TEXTRON Lycoming

TROUBLE–SHOOTING HIGH OIL TEMPERATURE

FOR TEXTRON LYCOMING OPERATORS THAT ARE EXPERIENCING HIGH OIL TEMPERATURE, THE TEXTRON LYCOMING ENGINE OIL SYSTEM CONSISTS OF A SUMP, SUCTION SCREEN, OIL PUMP, OIL COOLER BYPASS VALVE, OIL COOLER, PRESSURE SCREEN OR FILTER, PRESSURE RELIEF VALVE AND MAIN OIL GALLERIES (SEE FIGURE 1).

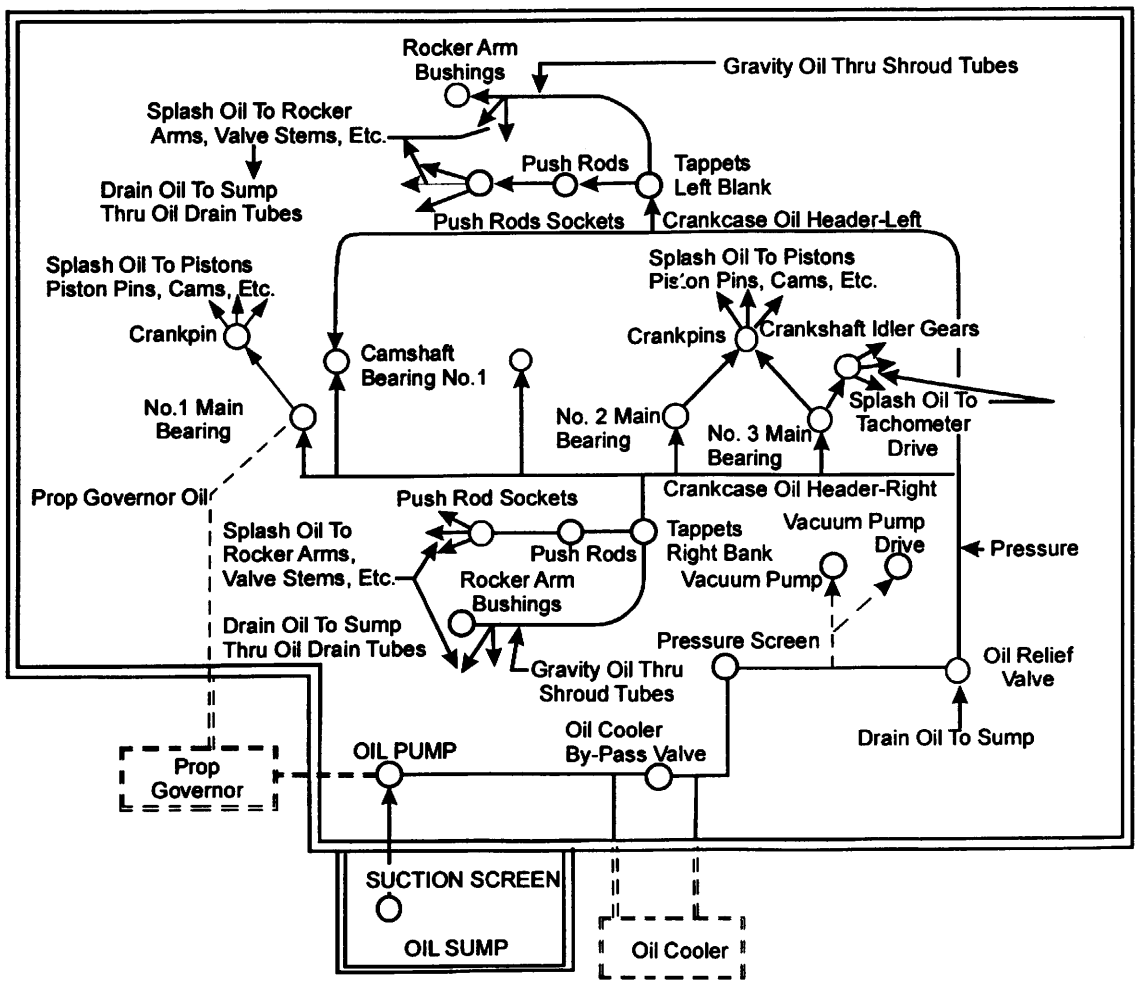

FIGURE 1.

