

# MODEL R182 AND TR182 SERVICE MANUAL

## SECTION 14 UTILITY SYSTEMS

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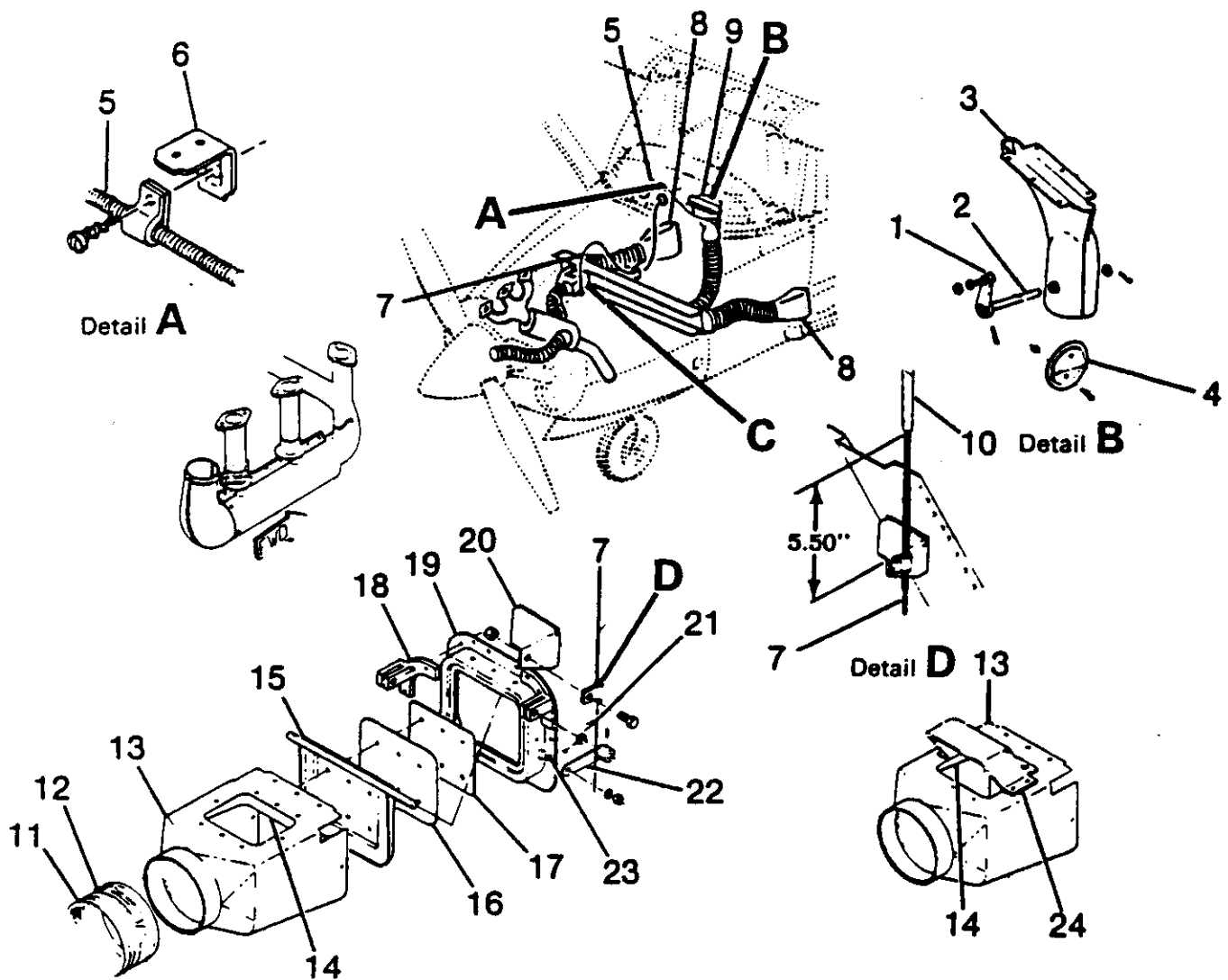
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- 14-1. UTILITY SYSTEMS.
- 14-2. HEATING SYSTEM.
- 14-3. DESCRIPTION. The heating system is comprised of the heat exchange section of the exhaust muffler, a shut-off valve mounted on the right forward side of the firewall, a push-pull control on the instrument panel, outlets and flexible ducting connecting the system.
- 14-4. OPERATION. Ram air is ducted through engine baffle inlets and heat exchange section of the exhaust muffler, to the shut-off valve at the firewall. The heated air flows from the shut-off valve into a duct across the aft side of the firewall, where it is distributed into the cabin. The shut-off valve, operated by a push-pull control labeled "CABIN HEAT", located on the instrument panel, regulates the volume of heated air entering the system. Pulling the control full out supplies maximum flow and pushing control in gradually decreases flow, shutting off flow completely when the control is pushed full in.
- 14-5. TROUBLE SHOOTING. Most of the operational troubles in the heating and defrosting systems are caused by sticking or binding valves and their controls, damaged air ducting or defects in the exhaust muffler. In most cases, valves or controls can be freed by proper lubrication. Damaged or broken parts must be repaired or replaced. When checking controls, ensure valves respond freely to control movement, that they move in the correct direction, that they move through their full range of travel and seal properly. Check that hoses are properly secured and replace hoses that are burned, frayed or crushed. If fumes are detected in the cabin, a thorough inspection of the exhaust system should be accomplished. Refer to applicable paragraph in Section 11 or 11A for this inspection. Since any holes or cracks may permit exhaust fumes to enter the cabin, replacement of defective parts is imperative because fumes constitute an extreme danger. Seal any gaps in heater ducts across the firewall with Pro-Seal #700 (Coast Pro-Seal Co., Los Angeles, California) compound or equivalent compound.
- 14-6. REMOVAL, INSTALLATION AND REPAIR. Figure 14-1 may be used as a guide during removal, installation and repair of heating system components. Burned, frayed or crushed hoses must be replaced with new hoses, cut to length and installed in the original routing. Trim hose winding shorter than the hose to allow clamps to be fitted. Defective air valves must be repaired or replaced. Check for proper operation of valves and their controls after repair or replacement.
- 14-7. DEFROSTER SYSTEM.
- 14-8. DESCRIPTION. The defrosting system is comprised of a duct across the aft side of the firewall, a defroster outlet and shut-off valve assembly mounted on the left side of the cowl deck immediately aft of the windshield, a shutoff valve control on the instrument panel and flexible ducting connecting the system.
- 14-9. OPERATION. Air from the duct across the aft side of the firewall flows through a flexible duct to the defroster outlet. The temperature and volume of this air is controlled by the settings of the heater system control.
- 14-10. TROUBLE SHOOTING. Since the defrosting system depends on proper operation of the heating system, refer to paragraph 14-5 for trouble shooting the defrosting system.

