TURBOMASTER COMPRESSORS—SERIES M
TROUBLE SHOOTING CHART

SYMPTOMS	CAUSES
1. Compressor Surging:	A. Insufficient load. B. Cooling water temperature too high. C. Low condensing water flow. D. Dirty condenser or evaporator tubes. E. Oil in evaporator or condenser tubes. F. Low refrigerant charge. G. Foul gas in system. H. Low driver speed. I. Excessive oil in the refrigerant. J. PRV closed from malfunction. K. Discharge check valve stuck in closed position. L. Improper float or intercooler operation. M. Recheck controls system.
2. Fluctuation or loss of oil pressure during startup:	A. Oil sump heaters not energized prior to startup. Sump temperature should be 150 F. In cold ambients, sump should be 90 F above ambient prior to starting. B. When oil foaming occurs, renew oil charge, prior to re-starting. C. Insufficient water flow thru lube oil cooler. D. Refrigerant condensed in casing, by running hot water or product thru chiller, while outdoor compressor is shutdown. E. Outdoor oil lines and lube oil cooler absorbed refrigerant. Remedy: Circulate hot sump oil, thru lines with auxiliary oil pump for 15 minutes, to move refrigerant laden oil back to sump heaters, prior to startup.
3. Low Oil Pressure:	A. Dirty oil filter. B. Obstructed jet nozzle. C. Oil foaming, due to refrigerant absorbed in the oil. D. Worn pump volute, seal ring. E. Worn journal bearings. F. Worn thrust bearing. The thrust oil outlet pressure should exceed the oil supply pressure. G. Improperly installed pump housing gaskets. H. Low driver speed. I. Valves improperly set on auxiliary oil pump. J. Low oil level.
4. High oil temperature: (Max. off thrust bearing 185 F) (Max. at filter - 140 F)	A. Dirty oil cooler. B. Reduced water (or air) flow. C. Extremely high discharge temperature. D. Thrust bearing failure, if temperature range across the thrust bearing increases (nominal is 30 F). Check balance piston pressure, (see item 5), and oil supply temperature. E. Low oil flow, indicated by reduced oil pressure differential across the thrust bearing.

SYMPTOMS	CAUSES
5. High Balance Piston Pressure: Note: - Pressure should be 2 to 5 psig above the pressure at equalized stage (see assembly drawings for specific compressors) on halocarbon compressors. For other gases, refer to Engineering Department-York, Pa.	A. Balance piston seal ring worn. B. Seal ring seized to balance piston and rotating with it. C. Compression seal ring on oil sump stuck, broken or otherwise damaged. D. Worn or missing McKim gaskets under bolt heads on collection ring (See Instr.). E. Improperly assembled vent tube seals. F. Exceptionally high discharge pressure.
6. Compressor loses oil into system:	A. Oil foaming, heaters not working prior to startup, insufficient cooling water to lube oil cooler, or liquid slopover. B. Balance piston seal ring worn. C. Porous casting at suction end. D. Porous casting or leaking plugs on oil sump. E. Equalizing tubes improperly installed. F. Excessive shaft gas seal leakage, worn gas seals. Check seal end first. G. Too high oil level, above sight glass.
7. Compressor vibrates:	A. Check and eliminate surging. B. Check and correct coupling alignment and spacing.
8. Shaft seal oil leakage:	A. Check oil pressure at shaft seal. B. Check oil temperature. C. Check alignment. D. Check thrust bearing axial clearance. E. Replace shaft seal as necessary.

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