



TROOP 219

TRAILER INFORMATION AND MAINTENANCE GUIDE

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By: Kelly Palmer

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INTRODUCTION

This Trailer Information and Maintenance Guide is designed to meet two objectives.

The first objective is to provide the Troop Quartermaster with that necessary information for understanding, maintaining and servicing the trailer system, thereby assuring that the trailer is in top possible condition prior to each use.

The second objective is to provide “how to” information for our volunteer trailer haulers to assure the best possible chance for a successful and safe trip each and every time.

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MAINTENANCE SERVICE SCHEDULE

Below is the recommended timeline for scheduled maintenance. Per use is by tower; 3, 6 and 12 Mo./K is performed by professional trailer service company only.

| <u>ITEM</u> | <u>FUNCTION REQUIRED</u> | <u>PER USE</u> | <u>3-MO. OR 3K MILES</u> | <u>6 MO. OR 6K MILES</u> | <u>12-MO. OR 12K MILES</u> |
|-----------------------------|---|--------------------|----------------------------------|----------------------------------|------------------------------------|
| Brakes and Trailer Lights | Test that they are operational at every use | X | | | |
| Breakaway System | Check battery charge and switch operation | X | | | |
| Tire Inflation | Inflate tires to mfg's. pressure specifications | X | | | |
| Brake Adjustment | Adjust to proper operating clearance | | X | | |
| Wheel Nuts And Bolts | Tighten to specified torque values | | X | | |
| Tire Condition | Inspect for cuts, wear, bulging, balance, etc. | | X | | |
| Brake Controller | Check for correct amperage and modulation | | | X | |
| Suspension Parts Torflex | Inspect for wear | | | X | |
| Wheels | Inspect for cracks, dents or distortions | | | X | |
| Brake Linings | Inspect for wear and contamination | | | | X |
| Brake Cylinders And Magnets | Check for leaks, wear and sticking | | | | X |
| Brake Lines | Inspect for cracks, leaks kinks | | | | X |
| Trailer Brake Wiring | Inspect wiring for bare, spots, frays, etc. | | | | X |
| Hub/Drum | Check for abnormal wear or scoring | | | | X |
| Wheel Bearings And Cups | Inspect for corrosion or wear. Clean and repack | | | | X |
| Seals | Inspect for leakage, replace if removed | | | | X |
| Axle Hangers | Inspect Welds | | | | X |

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TRAILER TOWING GUIDE

This brief guide should help you whether or not you are experienced with towing a trailer. Please follow these guidelines carefully, as they can help prevent serious accident and injury.

CAUTION: IF YOUR VEHICLE CANNOT INTERACT WITH THE TRAILER'S BRAKE SYSTEM AND/OR IS NOT DESIGNED TO TOW HEAVY LOADS YOU CANNOT TOW THIS TRAILER!!!

HOOKUP

Hooking up a trailer isn't difficult, but how you do it is important. Please follow these procedures:

1. Raise legs at back of trailer.
2. Using the tongue jack, raise the tongue of the trailer above the level of the hitch ball on your trailer hitch.
3. Remove tongue latch lock (bulldog coupler) and open the locking latch on the trailer tongue.
4. Back your tow vehicle into position under the locking latch.
5. Check hitch ball for wear and that it is tightly secured.
6. Make sure the hitch ball is lubricated with hitch lube.
7. Using the tongue jack, lower the tongue latch onto the ball hitch.
8. Close the locking latch, making sure the latch is completely seated (you should hear a distinct click) and secure the pin.
9. Raise the tongue jack up to maximum height so it doesn't drag the ground when you're underway.
10. Attach safety chains. **IMPORTANT**: criss-cross the chains beneath the tongue and hitch, but make sure there is equal slack in each chain and enough slack in both to permit the tow vehicle to turn at its sharpest radius.
11. Attach the trailer's brake-breakaway cable to the tow vehicle's hitch.
12. Plug in the 7-pin 12-volt electrical connector from the tow vehicle to the trailer for lights and brakes.
13. Remove trailer wheel chocks and wheel lock and stow them where you can get to them easily.
14. Inspect the following items before starting your trip:
 - Coupler and hitch
 - Tongue jack – make sure it's in the fully raised position
 - Safety chains
 - All lights, including turn signals and especially brake lights
 - Tire pressure (see below) (50 PSI)
 - The trailer should be towing in a level position - adjust hitch height if required.

ALL TRAILER EQUIPMENT SHOULD BE KEPT IN THE FRONT OF THE TRAILER BY THE SIDE DOOR FOR EASY ACCESS.

