

TRUCK PRODUCT TRAINING SELF-STUDY WORKBOOK

3. Frames and Suspensions (B50FS.M5P)

Part of GMC Retail Professionals Truck Product Training that focuses on important “under-the-skin” concepts to help ensure that salespeople can communicate the GMC Professional Grade advantage and effectively assist customers in finding the right GMC truck for their needs. Sales Consultants who’ve completed the training will have unlimited access to GATEPASS (GM Ask The Expert Product Assistance Support System). This is a place to go for answers to the toughest vehicle questions. Our goal is to provide e-mailed answers within one business day.

The GMC Standards for Excellence Program requires that some dealership sales employees become certified as GMC Retail Professionals; see SFE Program Rules for details. All Sales Consultants are eligible to participate in this training, but this course is not required as part of the 2005 GM Training Certification Program.

Upon completion of this course, the participant will be able to:

- A. Identify frame construction methods/benefits
- B. Differentiate GMC frame construction methods between truck model/series designations
- C. Identify front suspension and steering designs/benefits
- D. Identify rear suspension/axle designs/benefits
- E. Determine durability/strength benefits of GMC frame/suspension designs



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Frames and Suspensions



In this chapter, you will be taking a deeper dive into what makes a truck a truck.

The focus is partly on frame types and frame construction. But you will also find strong emphasis on front and rear suspension types and their components, both of which frequently need to be explained during walkaround presentations.

Solid knowledge of both frames and suspensions helps you communicate the designed-in durability and strength benefits, as well as some key exclusives of GMC trucks, to your customers.

There will also be commentary on GMC competitive benefits in frame and suspension design throughout the chapter.

Ladder-type Frame



The illustration depicts the “anatomy” of a ladder-type frame that is used on GMC pickups, sport utility vehicles, full-sized vans and chassis cabs. The bodies for those models are mounted separately on the frame.

The frame gets its name due to its construction, comprised of two side rails with bolted or welded crossmembers. This design helps distribute the load over a wide area. In addition, the crossmembers lend strength to the assembly and keep body and chassis components aligned.

Notice that the center of the frame drops down slightly. This is the area where the cab sits. This drop center design allows engineers to design a truck with a convenient step-in height while maximizing ground clearance.

It also helps lower the center of gravity of the vehicle, which in turn helps enhance the driver’s overall control of the vehicle.

Frame Cross Sections

“C” Channel Box Channel



If you look at a cross section of a frame, you’ll see that it’s shaped like a “C” in some areas and like a rectangular box in others. These shapes give the frame rigid strength. The metal, when formed to these shapes, is more rigid than the same piece of metal laid out flat.

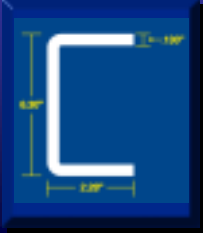
The box channel frame has two features that are used in a variety of GMC trucks. Because it is the best design to resist twisting, this is the best design to use in the front of a frame, where the front suspension components are attached and steering loads come into play. A box section frame can also provide the needed strength with a smaller height. Using this feature on our Savana vans and Envoy SUVs helps keep the load floor low and has a positive effect on entry and exit access.

Envoy features a fully boxed hydroformed frame, which will be explained in more detail shortly.

On Savana, boxed side rails extend the entire length of the frame for durability.

Section Modulus

- Height, Width, Thickness



Now for some detail on how frame strength is measured. This is important to know in order to combat competitive claims about frame superiority.


One of these measures is section modulus. This is a measure of frame strength based solely on **height, width, thickness and configuration of the side rails.**

This is not a measurement of material strength and is not, in itself, a number you should use to compare our frames to the competition's. (Note: You could only use this number if the frames were made of identical material.)

As you move along in your truck sales career, or if you have already entered the dynamic commercial truck arena, you will find that many municipal bids will require information on section modulus.

