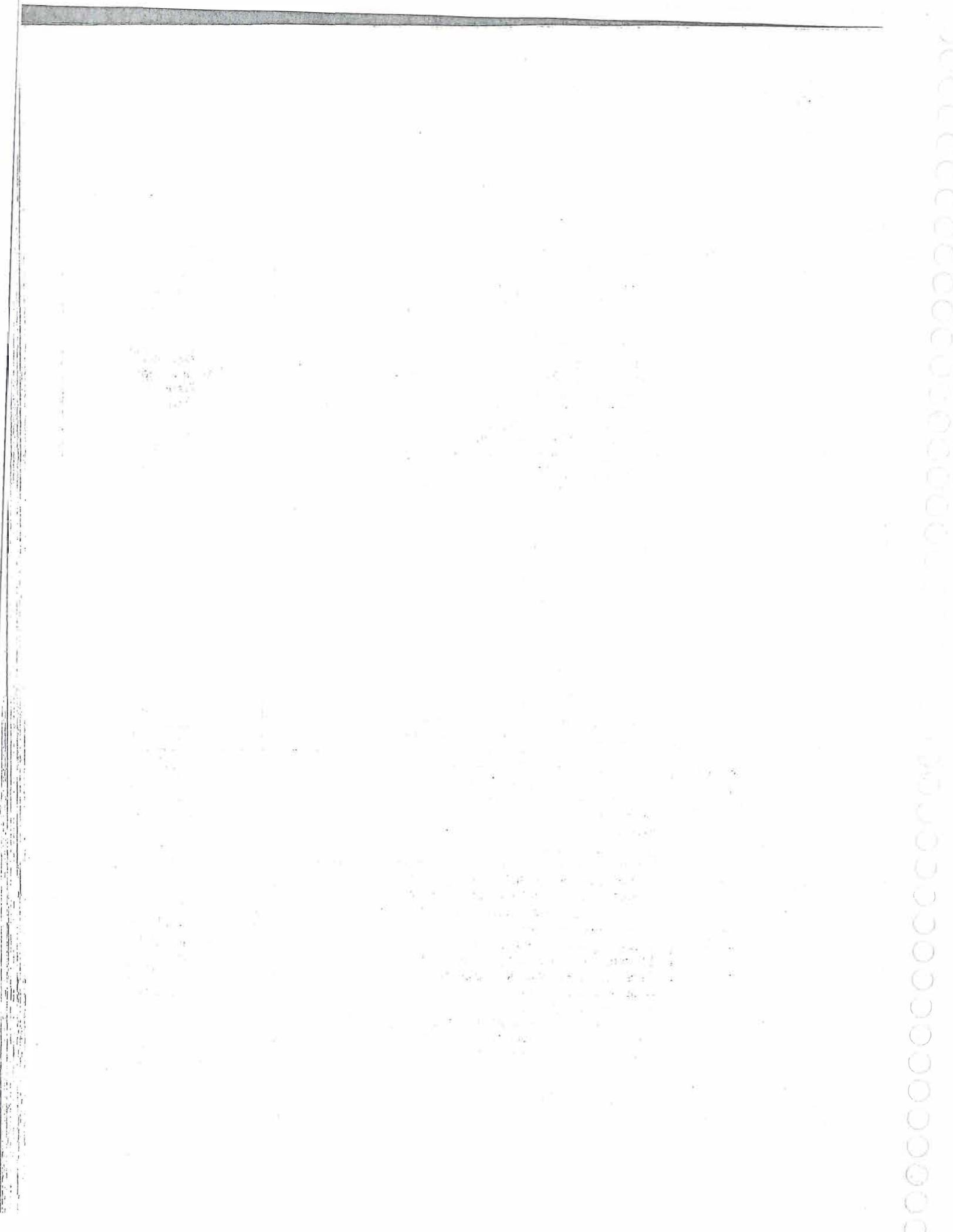
