 3.15-3.16).
003.2	2023.04	Submodule 8 - Added content on *Friction* and *Mechanical lock blind rivet* procedures.
004	2024.01	Regulatory update for EASA 2023-989 Compliance.
004.1	2024.07	Included missing Figures from Submodule 3 (3-136 and 3-137). Corrected sequence of Figures 3-117 and 3-118. Additional typo errors fixed.
004.2	2025.01	Page 5.9 - Corrected orientation of Figure 5-10B. Page 5.25 - Corrected y axis identifier for Figure 5-36. Page 12.3 - Corrected orientation of checknuts Figure 12-9.

Module was reorganized based upon the EASA 2023-989 subject criteria. Enhancements included in this version 004.2 are:

7.1 *Fuel Tank Safety* - topic added.
7.1 *Ballistic Parachutes* - topic added.
7.4 *Avionics Test Equipment* - topic moved to Modules 11, 12, and 13 per 2023-989.
7.7 *Connector Pin Wire Support* - topic added.
7.7 *Soldering Electrical Wires* - topic added.
7.7 *HIRF Protection Principles* - topic added.
7.8 *Special Purpose Rivets and Fasteners* - topic added.
7.9 *Visual Inspection of Springs* - topic added.
7.9 *Inspecting Squareness of Springs* - topic added.
7.13 *Cable Tension Regulators* - topic added.
7.13 *Cable Guides and Adjustment* - topic added.
7.14 *Additive Manufacturing* - topic added.
7.15 *Welding* - submodule deleted per 2023-989.
7.18 *Structural Repair Manuals* - topic added.
7.18 *Dye Penetrant Color Contrast* - topic added.
7.19 *HIRF Test Equipment* - topic added.
7.21 *Documentation and Communication* - new submodule added.

Figure 5-10, with the front view as principal view. If the right-side view is shown, it will be to the right of the front view. If the left-side view is shown, it will be to the left of the front view. The top and bottom views, if included, will be shown in their respective positions relative to the front view.

One-view drawings are commonly used for objects of uniform thickness, such as gaskets, shims, and plates. A dimensional note gives the thickness as shown in **Figure 5-11**. One-view drawings are also commonly used for cylindrical, spherical, or square parts if all the necessary dimensions can be properly shown in one view. When space is limited and two views must be shown, symmetrical objects are often represented by half views, as illustrated in **Figure 5-12**.

Aircraft drawings seldom show more than two principal or complete views of an object. Instead, there will be usually one complete view and one or more detail views or sectional views.

DETAIL VIEW

A detail view shows only a part of the object, but in greater detail and to a larger scale than the principal view. The part that is shown in detail elsewhere on the drawing is usually encircled by a heavy line on the principal view. [**Figure 5-13**] The principal view shows the complete object, while the detail view is an enlarged drawing of a portion of the object.

PICTORIAL DRAWINGS

A pictorial drawing is like a photograph. [**Figure 5-14**] It shows an object as it appears to the eye, but it is not satisfactory for showing complex forms and shapes. Pictorial drawings are useful in showing the general appearance of an object and are used extensively with orthographic projection drawings. Pictorial drawings are used in Aircraft Maintenance Manuals (AMM), Structural Repair Manuals (SRM), and Illustrated Parts Catalogues (IPC). Three types of pictorial drawings used frequently by aircraft engineers and technicians are: perspective, isometric, oblique, and exploded view.

