UNITED STATES MARINE CORPS
Logistics Operations School
Marine Corps Combat Service Support Schools
Training Command
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AOM 6409

STUDENT OUTLINE

MAINTAIN HMMWVA2 TIRE-WHEEL ASSEMBLY

LEARNING OBJECTIVES:

1. Terminal Learning Objective: Given a HMMWVA2, TM 9-2320-280-20-2, tools, shop supplies, and replacement parts, perform organizational maintenance on the tire-wheel assembly, per the reference. (6.4.17)

2. Enabling Learning Objectives: Given a HMMWVA2, TM 9-2320-280-20-2, tools, shop supplies, and replacement parts, per the reference:

a. Remove tire-wheel assembly. (6.4.17a)

b. Disassemble tire-wheel assembly. (6.4.17b)

c. Inspect tire-wheel assembly. (6.4.17c)

d. Assemble tire-wheel assembly. (6.4.17d)

e. Balance tire-wheel assembly. (6.4.17e)

f. Install tire-wheel assembly. (6.4.17f)

OUTLINE

1. INTRODUCTION TO THE HMMWVA2 TIRE-WHEEL ASSEMBLY

a. Operation. The HMMWVA2 is equipped with four tire-wheel assemblies. A runflat device located inside each tire permits continued operation of the vehicle under emergency conditions after the loss of air pressure in one or more tires.

b. Radial Type Tire.

(1) Radial tires as illustrated, are constructed with casing plies perpendicular to the tread direction, with several layers of tread-reinforcing plies of steel and fabric under the tread area. This construction permits flexing of the tire with a minimum of tread distortion, better traction, and a softer ride.

(2) Never mix radial tires and bias-ply tires on the same axle. If radial tires are used in combination with bias-ply tires, the radial tires must be placed on

the rear axle only. Operating a bias-ply and a radial tire on the same axle may cause injury to personnel and equipment damage.

(3) As you can see on the illustration, a tire size designator is located on the sidewall. Note that the radial tire is thirty-seven inches in diameter and the bias ply is thirty-six inches in diameter. There is also a noticeable tread difference between the radial and bias ply tire.

(4) The radial tire is mounted on a multi-piece wheel assembly and consists of the following components:

(a) An outer rim, twelve wheel nuts, and a valve stem.

(b) A one-piece rubber runflat device.

(c) An "O" ring.

(d) An inner rim to which twelve rim studs are attached.

2. SERVICE THE TIRE-WHEEL ASSEMBLY

a. Remove the Tire-Wheel Assembly.

(1) Park the vehicle on a level surface.

(2) Make the vehicle stationary. Apply the parking brake and chock the wheel on the opposite corner, front or rear, from the wheel to be removed.

(3) To remove a wheel, place a jack under the lower control arm next to the tire to be removed.

(4) Before raising the vehicle, loosen lug nuts that secure the wheel to the geared hub. There are two sets of nuts on the outside of the wheel. The inner circle of nuts are lug nuts. Never loosen outer circle of nuts; they secure the two halves of the wheel assembly together. Loosen lug nuts by turning them counter-clockwise. Do not remove them.

(5) Raise the vehicle with a jack until a stand can be placed under the flat side of the frame to support the vehicle.

(6) After a stand has been placed under the flat portion of the frame rails, lower the jack until the weight of the vehicle is supported by the stand and the tire is off the ground.

(7) Remove eight lug nuts that you loosened prior to raising the vehicle.

(8) Remove tire and wheel assembly by lifting slightly to keep the wheel from damaging treads on the wheel studs.

b. Disassemble the Tire-Wheel Assembly. Do not use a tire machine to break down this tire because of the runflat device inside.

(1) To remove air, unscrew the valve cap, and insert it into the valve stem until the slotted end is fully seated. Turn the valve cap counterclockwise and unscrew the valve core. Use extreme caution when removing the valve core. It is under pressure and could become a projectile and cause serious injury to yourself or other bystanders. When the tire is fully deflated, place wheel assembly flat on the floor with the valve stem facing up.

(2) The wheel assembly is made with two parts bolted together. In order to remove the tire from the wheel, we must first remove twelve locknuts to separate two halves of the wheel assembly. If for any reason you should hear air escaping, stop and allow all air to escape.

(3) Remove outer wheel half from the tire. Never attempt to separate wheel halves by inflating the tire with locknuts removed. The wheel assembly will separate under great pressure and could cause serious injuries or death to you or other Marines in the area. Use a tire spoon and mallet to break the tire bead.

(4) Remove inner half of the wheel from the tire and you will find a rubber "O" ring seal. This "O" ring seal must be cut in half and thrown away to keep anyone from trying to reuse it. A new "O" ring seal must be installed each time you reassemble a tire and wheel.

(5) Remove runflat device by positioning the compressor on the runflat, insure that the compressor hex drive is facing up, and the strap is centered around the runflat device.

(6) Compress the runflat using a compressor, it may be necessary to use a tire spoon and tire soap to remove the runflat.

(7) Remove the runflat compressor handle from the assembly, and remove runflat from the tire.

(8) Remove the runflat compressor from the runflat device by reinstalling the handle on the assembly and rotating it counterclockwise to loosen the compressor.

(9) Use a clip claw hammer to remove the balance weights from the rim halves; discard the weights.

c. Inspect and Clean Components. Do not reuse a tire which has been runflat without thoroughly inspecting it for damage.

(1) Inspect inside of the tire for cord or belt separation and inner liner damage.

(2) Check for protruding objects inside the tire which may not be visible from the outside. Do not run your hands around the inside of the tire, in most cases any objects puncturing the tire will be sharp and could cut your hand. Use a rag and slowly run it around the inside of the tire once in each direction. It should catch on any protruding objects instead of your hand.