Yield Strength

- Maximum load (psi) without permanently bending frame




Yield strength is another measurement of frame material strength. It's the maximum load in **pounds per square inch** that can be placed on a material and still have it return to its original position without becoming **permanently bent or creased.**

Again, this measurement is not recommended for competitive comparisons. Yield strength can only be used to compare frames of identical cross-section size.

For reference, GMC pickups have frame yield strengths of 40,000 psi. Our Medium Duty trucks may have frame yield strengths of 80,000 psi or 110,000 psi.

Resistance Bending Moment (RBM)

- Combines section modulus and yield strength



Resistance Bending Moment (RBM) is the **only** accurate number to use for frame comparisons, because it combines section modulus and yield strength.

You'll find these definitions in the Body Builder's Manual for the vehicle in question, along with the exact specifications of each frame. The most important thing to remember, though, is that the only true comparison figure is the RBM.

IMPORTANT TIP: You can find the frame dimensions, section modulus, yield strength and RBM measurements in the Online Order/Reference Guide. After selecting the desired model as outlined in previous chapters, click on "Ordering Info" and then on "Mechanical." Scroll down to "Frame" and if it is in blue type, click on it. A chart appears with detailed frame information.

Sierra Frame



GMC frames are engineered to support the powertrain, the steering mechanism and the load the truck is carrying.

The frame also serves to maintain correct alignment of body and chassis components.

That is why the frame is referred to as the **backbone of the vehicle** and can determine the actual load-bearing ability of the truck.

A frame should be durable enough to handle what the customer throws at it, but excess weight in the frame takes away from the truck's ability to haul.

The Sierra has a unique ladder-type frame; illustrated on the left are **three distinct modules**, each one designed with specific materials and processes to meet or exceed their individual requirements without adding unnecessary weight. Modular frames allow GMC engineers to tailor the frame to the truck's specific application.

Sierra Front Frame Module



The front frame module on the Sierra is made of hydroformed steel.

Hydroforming is a process that uses pressurized fluid to form parts. Fluid is inserted into a hollow steel tube and then sealed in a press. Then, the fluid is pressurized to form a shape from the inside of the tube out. This process was first used by GM for the frame of the 1997 Corvette. In addition to Sierra, it is also used on Yukon, Yukon XL, Denali and Envoy.

The key benefits of hydroforming include:

- Frame rails are stronger and lighter than traditional rails.
- Fewer welds result in more precise dimensions, for improved alignment and sheet metal fit.
- More accurate front suspension and cab to cargo box mounting.

Front frame rails are fully boxed for maximum torsional (twisting) strength. This is important to support our fully independent front suspensions, which provide excellent ride and handling and great durability.

Sierra Mid-Frame Module



The middle frame module comes in **multiple lengths** to accommodate different bed lengths and cab styles.

The middle module carries the weight of the load from the pickup box to the front axle and is **the strongest frame section** of them all. This is the bridge between the front and rear axles, so it has to be strong.

To provide this strength, the mid-rails are **roll-formed** from high-strength steel.

After they are roll-formed, the rails are draw-bent into a lipped C-

section to enhance strength and rigidity.



The rear frame module is primarily used for mounting suspension components, bolting the pickup box to the frame, and mounting the spare tire and trailer hitch.

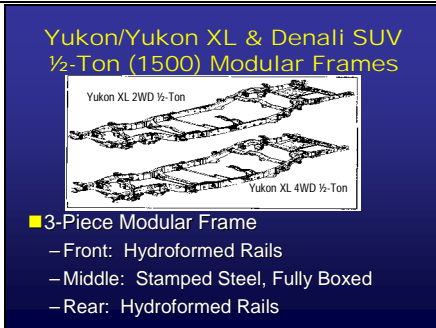
While the heaviest loads are carried in the rear of a truck, the load is directly supported by the rear suspension. There is little twisting motion here, so a box section isn't needed. And the stamped C-section is the best choice for attaching hitches or mounting equipment.

From the picture, it is easy to see Sierra's **tubular crossmembers** (they are white in the picture).

Tubular crossmembers are welded to the frame rails. Their tubular shape provides frame stiffness without excess weight.

