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Logistics Operations School
Marine Corps Combat Service Support Schools
Training Command
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AIM 5301

STUDENT OUTLINE

REPAIR M998 GEARED HUB

GENERAL KNOWLEDGE: This lesson will provide the background information that is required for a mechanic to effectively perform intermediate maintenance on the M998 vehicle's geared hub assembly. The classroom presentation is controlled to provide the following information:

1. An introduction to and the principles of operation of the geared hub assembly.
2. Identification and description of the geared hub assembly.
3. Intermediate maintenance responsibilities for the geared hub assembly.

TERMINAL LEARNING OBJECTIVE: Given a M998 Series vehicle geared hub assembly, the required tools, shop supplies, repair parts, and TM 9-2320-280-34, per information contained in the reference, repair the geared hub assembly. (5.3.1)

ENABLING LEARNING OBJECTIVES: Given a M998 Series vehicle geared hub assembly, the required tools, shop supplies, repair parts, and TM 9-2320-280-34, per information contained in the reference:

1. disassemble the geared hub assembly, (5.3.1a)
2. inspect the disassembled components for serviceability, (5.3.1b)
3. repair or replace the unserviceable components, and (5.3.1c)

4. assemble the geared hub assembly from serviceable components. (5.3.1d)

OUTLINE

1. INTRODUCTION AND THE PRINCIPLES OF OPERATION OF THE GEARED HUB ASSEMBLY

a. The geared hub assembly is the final drive component and serves as the mounting point for the tire-wheel assembly. The dropped geared hub extends HMMWV ground clearance to 16 inches.

b. The axle halfshaft provides torque to the drive gear from the differential assembly.

c. The geared hub utilizes a drive gear, a driven gear and an output shaft or wheel spindle to transfer torque to the wheel assembly.

d. The driven gear is splined to the wheel spindle and is driven by the drive gear which, in turn, is driven by the axle halfshaft. Both gears (drive and driven) are enclosed in the geared hub case. The front tie-rod is connected to the geared hub steering arm cover. On the rear suspension the radius rod extends from the frame to the geared hub steering arm cover.

e. The geared hub provides a 1.92:1 reduction to increase torque to the tire-wheel assembly. Because of this torque reduction at the wheel end, smaller differentials, brake assemblies and halfshafts can be utilized; resulting in a lighter, more cost-effective drive train.

f. The geared hub assembly is interchangeable from corner to corner.

2. IDENTIFICATION AND DESCRIPTION OF THE COMPONENTS OF THE GEARED HUB ASSEMBLY

a. The components of the geared hub assembly are:

- (1) geared hub case,
- (2) drive gear retainer and shims,
- (3) input seal,

- (4) drive gear,
- (5) drive gear bearings, inner and outer,
- (6) halfshaft retaining washer,
- (7) wheel spindle,
- (8) spindle bearings, inner and outer,
- (9) spacers, spindle, inner and outer,
- (10) output seal,
- (11) locknut, lockwasher and washer,
- (12) steering arm cover,
- (13) case side cover, and
- (14) driven gear.

b. The drive gear and driven gear must be replaced as a set. All other parts may be replaced individually.

3. INTERMEDIATE MAINTENANCE RESPONSIBILITIES FOR THE GEARED HUB ASSEMBLY

a. As intermediate maintenance mechanics, you will be required to disassemble and reassemble the geared hub assembly. You will also be required to inspect, repair or replace all components of the assembly.

b. Disassemble Geared Hub

(1) Position the geared hub with the spindle supporting the geared hub.

(2) Remove the four capscrews and washers securing the side cover to the geared hub and remove the side cover.

(3) Mount a dial indicator on the geared hub and index the indicator to register from one drive gear tooth. Move the drive gear back and forth while holding the driven gear stationary to read backlash. If the backlash between the drive

and driven gears is more than 0.018 of an inch, both gears must be replaced.

STOP! Have the instructor check your work.

(4) Remove the four capscrews and washers securing the steering arm cover to the geared hub and remove the steering arm cover.

(5) Bend the tab on the lockwasher away from the locknut.

(6) Using the locknut wrench, remove the locknut, lockwasher, and washer from the spindle.

NOTE: It may be necessary to lightly tap threaded end of the spindle to release it from the inner spindle bearing.