TIRE PRESSURE

Factory-recommended tire pressure is stamped on the side of each tire. **(T219 tires are radial and the COLD PSI should be 50 PSI)**. Check tire pressure **before** starting your trip **while tires are cold**.

IMPORTANT: Always inflate trailer tires to the maximum inflation indicated on the tire sidewall. Although tire pressure will increase as the tires heat up, they will still be under-inflated if they are not at the recommended pressure when they are cold. Once you are under way, **DO NOT release air pressure as the tires become hot.** If you do, the tires will be under-inflated, creating the risk of them overheating and blowing out. It's especially important that all four tires on the trailer are at equal pressure so the weight of the trailer is distributed evenly between all four tires. Otherwise, tire overheating and abnormal wear can occur.

CAUTION: Know the speed rating of the trailer tires and DO NOT exceed this speed under any circumstances.

!!!! Be sure the spare is inflated to about 60 PSI !!!

LOADING CARGO

Packing gear in your trailer requires serious consideration. All cargo should be distributed evenly **with the heaviest items stored in the lowest position over the axles or in front of the axles**. Heavy items must be secured to prevent weight shifts while traveling. Additional weight behind the axles should be kept to a minimum.

IMPORTANT: observe capacity rating to avoid handling problems.

WARNING: Never place heavy items at the rear of the trailer behind the axles. Weight behind the axle lightens the hitch weight and will magnify any sway that occurs when passing trucks or driving in gusty winds. **Excess weight (over the stated capacity rating) can cause severe sway that you may not be able to control.**

TOWING

1. While towing your trailer, you need to be aware of the extra weight behind your vehicle. Consider the following pointers while towing the trailer:
2. With the trailer attached, you will have slower acceleration and need more distance to stop – maybe as much as half the acceleration and double the distance to stop.
3. Ensure you have enough area at corners when turning, as wider turns are necessary. Use your turn signals early so drivers behind you have time to slow down.
4. When passing or changing lanes, remember to give enough space for the tow vehicle and the trailer. Carefully observe your trailer and traffic conditions at all times.

5. **WATCH YOUR REAR-VIEW AND SIDE-VIEW MIRRORS OFTEN.** When being passed by a large truck, bus or van, be prepared – your trailer and tow vehicle may sway violently. Try to anticipate this and begin correcting as the swaying starts. Do not over-correct.
6. When climbing or descending steep, long grades, use lower gears even before it seems necessary.
7. If your tow vehicle has overdrive, be careful that it doesn't shift in and out of overdrive too often, especially on hilly terrain or in windy conditions. Your transmission can be damaged. Instead, disengage the overdrive option and tow in the lower gear if necessary.
8. Drive slowly during wet or icy conditions to ensure better control of your vehicle and trailer.
9. **Use your brakes smoothly and evenly.** If you are decelerating and the trailer starts to sway violently, speed up again (which should stop the swaying immediately) and then try it again, but take longer to slow down. **IMPORTANT:** Give yourself at least twice to three times as much space to stop as you normally would.

UNHOOKING

Follow the “Hookup” instructions in reverse order. **IMPORTANT:**

1. Put wheel chocks in place before unhooking the trailer, especially on a hill or uneven ground.
2. Make sure no one else is standing near the trailer (front, back or sides) when you unhook.
3. Make sure to unhook the locking latch, 12-volt connector, safety chains and brake-breakaway cable before moving your tow vehicle out from under the trailer tongue.

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TRAILER EQUIPMENT LIST

Below is a detail of the specific key assignments/locations and equipment location, on or within, the trailer.

| <u>Item</u> | <u>Location</u> | <u>Phone</u> | |
|------------------------------------|---|---------------------------|---------------------------------|
| • Trailer Keys | SM – Calvin | <u>Hm</u> 972.964.2620 | <u>Wk</u> 972.690.1122 x 107 |
| | QM – Tom Thoma | 972.519.0957 | 972.813.5146 |
| | Sr. ASM – Ron Armstrong | 972.378.5800 | 972.788.9242 |
| | ASM's - Kelly Palmer | 972.309.0959 | 972.716.7198 |
| | Rich Black | 972.931.3353 | 972.3426680 |
| | Norm Thompson | 972.208.3151 | 214.859.1858 |
| | Mike Volpe | 972.377.9102 | 469.789.0063 |
| | • Ball-hitch lock | On hitch, or in trailer | |
| • Ball-hitch lock key | Inside side door, on chain | | |
| • Wheel Lock | Left rear tire | | |
| • Wheel Lock Key | Inside side door, on chain | | |
| • Wheel Chucks – Two | 1 for forward movement 1 for backward movement | | |
| • Tire Tool | Inside side door | | |
| • Trailer-Aid/Block of Wood | Inside side door | | |
| • Air Compressor | Inside side door | | |
| • Ball Lube | Inside side door | | |
| • Volt Meter | Inside side door | | |

