

HOW TO: Jeep Starter System Diagnostics

L134 & F134 Vehicles....Symptoms....no, slow, laboured or hard start issues....Tools: crank handle, jumper cables, auto multimeter/voltmeter & 6/12v trouble light

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posting by Jon @ Jeepdraw....suggestions from Marty, Gindi, Chuck plus contributions from Ren & a couple of very good links

1. BATTERY

Engine does turn over but starter operation doesn't seem right

<https://www.youtube.com/watch?v=Oi8sUE9XCgA>

Check battery charge & internal condition

A....Relative Density [SG] using a hydrometer not absolutely essential, if Volt readings seem good

B....Hi-rate discharge [specialist supplier test] or with cap tops off, safety glasses on observe each cell for bubbles when cranking which indicates a bad cell & battery will not hold a charge....

Eliminate battery as problem source by jump starting using a known good battery

A Low [RD/SG] battery charge or if an ongoing problem caused by B Replace Battery

Clean battery terminals [bi-carb or baking soda & water]. Check battery charge condition with voltmeter across + -terminals. Should read 6+ or 12+ V with engine not running or @ idle 7+ or 14+ @ 1000 RPM. This is a very good indication the charging system is functioning properly

2. ELECTRICAL WIRING & or the STARTER SWITCH

Check ALL associated electrical connections from the battery, starter switch, to the starter, live or positive circuit & earths/grounds. After trying to start, carefully feel battery terminals & all starter wiring connections for hot spots immediately after trying to start. Hot indicates bad connection/s @ that hot spot

Hook one of the quality jumper cables to the negative battery terminal & the other end to the starter bracket or to the engine block near the starter. Try the starter in NEUTRAL with the ignition off.

Starter turns OK now? Means there is a problem with your ground circuit to the starter. Disconnect the jumper cable then try to start using the normal starter circuit [ignition off]. Check ground circuit for hot spots

No difference? Remove the negative jumper cable & with transmission in neutral, ign. off connect positive jumper cable to the + starter terminal then the battery for <10 seconds.

If starter is now OK means an issue with the positive wiring circuit or that the starter switch needs attention. Carefully feel ALL positive related cables between the battery & starter.

**Guesser's &/or parts changer's can't & don't diagnose, fault find or troubleshoot, anything.
Diagnosing quickly & cost effectively, requires a fair understanding of how any system functions as a whole**

3. MECHANICAL/IGNITION UNRELATED to the STARTER

Battery has proved good but starter doesn't seem to be functioning correctly
Use hand crank or, socket & bar on crank pulley nut or using depressed fan belt & fan to turn engine out of gear

Ignition OFF & engine turns quite easily is OK

Engine is very hard to turn. Check mechanical reasons engine won't turn....crank/piston/s tight seized, new bad rear main oil seal. Have someone depress clutch. *Anything alter?*
New engines may be a little tight BUT this should not negatively affect a good starting system.

Not crank but starter only....Ignition ON, engine seems considerably harder to turn
Check for over advanced ignition timing.

4. MECHANICAL ISSUES RELATED TO THE STARTER MOTOR

Starter spins but is not engaging or is clashing with the flywheel ring

Bendix drive or ring gear issue/problem. The drive should be lubricant free or very lightly smeared with diesel fuel...**NO** grease.

Starter doesn't spin & engine doesn't turn

Bendix drive jammed to ring gear. Wrong tooth combination or damaged ring or Bendix.
Possible fix by putting Jeep/vehicle in 3rd gear & rocking using the back wheel.

Test starter motor

Starter really sluggish but no electrical symptom identified.

Bad bell housing bushing, starter bushings/bearings or bent starter armature shaft.

5. VOLTAGE DROP or VD TESTING

[Auto Electricians & Mechanics would probably do this test next after the battery tested good.]

<https://www.youtube.com/watch?v=XhRPLgH6uZg> Forget the electric/magnetic solenoid references BUT the Jeep foot starter switch is a mechanical switch that does the same thing. One can do a VD check on both sides of the foot switch. Voltage drop doesn't require use of 2 voltmeters just 1 @ a time.

6. REN's STARTER & BELL HOUSING BUSH REPLACEMENT

<http://www.rensjeep.com/fixstarter/starterrepair.html>

Once the starter is confirmed bad removing & replacing the starter & bell housing bush. The last picture of Ren's very helpful presentation *unfortunately is missing the ground from the frame to the rear bottom starter bracket*. This compromises starter operation & must be in place for optimum starter operation.

NOTE: More starter electrical issues are caused by ground/earth wiring issues than positive circuit related ones.

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