Aircraft Maintenance
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Lecture – 14
Inspection of Cessna 206

So, hello friends! Now we are in the last week of this course, Aircraft Maintenance. So far, we have seen the basic rules and regulations for civil aviation in India. We have read about some systems, hydraulic system, fuel system, landing gear system, electrical system. Now today, we will see some components on the aircraft; what are the maintenance checks we carry out on different parts of the aircraft at different intervals.

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So, let us start with from the front of the aircraft. You can see this is the propeller; propeller of this aircraft and before going into the details let me tell you this is Cessna 206 aircraft. This is the single crystal engine aircraft with a lycoming IO 540 engine. This is the 6 cylinder engine with the maximum horse power of 300. The propeller, this is the propeller; this propeller is a variable pitch constant speed propeller. The air craft is designed to fly with the maximum load of 1636 kilograms that is something around 600 pounds. This is a 6 heater plain with a fix landing gear and the aircraft has got digital avionics that is Garmin 1000 avionic installed in this.

So, let us start from the front of the air craft. This is the propeller as I told you. This is the spinner. During the maintenance, we check the general condition of the spinner. We check for any cracks; the attachment, the security of this spinner. These are the points, these are the holding points, you have the screws fitted here.

So, we check the spinner for security of attachment. We check for any cracks in any part of the spinner, then this is basically a visual check and get it out around a 50 hours of flying operation. After that, we will remove these screws, we will remove each screw and we will detach these spinner and check the hub inside for cracks. So, you can see I have removed this spinner from the air craft. I will check the general condition of this spinner. This is to be done every 100 hours.

I will check the general condition of this spinner. I will check the attachment points.

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Then we come to the hub. This is the hub of the propeller. You can see the 3 blades attached; 1, 2 and 3. We will check the hub for cracks. The entire area of the hub is to be checked for cracks, any leakage, grease leakage.

We check, we check the blade attachment points. We check the rings here for attachment, then wire locking this. You can see the wire locking here, this wire locking is to be checked. Then this is the spinner bulk head. We check the bulk head; spinner bulk heads for cracks and the general condition. Apart from the bulk head, spinner bulkhead, the

hub, the spinner, we check the blades, the blades, the leading edge of the blade. There should not be any damage. The leading edge edges are likely to get damage because of the pebbles on the runways. So, we check the general condition of the blades. There should not be any cracks. We check all the 3 blades. We check the tips; any leakage at the attachment points. So, in this way, the 3 blades of the propeller are checked.

After this, we come to the propeller mounting bolts.

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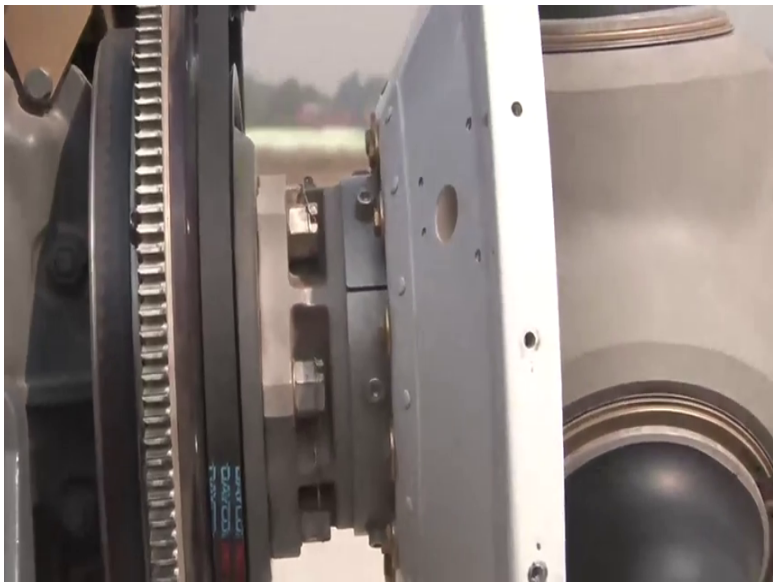

So, now you can see, these are the mounting bolts. You have 6 mounting, bolts 3 on this side, 3 on other side. We check the propeller mounting bolt whether they are securely attached, then wire locking is in place; we have to check the wire locking has not broken plus the adjacent area, we need to check whether there are any crack or any damage is there. So, on the propeller, we have seen, we have inspected the spinner then, we have inspected the hub, we have inspected the 3 blades, we have checked the propeller spinner bulk head and the propeller mounting bolts. Apart from this these things, in the propeller, we have a unit which keeps the rpm of the propeller constant that is the Hydraulic governor.

We have a hydraulic governor, since this is the constant speed propeller, there is a hydraulic governor installed on the engine. So, we will show you the location of hydraulic governor.

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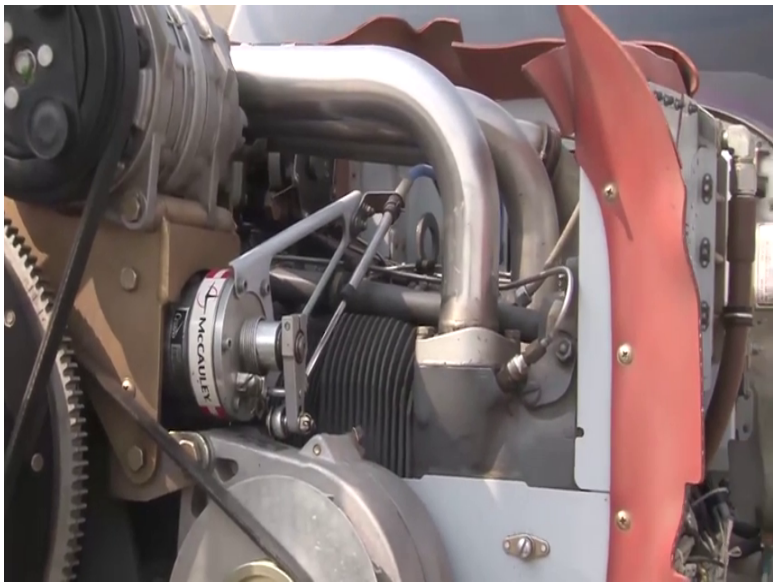

This is this is the hydraulic governor. You can see this is the hydraulic governor. This is attached to the linkage from the cockpit. And we check the governor for any leaks, for any damage, then we also move the control from the cockpit and check whether the control is free to move, whether there is no bindings. We will now move the control from the cockpit and show you how the control moves.