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- 14-11. **REMOVAL, INSTALLATION AND REPAIR.** Figure 14-1 may be used as a guide during removal, installation and repair of defrosting system components. Cut hose to length and install in the original routing. Trim hose winding shorter than the hose to allow clamps to be fitted. A defective defroster outlet must be repaired or replaced.
- 14-12. **VENTILATING SYSTEM.**
- 14-13. **DESCRIPTION.** The ventilating system is comprised of two airscoops mounted in the inboard leading edge of each wing, a manually-adjustable ventilator installed on each side of the cabin near the upper corners of the windshield, two plenum chambers mounted in the rear cabin wing root areas, a fresh airscoop door on the right side of the fuselage just forward of the copilot's seat, a control knob on the instrument panel and flexible ducting connecting the system.
- 14-14. **OPERATION.** Air received from scoops mounted in the inboard leading edges of the wing is ducted to adjustable ventilators mounted on each side of the cabin near the upper corners of the windshield. Rear seat ventilation is provided by plenum chambers mounted in the left and right rear cabin wing root areas. These plenum chambers receive ram air from the airscoops in the inboard leading edges of the wings. Each plenum chamber is equipped with a valve which meters the incoming cabin ventilation air. This provides a chamber of expansion of cabin air which greatly reduces inlet air noise. Filters at the air inlets are primarily noise reduction filters. Forward cabin ventilation is provided by a fresh airscoop door mounted on the right side of the fuselage, just forward of the copilot seat. The scoop door is operated by a control in the instrument panel marked "CABIN AIR." Fresh air from the scoop door is routed to the duct across the aft side of the firewall, where it is distributed into the cabin. As long as the "CABIN HEAT" control is pushed in, no heated air can enter the firewall duct; therefore, when the "CABIN AIR" control is pulled out, only fresh air from the scoop will flow through the duct into the cabin. As the "CABIN HEAT" control is gradually pulled out, more and more heated air will blend with the fresh air from the scoop and be distributed into the cabin. Either one, or both of the controls may be set at any position from full open to full closed.
- 14-15. **TROUBLE SHOOTING.** Most of the operational troubles in the ventilating system are caused by sticking or binding of the inlet scoop door or its control. Check the airscoop filter elements in the wing leading edges for obstructions. The elements may be removed and cleaned or replaced. Since air passing through the filters is emitted into the cabin, do not use a cleaning solution which would contaminate the air. The filters may be removed to increase air flow. However, their removal will cause a slight increase in noise level.
- 14-16. **REMOVAL, INSTALLATION AND REPAIR.** Figure 14-2 may be used as a guide during removal, installation and repair of the ventilating system components. A defective ventilator or scoop must be repaired or replaced. Check for proper operation of ventilating controls after installation or repair.
- 14-17. **OXYGEN SYSTEM.** (See figure 14-3.)
- 14-18. **DESCRIPTION.** The oxygen system consists of an oxygen cylinder, pressure gage, regulator assembly, control assembly, filler valve, pressure lines, outlets and oxygen masks with line assemblies. The pilot's mask is designed to provide a greater flow of oxygen than the passengers' oxygen masks. The masks are color-coded with a sleeve adjacent to the quick-connect adapter to indicate altitude ratings. Pilot's color code is red, and the passengers' color code is orange. The volume of oxygen is controlled by an orifice in the connector. A built-in flowmeter provides a visual indication of correct oxygen flow. The pilot's mask is equipped with a microphone that is keyed by a switch button on the pilot's

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THRU 1981 MODELS

BEGINNING WITH 1982 MODELS

Detail C

- |                      |                  |                            |
|----------------------|------------------|----------------------------|
| 1. Arm               | 9. Defroster     | 17. Retainer               |
| 2. Shaft             | 10. Nylon Sleeve | 18. Bearing                |
| 3. Nozzle            | 11. Hose         | 19. Valve Seat             |
| 4. Valve Assembly    | 12. Clamp        | 20. Control Attach Bracket |
| 5. Defroster Control | 13. Valve Body   | 21. Spring                 |
| 6. Angle Bracket     | 14. Seat         | 22. Arm                    |
| 7. Heater Control    | 15. Valve Door   | 23. Clamp                  |
| 8. Duct              | 16. Seal         | 24. Deflector              |

Figure 14-1. Heating and Defrosting Systems