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# Troubleshooting

**Hiace CDS 4.2 / 4.7**

**Section 10-6**

No	Problem / Possible Cause	Solution
<b>1</b>	<b>The radiator overflows.</b>	
1.1	The CDS <i>heat exchanger</i> has developed an interior leak.	Test each heat exchanger separately with pressurized water or air. Replace the bad one.
1.2	The <i>radiator cap</i> is faulty.	Test the cap for pressure. Replace it if necessary.
1.3	The engine is overheating because the <i>engine thermostat</i> is malfunctioning.	See an authorized dealer to check the engine thermostat for proper operation. Replace it if necessary.
1.4	The engine is overheating because the <i>engine water pump</i> is malfunctioning.	At the heater core, remove the return line from the heat exchanger to the heater core. Remove the radiator cap and hold the hose in the radiator. Replace the water pump if the water volume is below five gallons per minute at the van's idle speed.
1.5	The engine is overheating because the <i>engine fan clutch</i> is slipping or not engaging.	See an authorized dealer to check the fan clutch and replace it if necessary.

No	Problem / Possible Cause	Solution
1.6	<b>In Fords only</b> , the engine is overheating because the <i>oxygen by-pass relay</i> is missing or not working properly.	There should be + 12 volts present on both oxygen by-pass relay contacts 30 and 87a with the van engine running and the CDS <b>off</b> . However there should be + 12 volts present only on one of the oxygen by-pass relay contacts 30 or 87a with the van engine running and the CDS <b>on</b> . Replace the relay if necessary.

No	Problem / Possible Cause	Solution
2	The van engine sputters, then dies.	
2.1	In 1992 and 1993 Fords, there can be a loss of <i>fuel pressure</i> to the fuel injectors after the CDS has run for an hour or more.	See an authorized dealer to inspect the fuel pump in the gas tank.
2.2	The <i>van engine</i> is in need of a tune up.	See an authorized dealer.
2.3	The <i>van</i> is overheating.	Please refer to Problems 1.3 - 1.6 in this chapter. Also see an authorized dealer.

No	Problem / Possible Cause	Solution
<b>3</b>	<b>When the CDS is turned on, nothing happens.</b>	
3.1	A <i>circuit breaker</i> is blown.	a. Replace the weak breaker. b. There is a short in the wiring. See 3.3 in this chapter.
3.2	The <i>fuse link</i> is blown.	a. Replace the link. b. There is a short in the wiring between the battery and breaker. See 3.3 in this chapter.
3.3	There is a short in the <i>system</i> .	Unplug each individual wire, one at a time (ie. the clutch, the horn circuit), until the breaker does not blow. Replace the shorted wire or part. See Electrical, Chapter 9.
3.4	There is a bad <i>ignition switch</i> .	With the key in the "ON" position, test the switch with a V.O.M. or a 12 V.D.C. test light for voltage on the accessory or ignition post. If there is no voltage, replace the switch.
3.5	There is a bad <i>ground wire connection</i> .	Check all the grounds wires. Make sure all of the connections are secure. Ground wires are white in color.
3.6	The <i>recovery tank</i> is full of water.	Empty all the water from the recovery tank.
3.7	There is a bad <i>float in the recovery tank</i> .	Disconnect one of the wires on the recovery tank float switch and turn the CDS on. If the unit starts with the float disconnected then replace the defective float.

No	Problem / Possible Cause	Solution
3.8	The Vanguard light comes on because a sensor is sending a signal to the control unit.	<p>Check each individual sensor. Determine if the sensor is sending a true signal or if the sensor is defective.</p> <p><b>Example:</b> If it is determined that the oil pressure switch is signaling the control unit it must be determined if the van engine is in fact lacking sufficient oil pressure.</p> <p><b>Note:</b> The CDS heat exchangers need to be grounded will for the conductivity sensor to function properly. If the conductivity sensor is shutting the unit down, first ground the heat exchangers and then retest the installation. (See the CDS Owner's Manual page 9-1 for proper sensor function.)</p>
3.9	The control unit is defective.	<p>To check, remove the control box from the CDS dash assembly with the wires still connected. Verify that the control unit has 12 vdc going to the positive terminal and to the common terminal. Disconnect the green/white wire from input 2 and the blue wire from input 1. Disconnect the orange/white wire from the terminal labeled "Probe" and connect a ground wire to this terminal. If the system does not work with the control unit wired in this manner, replace the control box.</p>