THE OIL TEMPERATURE SHOULD BE BETWEEN 180° AND 220° F. FOR CONTINUOUS OPERATION WITH A MAX. OF 245°. YOU MUST REACH 180° OIL TEMPERATURE AND MAINTAIN FOR 45 MINUTES TO 1 HOUR TO VAPORIZE THE MOISTURE FROM THE LAST SHUTDOWN. ENGINE OIL PRESSURE WILL STAY STEADY WITH OIL TEMPERATURE OF 180° TO 220°, ABOVE THIS YOU WILL SEE A LOSS OF OIL PRESSURE AS THE OIL TEMPERATURE RISES. THIS IS A GOOD WAY OF CHECKING THE TEMPERATURE GAGE.

THE TEXTRON LYCOMING ENGINE USES ONE OF TWO VALVES TO CONTROL THE OIL TO THE COOLER. TYPE ONE IS AN OIL COOLER BYPASS VALVE (SPRING AND PLUNGER, SEE FIGURE 2). THIS VALVE IS NORMALLY CLOSED SENDING ALL THE OIL TO THE COOLER. WHEN THERE IS TOO MUCH PRESSURE DROP ACROSS THE COOLER THE VALVE WILL OPEN BYPASSING THE COOLER.

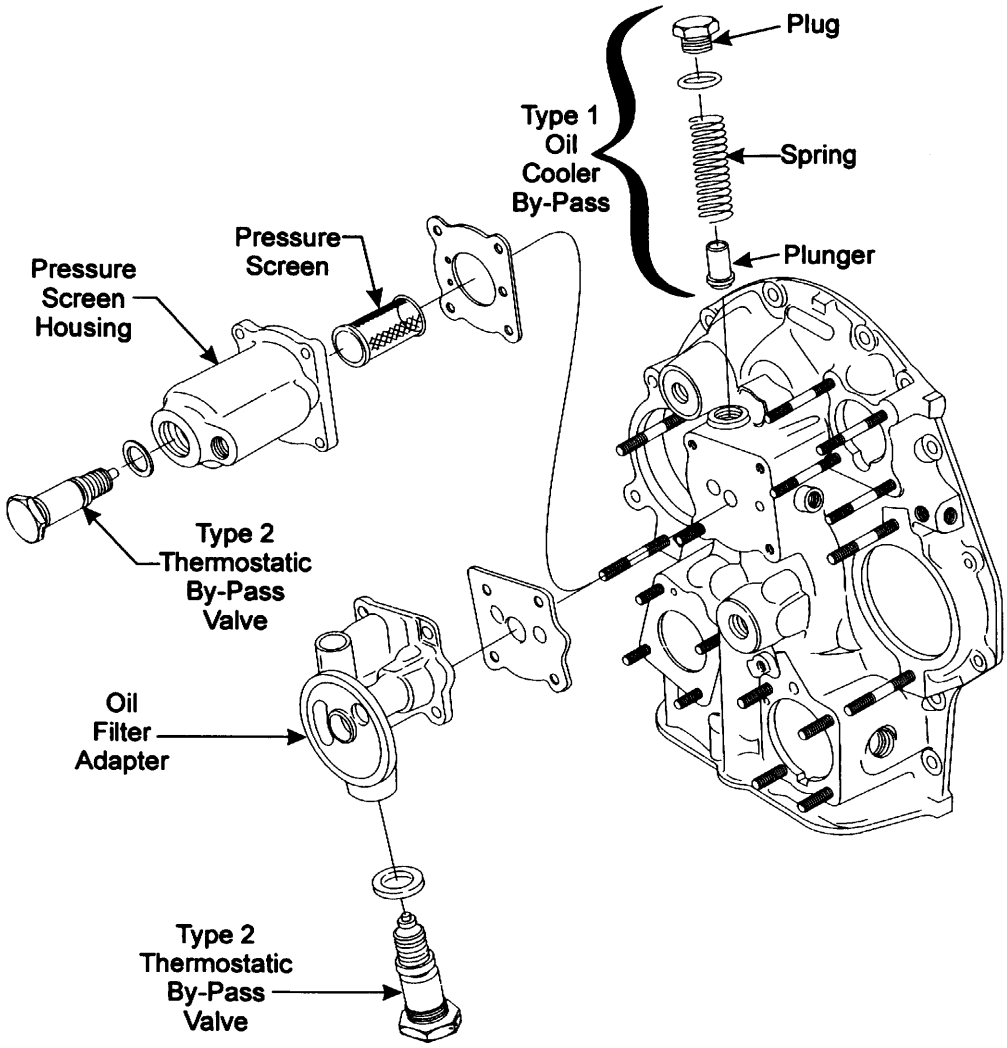

FIGURE 2.

TYPE TWO AND TYPE THREE CONFIGURATIONS UTILIZE THERMOSTATIC BYPASS VALVES (VERNATHERM). THE VALVES ARE NORMALLY OPEN. AS THE ENGINE HEATS UP TO 180° THIS VALVE STARTS TO GROW IN LENGTH CLOSING THE PORT AND FORCING THE OIL TO GO TO THE OIL COOLER (SEE FIGURE 2 AND FIGURE 3). IF THE PRESSURE DROP ACROSS THE COOLER IS TOO GREAT THE VERNATHERM WILL OPEN (60 TO 90 PSI DROP THROUGH THE OIL COOLER CIRCUIT) BYPASSING THE COOLER.