So, this is the control here. You can see the control. This is in the fine pitch at the movement. Now we will move it to the course switch. See the control is moving. Now the control has moved. This control, please move it to the other position; see this is the other position, this is the fine position. So, we check during the movement of control, we check whether the movements, the controls are free to move. There is no binding and in this governor, we will see that the other locking points the see the wire locking there that is in place, this is the stop screw high rpm stop screw, we call it we see that the stop screw is tightened. There is no the linkages are not loose, general mounting of the governor is ok.

And there is no damage in the adjacent area. So, these are the checks we carry out on the propeller system. The spinner here, the bulkhead ah, the propeller bulk head, the hub, the 3 blades, propeller mounting bolts and the hydraulic governor. So, these are the checks on the propellers generally carried out at different times. At 50 hours, we are carrying out

the visual inspection and 100 hours, we have removed the spinner. We have check the hub and the bulk head and the mounting bolts.

So, your maintenance on the propeller is divided into various flying hours and accordingly based on your inspection you take further actions.

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Now you have seen the propeller part coming to the engine. I will show you the different parts in this engine. These are the shock mounts; you can see these are the mounts where the engine is attached. This is the one first, this is the second one, these are 2 mounts in the front, 2 mounts at the back, these are the rubber mounts basically sandwich construction 2 rubber mounts; in between there is a metal-metal part. So, during that inspection, we check whether there is any crack on these mounts, whether they have compressed above and cracks in the adjacent areas. So, this is a very important check the entire engine is mounted on these shock mounts. These rubber shock mounts they are designed to observe the vibrations.

So, these are the critical part of this engine. So, you can see the 2 mounts here. The first 2 mounts in the front and similarly you have 2 mounts at the back.

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You can see the third one. This is the third mount and another mount on the other side. So, 4 mounts in all where your engine is mounted. As I have told that, this is the 6 cylinder engine, you can see 3 cylinders; 1, 2, 3 and 3 cylinders on the other side.

This is an in line horizontally opposed engine. The cylinders on the right side are numbered as, this is the first cylinder, this is the third cylinder and this is the fifth cylinder. Similarly, the cylinders on the opposite side; the cylinder opposite to this is the second cylinder. Cylinder opposite to this is the fourth cylinder and cylinder opposite to this is the sixth cylinder. So, this is the way cylinders are numbered. Then this is your exhaust system, the exhaust gases come out and from this location, these are the exhaust caps for the 3 cylinders. This is for this one this is for this one and this is for this one.

Then you can see the spark plugs. These are the spark plugs here. The spark plugs, this is the point from where we fill in the engine oil, this is the point from where the engine oil is filled. This is your battery compartment then you can see here.

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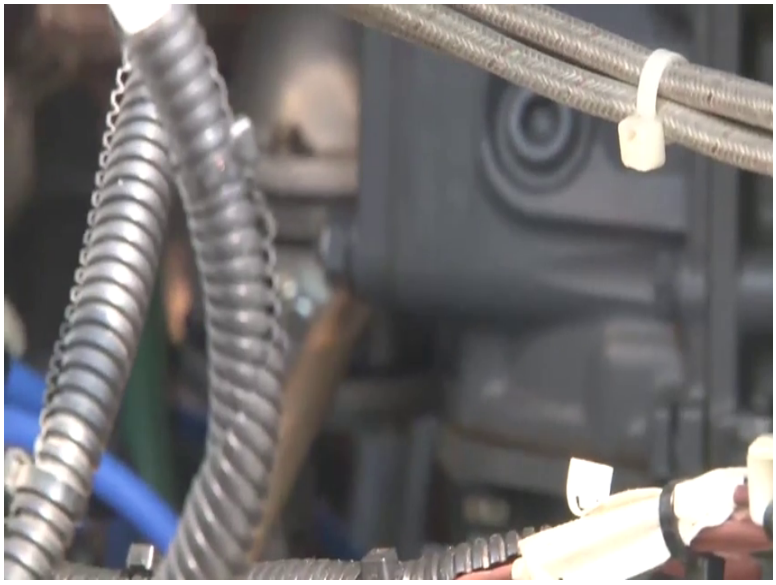

This is your fuel pump, this is the engine driven fuel pump. We will tell you about these parts at the movement I will just showing you the location. These are the magnetos; 2 magnetos; one on this side, one on the left side.

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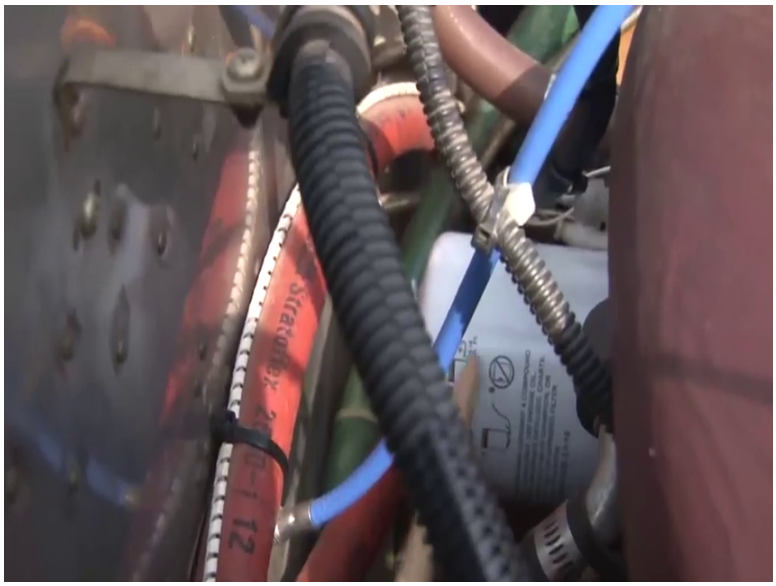

Then, so this white component this is your oil filter.