After assembly, the entire frame is immersed in high-temperature wax (295 degrees) for corrosion protection.

The Sierra HD frame has deeper side rails (7.87 inches vs. 6.10 inches), contributing to increased section modulus and RBM.



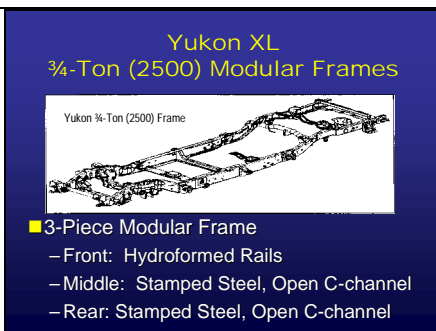
The Yukon family of full-size SUV frames is slightly different between 2WD and 4WD models, but has the same basic design.

Each is a full-ladder type with front and rear sections hydroformed for the following items:

- Two front rails
- Engine crossmember
- Two rear rails
- Rear fuel tank crossmember
- Lateral suspension link crossmember

The middle section is boxed stamped steel.

Two frame lengths are used to accommodate the different wheelbases.



The 3/4-ton Yukon XL frame is somewhat different from the 1/2-ton model, although both use a 3-piece modular frame.

Frame is the full-ladder type.


Front: Hydroformed front frame section.

Middle: Stamped steel mid-rail, the front portion of which is open or C-shaped. Beginning at the front end of the main fuel tank, the mid-rail section has an extra lip, or lipped-C shape, to accommodate the

tank, which is side-mounted inside the rail.

Rear: The third section also has a lipped-C shape for the most part. It has an open-section design mainly because of its leaf-spring rear suspension, which provides exceptional strength for the Yukon XL's ¾-ton high load-carrying/trailer-towing capabilities.

Safari




- Integral, unitized frame with partial front ladder-type frame
 - Structural rigidity
 - Reduces vehicle weight
 - Smooth ride

The Safari features an **integral frame and body** construction with a partial front ladder-type frame. The Savana has a full-length ladder-type boxed frame.

Here are a few benefits of the integral frame and body design:

- Integral design joins ladder-type frame components with floor panels for structural rigidity. The partial ladder-front frame holds engine and front suspension components.
- Includes a front crush zone to absorb impact energy in the event of a collision. This provides increased occupant protection.
- Reduces vehicle weight for improved fuel economy and handling ease.
- Is lighter weight than a full frame and also provides a lower floor height.
- Provides quiet, smooth ride due to the isolation from road noise.

Savana Frame



- Full-length box frame
 - Drop-center design
 - Longer and stronger than past designs
 - Stiffer than past designs

The Savana features a full-length boxed frame. The boxed section side rails run the entire length of the vehicle.


A drop center design is used to allow the frame to drop down between the front and rear wheels without affecting ground clearance.

Compared with earlier designs, the extended frame offers enhanced strength and occupant protection. The frame on 135-inch wheelbase light-duty models is 43% stiffer than the previous design (28% stiffer on heavy-duty models).

The benefits to Savana owners include:

- Exceptional strength and load-carrying characteristics
- Exceptional occupant protection
- Positive steering and suspension characteristics because of increased stiffness
- Savana's box-section frame can have smaller dimensions for the same strength as a larger height C-channel frame. This helps reduce loading height and step-in height, for added convenience.

Envoy Frame



- Body-on-frame construction
- First full-length hydroformed frame rails
- 8 crossmembers (9 on XL)
- Same frame on all configurations
- Stiff frame improves ride and handling

Envoy also has rugged body-on-frame construction, a major contributor to its ride quality and handling.

Envoy was the **first in truck history** to use full-length hydroformed frame rails. This results in stronger, lighter frames that are more dimensionally accurate.

The frame uses eight crossmembers, and nine crossmembers on Envoy XL.

