trim hydraulic motor assembly of the horizontal stabilizer. Accomplishment of the modification will minimize the possibility of fatigue failure of the motor case screws and shuttle valve screws. (The service bulletin references Sperry Rand Corporation, Vickers Division, Service Bulletin 390017-27-2, dated December 2, 1974, as an additional source of service information.) Failure of the motor case screws and/or failure of the shuttle valve screws, if not corrected, could result in loss of hydraulic system fluid. Failure of two shuttle valve screws could cause the shuttle valve to separate from the trim motor.-

3. McDonnell Douglas DC-10 Service Bulletin 27-152, dated August 9, 1976, was issued in response to a report of inoperative horizontal stabilizer trim due to disengagement of the torsional coupling of the drive system on Model DC-10 series airplanes that had accumulated approximately 4,100 flight hours. In addition, during fleet inspections, loose retaining nuts and locking clips were found on these airplanes; the torsional nut did not engage adequately to provide locking action. The inoperative horizontal stabilizer trim was attributed to failure of the locking clip to prevent the retaining nut of the torsional coupling from rotating and becoming loose. This condition could result in the retaining nut becoming loose and allowing disengagement of the torsional coupling. This condition, if not corrected, could result in the loss of horizontal stabilizer trim capability.

The service bulletin describes procedures for replacing the existing locking clip on the torsional coupling of the horizontal stabilizer with a new nut retainer of an improved design. Accomplishment of this modification will minimize the possibility of the torsional nut becoming loose.–

4. McDonnell Douglas DC-10 Service Bulletin 27–181, Revision 1, dated May 28, 1981, was issued in response to reports of failure of the differential drive shear pin in the horizontal stabilizer drive system. These failures occurred during takeoff climb on Model DC-10 series airplanes that had accumulated between 4 and 4,201 flight hours. Investigation revealed that these failures were caused by bending fatigue of the shear pin due to a loose fit. Failure of the shear pin could result in an inoperative horizontal stabilizer drive system. This condition, if not corrected, could result in reduced controllability of the airplane.-

The service bulletin describes procedures for installation of a modified chain drive unit on the horizontal stabilizer. The new unit incorporates a larger shear pin with a single shear point having a larger diameter with less constraint. Accomplishment of this modification will increase the reliability of the drive assembly.–

5. McDonnell Douglas DC-10 Service Bulletin 27-201, dated December 30, 1985, was issued in response to a report of in-flight loss of hydraulic systems 1 and 2 shortly after takeoff of a Model DC-10 series airplane. Investigation revealed that the loss of hydraulic systems was caused by blowout of the number 6 tire after gear retraction. The blowout deflected the keel web structure, which ruptured hydraulic pipes to the flap lock valves and caused rapid loss of fluid. This condition, if not corrected, could result in loss of operation of the hydraulic system.-

The service bulletin describes procedures for replacement of the hydraulic pipe assemblies of the flap lock valve with new pipe assemblies having increased flexibility and strength. Installation of these pipe assemblies will minimize the possibility of rupture of the pipe assemblies during events such as those described previously.–

6. McDonnell Douglas DC–10 Service Bulletin 27–208, dated September 5, 1989, was issued in response to reports of cracking of the end caps of the trim control valve of the horizontal stabilizer on Model DC–10 series airplanes that had accumulated between 9,800 and 16,000 flight hours. Investigation revealed that fatigue cracking initiated from inside the radius of the end cap. Such fatigue cracking, if not corrected, could result in loss of hydraulic fluid and eventual shutdown of the hydraulic system.–

The service bulletin describes procedures for replacement of eight end caps of the trim control valve of the horizontal stabilizer with new end caps having a larger inside radius. Replacement of the end caps will minimize the possibility of cracking of the end caps.–

7. McDonnell Douglas DC–10 Service Bulletin 27–209, dated October 20, 1989, was issued in response to reports of failure of the chain drive fuse of the horizontal stabilizer on Model DC–10 series airplanes that had accumulated between 4,000 and 18,000 flight hours. Investigation revealed that a fuse pin within the chain drive unit had sheared due to loose nuts on the shaft assembly. These conditions, if not corrected, could result in the horizontal stabilizer drive system becoming inoperative.–

The service bulletin describes procedures for inspecting the nuts on the shaft assembly for looseness, proper orientation, excess backlash, and engagement of the washer locking tab; and replacing the fuse pin, adjusting backlash, and properly positioning and tightening the nuts, if necessary. Replacing the fuse pin and tightening the nuts will minimize the possibility of failure of the chain drive fuse of the horizontal stabilizer.–

Two of the 12 service bulletins describe procedures for modifications of certain hydraulic power systems:-

8. McDonnell Douglas DC-10 Service Bulletin 29-109, Revision 1, dated September 22, 1978, was issued in response to reports of rapid rise in temperature in hydraulic system 3 subsequent to the loss of hydraulic fluid in hydraulic system 1 or 2. Investigation revealed that a shutoff valve on the reversible motor pump may fail on one side of the reversible motor pump and that failure may go undetected. This failure poses a problem if a failure occurs in the opposite hydraulic system that causes total loss of that system's fluid. If a valve fails in the open position on one side and fluid is lost from the opposite hydraulic system, the reversible motor pump will rotate at maximum rpm (limited by the flow control). This condition, if not corrected, could result in a rise in temperature in the opposite hydraulic system, which may necessitate limited use of the engine-drive pumps on that hydraulic system.-

The service bulletin describes procedures for installation of an indication system that will allow the flight crew to immediately detect an inoperative shutoff valve on the reversible motor pump. The installation of the indication system involves installing two pressure switches on the reversible motor pumps; installing a ground stud, two relays, and receptacles on the center compartment electrical rack; replacing the 6-post terminal strip in the wheel well of the right main landing gear with an 8-post terminal strip; installing an annunciator legend on the flight engineer's annunciator panel; installing a circuit breaker and replacing the nameplate on the flight engineer's circuit breaker panel; revising the failure indication wiring on the constant speed drive; and installing indication wiring and associated clamps and brackets on the reversible motor pump.-

9. McDonnell Douglas DC-10 Service Bulletin 29–125, Revision 2, dated October 23, 1987, was issued in response to reports of complete loss of fluid from the number 3 hydraulic system. The fluid loss was caused by a ruptured hi-pressure switch on the hydraulic case drain. This condition, if