

INSTALLATION INSTRUCTIONS: PURGING THE SYSTEM

SYSTEM FLUID SHOULD BE MIL-H-5606A AVIATION HYDRAULIC OIL, OR EQUIVALENT. THIS FLUID IS AVAILABLE FROM HYNAUTIC UNDER PART # MCO-02, FROM TEXACO AS TEXACO 15.

LOOSEN THE TWO VALVE SCREWS ON THE RELIEF VALVE (SEE THE RELIEF VALVE LAYOUT DIAGRAM) WITH A 1/2" WRENCH UNTIL ALL THE PRESSURE IS REMOVED FROM THE INTERNAL SPRING. NOTE: THESE SCREWS CANNOT BE REMOVED FROM THE RELIEF VALVE EXCEPT BY TOTAL DISASSEMBLY OF THE RELIEF VALVE.

REMOVE THE FILLER PLUG FROM THE TOP OF THE RESERVOIR AND FILL WITH OIL TO WITHIN 2" OF THE TOP. REPLACE THE FILLER PLUG AND SLOWLY PRESSURIZE WITH AIR TO 20-30 PSI. THE RESERVOIR IS EQUIPPED WITH AN AIR VALVE LIKE THOSE USED IN AUTOMOBILE TIRES, SO A BICYCLE PUMP OR OTHER SOURCE OF COMPRESSED AIR IS USED. OIL WILL START FLOWING INTO THE LINES AND THE OIL LEVEL WILL START TO DROP. SHOULD THE OIL LEVEL DROP TO APPROXIMATELY 2" FROM THE BOTTOM OF THE RESERVOIR AT ANY TIME, STOP AND OPEN THE SYSTEM, THEN REFILL WITH OIL TO WITHIN 2" OF THE TOP AND REPRESSURIZE. IF AFTER A FEW MINUTES THE PRESSURE AND OIL LEVELS ARE NOT HOLDING FAIRLY CONSTANT, CHECK ALL YOUR FITTINGS AND CONNECTIONS FOR LEAKS. NOTE: THE RESERVOIR PRESSURE MAY BE INCREASED TO 50 PSI IF LONG TUBING RUNS ARE ENCOUNTERED (HOUSEBOATS, TUNA TOWERS, ETC.). HOWEVER, A FINAL PURGE APPROXIMATELY 8 HOURS AFTER MUST BE PERFORMED. TO COMPLETE THE PURGING PROCESS, PERFORM THE FOLLOWING STEPS:

- 1) WHEN POSSIBLE, DISCONNECT THE CYLINDER FROM THE RUDDER SYSTEM. MAKE CERTAIN IT IS FREE TO STROKE FULL STROKE WITHOUT INTERFERENCE.
- 2) WHILE AT THE CYLINDER, BLEED BOTH ENDS BY CRACKING THE BLEEDER SCREWS (OR FITTINGS) AT EACH END OF THE CYLINDER. AIR WILL ESCAPE; RETIGHTEN THE BLEEDER SCREW (OR FITTING) WHEN SOLID OIL APPEARS. WHEN BLEEDING A SINGLE ROD END CYLINDER, BEGIN BLEEDING THE CYLINDER AT THE ROD END FIRST.
- 3) GO TO THE HIGHEST HELM AND TURN SLOWLY (2 TO 3 SEC./REV) 25-35 TURNS IN ONE DIRECTION.
- 4) REPEAT 25-35 SLOW TURNS IN THE SAME DIRECTION AT THE NEXT LOWEST HELM.
- 5) REPEAT 25-35 SLOW TURNS IN THE SAME DIRECTION AT THE NEXT LOWEST HELM FOR THE REMAINDER OF THE HELMS.
- 6) ONCE MORE CRACK THE FITTINGS AT THE CYLINDER AS IN STEP 2, CLOSING WHEN SOLID OIL APPEARS.