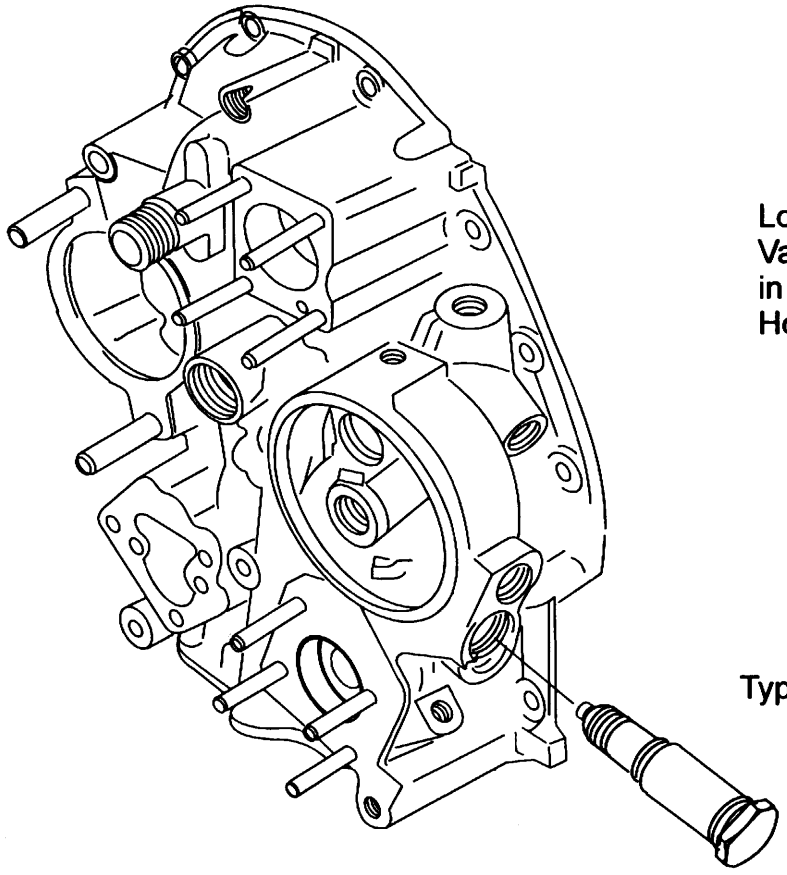

FIGURE 3. DUAL MAGNETO ACCESSORY HOUSING WITH INTEGRAL VALVE PORT AND SEAT

TESTING THE OIL COOLER SYSTEM

1. CHECK THE ACCURACY OF THE OIL TEMPERATURE GAGE.
2. RUN THE ENGINE UNTIL 180° TQ 200°.
3. SHUTDOWN AND TOUCH (CAUTION HOT) OIL COOLER LINES (BOTH ENDS) AND OIL COOLER (ALL SIDES). TEMPERATURE SHOULD BE THE SAME AS THE OIL SUMP.
4. A COLD FEED LINE (NO OIL TO COOLER) MEANS THAT THE VALVE IS NOT WORKING OR THE SYSTEM IS BLOCKED.
5. COLD SPOT ON THE COOLER MEANS THAT YOU HAVE AN AIR BUBBLE IN THE COOLER.
6. IF THE SYSTEM IS WORKING PROPERLY, THE COOLER WILL BE JUST AS HOT AS THE OIL SUMP ON ALL SIDES.

INSPECT THE THERMOSTATIC BYPASS VALVE AND SEAT FOR CONDITION

1. YOU SHOULD SEE A 360° CONTACT MARK CENTERED ON THE FACE OF THE VALVE.
2. IF THE FACE IS DAMAGED, THE VALVE NEEDS TO BE REPLACED (P/N 53E22144).
3. IF THE SEAT IS DAMAGED IT WILL NEED TO BE REPAIRED. SEE SERVICE INSTRUCTION NO. 1316A. TOOLS LISTED IN SERVICE INSTRUCTION NO. 1316A CAN BE RENTED FROM A TEXTRON LYCOMING DISTRIBUTOR.