- Most midsize utilities use either four or six crossmembers
- Most of the crossmembers are welded in place
- Two of the crossmembers are removable to allow easier service

Both the 2WD and the 4WD have the same frame configurations. The frame design of the Envoy is very stiff for improved ride and handling.

Frame Design

- GMC has many types of frames
- Each design is best for a specific vehicle
- GM technology provides real customer benefits

Not all customers will require a detailed discussion of many of the concepts discussed up to now. However, when the topic of long-lasting durability is raised, that's your cue to talk up the modular nature of GMC ladder type, or other types of frames, the benefits of the hydroforming process and how frame stiffness helps improve ride and handling.

GMC offers many different types of frames.

Each frame design is best suited to a specific vehicle.

GM technology, such as hydroforming, results in real customer benefits of load-carrying capacity, durability, ride comfort and handling.

Suspensions

- Axles
- Springs
- Tires
- Wheels

A suspension is only as strong as its least-rated component

Now, let's get into the role and types of suspensions used on GMC Trucks.

Suspension components include the axles, springs, tires and wheels. The suspension's function is to isolate the truck and its occupants from road bumps and inconsistencies.

On trucks, the suspension must also be versatile enough to handle both a loaded and unloaded truck.

As was discussed in an earlier chapter, the suspension is only as strong as its least-rated component. Every truck in the Online Order/Reference Guide is listed with the maximum payload and trailer towing capacity that it is designed for.

It's necessary for you to find out from a customer the types of loads that will be carried, the weight of the load and/or trailer, and how they plan to use the truck. From this information, it will be relatively easy to recommend the truck that meets their needs.

Suspension Load Ratings

**Sierra 1500
Model TC15903
2WD Regular Cab Long Box**

	Front	Rear
Axles	3,150	3,750
Springs	3,150	3,686
Tires	1,903 (3,806)	1,903 (3,806)
Wheels	2,000 (4,000)	2,000 (4,000)
GAWR	3,150	3,686

Look at the load ratings in this example. Use the lowest-rated component when calculating capacity.

Wheel and tire ratings are generally the highest-rated components. As a result, they are no longer cited in the Online Order/Reference Guide. Instead, GMC light trucks are provided with tires and wheels that are **sufficient for the load rating** of the vehicle from the factory.

Note that the spring rating is for each pair of springs.

Our example shows that individual tire and wheel ratings must be doubled, because there are two on each axle. Or, in the case of a dual-rear wheel truck, the tire ratings would be multiplied by four.

Now, we'll examine major suspension designs and how they work.

Front Suspension Designs

- Independent
 - Short-and-long arm
 - MacPherson struts
 - Ford's Twin-I-Beam
- Non-independent
 - Beam axles

Light trucks have made a gradual transition from common and basic suspension types to more sophisticated designs. GMC is a leader in applying new technology where there are real customer benefits.


The most fundamental difference in designs is between independent and non-independent suspensions.

An independent suspension has a **separate component** for each side of the axle, allowing individual wheel motion, and reducing the weight of suspension components that must move to follow the surface. This is what allows a GMC front suspension to "walk" over bumps in the road.

A non-independent suspension consists of a solid axle between the left and right sides. Ford and Dodge heavy-duty pickups use these solid axles for the front suspensions of 4WD pickups. They provide a rougher ride and somewhat less steering precision. These designs are common on medium-duty and heavy-duty trucks, including the C4500 TopKick. Solid axles may be supported by leaf springs, or by coil springs with multiple links.

Front Suspension Designs

- Independent
 - Short-and-long arm
 - MacPherson struts
 - Ford's Twin-I-Beam
- Non-independent
 - Beam axles



All GMC light-duty trucks have short-and-long arm front suspensions for both 4WD and 2WD applications. Only GM dealers can make that statement.

The use of different-length arms on front suspension designs changes the camber of the front wheels during suspension motions, to help improve cornering ability. This design also helps reduce tire wear. These are also called *Double A-Arm*, *Double Wishbone* or *Unequal A-Arm* suspensions.