No	Problem / Possible Cause	Solution
<b>4</b>	<b>The tachometer bounces.</b>	
4.1	There is a bad <i>ground wire connection</i> on the sensor or the gauge.	Check the ground wires to make sure all of the connections are secure and clean.
4.2	The <i>gauge</i> is bad.	Check the wires going to the gauge for cuts, abrasions and bad connections. With the CDS ignition on, the red wire should have + 12 volts on it. The black wire should have a ground common to the sensor ground and the white wire should go to the sensor. Replace the gauge if necessary.
4.3	The <i>sensor</i> is bad.	Disconnect the wire going to the sensor. Using a volt-OHM meter, check the resistance from ground to the wire going to the sensor. The resistance should be 410 to 450 OHMs. Replace the sensor if necessary.

No	Problem / Possible Cause	Solution
<b>5</b>	<b>The engine RPM is too high or too low.</b>	
5.1	The <i>vacuum throttle booster cable</i> is stretched or broken.	Replace the cable and readjust the pods. See your nearest HydraMaster Service Center.
5.2	The <i>vacuum throttle booster</i> (pod) is out of adjustment.	Readjust the pods. See your nearest HydraMaster Service Center.
5.3	The <i>vacuum solenoid</i> is bad.	The vacuum solenoid is normally a closed valve. The valve will open to allow vacuum through when 12 volts are present across its terminals. Replace the solenoid if necessary.
5.4	The <i>vacuum hose</i> going to the solenoid valve or throttle booster is clogged, pinched or cut.	Replace the hose.
5.5	The <i>vacuum throttle cable</i> is catching on something.	Replace the cable or add a protective cover.
5.6	The vacuum solenoid is not getting <i>power</i> .	Trace the wiring and locate the electrical problem.
5.7	The <i>vacuum throttle booster</i> does not engage.	Check the vacuum at your vacuum hose. If there is vacuum but the pod does not engage, replace the vacuum pod.

<b>No</b>	<b>Problem / Possible Cause</b>	<b>Solution</b>
6	The van engine is overheating.	
6.1	See Problems 1.3 - 1.6 in this chapter.	

No	Problem / Possible Cause	Solution
<b>7</b>	<b>The front end clutch will not work.</b>	
7.1	The <i>recovery tank</i> is full.	Empty the tank.
7.2	The <i>float switch</i> in the recovery tank is defective.	When the float is down, the circuit is open. When the float is up, the circuit is closed. If necessary replace the switch.
7.3	There is no <i>power</i> getting to the clutch.	Locate any burnt, broken, or cut wire and repair as necessary.
7.4	The <i>clutch</i> is burnt and slipping.	See Problem 9 in this chapter.

No	Problem / Possible Cause	Solution
<b>8</b>	<b>The pump clutch will not work.</b>	
8.1	The <i>pump clutch switch</i> has failed.	Replace the switch.
8.2	The <i>lower float switch</i> in the mix tank is defective.	When the float is down, the circuit is open. When the float is up, the circuit is closed. Replace the switch if necessary.
8.3	There is no <i>power</i> getting to the clutch.	Locate any burnt, broken, or cut wire and repair as necessary. Also check for and repair any loose connection.
8.4	There is a bad <i>ground</i> .	Check the blower frame ground connection. Repair as necessary.
8.5	The <i>clutch</i> has failed.	Replace the clutch.

No	Problem / Possible Cause	Solution
9	<b>The clutch is burnt and slipping.</b>	
9.1	The <i>clutch housing</i> is defective (bad bearings or worn shaft).	This allows the clutch pulley to rub on the coil of the clutch. Replace the clutch housing. And, if the clutch is burnt, replace it.
9.2	There is too much blower load due to excessive <i>vacuum</i> .	Clean and adjust the vacuum relief valve. Readjust the vacuum to be 12 Hg when under a full load. Replace the clutch.

No	Problem / Description	Solution
10	Problems with the drive shaft.	
10.1	The drive shaft vibrates.	Vibration is usually caused from one of the following: a. A bent shaft. If this is the cause, replace the shaft. b. An excessive amount of the splined shaft is exposed. If the exposed shaft is over 4 inches, remount the blower closer to the engine. c. The bearings in the clutch housing are worn. If this is the cause, replace the bearings and clutch housing shaft. d. The universal joints are worn out. If this is the cause, replace the shaft. e. The blower is out of alignment. If the blower is more than 3° out of alignment with the van engine, the universal joints on the drive shaft fight each other. This causes the vibration. If necessary, reinstall the blower.
10.2	The drive shaft is broken.	Replace the shaft.
10.3	The drive shaft is rattling.	Remove the splined shaft and grease.
10.4	The drive shaft is rubbing on the safety ring.	This is usually caused by the deterioration of the motor mount on the passenger side. Inspect the engine motor mounts and replace them as necessary.