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- 5) REPEAT 25-35 SLOW TURNS IN THE SAME DIRECTION AT THE NEXT LOWEST HELM FOR THE REMAINDER OF THE HELMS.
- 6) ONCE MORE CRACK THE FITTINGS AT THE CYLINDER AS IN STEP 2, CLOSING WHEN SOLID OIL APPEARS.
- 7) CHECK RESERVOIR PRESSURE AND OIL LEVEL AND RE-ESTABLISH THE OIL LEVEL IF REQUIRED, AND THE PRESSURE TO 20-30 PSI.
- 8) GO TO TOP STATION AND TURN SLOWLY 25-35 TURNS IN THE OPPOSITE DIRECTION. REPEAT AT SUCCESSIVELY LOWER STATIONS.
- 9) ONCE MORE, CRACK THE FITTINGS AT THE CYLINDER AS IN STEP 2, CLOSING WHEN SOLID OIL APPEARS.
- 10) IF BOAT IS EQUIPPED WITH AN AUTO-PILOT, REFER TO THE SECTION ON "PURGING THE AUTO-PILOT" IN THE MANUAL.
- 11) PURGING SHOULD BE COMPLETE AT THIS POINT.

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 * CRACKING THE FITTINGS AT THE CYLINDER IS NOT *
 * ABSOLUTELY NECESSARY, BUT IT WILL GREATLY REDUCE *
 * YOUR PURGING TIME. *
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AS A PROGRESS CHECK, CLOSE THE VALVE SCREWS ON THE RELIEF VALVE AND SEE HOW MANY TURNS ARE REQUIRED AT THE HELM FROM HARDOVER TO HARDOVER. REFER TO THE "HELM AND CYLINDER PERFORMANCE CHART" FOR THE NUMBER OF TURNS YOU SHOULD HAVE WITH YOUR COMBINATION OF HELM AND CYLINDER(S).

YOU SHOULD BE WITHIN 1/2 TURN OR LESS OF THE DESIGNED NUMBER OF TURNS. IF YOU EXCEED THE LIMITS BY MORE THAN 1/2 TURN, THE SYSTEM IS NOT COMPLETELY PURGED AND YOU MUST REPEAT THE PURGING PROCESS. AGAIN, CHECK THE OIL LEVEL AND GAUGE PRESSURE OF THE RESERVOIR IF IT HAS DROPPED; RE-CHECK FOR LEAKS AT ALL JOINTS AND FITTINGS.

IF A LINE MUST BE DISCONNECTED FOR ANY REASON, LET THE AIR OUT OF THE RESERVOIR AND REMOVE THE FILLER CAP AND THEN LOOSEN THE SCREWS ON THE RELIEF VALVE TO RELIEVE ALL PRESSURE IN THE CYLINDER LINES. DO NOT FORGET TO RE-TIGHTEN AFTER MAKING YOUR ADJUSTMENT.