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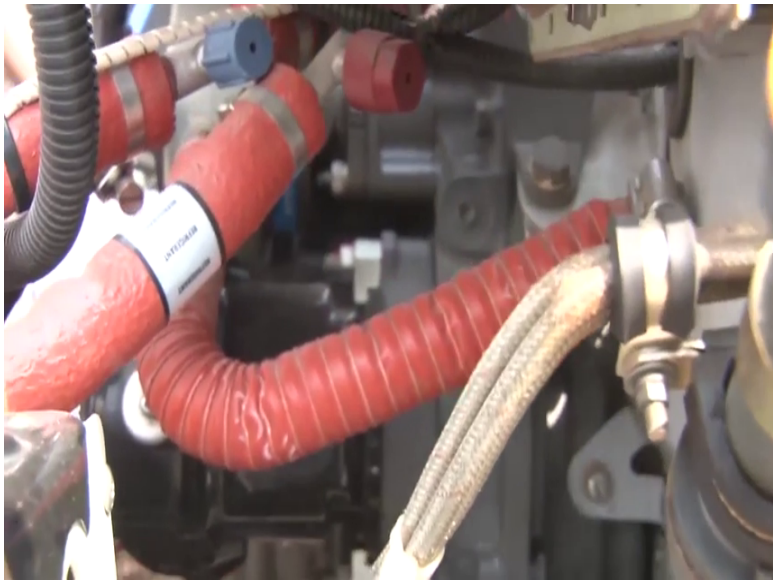

This is black component, this is magneto. There are 2 magnetos; one on the right side, one on the left side. So, in this air craft has got slick magnetos slick is the manufacturer.

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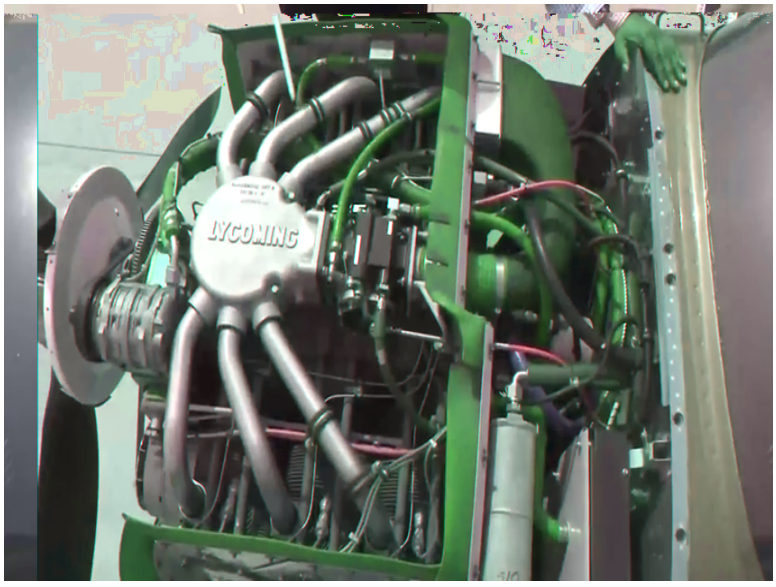

So, you can see the top view of the engine. This is your fuel air control unit. Fuel air control unit, then this is your air filter here. This is the air filter. These are the 3 cylinders here; 3 cylinders and 3 cylinders on the opposite side. These are the 3 cylinders. You can see the metal lines. These metal lines, these are the fuel lines. 3 spark plugs, these are the spark plugs. Then this is your induction manifold, your induction air going inside the cylinders.

So, the air enters this side of the calling. There is a opening here where the air enters from this place, this is your filter, this is your induction air filter. This filter this will filter the air going inside the engine. So, air enters via this filter goes to the ducting and this is your fuel air control unit where the air enters the fuel air control unit.

From here, it is giving to the induction manifold and then to the cylinders. According to the air, your fuel is metered accordingly by this fuel air control unit. So, this is how your induction system is working. Now the maintenance checks on the induction system; this is the filter. We remove the filter from here and check for the general cleanliness. Generally the filter is to be cleaned depending on the area and depending on the environmental condition in which you are operating the air craft.

In general, the filter should be cleaned every 100 hours. So, you can see this is a filter. This is a new filter which is installed here. This filter is removed from the air craft. It is cleaned; this is a paper filter and cleaned with a dry air. So, as I told here, this is fuel air control unit. This fuel air control unit will heater the fuel depending on the air intake.

So, here you can see this is your mixture adjustment. You can vary the mixture of fuel and air going inside the engine cylinders. With this, this is a wheel here. With this, you can vary the mixture here. This is your throttle control, during the maintenance checks we check, whether your controls are free to move, whether there is no binding in the controls. I will show you how the control are moving. So, you can see the throttle moving. This is your throttle control moving. So, during this, we check whether your controls are free to move, whether there is no binding in the controls. Now with this, you can see the mixture also moving. You can see the mixture here, the mixture control moving.

So, we during the movement, we check whether your controls are free to move; there is no binding in the controls. So, you have seen the throttle control, the mixture control, then in the fuel system, apart from the fuel air control unit, so this is the fuel manifold. You can see here fuel manifold. The fuel manifold, there are various connections various metal lines connected to which are going to the different cylinders. So, we check the security of attachment at each line at the manifold. We check the wire locking at the manifold. We check there is leakage or not.

And after inspecting this manifold each and every fuel line each and every metal line is to be inspected for any crack, for any leaks. You can see the various metal lines going in different cylinders. You can see here the different metal lines, thin metal lines going inside the engine cylinders. So, each and every metal line is to be checked, is to be inspected. The support clamps, you can see the support clamps here. You can see here, these are the support clamps, these are the metal lines. Each and every metal line going to each and every cylinder is to be checked for cracks, for leaks, for distortion, damage. Your support clamps should be firm, they should not be loose and there should not be any tension in the clamps. So, each and every lines has to be inspected. Now how the fuel how the fuel is coming to these cylinders? Fuel is coming from the tanks we have the fuel tanks in the wings; one in the left wing, one in the right wing

From the tanks the fuel is coming to the filter. So, the fuel from the fuel air control unit comes to the floor divider or the fuel manifold. Here from the fuel manifold the fuel is given to the various cylinders through these metal lines. So, the fuel is given to the various cylinders is metered according to the air intake from this fuel air control unit. In the maintenance checks, we have seen that we check these metal lines for any cracks, for any damage, we check the support clamps that they should be fixed. Then we check the movement of these controls, the throttle control and the mixture control. We check whether the controls are free to move whether there is no binding in the movement.

Apart from that at various hours, say around 50 hours, 100 hours of operation, there is these controls are to be cleaned. They need ne need to be lubricated by the lubricant as suggested by the manufacture in the maintenance manual. These controls are lubricated. You have an a filter, a injector inlet screen we call it in injector inlet screen it is a filter in this fuel air control unit which is to be cleaned every 100 hours of operation. This it is a filter here and then the filter is removed and it is cleaned. So, these are basic checks plus we have seen one filter. The first filter we had seen which is there at bottom point, the gasculator filter that also needs to be cleaned every 100 hours of operation. So, apart from this fuel air control unit, the fuel manifold, the different metal lines, we check the different cylinders. You can see the different cylinders here; 3 cylinders on the left side, 3 cylinders on the right side. These are the fins. You can see, these are the fins here. Cylinder has got fins, that got they are the cooling fins.

