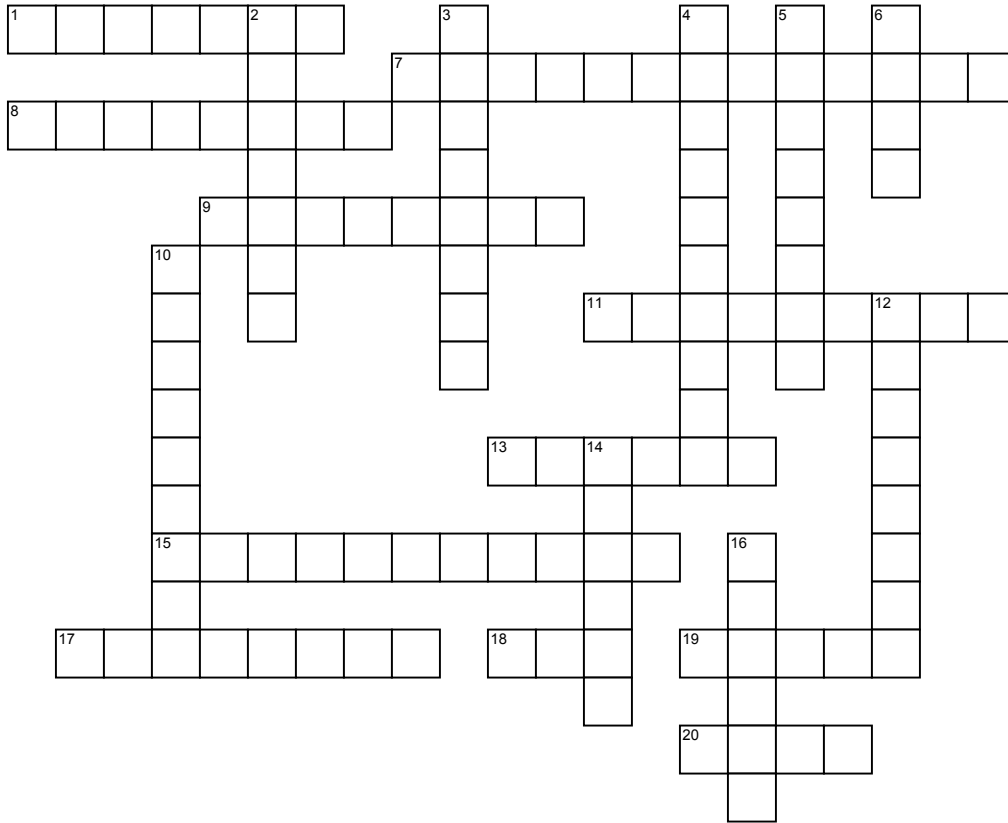


# Cranking System



Puzzle by Tony and Lara Martin. [www.CrosswordWeaver.com](http://www.CrosswordWeaver.com)

## ACROSS

- 1 Pull-in \_\_\_\_\_: used to draw the plunger into the solenoid
- 7 CEMF: Counter \_\_\_\_\_ force
- 8 Type of starter motor with field windings in series and parallel with the armature
- 9 Turning the engine in order to start it
- 11 Type of gear reduction used in PM starter motors
- 13 Magnetic field strength is measured in \_\_\_\_\_-turns.
- 15 One-way clutch used in starter drives
- 17 Controls the starter current
- 18 Starter solenoids have \_\_\_\_\_ windings
- 19 Failure of this part can cause starter "whine"
- 20 \_\_\_\_\_ reduction is used to increase torque in starters

## DOWN

- 2 \_\_\_\_\_ safety switch: prevents the vehicle from starting in gear
- 3 Field coils can be made of copper or \_\_\_\_\_.
- 4 Part of the starter armature that makes contact with the brushes
- 5 Armature windings are \_\_\_\_\_ to the commutator segments
- 6 Used for insulation between commutator bars
- 10 Used to limit the maximum speed of the starter
- 12 Supported by the starter bushings
- 14 Part of the starter drive that contacts the flywheel gear
- 16 This type of starter motor develops maximum torque at 0 RPM