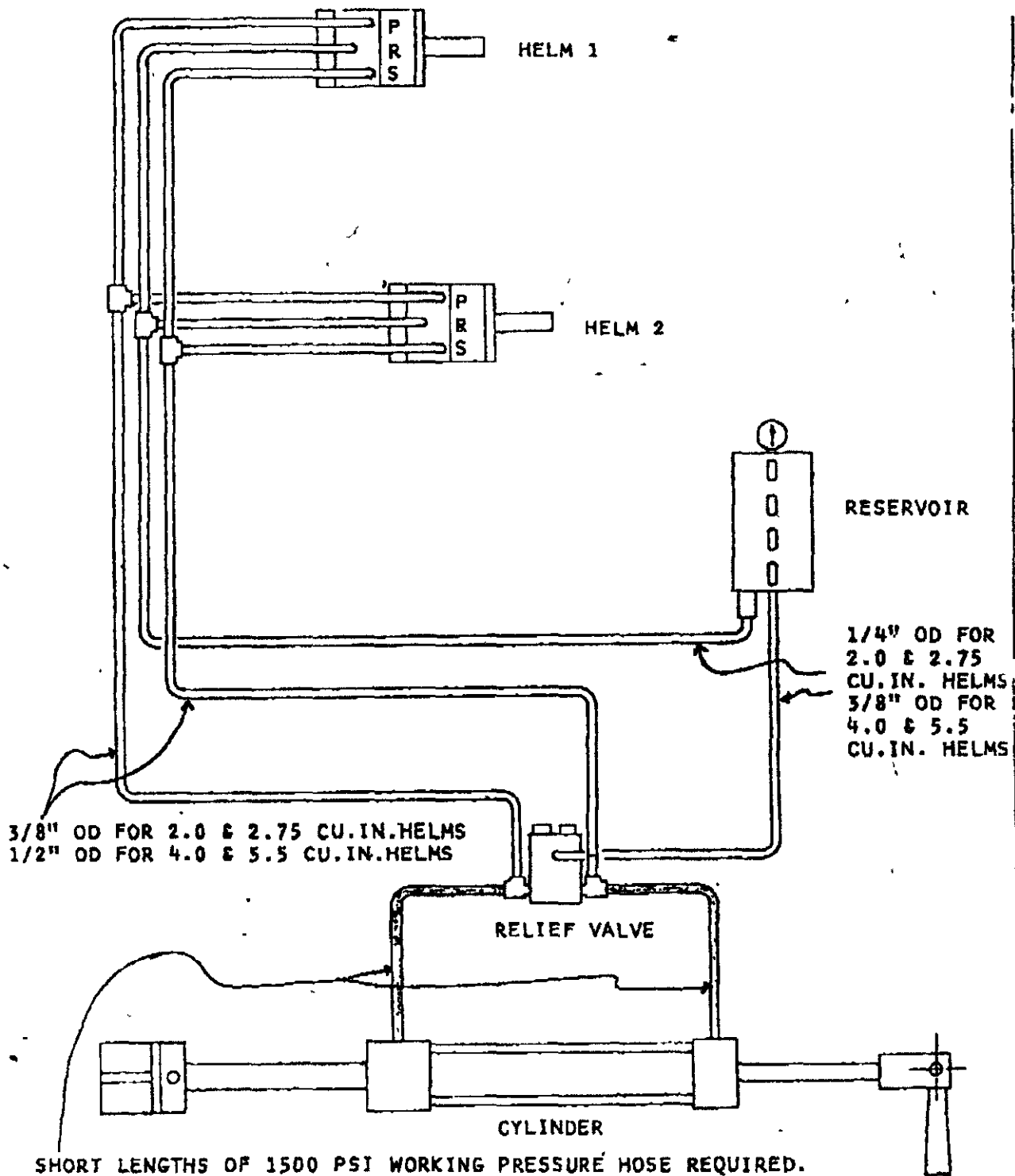
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(CONTINUED)**

IF IT IS NOW DETERMINED THAT THE PROPER NUMBER OF TURNS LOCK TO LOCK HAVE BEEN OBTAINED, WE SHOULD RE-CHECK THE OIL LEVEL (2/3 TO 1/2 FULL) AND LEAVE 20-30 PSI OF PRESSURE ON THE SYSTEM.

IF IT IS POSSIBLE, IT IS RECOMMENDED TO GIVE THE SYSTEM A SHORT FINAL PURGE AFTER A PERIOD OF TIME (APPROXIMATELY 8 HOURS). THIS TIME PERIOD ALLOWS ANY SMALL POCKETS OF AIR THAT EXIST TO FORM LARGER BUBBLES AND BE EASILY REMOVED WITH THIS FINAL PURGE. A FEW TURNS AFTER REACHING HARDOVER ON EACH OF THE HELM UNITS WILL BE SUFFICIENT.

VERIFY THAT THE VALVE SCREWS ON THE RELIEF VALVE HAVE BEEN CLOSED. IF THEY ARE NOT CLOSED, THE CYLINDER WILL BE BYPASSED AND THIS WILL RESULT IN NO STEERING.

PIPING DIAGRAM - PIVOT & TRUNION MOUNT CYLINDERS



SHORT LENGTHS OF 1500 PSI WORKING PRESSURE HOSE REQUIRED.
3/8" NOMINAL FOR 2.0 & 2.75 HELMS; 1/2" FOR 4.0 & 5.5 CU. IN. HELMS
(AEROQUIP 2651 OR EQUIVALENT). DO NOT USE COPPER HERE. IT WILL
WORK-HARDEN & FAIL.