So, each each cylinder is to be checked visually for any cracks on the cooling fins; the cylinder attachment points, the cylinder holding points the attachment points, you can see the cylinder attachment points cylinder is attached by the bolts and the nuts. So, the holding points, we need to check whether they are tightened where otherwise any leakage at the cylinder base. So, these are the few checks on the cylinders, on the fuel air control unit, on the controls fuel air controls, the engine controls the engine controls, we have seen this is the throttle control, this is your mixture control, one control we have seen earlier which is the other one control which is there. So, all the controls, we need to check whether they are free to move, whether there is no damage, the locking is there, the splitance which are there in the controls they are there intact and properly lubricated.

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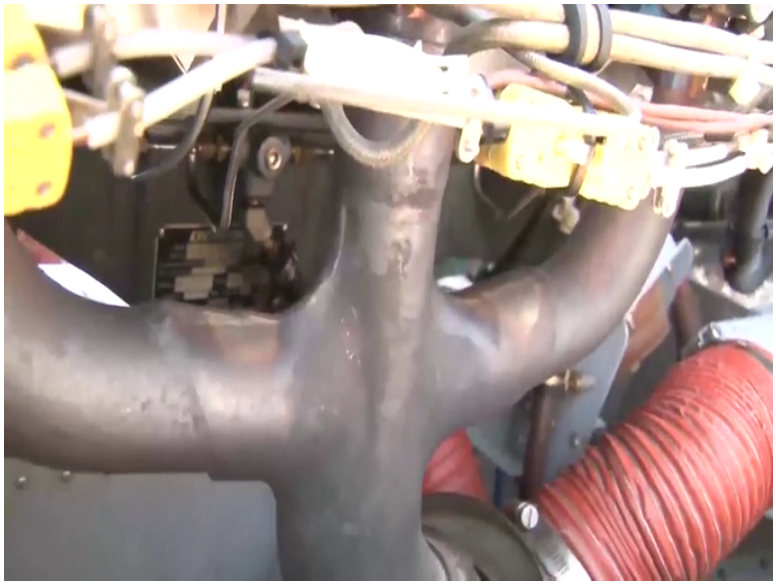

So, coming to the oil system of this engine, this is a wet slump lubrication system. You can see this is the crank case, this is the crank case, this is the place where the oil finally settles down; oil is there and this location this point this is the opening point, we in order to drain the oil from the system, we need to open this point, this is wire locked at the movement you can see after tightening it, we need to wire lock. So, remove.

In order to remove, we need cut this wire, open this point and drain the oil. This oil the capacity of the oil tank the oil sump in this is 11 cots roughly approximately equal to 10.5 litres. So, once the oil is drain from this point, we again put this bolt inside and wire

lock it and then the oil is filled from the filling point. I will just show you the filling point.

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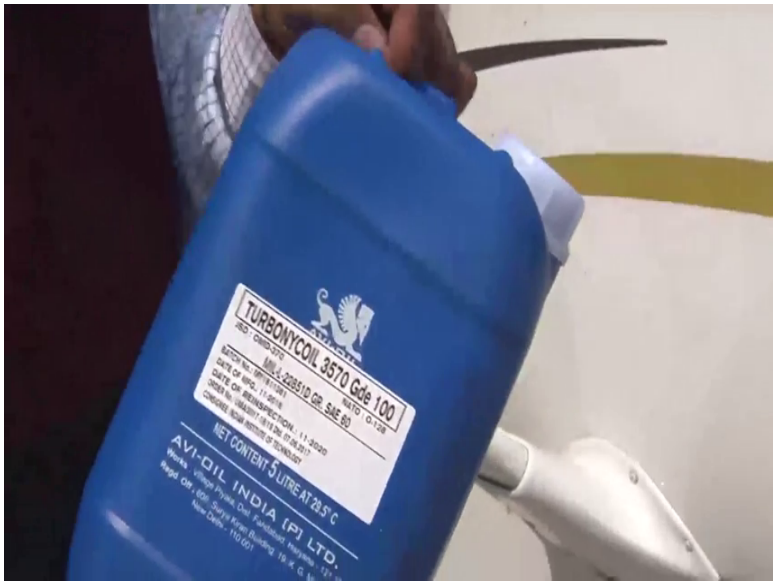

So, this is the engine oil this is m I l 2 2 8 5 1 D which is s a 60, this is the engine oil which is filled in at from this point.

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This is the oil dipstick. We remove the oil dipstick and this is your oil dipstick.

In order to measure the oil quantity, we first clean the dipstick with a clean cloth ; this is how your dipstick is open and you can check the oil quantity, you can see the various graduations here the which indicates the quantity of oil in your tank. So, the oil is poured from this point. Around 10.5 litres of oil goes in this tank. While replacing the engine oil, the oil filters is also to be replaced. We have just seen this white components here the oil filter, you can see this is the oil filter here.

This is your oil filter. This oil filter also needs to be replaced while replacing the engine oil. And the frequency of replacement is 50 hours of operation or 4 months 4 calendar months whichever is earlier. So, the engine oil is to be replaced 50 hours of operation or 4 months whichever is earlier. And while replacing the engine oil, you also need to replace the oil filter. The oil filter is replaced and after replacement it is entightened and then wire locked. As we have seen the induction system, the air air filter this is the ducting which is going from the filter to the fuel air control unit. In this duct, you can see this is in alternate air door also. This is the alternate air in case, if your induction air filter gets locked due to section pressure, this door will open and there will be an air supply; wire this door to the fuel air control unit.

So, during the maintenance checks, we also need to check the hinge of this doors and whether the door is properly opening and closing.

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So, in the oil system another critical component is the oil cooler. This is the oil cooler here. So, during the inspection part, we need to check whether the cooling fins these fins they are not obstructed, there is no damage in the cooling fins. The lines, these are the holes the attachments their intact there is no leakage here, these clamps and all everything is tightened, the mounting of the oil cooler is intact and there is no visible damage. And 2 hundred hours of operation, we need to remove this oil cooler. Then this oil cooler has to be cleaned by forcing fuel inside the oil cooler by a pump and then the durt inside the oil cooler is to be cleaned. There is a proper procedure spelt out in the maintenance manual around cleaning of this oil cooler. So, these oil coolers are cleaned accordingly.