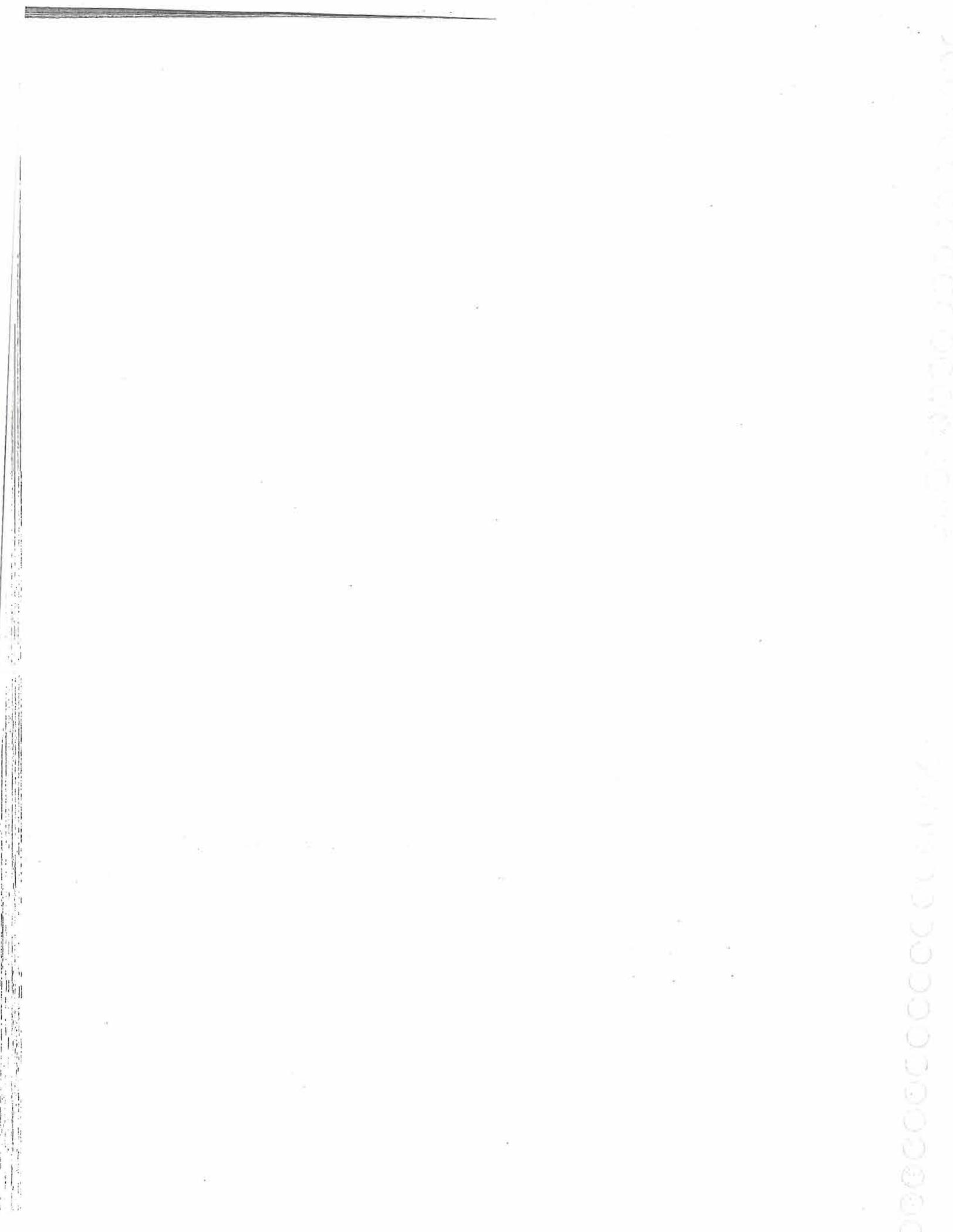