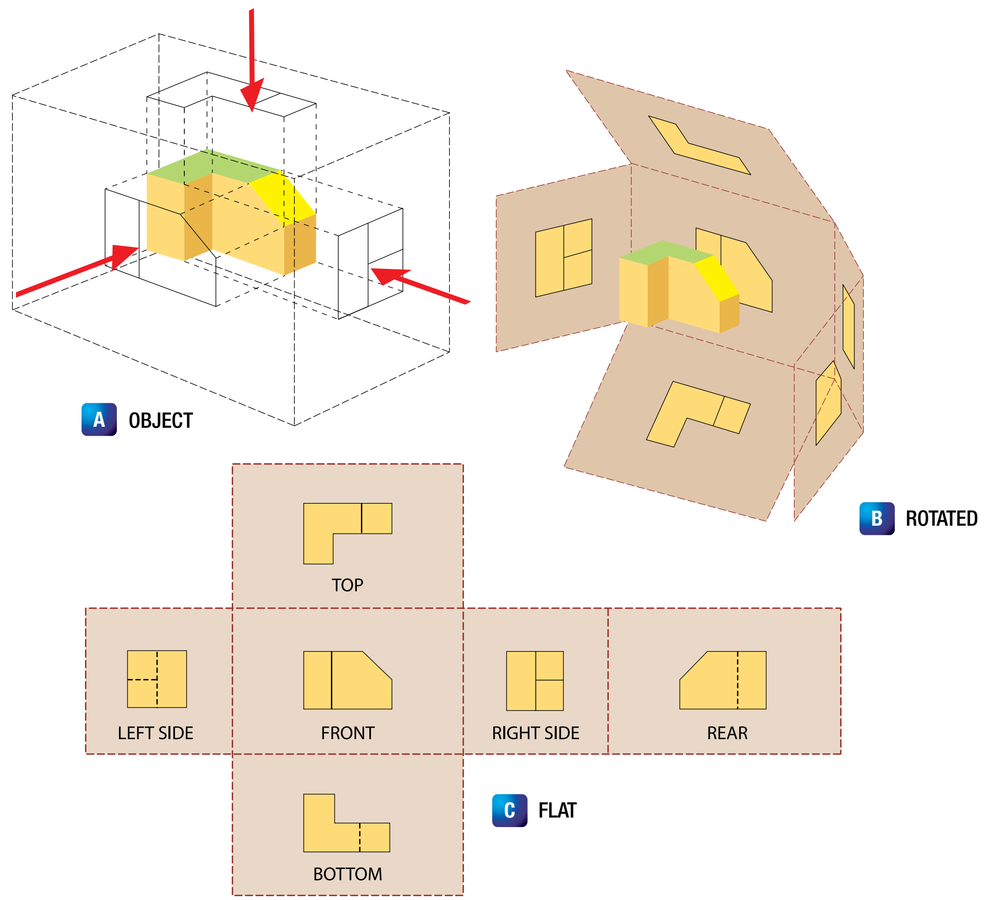

Figure 5-10. Orthographic projection.

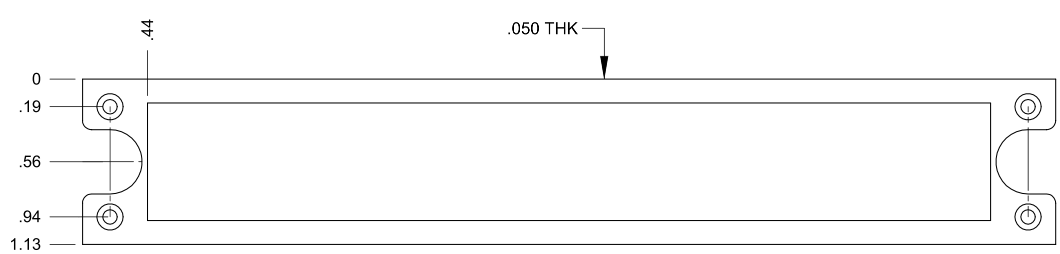

Figure 5-11. One-view drawing.

Density Variation of Aviation Fuel

Based on Average Specific Gravity

Fuel	Average Specific Gravity at 15°C (59°F)
Aviation Kerosene Jet A and Jet A1	0.812
Jet B (JP-4)	0.785
AV Gas Grade 100/130	0.703

NOTE: The fuel quantity indicator is calibrated for correct indication when using Aviation Kerosene Jet A and Jet A1. When using other fuels, multiply the indicated fuel quantity in pounds by 0.99 for Jet B (JP-4) or by 0.98 for Aviation Gasoline (100/130) to obtain actual fuel quantity in pounds.