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So, this is the exhaust system. The exhaust gases coming out from each cylinder, you can see the exhaust gases; this is for the first cylinder, another cylinder, another cylinder. Similarly, the system is there on other side for the 3 cylinders. The exhaust gases come out of these. This is your exhaust manifold, here for the inspection part, we need to check whether all the well seens are there intact; there is no damage, there is no crack, there is no porosity in the exhaust system. All the connections they are intact and there is no damage in the well seemed area and the adjacent area.

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According to the ignition system of this engine, these are the spark plugs.

You have 2 spark plugs in each cylinder. So, you have 12 spark plugs in the engine. These spark plugs are to be removed every 100 hours of operation and they are to be cleaned, you can see this one sample spark plug here.

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This spark plug is needs to be removed, cleaned and then installed back.

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Then another critical component of the ignition system is the magneto. This is the magneto you can see this is the magneto. We have 2 magnetos. They are 6 6 3 5 1 auto magnetos installed on this engine. This is your distributor block, the distributor block and the ignition harness. This is the ignition harness. This distributor block the spark the spa the electrical sparks are generated in this electrical energy is generated in this magneto.

And from this distributor block this is transmitted to the different spark plugs in different cylinders. So, the distributor block, the ignition harness, the magnetos, they are an important part of the ignition system along with this spark plug. One of the important feature in the 100 hours inspection of this engine is the engine compression check; we check the health of the engine by doing the compression check which you will see in the we will show you an engine compression; not on this engine in on other engine, we will show you how the engine compression is done. Apart from compression, then the idle speed and idle mixture adjustment is an important check of this engine plus the magnetos, the magnetos just we just saw in the ignition system, the magnetos needs to be synchronised there is a proper check for magneto synchronisation. So, these are some of the important things which are critical for safe operation of an engine.

The compression check, the idle speed, idle mixture check, the magneto synchronisation and another very important critical feature for any engine is for an good health of this engine is that your engine oil should be replaced every 50 hours or 4 months. This is a very very important step; the replacement of engine oil and oil filter.

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So, after the engine part, we will come inside the cockpit. These are the seats. The seats are to be inspected that they are serviceable and are installed correctly. Then, the seat movement on the rails the seat moves smoothly on the rails moves smoothly the the seats stops, the stops are here, the stops are here these stops are intact and the rails on which the seats are moving these are the rails, you can see here these are the rails.

The rails on which the seats are moving there is no damage on the rails, there are no cracks on the rails and the locking mechanism of the seat on the rails is intact. The restraint system on the seat belt the seats on the seats the seat belts for the front seats, the rear seats, they are to be checked for security of installation thinning, fraying, cutting, broken stitches or deterioration. So, these seat belts are also to be check for the locking mechanism for any cutting, for any fraying etc. To do fire extinguisher inside the cabin, this is this fire extinguisher this is to be checked for security of installation. We remove this extinguisher and carry out a weight check see that there are no leakages there is the needle on the fire extinguisher is in the green range. So, the fire extinguisher is checked every 100 hours of operation for security of installation for proper functioning.

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So, this is the alarm, you can see the alarm. During our maintenance checks, we carry the movement of alarm surface; there should not be any binding in the movement, it should be free to move. Your surface, the alarm surface, there should not be any cracks. It has to be inspected the training edges, the entire surface, there should not be any crack, no loose rivets from the surface. Then, during the 100 hours check, we have to remove the inspection channel from the wing. The cables inside the inspection panels these cables, you need to inspect these cables. There should not be any fraying of cables. The pulleys the pulleys on which the cables are moving, these are the pulleys here, you can see these pulleys. The pulleys should be in place, cables should be riding on the pulleys. Then, this is the turn buckle here for the alarm control system, you can see the turble the wire locking on the turn buckles should be in place, turn buckles should to be tight, then every 100 hours of operation, there is a very important check called cable tension check. The cable tension it is to be checked by a Cable Tensiometer, you can see here this is the cable tensiometer depending on the size of the cable.

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The cable tens the a block is fitted here and this is fixed on the cable and the tens and the tension recorded on this cable tensiometer. So, this is a very important check depending on the temperature on which you are operating and the cable size you get your cable tension get you prescribed. Tension limit by the manufacturer the your cable tension should be within that range. This tensiometer should also be periodically calibrated.

And apart from this cable tension, we need to measure the control surface travel. There is a specific range of control surface travel specified by the manufacturer. The control surface should be travel surface should be within that range, the down movement the up movement of the control surface, it should be within the range. So, in order to see the control surface travel; initially, you have to level your air plane, level the air craft laterally as well as longitudinally there are specific points on the air craft from where you level the air craft laterally and longitudinally. First the air craft is levelled, then you check the control surface travel. Initially, you check the neutral, neutral level and then, you check the extreme up and extreme down travel. So, this travel should also be within your prescribed limits. Very important check for the control surfaces for all the flight controls this is the alarm, you can see.

Similarly, you will see the movement for the other alarm on the left side and you will do the similar checks for the cables, pulleys, turn buckles and the internal structure.

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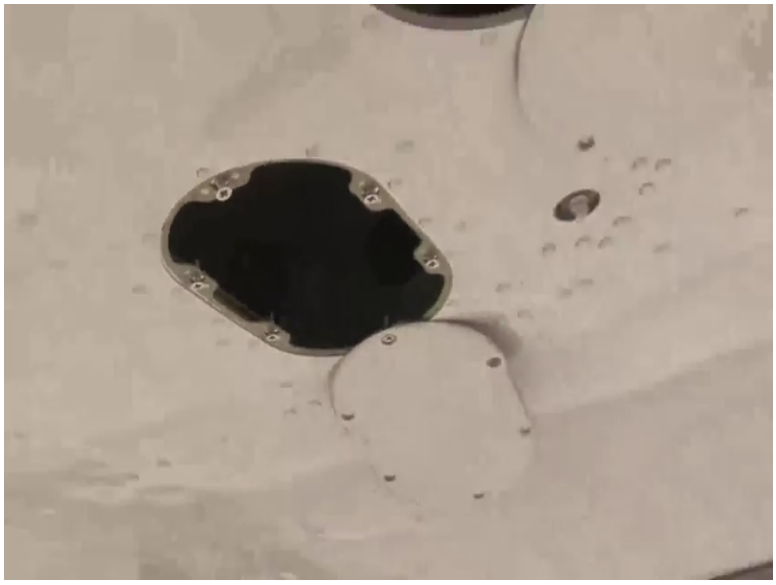

The once you have opened the inspection panels, you will check the internal structure also here you can see this is the rib. Similarly, you have the ribs all over. You check the ribs, there should not be any cracks, the internal skin there should not be any cracks and there should not be any deformation.