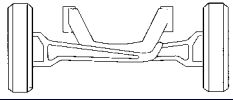
MacPherson struts are typically used on the front suspensions of passenger cars. They do a good job of controlling front tire alignment, but are not as well suited for heavy loads.

It's worth noting that among midsize vans, **only the GMC Safari** and its Chevrolet counterpart use a sturdy short-and-long arm front suspension design. The front-wheel-drive vans all use a strut-type front suspension.

The Dodge Sprinter also uses a strut-type front suspension, while the Savana has a heavy-duty short-and-long arm design, similar to what GMC has used for many years on its rugged pickups.

Front Suspension Designs

- Independent
 - Short-and-long arm
 - MacPherson struts
 - Ford's Twin-I-Beam
- Non-independent
 - Beam axles



Ford continues to use a Twin-I-Beam design on its E-Series vans and its Super Duty 2WD pickups.


That design uses two tapered I-beams, one for each side, holding the front wheels. It's a simple and rugged design, but as the front wheels move up and down, the camber changes, which can cause excessive front tire wear and imprecise steering.

If you have a used Ford on your lot for resale and the tires are not new, you can usually show customers the effects of this suspension design by pointing out the "cupping" wear on the front tires.

Most Ford trucks have transitioned away from this design for that reason.

Rear Suspension Designs

- Solid axles
 - Live axles
 - Beam axles
 - Leaf springs



By far the most common rear suspension on light-duty through heavy-duty trucks is a live (power-transmitting) solid axle suspended by parallel leaf springs.

This is also known as a Hotchkiss suspension. This type of suspension is used on the Canyon, Sierra, Savana, Safari and the ¾-ton Yukon XL 2500 Series. It is rugged and can handle the heaviest loads.

By using separate leaves in the springs (known as multileaf) that are compressed as the suspension is loaded, the spring rate can vary, providing both good load-carrying capacity and reasonable ride quality.

Rear Suspension Designs

- Multi-link coil spring
- Twist-beam
- Independent short-and-long arm



Virtually all GMC SUVs — Yukon, Yukon XL 1500, Yukon Denali, Yukon XL Denali, Envoy and Envoy XL — use a 5-link coil spring rear suspension.

This design provides excellent suspension compliance for ride quality, yet it retains a solid rear axle for load-carrying capability and durability. With this design, there is **never any rear alignment maintenance**.

Some front-wheel-drive midsize vans, such as the Chevrolet Uplander and Pontiac Montana SV6, use a twist-beam rear suspension. This design is space efficient, but it can't match the load-carrying capacity of a Safari.

Ford and Lincoln SUVs have introduced independent short-and-long arm rear suspensions. This design can lower the load floor slightly. However, it also **requires periodic alignment**, both customer time and cost factors that the GMC customer will never have to bear.

Springs

- Absorb energy
- Distribute sprung weight to axles
- Sprung weight
- Unsprung weight
- Spring capacity

Now, we come to another key suspension component — the springs.

They are designed to absorb energy and help dissipate the jolts to the truck as it travels on both rough and smoother surfaces.

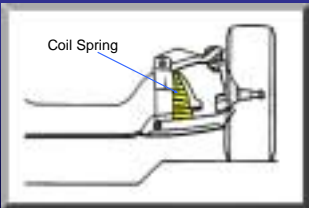
They also distribute sprung weight to the axles. Sprung weight is the weight of components supported by the springs (frame, engine, body, etc.).

Unsprung weight is the weight of components not supported by the springs, including the springs themselves, tires, wheels, axles and brakes.

Spring capacity at ground is the total weight (sprung plus unsprung) that will deflect the spring at the maximum normal amount.

There are three basic types of springs.

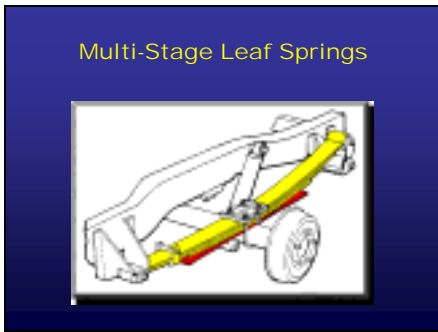
Coil Springs



The illustration depicts a coil spring. Since coil springs do not hold the axle in place like leaf springs, other components such as shock absorbers, stabilizer bars and the upper and lower control arms help control the motion of the front wheel.