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TRAILER SPECIFICATIONS

| | |
|------------------------------------|-----------------------------|
| MODEL | Wells Cargo TW122 |
| VIN | 1WC200E2852053380 |
| Year Manufactured | 9/15/04 |
| Year Purchased | 2005 |
| County Registration Date | Annually - November |
| | |
| Weight Capacity Parameters: | |
| GVWR (Whole Trailer) | 7,700 Lbs. |
| GAWR (Each Axle) | 3,500 Lbs. |
| Curb Weight (Empty Trailer) | 1,615 Lbs. |
| Ave. Payload Capacity | 6,085 Lbs. |
| | |
| Hitch (Tongue) Weight | 242 lbs. 10-15% Curb Weight |
| Hitch Ball Size | 2 5/16" |
| | |
| Vehicle Tow Capacity: | Sample Calculation: |
| Vehicle Rating | 5,000 Lbs. |
| Trailer Weight (Empty) | (1,615 Lbs.) |
| Max Gear Load | 3,385 Lbs. |
| | |
| Brake Parameters: | |
| 4-Wheel Electric Brakes | Yes |
| Breakaway System | Yes - With Wet Cell Battery |
| Brake Control Interface | Required for Towing Vehicle |
| | |
| Tire/Axle Parameters: | |
| Tire Size | 15" |
| Tire Type | Radial; ST205/75R15C |
| Tire Inflation Required | 50 PSI COLD |
| Tire Load Range | C – High Speed |
| Axles | Tandem |
| Suspension | Torflex |

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TRAILER EDUCATIONAL INFORMATION

GENERAL Q & A:

1. How much extra room do I need when turning with a trailer?

It's difficult to give an exact distance since it depends on the length of the trailer. With a typical boat trailer, making left turns isn't a big deal. But for right turns, you'll want to compensate at least some, initially, until you can determine how much space you need. With longer trailers, you'll need to "go wide" to some extent like big rigs do so you don't hit a curb with the trailer while in the middle of a right turn. Think, for example, of how a big rig often makes right turns at least one lane over to the left in smaller intersections so the trailer doesn't hit the curb (or a sign or stoplight) as it travels through the turn. You need to apply the same logic when towing a trailer, even though your trailer isn't nearly as long.

2. How much does the typical 3500-pound trailer affect braking distances?

Obviously, the added weight of any trailer is going to affect braking distances significantly in an emergency situation. It's difficult to pinpoint exact distances, since much of it depends on factors like if the trailer is equipped with brakes and how much tongue weight there is. Testing is not commonly performed to determine braking distances with trailers in tow. But, the best way to be safe is to avoid emergencies in the first place. Allow as much space as possible between you and those in front of you. A good place to start is to double the standard "two-second rule" when following behind another vehicle. Allow double the amount of space between you and the vehicle in front of you when towing a trailer. And the heavier the load, the more space you should allow.

3. Why are body-on-frame vehicle designs better for towing than unibody vehicles?

Part of the reason is that you can attach the receiver part of the hitch directly to the frame of the vehicle. On a vehicle with unibody construction, there's not as solid a place to bolt the hitch to the vehicle. With a body-on-frame design you're pulling the trailer with the actual frame of the truck or SUV rather than just having the trailer attached to the body of the vehicle.

4. What can happen if I exceed the tow rating for my vehicle?

The tow rating of any vehicle is based on numerous factors. The best advice is *do not* exceed the tow rating for any vehicle. If you do, you'll be overloading the suspension, overextending safe braking distances, and experience further reduced and possibly unsafe passing ability. You'll also overextend brake component capacities and, in some situations, encounter premature brake fade. Furthermore, you won't be doing any favors to the engine and drivetrain, and the chance of eventual transmission failure is also possible.

5. What should I do if the trailer starts to sway at a high speed - i.e. if "the tail starts wagging the dog," so to speak?