So, during the 100 hours; 100 hours is, 100 hours or an annual check it is the very important check which gives you an opportunity to inspect the complete air craft. So, during the 100 hours, we do this internal check, we clean the internal structure, we check the internal structure for cracks, check the cables, we check the cable tension, we do the control surface travel for all the controls. Apart from this check, important checks, another important checks are the struts, these are the struts; you can see here. These are the strut fairings inside the strut fairing you have the strut attachment bolts. There is a prescribed torque given by the manufacturer for the strut attachment for those torque values also needs to be checked whether your struts are properly torqued or not. So, there is an attachment here at the wing. This is the bottom point you have the strut attachment here. So, these fairings are removed the bolts are checked.

In case if they are loosed, then they are retightened. So, this is part of the 100 hours inspection. Apart from the struts tightening, the wings the wings are attached here. This is the attachment point here for the wings. The wing attachment bolts are here on the front side as well as the rear side. So, you need to check whether your bolts the wing attachment bolts are properly tightened or not. In case if they are loose, they needs to be

retightened according to the limits specified by the manufacturer in the maintenance manual.

So, important checks as part of the 100 hours inspection the tightening of the wing attachment bolts, tightening of the strut attachment bolts, then after tightening all these things, you need to check each and every rivet; each and every rivet needs to be checked that the rivet is not removed, rivet is in place, the skin is not damaged, there should not be any scratches, any cracks all over the skin. So, the entire wing assembly is checked. Then, you come to the tips the different lights on the wings the lights need to be checked these are the navigation lights.

These lights need to be checked. Then, the trailing edges of the wings, the trailing edges of the alarm, the trailing edges of the flap, this is the flap you can see the trailing edges of the flap and the entire structure, similarly, the entire structure to be checked for the rivets for any cracks, for any damage on the entire surface. The whole surface is checked. So, this is the flap of the air craft. In this air craft, it has an electrical flap. We operate the flap from the cockpit and there are various checks to be carried out on the flap system, you will now see, how the flap is going down. You can see this is electrically operated. Now, there are various positions at which the flap can go. This is the first position this is 10 degrees reflection, now it is going to the 20 degrees reflection.

The flap has gone to down position. Now, it will go to the full down position. Now, this flap is in the full down position, you can see it has been electrically operated. Now, the flap here you can see.

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This is the control rod, this is the linkage points. During our inspection, we need to see that this rods they are there is no damage they are securely attached.

Then these are the cracks on which the flaps are moving, these are the crack rollers. We need to check whether these cracks there is no damage the tracks have not elongated, they have not worn out. So, that in case these cracks are worn out, then there will be play in the flap. So, this needs to be checked whether your cracks and the rollers have not worn out. The entire surface the flap surface is intact there is no damage on the skin, there are no loose rivets.

The rivets are not damaged and the control rods are in place. Apart from this, there are there is a flap motor which operates the flap, you can see here, this is the flap motor. You can see here, this is the flap motor. The flap motor, the electrical connections in the flap they need to be checked whether the connections are intact, there are no loose connections, no damage in the connections. Then, there is a screw jack on which the flap is moving. The screw jack needs to be checked, the screw jack needs to be lubricated in every 100 hours schedule. So, the flap this is an electrical flap a very important control surface.

So, all the inspections inside the electrical connections on the flap motor, the track, the rollers, the screw jack and all needs to be inspected for the flap, similar inspections to be done on the other surface of the flap. You can see the flap is been distracted. Now, the flap is going to the up position. You have seen the flap, now flap is fully retracted. So,

during our inspection, another important thing is also that we need to check control surface travel as we had checked in the alarm. Similarly, in the flap also, we will check the control surface travel at different positions and that control surface travel should be within the prescribed limit as specified by the manufacturer.

So, in addition to the control surface travel, another important thing to be checked is the flap cable tension also. The flap cable tension is also checked as we have checked in the alarm system. Similarly, in the flap system also, we will check the cable tension and that tension should be within the prescribed limit, the tool being used for checking the cable tension is the cable tensiometer. Depending on the size of the cable, the cable tension meter is accordingly used.

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Another important control, this is the alleviator. The alleviator needs to be inspected as we have checked the alarms and the flaps. There should not be binding in the movement of control surface.

We check the movement. The control surface should be free to move. The control attachment points, these are the hinge bolts, you can see here; these are the hinge bolts. The hinge bolts should be in place, you can see the hinge bolt here. This is the hinge bolts. Similarly, you have the hinge bolts here. All the hinge bolts, they should be in place, they should be securely attached, you should we need to check all the attachment

points. The control surface needs to be checked. There should not be any crack on the surface, it should be clear.

The rivets, each and every rivet should be checked. No loose rivets, no damage on the rivets, the control surface needs to be checked. Similarly, on the other side on the left side also, the control surface will be checked, the hinge bolts will be checked, the connecting rods which attach the surface, this also needs to be checked. So, 100 hours inspection is an important check where you need to check the entire air craft. We will open the inspection panels and we check the cables, the cables which attach the alleviator surface to the control stick with all the cables they need to be check the whether there is any damage in the cable, whether the routine of the cable is and the control surfaces not damaged. Similarly on the alleviator surface also, you need to measure the control surface travel.

Same as we have done in the case of alarm, flaps, alleviator also control surface travel need to be checked. The air craft is levelled first then the surface travel is checked and it should be within the range specified by the manufacturer. After checking the control surface travel, we also check the cable tension. The cable tension again with the cable tensiometer depending on the size of the cable, this is the rudder. Similarly, the entire surface, the rudder surface needs to be checked for any damage, for any cracks, the trailing edge of the rudder should be free of any damage. The rivets on the surface, there should not be any loose rivets no damage on the surface. The attachment points, the hinge bolts you can see there is this is the place where there is a hinge bolt here, here and at the top all the hinge bolts.

They should be in place they should be securely attached. So, apart from the hinge bolts, you also need to check the rubber travel, surface travel as we have check in other cases and the cable tension. The rudder cable tension should also be within the prescribed limits.

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So, this is the top of the wing. This is the fuel tank cap, we remove this tank cap and the fuel is filled at this point. The maximum fuel tank capacity is 99, 92 gallons, US gallons. We have 2 fuel tanks, one in the left wing, one in the right wing. The fuel is filled from this point, this tank is opened, there are this; we need to be careful that this while locking that this has properly locked or not.