Coil springs are found on most front suspensions and on rear suspensions where ride quality is a primary criterion (e.g., Envoy, Yukon, Yukon XL ½-ton).

Spring rate is primarily what determines the ride quality and load-carrying capacity. This is determined by the size of the wire used to build the coil spring, and how many spirals it has.



A single-stage leaf spring system has one spring rate. This results in a rough ride when a truck is unloaded.

Two-stage, multileaf rear springs can provide both good ride quality and good load-carrying capacity. When the truck is empty or lightly loaded, the longer leaves support the vehicle and provide a smooth ride. When the truck is heavily loaded, the long leaves flatten out and engage the shorter, stiffer leaves for maximum support.

Three-stage multileaf springs are used on Sierra Denali for the best ride quality whether the truck is empty, lightly loaded, moderately loaded or heavily loaded. This explains the excellent ride quality your customers will notice on the Sierra Denali, and gives them a reason to purchase this high-quality truck.

Three-stage multileaf rear springs are also used in certain heavy-duty applications, specifically the 3500 models. This provides the best ride when lightly loaded, yet the load capacity is adequate to carry very heavy loads.



On 4-wheel-drive and select 2-wheel-drive models, torsion bars are used in place of coil springs for the front suspension. The torsion bars run from the lower control arm to a frame crossmember. As the wheel moves up and down, the torsion bar twists and absorbs the impact.

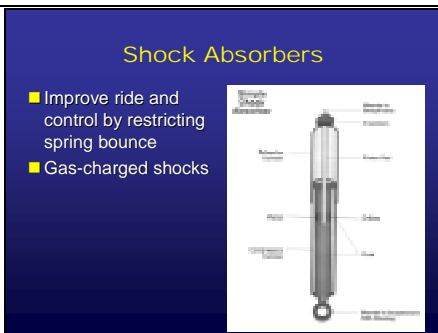
Torsion bars are especially advantageous on 4x4 applications for a variety of reasons.

One reason is that they allow more clearance for the front drive shafts.

The second reason is that they do not require tall spring towers to provide long wheel travel, which is important for an off-road vehicle that may be subjected to uneven terrain.

Third, they contribute to a relatively low step-in height, for easy entrance and exit.

The spring rate of a torsion bar, like that of the coil spring, is determined by the diameter of the spring.




In addition to springs, shock absorbers are used at each wheel to improve ride and control by restricting the suspension bounce caused by springs.

A shock absorber has a piston that pushes through a cylinder of hydraulic fluid, with holes allowing some fluid through the pistons. The size of the holes determines how stiff the shock absorber is.

Shock absorbers develop heat as they operate. This can cause the fluid to boil and become less effective, particularly on rough roads.

Gas-charged shock absorbers with a volume of nitrogen gas help keep the bubbles from forming at high temperatures, so the suspension remains controlled on rough surfaces.

Automatic Load Leveling



- Provides air assist shocks to maintain vehicle height when loaded
- Available on Envoy (G67)
- Included in Autoride Option (Z55) on:
 - Yukon, Yukon XL, and Yukon Denali XL

Automatic load leveling is a major convenience for customers and helps demonstrate that shock absorbers can do more than contribute to ride comfort.

Automatic load leveling shocks help maintain vehicle height when fully loaded and are included as a specific option (G67) on Envoy or as part of the Autoride Suspension (Z55) on Yukon, Yukon XL, Yukon Denali and Yukon XL Denali.

Air adjustable shocks automatically adjust the suspension height to maintain proper vehicle trim.

No action is required by the driver. Additional spring capacity is determined by the load, to maintain ride height.

This feature allows both a soft ride and a high load-carrying capacity.

