

# 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 3<sup>rd</sup> 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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