So, the fuel that can be filled in these tanks is grade 100 ll, which is aviation gasoline which is specially play carded here. You can see this grade 100 ll fuel is filled in this tank. From the fuel tank, the fuel will go to the fuel gasculator. We have just see that what is the fuel gasculator. In the fuel system, these are the different drain points here. You can see the drain points, the fuel is drained from these drain points to see whether there are no water segments inside the fuel, then the fuel vent line, this vent line is inspected. There should not be any damage in the fuel vent line.

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This is your fuel tank selection inside the cockpit. From here you can see you can select the fuel tank. At the movement this is your of position, this is your both position; that means, you can supply fuels simultaneously from both the tanks. You can either select the lack tank. This is your left tank selection.

Fuel to be supplied from the left tank or you can select the fuel from the right tank. So, you have left, both, right and of selection. So, fuel can be supplied from either position as part of the maintenance during the inspection schedule. We check freedom of the movement of this control they, this control should be free to move. There should not be any binding and there should not be any damage.

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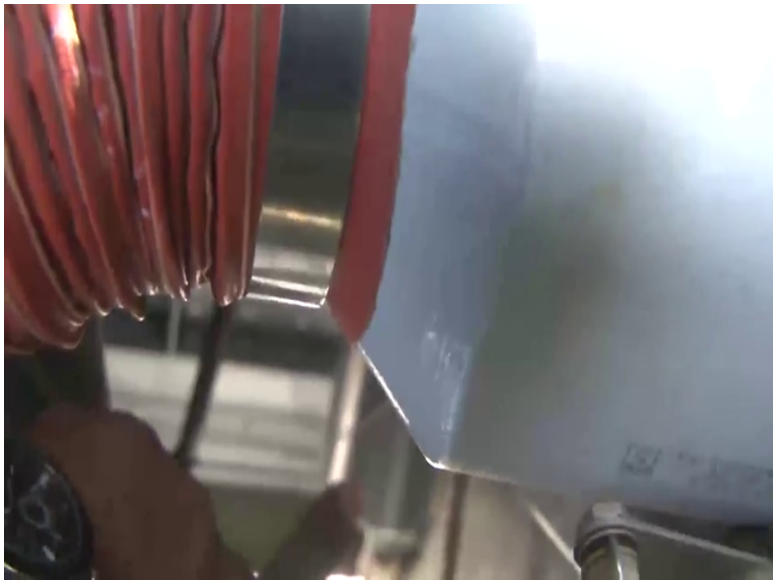

So, this is the gasculator filter. This is the fuel filter as part of the 100 hours inspection, we need to open this assembly and we need to remove the filter and clean the filter.

This is the very important check, very important part of maintenance. This fuel filters is to be 300 hours of operation. So, this air craft has got a fixed landing gear. You can see this is the fix landing gear. The important checks in the 100 hours schedule is we need the to check whether the landing gear is securely attached, the bolts attaching the landing gear to the structure they are firmly in place, they are properly talked.

Then here is your break unit you can see.

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This is your break unit, this is your break unit. We need to check that the break unit is firmly placed. There are no damages, this is the break line which is coming and attaching to the break unit. This break unit, there is no leakage in this line, there is no damage in this line. The break lines, you can see here, these are the 2 liners, these are the liners break liners. The break liners have not worn out. The disk, the break disk, the rotters, they are not damaged plus the tire assembly, the tyre there are no cuts there are no damage on the tyre. The tyre pressure is proper and you can see the creep marks, the creep marks on the tyres the marks are in place.

The split pin which is there, that is in place. So, the entire landing gear from the strut, break unit, tyres and the hub, this needs to be checked that everything is proper, there are there is no damage, there is no leakage. Similarly you have the landing gear on the other side. Similar checks to be done on the other gear. This is the nose landing gear you can see.

As part of the maintenance, we need to check the strut extension. The strut extension should be within the limits, there should not be any leakage and at this part, these are the links, the bolts are properly in place. There should not be any damage on the talk links. The splitance in these bolts, they should be in place. This is the nose tyre, the no, no, damage should be there on the nose tyre. There should not be worn out. It should be having proper tyre pressure as specified by the manufacturer. In this case, it is 49 plus minus 3 PSI. It should be within this range. The split pins should be intact. So, as part of the schedule, this inspection is required on the nose and a carriage.

So, this aircraft has got a fixed under carriage, fixed landing gear. There is no retraction check involved, but on other aircrafts which have a retractable landing gear, we also need to check the carry out the retraction check of the landing gear system at every 100 hours of operations. So, you will see in one of our aircrafts, we will show you how the landing gear attraction check is carried out.

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So, we are now on the Piper Saratoga aircraft which has a retractable landing gear. You can see the right main landing gear of Piper Saratoga aircraft.

These are the landing gear attachment points. You can see this is the landing gear attachment bracket, the 4 bolts; 1, 2, 3 and one on the back side. 4 these 4 bolts plus 1 attachment here, these attachments attach the main landing gear to the fuselage. You can see the springs, since this is the retractable landing gear this spring you can see, the hook, the down lock hook. This is the down lock hook. The switches, the electronic switches, the down lock switches plus you see the oliomonatic strut, the torque links, the tyre assembly and the break unit.

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So, this is Piper Saratoga aircraft. You can see the landing gear of Piper Saratoga aircraft which is a retractable landing gear. Now you will see the retraction check. The retraction and extension check of Piper Saratoga aircraft. Layer up, you have seen that the landing gear, all 3 landing gears both main landing gears and nose landing gear have retracted. They are now up, we will now see how the landing gears are coming down, down you can see the grad gradual movement of the landing gears.

They have come down now. They are completely down and locked. You can see the 3 gears completely down and locked. There is an emergency check also on this air landing gear. We will do an emergency landing check, the retraction is normal, the landing gears are normally retracted and ne with an emergency selection they are made to free fall. You can see the landing gears again going up, up. You have seen that the landing gears have fully retracted. The gears will now make emergency free fall. Emergency down, you can see now the emergency selection now have been take put on.

And the gears are making a free fall. You have seen now the landing gears are down and locked. They have made a free fall after emergency selection was done. We are inside the cockpit of Cessna 206 air craft.

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You can see this is the cockpit. This is the pilot seat. These are the control sticks, the control wheels. This is your PFD, Primary Functional Display. This is the MFD, Multi-Functional Display and these are some of the stand by instruments. This is your master switch, this is your stand by battery switch.