It is a feature not found on most competitive vehicles.

This, together with the 5-link coil spring design of our SUVs, is the best response to customers who think that Ford's independent rear suspension is important.

But there is more to the story, as GMC continues to utilize technology to further improve suspension capabilities and enhance driver and passenger comfort and convenience.

Manual Ride Control

- Available on Sierra 1500 and 1500 HD pickups
- Driver adjustable
- Stiff or soft ride

Here's one example:

Sierra 1500 pickups and the Sierra 1500 HD are available with ZX3 Manual Ride Control suspension.

The driver can select a stiff ride for carrying loads or to improve handling, or a softer ride, since shock absorber damping is electronically adjusted. The shock absorber tubes on this suspension are orange-colored.

The Manual Ride Control is included with QUADRASTEER.

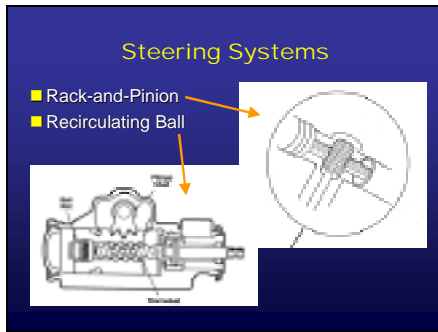
Autoride Suspension

- Bi-state variable shock damping
- Rear air-assisted load leveling
- Available on Yukon, Yukon XL
- Standard on Yukon Denali and Yukon XL Denali

Standard on Yukon Denali and Yukon XL Denali, and available on Yukon and Yukon XL, is Z55 Autoride suspension.

This design adjusts shock absorber damping automatically. It allows a smoother ride on rough surfaces and automatically stiffens shock absorber damping when needed to control wheel motion. When Tow/Haul mode is selected, these shock absorbers automatically are adjusted to the stiffer setting.

Z55 Autoride also includes the rear air-assisted load-leveling suspension. Like the Manual Ride Control suspension, trucks with the Z55 Autoride suspension also have orange-colored shock absorber tubes.



Two types of steering systems are used on GMC and other trucks.

Rack-and-pinion steering has been used on passenger cars for years. It is becoming increasingly common on light trucks for those who want a more passenger car-like feel.

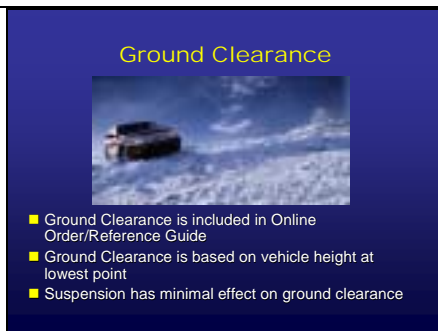
Rack-and-pinion steering uses a small pinion gear to turn a straight toothed rack. This rack is attached through tie-rods to the steering knuckles that turn the wheels. Rack-and-pinion steering provides precise steering feel and is a lightweight steering gear.

Recirculating ball steering is used on heavier duty trucks. It turns a rotating Pitman Shaft with a worm gear, using recirculating ball bearings between the gear teeth.

2WD Sierra 1500 pickups use rack-and-pinion steering. All other GMC models use a recirculating ball power steering system.

Either type of steering system can have variable effort, usually controlled by vehicle speed. These systems reduce steering effort at low speeds for easier maneuvering, while increasing steering effort at high speeds for increased steering feel and control.

“Steering ratio” is a ratio of how much the steering wheel must be moved to move the front wheels. A number like 15:1 indicates a faster ratio than 18:1 because the steering wheel would not have to move as much to turn the front wheels the same amount.



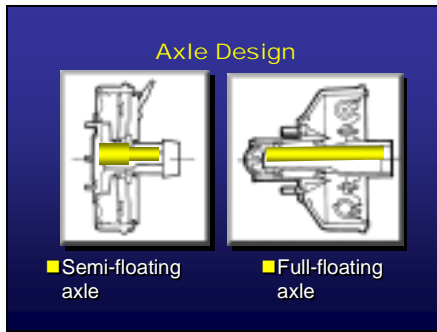
Frame and suspension design contribute to ground clearance, which can be a high customer priority, particularly in the selection of off-road vehicles. It also can come into play in cold weather areas.

