BorgWarner



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Delco Remy 31MT[™]: The Trusted Choice for School Bus Fleets

School buses present a unique set of challenges. A school bus performs the majority of its workday at

> slow speeds. At the same time, lighting and safety equipment on a bus increase the electrical loads that must be met at these same slow speeds. Add to that cold temperatures during certain times of the year and it's easy to see why school buses need a starter you can

count on—every time. The Delco Remy 31MT[™] is at the top of the class for school bus starter options!

"The 31MT is ideal for applications that have lots of starts and stops or work in a variety of stressful driving conditions. This describes school buses perfectly," says Brian Koehlinger, Senior Sales Manager. "The 31MT gives buses strength, power and durability-and districts the affordability they need."

The 31MT—which provides 10% more peak power than competing models-is a robust, corrosion-resistant starter that produces the torque and speed necessary to crank 12V diesel engines up to 9 liters. Its lightweight aluminum housing reduces overall vehicle weight, and its sealed solid link solenoid construction protects against solenoid contact welding and exposure to contaminants. Additionally, the 31MT is equipped with the electrical soft-start engagement system for a predictable start every time. All of this ensures reliability and long service life-critical for school district budgets that are often being stretched.

Download our **31MT product** brochure to see application coverage and the top competitor part number cross references.

Download our school bus brochure to see all the available options of starters and alternators for a variety of applications.



| Engine Size | 12V up to 9 liters |
|--|--|
| Rotation | Clockwise |
| Mounting | SAE #1 |
| Pinion | 9 Tooth, MOD 3 (Metric) 10 Tooth, 8-10 Pitch 10 Tooth, 10-12 Pitch |
| Peak Output | 12 Volt 4.1 kW |
| Weight | 18.5 lbs / 8.4 kg |
| Frame Diameter | 3.5 in / 90 mm |
| Overall Length | 11.46 in / 291 mm |
| Motor Type | Wound Field Planetary Gear |
| Pinion Support | Noseless |
| Drive Design | 12 Volt Positive Shift Engagement |
| Warranty (Applies to North America) | 1 year / unlimited miles 2 year / unlimited miles - School Bus |

Tech Tip: Measuring Current Draw of a Bus

Oftentimes, school buses are outfitted with air conditioning units, wheelchair lifts and many other accessories after they are sold to the school district. Eventually, these buses start experiencing battery issues because the originally installed alternator doesn't provide enough output to handle the new electrical demands. If the alternator is not upgraded, this will result in constant discharging of the batteries, premature alternator failure, and starting issues due to low voltage.



Watch our Tech Tip video to find out how you can determine if your alternator has sufficient output for your vehicle.

Visit the **BorgWarner** YouTube channel today!



Checking Sufficiency of Alternator Output

Measuring the current draw for the bus is the best way to ensure the alternator has sufficient output for all of the vehicle's electrical demands. This will help you determine if you have the correct alternator for your application.











Step 4

- **1.** Fully charge the batteries before beginning. Partially charged batteries will result in inaccurate readings.
- **2.** Attach a clamp-on ammeter around negative battery cables.
- **3.** With the ignition key on and engine off, turn on all accessories, including the heater, defroster blower fan, lights, wipers, radio, video monitor system, stop flashers and warning lights.
- **4.** With the clamp still in place, take and record a reading. Then turn off all the accessories and leave the ammeter in place.
- Record the amperage draw of the special needs lift if the bus has one. With the key on and engine off, place a load on the lift and raise it. Take a reading and record it.
- Measure the amperage for all accessories that automatically turn on when the engine is started. Record a reading with the engine on, and at high RPM with the accessories off.
- 7. Calculate the recommended alternator amperage rating by adding all the readings together and then multiplying that total by 1.2. As a rule of thumb, the total vehicle amperage demands should be 20 to 30 percent under your alternator's rated output.

Diagnosing Starter Systems with Smart IMS

Over the last year, more and more fleets are equipping their heavy-duty applications with the Smart IMS-and for good reason. The Smart Integral Magnetic Switch-or Smart IMS—is simply smart! It protects against six of the most common failure modes that arise from system issues. For each failure mode, there is a protection feature in the Smart IMS specifically designed to counter it and prevent the failure from occurring.

As the Smart IMS continues to become more prevalent in use, it's important for technicians to know the troubleshooting techniques for starters equipped with a Smart IMS. Some of the Smart IMS features could be misdiagnosed as a starting problem, when, in fact, these features are helping protect the starting system.



You can also find step-by-step instructions on our website: https://bit.ly/2lzXjcX



| Top Six Failure Modes | Protection Feature |
|---|--------------------------------|
| Click-no-crank (driver annoyance) Solenoid prolonged power | Engagement/Auto-retry |
| Damaged pinion & ring gear teeth | Rapid re-engagement lockout |
| Engagement into running engine, damaged pinion & ring gear teeth | Running engine lockout |
| Over crank and solenoid chatter due to low battery state of charge | Low voltage lockout |
| Over crank | Time-limited crank |
| Extended overrun | Auto-disengage at engine start |



For a refresher on how to diagnose a starter system with Smart IMS, watch our Tech Tip video on the BorgWarner YouTube channel: youtube.com/watch?v=w2fhj_7jsog.

CONNECT

E-Catalog Now Includes Thermal Parts Numbers

Our online catalog continues to grow as a key resource! We've now expanded it to include the BorgWarner thermal part numbers, including the popular On/Off, Viscous and Visctronic[®] fan drives.





Simply visit us at **borgwarner.com/aftermarket/ thermal-management**, select product search and search by part number, application, family or service parts. There are additional fields within each tab to help you narrow your search even more. As always, if you don't find what you need, click the "Not finding your application?" button to send an email to our technical support team and someone will respond within 24 hours.



A big shoutout to our team who helped run the BorgWarner-sponsored Starting and Charging Station at the 2019 TMC Top Tech Competition in Raleigh, NC.

New Part Numbers

Go to The Latest at **delcoremy.com** to find the following:

- New part number cross references
- Most frequently searched competitor part number cross references



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Stay connected to what's happening with Delco Remy genuine starters and alternators on the BorgWarner social media pages.



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