(7) Lift the geared hub case off the spindle.

(8) Remove the inner bearing, inner bearing spacer, and driven gear from the geared hub case.

(9) Remove the outer bearing spacer from the spindle. Remove the outer bearing only if it is damaged.

(10) Remove the four capscrews and washers that secure the drive gear retained to the geared hub.

(11) Remove the drive gear retainer and shim gaskets.

(12) Turn the geared hub case on its side. Remove the bearing cup, bearings and drive gear as an assembly, from the geared hub case. The halfshaft retaining washer may fall out of the drive gear into the geared hub case. Remove the bearings from the drive gear only if they are damaged.

(13) Remove the halfshaft retaining washer from inside the drive gear or the geared hub case.

(14) Remove the spindle seal from the geared hub case. Discard seal.

(15) Remove the input seal from the drive gear retainer. Discard seal.

STOP! Have the instructor check your work.

c. Inspect Geared Hub Components for Serviceability

NOTE: Clean all geared hub components in accordance with para. 2-9 of TM 9-2320-280-34. For general inspection instructions, refer to para. 2-10 of TM 9-2320-34.

(1) Inspect the splines and gear teeth on the drive gear and driven gear for damage. If damaged, the drive gear and driven gear must be replaced as a set.

(2) Inspect the spindle for damage. Inspect for rough or corroded sealing surface. Replace the spindle if damaged or sealing surface is rough or corroded.

(3) Inspect all bearings and bearing races for damage. Replace the bearing and its race as a set if either is damaged.

(4) Inspect the steering arm cover for damage. Replace if damaged.

(5) Inspect the geared hub case and all threaded holes for damage. Repair any damaged holes using thread repair inserts. Replace geared hub assembly if geared hub is damaged.

STOP! Have the instructor check your work.

d. Assemble the Geared Hub Assembly

NOTE: Coat all internal parts with lubrication oil.

(1) Make sure the radius on the outer diameter of the input seal faces inside the drive gear retainer and, using a driver handle and spindle seal installer, install the spindle seal in the geared hub case.

(2) Using the input seal installer and driver handle, install input seal in the drive gear retainer.

(3) Install the halfshaft retaining washer in the shallow end of the drive gear.

(4) Turn the geared hub case onto its side.

(5) Install the drive gear and inboard bearing cup in the geared hub case.

(6) Apply sealing compound to the capscrews. Install the shim gaskets and drive gear retainer on the geared hub case. Secure with four washers and capscrews. Tighten capscrews to 30 ± 5 foot-pounds.

(7) Mount a dial indicator on the geared hub and index the indicator to register on the end of the drive gear.

(8) Move the drive gear up and down to read end play. End play should be 0.001-0.006 of an inch. If end play is incorrect, add or subtract shim gaskets and recheck end play.

STOP! Have the instructor check your work.

(9) Install the driven gear and bearing spacer in the geared hub case.

(10) Install the outer bearing spacer on the spindle.

(11) Have an assistant hold the spindle and lower the geared hub case onto the spindle, and align the splines on the driven gear with the splines on the spindle. Make sure the outer spindle bearing seats in the bearing cup.

(12) Install the inner bearing, washer, lockwasher, and locknut, with beveled side down, on the spindle.

(13) Using the locknut wrench, tighten the locknut to 40 foot-pounds while rotating the geared hub back and forth to seat the bearings.

(14) Loosen and retighten the locknut to 25 foot-pounds.

(15) Determine which locktab on the lockwasher aligns with a slot in the locknut. Bend locktab into the slot on the locknut.

(16) Apply flange sealant to the steering arm cover and install the steering arm cover on the geared hub.

(17) Apply sealing compound to the capscrews. Install the four capscrews and washers securing the steering arm cover to the geared hub. Tighten the capscrews to 65 foot-pounds.

(18) Apply flange sealant to the side cover and install the side cover on the geared hub.

(19) Apply sealing compound to the capscrews. Secure the side cover to the geared hub with eight washers and capscrews. Tighten the capscrews to 8-13 foot-pounds.

STOP! Have the instructor check your work.

(20) Secure the geared hub, tools, and equipment and return to the classroom.

REFERENCES :

TM 9-2320-280-34

TM 9-2320-280-34P