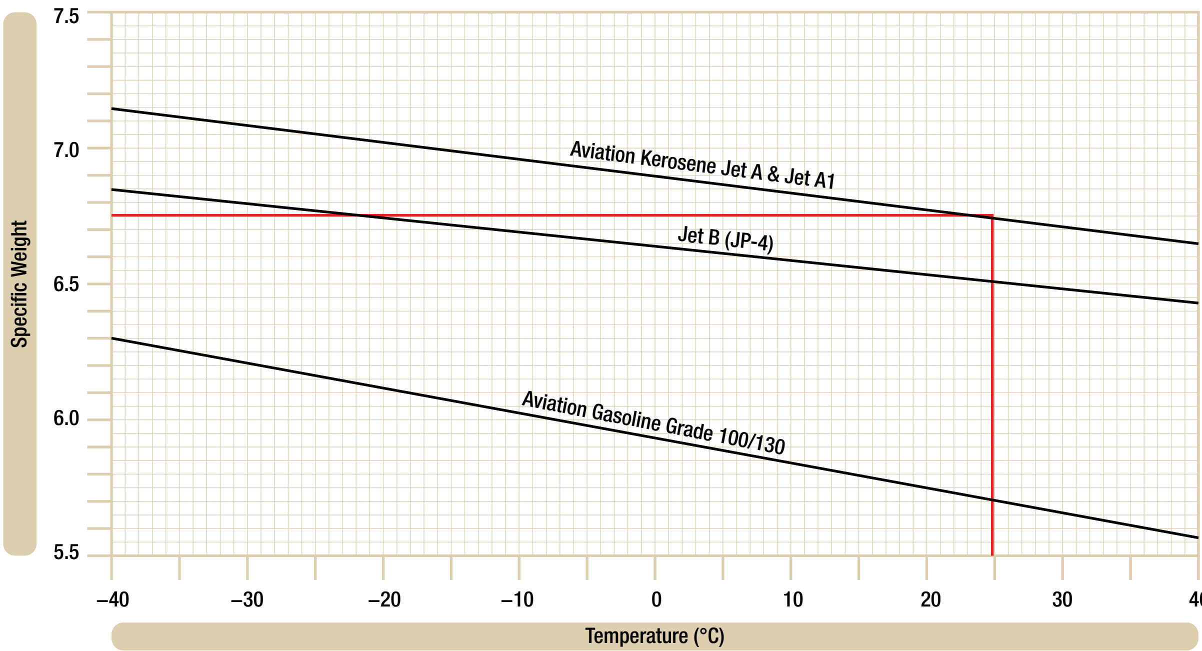

Figure 5-36. Nanogram.

Wire length in feet for allowable voltage drop

Circuit Voltage			
115	**200**	**14**	**28**
800		100	200
600		75	150
400	700	50	100
360	630	45	90
320	560	40	80
280	490	35	70
240	420	30	60
200	350	25	50
160	280	20	40
120	210	15	30
100	175	12	25
80	140	10	20
72	120	9	18
64	112	8	16
56	98	7	14
48	84	6	12
40	70	5	10
36	63	4	9
32	56		8
28	49		7
24	42	3	6
20	35	2	5
4	**7**	**.5**	**1**
Voltage Drop			

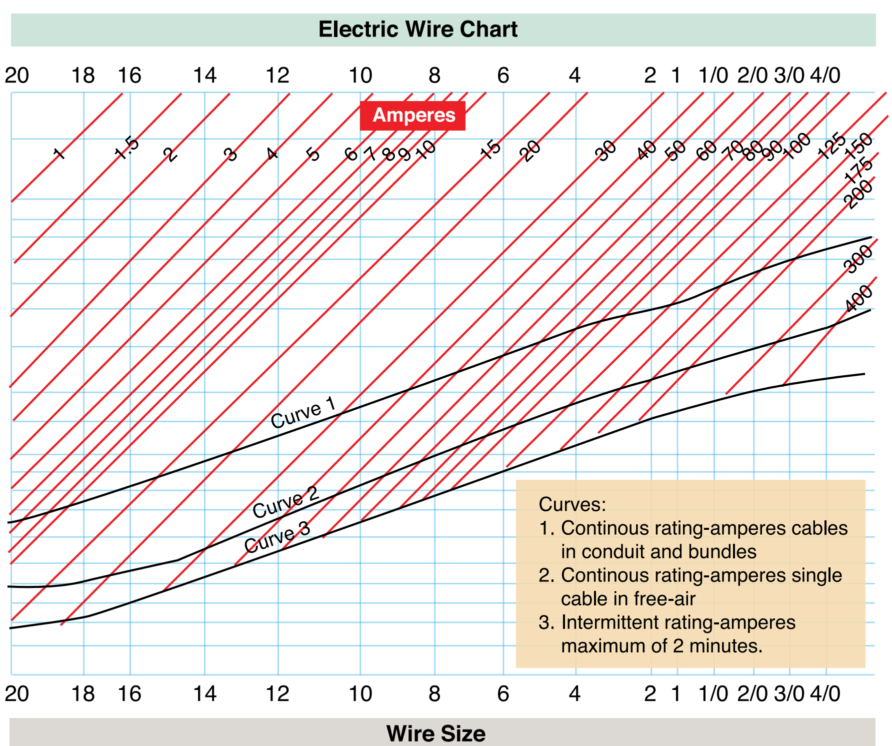

Figure 5-37. Electric wire chart.