If you get to a point where you experience trailer sway, it's likely that something else is wrong. The problem could be insufficient tongue weight. If you have a travel trailer, shift heavier items to the front and lighter ones to the rear. With a boat or car trailer, move the vehicle forward. There are also a number of sway-control devices available to stop this condition before it begins. If this condition exists, the trailer and tow vehicle haven't been set up properly. Whatever the case, the first thing is to avoid panic. It's also likely this condition will occur gradually. Don't ignore any first signs of trailer sway. But if it starts, slow down by taking your foot

off the accelerator. Let vehicle speed decrease but *do not* put your foot on the brake pedal, which can make the situation worse. Once you're down to a safe speed, carefully apply the brakes and stop.

You should then readjust the load or determine what else might be causing this condition.

6. How do I back up with a trailer attached?

If you've never backed up with a trailer, the first thing we'd recommend is to go to an empty parking lot or somewhere else with lots of space and practice to see what happens when you back up with the trailer attached. Also, don't rely on rearview mirrors. Turn behind and look at the trailer. Basically, when you turn the wheels of the tow vehicle to left, the trailer will go to the right; turn the wheels to the right and the trailer will go left. To control the direction of the trailer while backing up, you need to keep this "reverse action" concept in mind. Oftentimes, you'll also have to pull forward and start over again to position the trailer exactly where you want it. Small and shorter trailers are often more difficult as they react much more quickly to steering wheel input. If possible, it's also very helpful to have a spotter watching at the back of the trailer. If nothing else, they can yell "stop" before you back into something and cause damage to the trailer or any other item. Also, don't forget to look at the front of the tow vehicle, too, because when you turn while backing up, the front of the vehicle could possibly swing out far enough to hit something.

7. When I attach a trailer to my tow vehicle, the tow vehicle sags significantly. What can I do to keep that from happening?

Most trucks are set up to tow and haul, so their suspension probably won't sag when a trailer is attached. Passenger cars and some SUVs have softer suspensions and may need some help. A weight-distributing hitch should be used in these instances. It helps to evenly distribute the weight between the front and rear axles of the tow vehicle. The spring bars of a weight distributing hitch work similarly to the handles of a wheelbarrow, lifting on the back of the tow vehicle and shifting the weight forward. Airbags or air shocks can also help the rear suspension when towing. When in doubt, seek the help of a qualified RV shop.

8. Some minivans such as the Chevy Venture are rated to tow 3,500 pounds. Are front-wheel-drive vehicles OK for towing? How about all-wheel-drive? What are the benefits and detriments of each type of system?

As long as you don't exceed the tow rating of the vehicle, any front-wheel-drive car, SUV or minivan will tow fine. The main consideration with using a front-wheel-drive vehicle as a tow rig is the fact there will be less weight over the drive wheels, which could be a factor in such situations as towing up a steep and wet boat ramp. An all-wheel- or four-wheel-drive vehicle for towing also works fine, but keep in mind that an all- or four-wheel-drive version of any vehicle will usually have a lower tow rating than the same vehicle in a two-wheel-drive version. Obviously, you don't need an all-wheel-drive vehicle or a 4x4 truck for towing a trailer on the highway. If you're thinking about a vehicle purchase and towing is a large reason for buying that vehicle, then a rear-wheel-drive truck or SUV is the best way to go. All- or four-wheel-drive vehicles will tow just as well, but the vehicle will use more gas due to the added weight of the components.

9. If a tire on my trailer suffers a blowout, are there any differences to changing a trailer tire from a vehicle tire?

Not really. Any safety precautions you use to change a tire on a car apply to the trailer, too. Chock the opposite side wheel, use a heavy enough jack to support the trailer's weight and loosen the lug nuts some first before raising the wheel off the ground. That way, the wheel won't spin while it's in the air and you're trying to loosen the lug nuts.

10. Do I need those extra-wide mirrors for towing?

That depends on the width of the trailer. For the average boat or car trailer, you'll likely be able to see down the side of the vehicle and trailer with the factory-equipped side-view mirrors. But for wider trailers, you'll need side-view mirrors that stick out far enough so you see down the side of the trailer. For example, a narrower

SUV like an Explorer towing a wider camping trailer might need to be equipped with aftermarket towing mirrors that match the width of the trailer so the driver can see down both sides. In addition, it's illegal to tow without mirrors that don't allow the driver to see down the entire length of the vehicle and trailer. Check your state's laws for specific guidelines regarding towing mirrors.

11. Current full-size Chevy/GMC trucks have a tow/haul mode for the transmission. How does it work and why don't other half- and three-quarter-ton pickups have this feature?