So, I will put the PFD's and MFD's on. Before doing that, we do a test for stand by battery. So, we put this switch on the test mode for the 10 seconds and observe the test light to eliminate. So, for the 10 seconds, I will hold this switch in the test position and then I will put it to the arm position. So, now, the stand by battery switches in the arm position and I will wait for this PFD to glow. You can see that this has activated and this is a Garmin 1000 avionic system. Now my I will put the master switch on position. You can see here, the screen is on this PFD is on. There are various parameters various instruments. On one screen, we have the flight instruments, navigation instruments, the engine instruments, lot of information on one screen.

I will tell you, what are the different parameters, what are the different instruments there on the screen. This instrument, this is your air speed indicator. This gives you the indicated air speed which at which your air craft is flying. This is the vertical scale with the fix pointer. This at the bottom, you can see this is true air speed is shown here. Then this is your this scale on the right side, this is vertical scale this is altimeter this indicates the altitude at which you are flying. This is your vertical speed indicator, this gives you the vertical speed, the rate at which your aircraft is ascending or descending. This is your

attitude indicator; this gives you the attitude of aircraft at which the air craft is flying. This is your horizontal situation indicator that is the HIS.

This is the HIS here at this at the bottom of the screen. In the top most left corner, you can see these are the navigation box. You can see the navigation frequencies here. On the extreme left, all these parameters you can see the engine parameters. This is your manifold pressure gage. This gives you the manifold pressure going in the cylinders. This is your rpm gage, gives you the rpm of the propeller.

In this case, this air craft the maximum rpm that is the revolutions per minute of the propeller is 2700, 2700. This you can see this gage horizontal gage, this gives you the fuel flow. This, this thing you can see the red light blinking this is the oil pressure gage. This is a very very important instrument oil pressure. As soon as you start the air craft the very first thing after the engine starts to be observed is the oil pressure.

Once the oil pressure has registered; that means, your lubrication system yeah oil in the lubrication system has started flowing. In case within 30 seconds of starting the engine your oil pressure gets registered, you have to switch off the engine and look for the cause. So, oil pressure indicator is very important. In case if the oil pressure has not registered within 30 seconds means your oil has not started flowing and your engine can get damaged.

So, oil pressure is a very very critical parameter to observe as soon as you start the engine. Next is here oil temperature gage. This gives you the temperature of the oil. On the on the instruments, you can see there are various colour markings, code markings there. These green markings you can see this green marking are the normal operating range. If you are needle, if your gage is functioning in the green range; that means, the system and the gage is operating normally and then at the end you can see the red markings also. The red markings are the danger marking, in case, if your needle is going to the red mark, then there is the problem in the instrument in the system, you need to need to rectify that problem.

So, this is your oil temperature gage. Then comes your cylinder head temperature, this is the CHT gage, Cylinder Head Temperature gage. Then you have the exhaust gas temperature that is called the EGT, this is called the Exhaust Gas Temperature and then you have the fuel quantity gage.

The top, top mark is showing the left tank, the bottom mark is showing the right tank; that means, you have the information for of fuel quantity in both the tanks, the left tank as well as the right tank. As I have told you earlier that the air craft has got the 2 fuel tanks, one in the left wing one and one in the right wing, the total fuel quantity that can be carried in this air craft is 92 US gallons and out of which 88 US gallons is usable. Then you have the electrical information electrical parameters here. This is the bus voltage and this is your battery amp meter. This was about your instruments. Here you have some of the stand by instruments. This is your air speed indicator. Digital air speed indicator is here.

And the analogue stand by instrument, this is the air speed indicator. On this indicator also, you can see the various colour coding, colour markings. The green mark indicates normal operating range; yellow is caution and red is danger mark. Then this is your attitude indicator or the artificial horizon.

Same digital instrument is here and the stand by analogue is here. And this is your altimeters gives you the attitude at which you are flying. The digital altimeter is here and the analogue altimeter is here. This is your control stick then, these are your engine controls. The engine fuel controls, this is your throttle, this is your propeller control, this is full fine pitch, full fine setting and when I move the control from press it and move it back, this gives you the course setting for the propeller.

So, this is your propeller control, this is your mixture control; mixture means mixture of fuel and air going inside the engine cylinders. So, with this, this extreme out position is the maximum lean position, we also call it the idle cut off position and I press it and put it in. This is your full rich position means maximum fuel minimum air and if then I have to cut off the engine, I just press it and bring it back. This is your idle cut off position. So, 3 engine controls throttle, propeller control mixture control these are the different switches.

Switches for different circuits, you can see this is. In fact, these are the switches for the lights, this is the beacon light, this is the navigation light. Navigation lights, we have 2 lights, one in the left wing, one in the right wing. Left wing tip, right wing tip, this is your strobe light.

This is your landing light, landing lights are there on the wings, cleaning edge. So, these are the switches for the lights. Then these are the switches for the fuel pump. This is the fuel pump switch, this is your pitot heater, pitot heat switch and this is your cabin, cabin power light 12 lights 12 volts. Then these are your circuit breakers, this is the circuit breaker panel here. This is your ignition switch, this is your ignition key, you have the left position, off position this is in the off position at the movement, then this is your right position, left position, both and start. When you have to start the engine, you put the key in the start mode, you put the key in the engage it in the start position, as soon as the engine starts you, le you put the key in the both position.

Then apart from the switches, the circuit breakers, we have some optional instruments also. This air craft has got some an optional instrument called the ADF, which is Automatic Direction Finder, then this is your magnetic compass.

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We also call it the DR compass, Direct Reading compass. Then this is your flap control, with this you can control the flap, you can switch on the flap. This is the these are the ventilation controls, this is your defrost, this is cable heat and alternate air. So, you have the ventilation controls also. This is your fuel tank selection here.

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The fuel tank selection, we have seen it earlier also it has got 4 positions: left, both, right and off.

So, fuel tank can be selected simultaneously from both the tanks when you put it on the both position. When you put it in the left position, you will get fuel from the left position left tank. If you put it in the right position, you will get fuel from the right tank. Then this is your parking break. This is your parking break liver. You have to press the paddles like this and put the pull the liver. So, this means your parking break is on. Then you have the 2 trimmers. This is your rudder trimmer. This is the rudder trimmer wheel and this is your alleviator trimmer. This is the control for the alleviator trimmer. So, this was the brief idea about the cockpit, about the instrument panel and of the Cessna 206 aircraft.