4. TO TEST THE VALVE FOR OPERATION, IMMERSE THE VALVE IN LIGHT OIL AND HEAT, AT ABOUT 150°. THE VALVE WILL START TO GROW. AT 185° THE VALVE SHOULD BE FULLY EXTENDED (.160" MIN. TRAVEL).

THE OIL COOLER

THE OIL COOLER AND LINES ARE AIRFRAME PARTS. IF THE BYPASS VALVE IS OK THEN YOU NEED TO CHECK THE OIL COOLER ITSELF. OIL COOLER LINES MUST BE CLEAR (NO RESTRICTIONS, LOOK THROUGH THE HOSES). THE OIL COOLER NEEDS TO BE FULL OF OIL. MANY AIRFRAME'S HAVE THE COOLER MOUNTED WITH INLET AND OUTLET ON THE BOTTOM. THIS LET'S AN AIR BUBBLE GET TRAPPED AT THE TOP OF THE COOLER. YOU MAY FIND THIS AFTER RUNUP BY CHECKING FOR COOL SPOTS ON THE COOLER. IF YOU FIND A COOL SPOT, YOU WILL NEED TO BLEED THE AIR OUT OF THE COOLER.

FIGURE 4 SHOWS THE LOCATION OF THE OIL COOLER LINES (OIL OUT TO COOLER - OIL RETURN TO ENGINE). THE OIL OUT TO COOLER SHOULD BE CONNECTED TO THE BOTTOM OF THE COOLER AND THE RETURN TO THE TOP; THIS WILL SELF PURGE THE COOLER. IF THE COOLER INLET AND OUTLET ARE BOTH AT THE BOTTOM, THE COOLER WILL NEED TO BE DISMOUNTED AND TURNED TO PURGE THE AIR.