No	Problem / Possible Cause	Solution
11	In Fords only, the insulator spacer on the radius arm is deteriorated (passenger side).	
11.1	The <i>heat shield</i> is not in place.	Install a shield, auxiliary fan and oxygen by-pass relay.
11.2	There is a problem with the <i>radius arm</i> .	Repair or replace the arm.

No	Problem / Possible Cause	Solution
12	<b>The van starter is burnt or not working.</b>	
12.1	The <i>starter blanket</i> is missing.	Inspect the starter. Replace the missing blanket if necessary.
12.2	The <i>auxiliary fan</i> is not working.	Inspect the fan and replace if necessary.
12.3	<b>On Fords</b> , the <i>oxygen by-pass relay</i> is not working.	There should be + 12 volts present on both oxygen by-pass relay contacts 30 and 87a with the van engine running and the CDS <b>off</b> . However there should be + 12 volts present only on one of the oxygen by-pass relay contacts 30 or 87a with the van engine running and the CDS <b>on</b> . Replace the relay if necessary.
12.4	The <i>starter motor</i> is defective.	Replace the starter and install a starter blanket if it is not already equipped.
12.5	The <i>starter solenoid</i> is defective.	Remove and test the solenoid. Replace it if necessary.
12.6	The <i>battery</i> is dead.	Charge the battery.
12.7	The <i>RPMs</i> are too high.	See Problem 5 in this chapter.

No	Problem / Possible Cause	Solution
13	The cleaning water is too cold.	
13.1	Too much <i>water</i> is being moved.	Measure the water output with an 8006 jet installed. Your output at 300 PSI should be less than 1.5 GPM. If the flow is more than 1.5 GPM, the temperature will be low. To achieve maximum efficiency with your heat exchangers the water flow must not be continuous. A ten seconds "on" and ten seconds "off" pattern will keep the temperature at maximum.
13.2	The incoming <i>water temperature</i> is extremely low.	Insulate the incoming garden hose.
13.3	The <i>heat exchangers</i> are clogged with hard water deposits.	Remove the fittings on the cleaning water end of the heat exchangers and inspect for hard water deposits. If the heat exchangers have deposits, they must be cleaned or replaced.
13.4	The <i>water hose</i> is kinked somewhere from the van engine to the heat exchangers.	Inspect both of the hoses going to the heat exchangers from the engine compartment. Repair or replace as required.
13.5	The <i>van engine thermostat</i> is bad.	Check the "Engine Temperature" gauge located on the van instrument panel. If it reads "Cold" or below "Normal" have the thermostat replaced.

No	Problem / Possible Cause	Solution
13.6	The <i>engine water pump</i> is bad.	Check the water flow going to and from the heat exchangers. (See Problem 1.4 in this chapter.) If the water flow is bad then replace the water pump. <b>NOTE:</b> The water pump must match model and year exactly.
13.7	The <i>water hoses</i> from the engine to the heat exchangers are plumbed backwards.	Reroute the hoses correctly.
13.8	The <i>high pressure water hoses</i> are plumbed wrong.	Reroute the hoses correctly.
13.9	The <i>shut off valve</i> is malfunctioning.	Repair or replace the valve.
13.10	The <i>radiator</i> is plugged.	Remove the radiator. At a radiator shop, give it a hot tank treatment.
13.11	The <i>heater core</i> is restricted or plugged.	See Authorized HydraMaster Dealer.

No	Problem / Possible Cause	Solution
<b>14</b>	<b>The water pump is pulsing.</b>	
14.1	The hoses are restricted due to <i>hard water deposits</i> and/or <i>chemical build-up</i> .	Descale the machine.
14.2	The <i>throb hose</i> is hardened due to age or heat and cannot absorb spikes.	Replace the throb hose.
14.3	The <i>inlet hose</i> is drawing air.	Reseal the fittings. Tighten the hose clamps. Or replace the hose.
14.4	The <i>valves</i> are obstructed.	Clean or replace the valves.
14.5	There is a pin hole in one or more of the <i>diaphragms</i> , small enough to lose the prime but not to leak any oil into the water or water into the oil.	Replace all of the diaphragms. One could be replaced temporarily, however all should be replaced.
14.6	The <i>valve spring</i> is broken.	Replace the valves.