TROUBLESHOOTING GUIDE

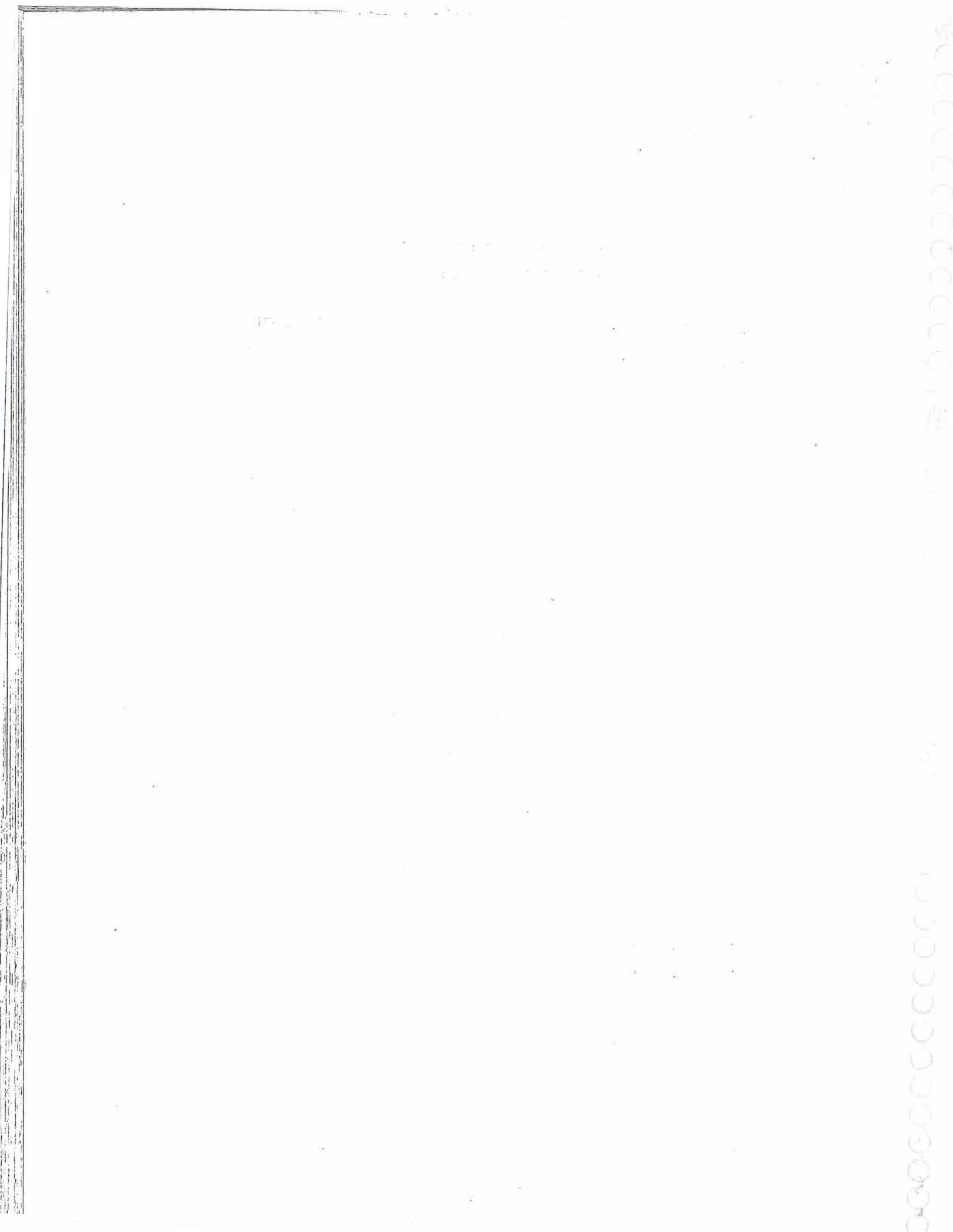
Problems	Possible causes	Remedy
The starter motor does not rotate, or the rotation speed is not sufficient to start the engine.	<p>Causes related to battery and power wiring</p> <ul style="list-style-type: none"> * Battery connections loose or dirty * Bad ground (-) to frame. * Bad battery positive (+) cable. * Discharged (low) battery * Low voltage due to defective battery <p>Causes related to control wiring</p> <ul style="list-style-type: none"> * Key switch defective * Voltage drop in key switch wiring or connectors * Starter relay defective. * Starter solenoid coil defective. <p>Causes related to starter solenoid</p> <ul style="list-style-type: none"> * Broken wire in pull-in coil in starter solenoid * Defective contact of contact plate in starter solenoid * Broken wire in holding coil in starter solenoid <p>Causes related to starter motor</p> <ul style="list-style-type: none"> * Defective brushes * Weak brush springs * Defective field coil * Defective field coil connections * Defective commutator * Defective armature 	<p>Clean and tighten Clean and repair Clean and repair Charge Replace</p> <p>Replace Repair or replace Replace Replace</p> <p>Replace Replace Replace</p> <p>Replace Replace Replace Repair Repair or replace Replace</p>
The starter motor rotates but the engine does not start	<ul style="list-style-type: none"> * Discharged (low) battery <p>Causes related to air heater system (when cold)</p> <ul style="list-style-type: none"> * Defective air heater control unit * Defective air heater relay * Defective air heater * Defective water temperature sensor * Defective wiring for air heater system 	<p>Charge</p> <p>Replace Replace Replace Replace Repair or replace</p>
The starter motor turns but the pinion does not engage properly with the ring gear.	<ul style="list-style-type: none"> * Worn over-running clutch pinion end * Fatigued over-running clutch drive spring * Slipping over-running clutch * Binding spline * Worn bushing * Worn ring gear 	<p>Replace Replace Replace Repair or replace Replace Replace</p>
The starter motor does not stop running	<ul style="list-style-type: none"> * Starter solenoid contacts welded closed * Solenoid coil shorted to battery positive (+) * Defective key switch (stuck or shorted in the start position) 	<p>Replace Repair or replace Replace</p>
Discharging of the battery	<ul style="list-style-type: none"> * Loose alternator drive belt * Short circuit or broken wire in the stator coil * Defective brush and slip ring contact * Defective rectifier * Defective IC regulator * Insufficient or improper battery fluid * Faulty battery electrode (internally short circuited) * Battery connections loose or dirty * Excessive electrical load 	<p>Adjustment Replace Clean or replace Replace Replace Adjustment Replace Clean and tighten Inspect each electrical part</p>
Overcharged battery	Defective IC regulator	Replace