(3) Check tire tread for unusual wear and check tread depth. When the tread is worn to a certain point, you will see wear bars appear between the tread.

The tread should not be allowed to wear below 3/32 of an inch or the wear bars that are spaced around the tire. This is an indication that the tire needs to be replaced as soon as possible.

(4) Inspect runflat for splitting, wear, or excessive chafing. Replace the runflat if it is damaged.

(5) Clean dirt, and foreign material from the runflat with soap and allow to air dry.

(6) Use a wire brush to clean the wheel studs. Clean all rust and dirt from the wheel halves. Make sure the "O" ring sealing surfaces and pressure relief grooves on rim halves are smooth and clean. Insure wheel halves are not bent, rusted, pitted, or have loose studs.

(7) Inspect the valve stem to make sure it is not cut, bent, or loose; if it is, replace it so the tire will not lose air when reassembled.

d. Assemble the Tire-Wheel Assembly

(1) Position compressor on the runflat so that the compressor is facing up and the strap is centered.

(2) Compress runflat by rotating the handle assembly in a clockwise direction.

(3) Stand the tire up and lubricate bead with tire soap.

(4) Remove compressor handle assembly from the runflat compressor and insert runflat, compressor side first as far as possible into the tire.

(5) Lay the tire flat on protruding runflat side and loosen the compressor, runflat should insert itself inside tire. If not, repeat the procedures or use a tire spoon to assist in installation.

(6) Turn compressor handle counterclockwise to loosen the compressed runflat.

(7) Ensure the longer lip of the runflat faces the inner rim and square cut edge of the runflat spacer butts up against the flat side of the runflat.

(8) Before installing tire on the inner rim half, inspect tire side walls for a paint dot, you should install the tire so the paint dot will be 180 degrees from the valve stem when the outer rim half is installed. If there is no paint dot present, proceed with the tire assembly.

(9) Center runflat in the tire, and with an assistant, carefully lower the tire over inner rim half. Ensure the runflat is not binding on flat portion of the inner rim half.

(10) Lubricate O-ring seal with tire soap and install O-ring in groove on top of inner rim around the studs, ensure O-ring is not twisted and uniformly positioned in the groove. Do not over stretch the O-ring.

(11) If valve bore and insert were removed install insert, O-ring, and locknut on outer rim and apply sealing compound to the valve bore insert. Tighten locknuts 40 to 60 inch-pounds. Tighten valve bore 25 to 30 foot-pounds. Make sure the O-ring seal was not disturbed.

(12) Next torque the locknuts in sequence to 85 foot-pounds, torque them again in the same sequence to 125 foot-pounds.

(13) Check wheel assembly for gaps at each stud, with a 0.0015 in. thickness gauge to detect gaps. If gaps are detected, disassemble and reassemble wheel assembly then recheck for gaps. If gaps are greater than 0.0015 remain, replace the outer rim half.

(14) Insert valve core into the valve stem and tighten with the valve cap.

(15) When we inflate any tire, it must be placed inside of an approved tire inflation cage. Keep your hands and arms outside the cage at all times inflate the tires to 25 psi.

(16) Check the tire for leaks by pouring a small amount of soapy solution around the rim and tire on both sides with the tire laying flat. Pour a small amount around the valve stem and core to look for bubbles which would indicate a leak.

3. BALANCE THE HMMWVA2 TIRE-WHEEL ASSEMBLY

a. Prepare the Tire-Wheel Assembly for Balancing. Prepare the tire-wheel assembly for balancing by removing existing wheel weights and cleaning the tire and wheel. Foreign material on the tire and wheel can have an adverse effect on balancing and new adhesive weights will not adhere properly to a wheel that is not clean.

b. Balance the Tire-Wheel Assembly

(1) Using the leveling legs, center the bubble on the cross hairs.

(2) Next mount tire and wheel on the balancer outside face up. Place valve stem behind the black pointer of the bubble. The wheel must be centered on the balancer using lug nut mounting holes. Foot pedal on the balancer must be in the off position.

(3) Turn balancer on by using the foot pedal.

(4) Locate and mark light spot on the tire. Working from light spot on front of the tire, mark rear of the tire.

(5) Add balancing weights in six ounce increments to the center of the light spot between wheel and clamp ring, until weight required to balance the tire-wheel assembly is determined. Do not permanently attach weights at this time.

(6) Record total weight and remove wheel and rim from the balancer.

(7) Split, total weight 50/50 between inner and outer wheel edge of wheel rim, If more than two weights are used, stagger the weights.

(8) Center weight clips on light spot and attach to the rim using a clip claw hammer.

(9) If adhesive type weights are used, temporarily attach a six ounce weight to the center of the light spot between wheel and clamp ring with tape until weight required to balance the tire is met or exceeded.

(10) Equally remove the weights in 1/2 oz. increments from each side of the light spot, until tire and wheel is properly balanced. Record amount of weights used and remove tire and wheel from the balancer.

(11) Working from the light spot on the front side of the tire, mark the rear and inside of the wheel for light spot identification.

(12) Attach weights inside the wheel.

(13) Remount tire on balancer to verify wheel balanced.

(14) Remove wheel from balancer.

c. Install the Tire-Wheel Assembly

(1) Raise tire and wheel and guide it over the hub studs carefully to avoid damaging the treads.

(2) Install lug nuts and finger tighten until full engagement. The wheel should be seated evenly on the hub.

d. Lower the Vehicle

(1) Raise the vehicle high enough to remove the jack stand from under the frame, lower and remove the jack.

(2) Tighten lug nuts in proper sequence with a torque wrench according to torque specifications in the TM.

REFERENCE:

TM 9-2320-280-20-2