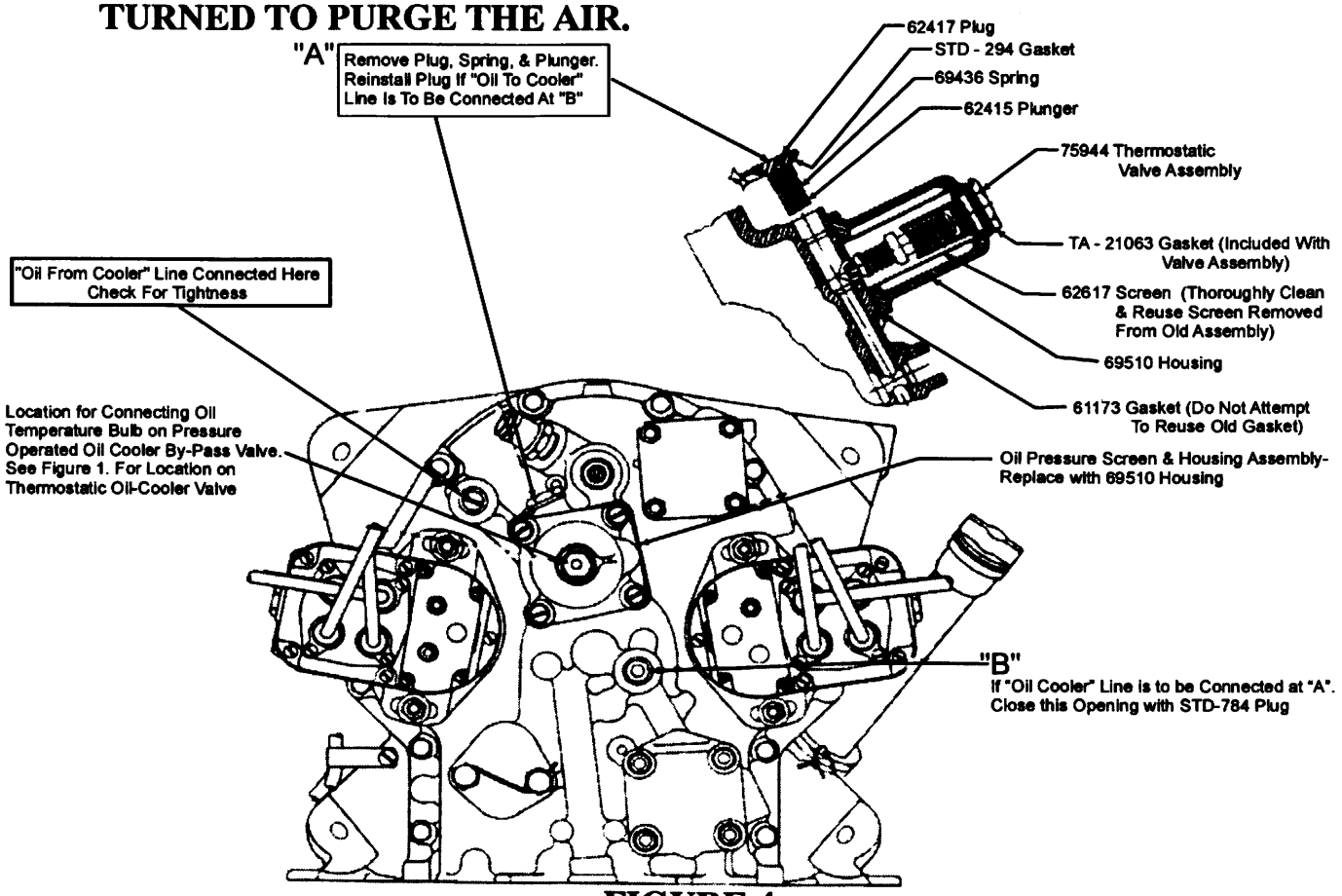

FIGURE 4.

THE OIL COOLER ITSELF MAY BE THE SOURCE OF THE PROBLEM. IF THE COOLER AND BOTH LINES ARE GETTING HOT THEN YOU MAY HAVE A PROBLEM WITH THE COOLER. A HIGH TIME COOLER MAY BE RESTRICTED OR THE INSIDE MAY BE COATED WITH GUNK. THIS WILL REDUCE THE EFFICIENCY OF THE COOLER. COOLERS SHOULD BE CLEANED AND FLUSHED BY AN APPROVED OIL COOLER REPAIR SHOP; FLUSHING WITH SOLVENT WILL NOT DO THE JOB!

AIR FLOW

IF THE OIL IS GOING THROUGH THE COOLER AND THE ENGINE IS STILL HOT, YOU HAVE AN AIR FLOW PROBLEM. CHECK ALL BAFFLING FOR PROPER SEALS AND THE AIR FINS OF THE COOLER FOR CLEAR AIR FLOW. IN ADDITION, IT IS POSSIBLE FOR EVERYTHING TO LOOK GOOD BUT CONDITIONS MAY EXIST THAT CAN CREATE A HIGH PRESSURE AREA BEHIND THE COOLER. THIS WILL NOT LET THE AIR FLOW THROUGH THE COOLER. NO AIR – NO COOLING.