The 2016 NISSAN MAXIMA

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Steel Matters: Demand Nothing Less

www.autosteel.org
35 Year History of Maxima

1981
1st GEN
First generation was RWD
145-hp, 2.4L I6

1985
2nd GEN
Second generation was FWD
154-hp, 3.0L V6

1989
3rd GEN
Third gen was mid-sized
160-hp, 3.0L V6

1995
4th GEN
Fourth gen got a new engine
190-hp, 3.0L V6

2000
5th GEN
Fifth gen received the VQ35 V6
255-hp, 3.5L V6

2004
6th GEN
Manuf moved from Japan to USA
265-hp, 3.5L V6

2009
7th GEN
Aggressive styling & performance
290-hp, 3.5L V6

2016
8th GEN
V-Motion front end, floating roof design, LED signature headlights
300-hp, 3.5L V6
LEGITIMATE PERFORMANCE
WITH CREDIBLE HARDWARE

300HP
30MPG

- TARGET: Best-in-class 0-60mph*
- 61% all-new engine components
- New CVT with new D-step logic
- Increased Ratio Coverage
  (5.4 → 6.3, ~8 speed equivalent)
- Power UP + Weight DOWN = Best-in-class power-to-weight ratio

Rigidity 25%

- Ultra high strength steel (1.2GPa)
- Strategic chassis reinforcements
- HIGHER rigidity than Porsche Cayman

Monotube Dampers

- ZF Sachs
- Commonly used on high perf. vehicles
- Further SR specific tuning

*0-60mph in estimated 5.9 seconds
Nissan Maxima

- Designed in California
- Tested in Arizona
- Engineered in Michigan
- Built in Tennessee
- Powertrain built in Tennessee
The 2016 NISSAN MAXIMA
Nissan Maxima Dimensions

Overall Length is extended vs previous Maxima (+54mm) but Roof Height is lowered 30mm for more sporty image.

- Overall Length (OAL): 4897 mm (+54)
- Width between wheels (W/B): 2775 mm (±0)
- Front Wheel Hub to Headroom (FR OH): 1010 mm (+41)
- Rear Wheel Hub to Headroom (RR OH): 1112 mm (+13)
- Over All Wide (OAW): 1860 mm (±0)
- Over All Height (OAH): 1435 mm (-30)
- Turning Radius: 5.8 m (±0)
Spot Welding

4718 total spot welds are used to connect the Nissan Maxima Upper Body
8th Generation Maxima

HIGH STRENGTH STEEL
APPLICATION & BENEFITS
Steel Usage – Upper Body

Mild Steel
- 55.45%
- 440 MPa
- 1.78%
- 540 Mpa
- 1.13%
- 590 MPa
- 16.16%
- 780 Mpa
- 0.29%
- 980 Mpa
- 9.58%
- 1180 Mpa
- 6.16%

Die-quench
- 0.94%

Alum Bolt/Nut
- 4.89%

Bolt / Nut
- 0.93%

Other
- 2.68%

- 590 MPa
- 16.16%

- 540 Mpa
- 1.13%

- 440 MPa
- 1.78%

Mild Steel
- 55.45%
Steel Usage – Platform

Die-quench
1180 MPa
980 MPa
780 MPa
590 MPa
540 MPa
440 MPa
370 / 390 MPa
Mild
Other
Bolt / Nut
AL

1350 MPa
980 MPa
780 MPa
590 MPa
540 MPa
440 MPa
Mild
Bolt / Nut

780 MPa 7.7%
980 MPa 4.0%
1350 MPa 2.2%
440 MPa 8.7%
540 MPa 0.7%
590 MPa 28.7%

FR ISO VIEW

Mild Steel 45.5%

BOTTOM VIEW
Vehicle Light Weighting

By using AHSS we are able to significantly reduce our BIW mass.
1180 MPa Steel Usage

- Benefits of application of Ultra High Strength Steel (UHSS) 1180 MPa material
  - Mass Reduction
  - Safety Performance Enhancement
Safety Performance – Side Impact

Multi-Load path distribution through the Sill, B/Pillar and Floor cross members
Safety Performance – Side Impact

CAE iterations used to reduce physical development timing
Safety Performance - Small Overlap

Push off the barrier in the front structure
Manage energy in the Sill & A/Pillar
Safety Performance - Small Overlap
Safety Performance

Offset Deformable Barrier

Efficient Energy absorption side member structure was achieved with the use of high strength steel
Safety Performance

Offset Deformable Barrier
Load distribution through the Front Rail, Floor Rails, Hinge Pillar, & Sill
Safety Performance

Roof Crush Resistance

Load distribution through the Roof Bow, Roof Rail, & B/Pillar
Safety Performance

Roof Crush Resistance achievement with smaller section sizes to meet visibility and roominess targets.
Ride & Handling

- Overall Improvement in Body Stiffness vs. 7th GEN Maxima
  - A stiffer body structure has less flexing allowing for more precise control and improved ride comfort.
  - Contributes to achievement of Nissan’s “Premium Flat Ride”

GLOBAL TORSION
6% ↑ vs. 7th GEN Sport Model*
25% ↑ vs. 7th GEN Base Model*

*Normal Roof Structure

REAR END LATERAL
1% ↑ vs. 7th GEN Base

ENCON STIFFNESS
Front Lateral
8% ↑ vs. 7th GEN Base
FR Strut Lateral
2% ↑ vs. 7th GEN Base

REAR TORSION STIFFNESS
27% ↑ vs. 7th GEN Base

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Ride & Handling

- Rear End Torsional Stiffness Improvements
  - Reduced RR Delay → Uniform Body Feel → More Predictable Vehicle
  - Response → Increased Driver Confidence

**Changing point from 7th GEN Maxima**

- (1) Changing thickness of RR PANEL (t0.9mm ← t0.6mm)
- (2) Adding REINF-RR PANEL LWR

**Effect of Items (RR delay)**

- 7th GEN Maxima (6.125 pt.)
- 8th GEN Maxima (7.25 pt.)

**Driver Subjective Scale**

- Any Customer Notices
- Discerning Customer Notices
- Expert Driver Notices
Ride & Handling

- Front End Lateral Stiffness Improvements
  - Increased FR Strut Stiffness $\rightarrow$ Greater Cross-car Load Transfer $\rightarrow$ Less
  - Body Flex $\rightarrow$ Improved Handling, Acceleration, and Breaking

**Effect of Items (FR Strut Lateral Stiffness)**

7th GEN Maxima (6.25 pt.)
8th GEN Maxima (6.6 pt.)

- UPR: t0.6 mm
- LWR: t1.6 mm
- (1) t2.0 mm Tubular Section
- -1.0 kg (Mass Reduction)
THANKS FOR YOUR ATTENTION!