The ground clearance dimension is included in the Online Order/Reference Guide in the dimensions for virtually all GMC Trucks.

Ground clearance is based on vehicle height at the lowest point. The typical low point of the vehicle from which ground clearance is measured is the axle housing, where the ring, pinion and differential gears are located.

Tire and wheel height has the most effect on ground clearance, since they can, in effect, raise the vehicle.

Competitive vehicles sometimes measure ground clearance from frame height, and this will make them appear to have an advantage. Ensure customers know that GM ground clearance measurements are “real world” when the subject is brought up.



Last, we come to rear axles and their contribution to vehicle performance.

On vehicles with rear-wheel drive (RWD), four-wheel drive (4WD) or all-wheel drive (AWD), the rear axle assembly performs three functions:

1. Helps support the weight of the vehicle
2. Carries and aligns the rear wheels and links the wheels to the suspension
3. Transmits power from the driveshaft to drive the rear wheels and moves the vehicle

There are two kinds of rear axles: full-floating and semi-floating. A semi-floating rear axle distributes the truck's load directly on the axle shafts.

With a full-floating rear axle, the weight is supported only by the axle housing. Full-floating axles are used on rear axles on some models at 8,600 lb. GVWR and above.

GMC RETAIL PROFESSIONALS TRUCK PRODUCT TRAINING

Now that you have completed this course, you should take the test. Go to the www.gmcommontraining.com website. After logging in, click on the "Testing" link under "Menu." Then click on "Product." Next look for this course, "Frames and Suspension" number B50FS.M5P, and click "Take Test."

Please photocopy, complete and return the Customer Satisfaction Survey for these Self-Study Materials, which is on the next page.

If you have any questions, please call Program Headquarters at 888-748-2687. At any time after the main menu starts, press prompt 3, and then press prompt 6.

Customer Satisfaction Survey
Self-Study Materials

We value your opinion on this course. Please take a few minutes to complete this evaluation, particularly noting any course improvements that might be made. **If a statement does not apply, leave it blank.**

Please circle your opinion of the following statements.

Strongly Disagree Disagree Somewhat Agree Agree Strongly Agree

Relevance/Value

- | | | | | | |
|---|---|---|---|---|---|
| 1. This course provides knowledge/skills useful to me now and/or in the future. | 1 | 2 | 3 | 4 | 5 |
| 2. This course met the stated objectives. | 1 | 2 | 3 | 4 | 5 |
| 3. I will recommend this course to others. | 1 | 2 | 3 | 4 | 5 |

Design

- | | | | | | |
|---|---|---|---|---|---|
| 4. The amount of material presented in this course is just right. | 1 | 2 | 3 | 4 | 5 |
| 5. The content is realistic and practical. | 1 | 2 | 3 | 4 | 5 |
| 6. The content is sequenced so that it is easily understood. | 1 | 2 | 3 | 4 | 5 |

Delivery

- | | | | | | |
|--|---|---|---|---|---|
| 7. These self-study materials are clear, effective and understandable. | 1 | 2 | 3 | 4 | 5 |
| 8. The content of this program was easy to follow and understand. | 1 | 2 | 3 | 4 | 5 |

Additional Comments

Please share any additional comments, positive or negative, you may have regarding course improvements.

Please fax this completed evaluation to Program Headquarters at 248-816-2314.

Name: _____ Title: _____

Dealership: _____ Dealer Code: _____ Phone: _____

You may also mail the evaluation to:

GM Product Training, Program Headquarters, MSS
1500 West Big Beaver Road, Troy, MI 48084-3541



Additional copies can be obtained by calling 1-888-748-2687, prompt 3, then prompt 6. **Information was correct at time of printing.**

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