The tow/haul mode found in the current-generation Chevy Silverado and GMC Sierra pickups delays upshifts for more effective towing and hauling. The higher upshift speeds and firmer gear changes are due to an increase in line pressure. While other pickups don't have this specific feature controlled by a button on the end of the shifter, we took a look in a 2000 Ford F-150 owner's manual and discovered a similar type of function. Although there isn't a specific control for it, Ford's "adaptive learning strategy" means the transmission "knows" you're carrying a load or towing a trailer and adjusts the transmission's shifting schedule accordingly.

12. What's the best way to ascend a mountain when towing? What about descending?

In general, you want to keep things steady and consistent. That means when you're going uphill you don't want the transmission hunting between gears, such as third and fourth. Depending on the weight of the load and the grade of the hill, you'll likely want to hold the transmission in third gear (locking out overdrive), which will also keep the engine in the range where it makes the most torque. Keeping the transmission out of top gear will also prevent you from lugging the engine or necessitating undesired downshifts when you accelerate out of turns at slow speeds. It's the same for a manual transmission. Driving in the next lower gear will keep the engine in its best operating range. Going downhill, you want to use a combination of the engine and the brakes to keep your speeds safe. Don't ride the brakes too much and get them too hot. Downshift to a lower gear and use the engine as a brake on steeper hills and then, when needed, use the brakes sparingly to slow down from there. When the hill levels off a bit, you can upshift to the next gear and keep your frequency of brake use about the same. It's all a give-and-take in relation to the grade of the hill, the weight of your load and the gear ratios in the transmission, which all need to be considered when it comes to keeping your speeds safe going up and down hills.

Changing A Flat Tire On A Tandem Axle Trailer:

Before you leave on a trip you should first make sure you have everything with you for changing a flat. Tire iron, breaker-bar, spare tire(s), Trailer Aid jack, blocks of wood.

It is also a good idea to do a practice run tire change at home under non-stressful circumstances too.



Get the spare out, check for proper PSI and then started loosening the nuts on the flat tire. After loose, pull the good tire onto the trailer-aid or block of wood.



Finishing removing the nuts from the flat tire.

Before you leave on a trip you should first make sure you have everything with you for changing a flat- a tire iron, breaker-bar, spare tire(s), Trailer Aid jack, blocks of wood.

It is also a good idea to do a practice run tire change at home under non-stressful circumstances too. You may have a decorative cover over your lug-nuts and if so should know how to remove it. You'll note that my trailer no longer has any decorative covers!

If you are driving and get a blowout - pull over as far away from traffic as possible and turn on your emergency flashers. If it's dark or there is no safe place to pull over try to limp along to the next exit or a wider area so that you can change the tire safely.

- 1) Remove your spare tire and ensure that the bolt attachment pattern on the spare is the same as the tire you are replacing and that it has air in it - this is something you should check before every single trip.
- 2) Use the tire iron to slightly loosen the nuts on the affected tire before driving the trailer up onto the trailer jack. The weight of the trailer on the flat tire will make easier to slightly loosen the nuts without the tire rotating. It is good to have a breaker-bar with you to help get the nuts started.
- 3) Drive the trailer up onto the Trailer Aid jack (blocks of wood work too, as would a large smooth rock). Once you have done this, lock your emergency break and chock the

other wheels on the trailer and don't get underneath anything - you don't want anything rolling or moving and squashing you.

4) Now that the tire is up on the Trailer Aid jack, loosen the nuts completely and remove them (be sure to keep them all together). Pull the tire and wheel straight out from the bolts and set them aside.

5) Mount the spare tire onto the bolts that are exposed. Use your foot or a piece of wood to help lift it up high enough to get it on there. Spin all the nuts loosely onto the bolts to hold the tire in place.



Tightening the nuts in a star pattern –

Once the trailer is backed off of the Trailer Aid they'll be tightened again.

6) Use the tire iron to tighten the nuts a few spins at a time in an alternating star pattern. This will ensure an even tightening of the wheel onto the axle. Tighten as far as possible until the wheel starts to rotate.

7) Move the trailer off the Trailer Aid jack so that the tire is in contact with the ground. Do a final tightening of every nut, as tight as you can.

8) Put your spare away. If you got the flat due to a blowout check to see if there was any additional damage like to your wiring or if something may be bent in such a way as to cause a problem.

When you get to your next stop it's a good idea to check the tightness of your nuts again and make sure everything is good and secure and have somebody help you check to make sure all of your lights are working properly. Remember to practice good trailer maintenance and always check the tread wear and air pressures on your tires prior to every trip.

Additional Information