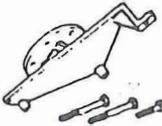
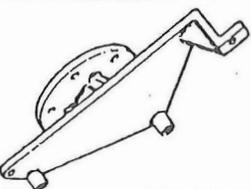
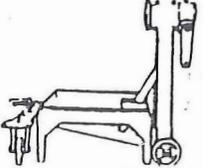
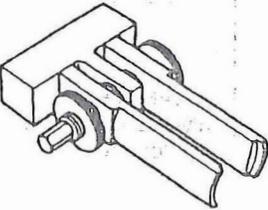
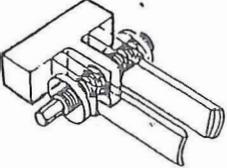
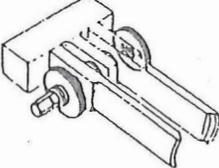
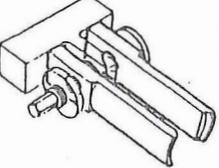
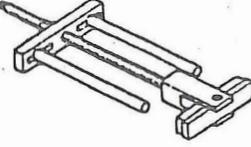
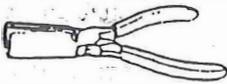
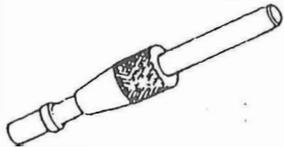
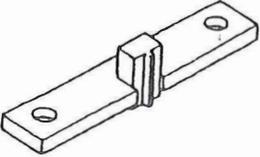


SECTION 8 – CONTENTS
USER SUPPORT INFORMATION

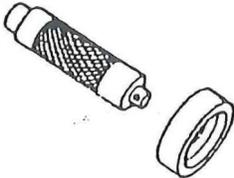
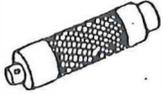
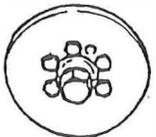
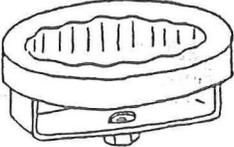
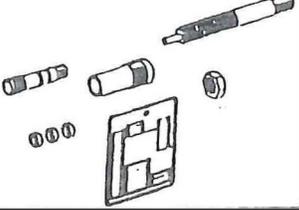
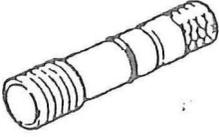
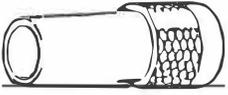
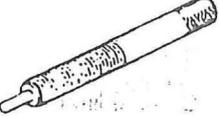
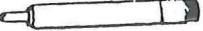
DESCRIPTION	PAGE NUMBER
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SPECIAL TOOL LIST

Tool Part Number / Description	Illustration	Tool Part Number / Description	Illustration
9225423-01 Engine stand hanger		9225423-02 Body (component of 9225423-01)	
9225423-03 Bolt (component of 9225423-01)		9125483-05 Engine stand	
9225423-04 Pivot		9225423-05 Body (component of 9225423-04)	
9225423-06 Foot (component of 9225423-04)		9225423-05 Lock nut (component of 9225423-04)	
9125483-59 Valve spring lifter arm		9225423-08 Cylinder liner remover set	
9225423-09 Attachment		9225423-10 Coupling flange holder	
9225423-11 Valve seal remover		9225423-11 Valve guide installer	
9225423-13 Clutch disk centering tool		9225423-14 Ring gear brake	

SPECIAL TOOL LIST

Tool Part Number / Description	Illustration	Tool Part Number / Description	Illustration
9225423-15 Oil seal installer		9225423-16 Handle (component of 9225423-15)	
9225423-17 Oil seal installer (component of 9225423-15)		9225423-18 Pulley puller	
9224473-00 Wrench oil filter bypass		9125483-56 Valve seal and valve guide installer set	
9125483-81 Installer (component of 9125483-56)		9125483-82 Body (component of 9125483-56)	
9125483-83 Installer (valve guide) (component of 9125483-56)		9125483-84 Nut (component of 9125483-56)	
9125483-87 Spacer (component of 9125483-56)		9125483-40 Piston pin installer	
9225423-19 Compression gauge adapter		9125483-40 Oil pressure gauge	
9125483-58 Tacho dwell tester	