Another main issue with this type of installation is cleanliness and lubrication. Follow the manufacturer's recommendation for cleaning and lubricating the chain and sprocket.

INSPECTION OF SCREW JACKS, LEVER DEVICES, AND PUSH-PULL ROD SYSTEMS

JACK SCREWS

A jack screw transmission of power is common on aircraft. It is often used as the drive for lowering and raising flaps and on stabilizer and rudder trim mechanisms. A gear arrangement or gearbox is used to transfer the power to the jack screw.

A ball nut attached to the moving component is rotated which follows the helically ground jack screw until the component is in the selected position. Lubrication and backlash are the two primary maintenance concerns with a jack screw arrangement.

The jackscrew must be cleaned before lubricating or making clearance adjustments. Regular lubrication intervals are specified in maintenance data due to the environmental exposure of many jackscrew installations. Ball nut wear is possible and is also checked. Use of jigs or special measuring tools is common. [**Figure 12-7**]

LEVERS

Levers can be found in numerous places within an aircraft and maintenance of these items can vary, depending on their location and purpose. As a rule, levers will be used to transmit thrust from one medium to another. For example, a push/pull system may drive a lever that operates a service, with an increase or decrease of mechanical advantage or a change of direction. Apart from the bearings of the lever requiring lubrication, (unless they are sealed-for-life bearings), there is little maintenance required, other than physical checks for damage, distortion and cracks.

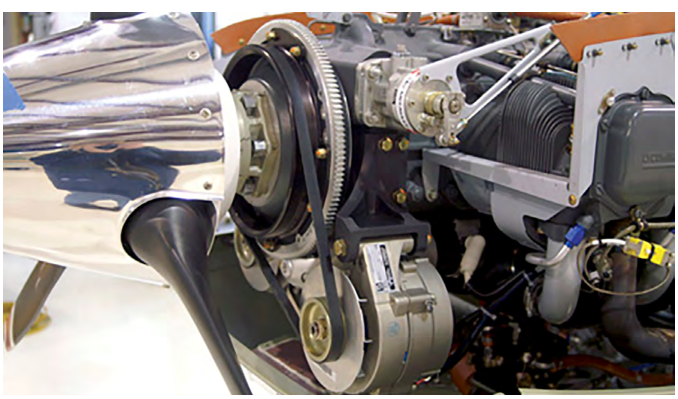

Figure 12-6. An alternator drive belt on a piston aircraft engine.

Some commonly visible lever are shown in **Figure 12-8.** The action produced by moving the levers is hidden below the console.

PUSH-PULL ROD SYSTEMS

Push rods are used as links in the flight control system to give push-pull motion. They may be adjusted at one or both ends. **Figure 12-9** shows the parts of a push rod. Notice that it consists of a tube with threaded rod ends. An adjustable antifriction rod end, or rod end clevis, attaches at each end of the tube. The rod end, or clevis, permits attachment of the tube to flight control system parts. The checknut, when tightened, prevents the rod end or clevis from loosening. They may have adjustments at one or both ends.

The rods should be perfectly straight, unless designed to be otherwise. When installed as part of a control system, the assembly should be checked for correct alignment and free movement. It is possible for control rods fitted with bearings to become disconnected because of failure of the peening that retains the ball

Figure 12-7. A jackscrew control arrangement on a Boeing 737-NG horizontal stabilizer.

Figure 12-8. Aircraft engine control levers.

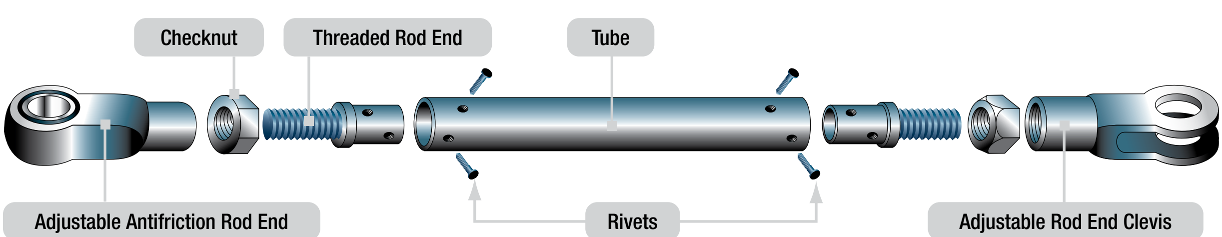

Figure 12-9. Push rod.