

Starter circuit diagnosis

Telling a bad starter from a bad cable, what cranking voltage and draw should be, and reading the click.

PROCEDURE

- 1 Verify the battery**
Charged and capacity tested. Everything downstream is meaningless otherwise.
- 2 Measure cranking voltage**
At the battery posts while cranking. Should stay above about 9.6 V.
- 3 Drop the feed side**
Battery positive to starter stud, cranking. Under 0.5 V.
- 4 Drop the ground side**
Engine block to battery negative, cranking. Under 0.5 V.
- 5 Clamp the draw**
Compare to spec for the engine type.

NUMBERS

Cranking voltage	above 9.6 V	at the posts, room temperature
Feed cable drop	under 0.5 V	battery positive to starter stud, cranking
Ground path drop	under 0.5 V	block to battery negative, cranking
Draw, gas engine	150–250 A	clamp meter
Draw, diesel	400–800 A	clamp meter; varies widely by displacement

COMMON MISTAKES

- Replacing a starter without dropping the cables first — the most common wasted repair in this circuit.
- Testing with a battery that is merely charged rather than capacity tested.
- Ignoring the ground side, which fails as often as the feed.
- Missing a heat-soak fault that only appears on a hot restart.

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