WAR DEPARTMENT

TECHNICAL MANUAL

ORDNANCE MAINTENANCE

CHASSIS AND BODY FOR SCOUT CARS M3A1

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SECTION I

GENERAL

1. Scope.—This manual is published for the information and guidance of ordnance maintenance personnel, and is one of a series of five maintenance publications on scout cars. It contains detailed instructions for inspection, disassembly, assembly, maintenance, and repair of the scout car M3A1 supplementary to those in the Field and Technical Manuals prepared for the using arm. Additional descriptive matter and illustrations are included to aid in providing a complete working knowledge of the matériel.

a. The vehicle.—Information concerning lubrication of the entire vehicle will be found in TM 9–705 and TM 9–1705.

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b. Chassis and body.—Information is included in this manual concerning the detailed description, operation, inspection, and trouble diagnosis, disassembly, maintenance and repair, assembly, and test of major components of the chassis (exclusive of power train and power plant) and body, supplementary to that in TM 9–1705.

c. Power train.—Maintenance information concerning the power train will be found in TM 9–1705.

d. Power plant.—Maintenance information concerning the power plant and its accessories will be found in TM 9–1706, TM 9–1707, and TM 9–1708.

Section II

SERVICE MAINTENANCE

2. General.—The primary objective of organization maintenance personnel is the routine preventive care and adjustment necessary to maintain efficient operation of vehicles. The primary objective of ordnance maintenance personnel is the technical inspection and repairs beyond the authorized capacity of the using arm. The scope of maintenance repair operations is governed by weather, concealment, shelter, available equipment, tools and parts, and skill of personnel. Since these factors are variable, no rigid system of procedure can be prescribed.

3. Allocation of repair jobs.—The following operations augment those which may be performed by the using arm:

a. Body.—Replace.

(1) *Body plates and supports.*—Repair, replace, or rebuild.

(2) *Seats.*—Repair or rebuild.

(3) *Sheet metal.*—Repair, weld, or rebuild.

(4) *Tops.*—Repair, weld, or rebuild.

(5) *Upholstering.*—Repair or replace.

(6) *Windshield.*—Repair.

(7) *Windshield wipers.*—Repair or rebuild.

b. Brakes.—(1) *Brake cylinders.*—Repair and hone.

(2) *Brakeshoes.*—Reline.

(3) *Brake vacuum booster.*—Adjust, repair, and rebuild.

c. Cooling system.—(1) *Fan.*—Repair.

(2) *Fan bearings.*—Replace.

(3) *Radiator.*—Repair.

(4) *Water pump.*—Repair or rebuild.

d. Electric lighting system and accessories.—(1) *Battery.*—Repair.
(2) *Heater.*—Repair.
(3) *Horn.*—Repair.
(4) *Lights.*—Repair.
e. Frame.—(1) *Frame.*—Repair or straighten.
(2) *Pintle.*—Repair.
(3) *Roller.*—Replace or repair.
f. Fuel system.—(1) *Fuel gage components.*—Repair.
(2) *Fuel tanks.*—Repair.
(3) *Carburetor.*—Repair or rebuild.
(4) *Fuel pump.*—Repair or rebuild.
g. Instruments.—(1) *Cluster.*—Repair.
(2) *Meters.*—Repair.
h. Springs and shock absorbers.—(1) *Absorbers.*—Repair.
(2) *Springs.*—Repair or rebuild.
i. Steering gear.—(1) *Drag link.*—Repair.
(2) *Steering gear.*—Repair or rebuild.
j. Wheels.—(1) *Line casings and tube.*—Repair.
(2) *Wheels.*—Repair, weld, machine, and aline.

SECTION III

TECHNICAL INSPECTION

4. Description.—Technical inspections are a follow-up and check on organizational maintenance inspections and other maintenance functions and determine whether the vehicle should be continued in service or withdrawn from operation for overhaul. These inspections are covered in AR 850–15.

5. Inspection form.—W. D., Q. M. C. Form No. 260 (Technical Inspection Report of Motor Vehicles), is the standard and official form for recording the inspection of all motor vehicles. The extent to which use is made of this form or its modifications depends entirely on the technical ability of available personnel, the time factor, and the test and shop equipment available.

6. Practical application.—*a. External inspection of body and frame components.*—(1) *Bumpers.*—Examine for straightness; use wrench to test channel bolts for tightness; inspect brackets for breaks.
(2) *Tow hooks.*—Inspect for straightness and fractures; use wrench to test mounting bolts for tightness.

(3) *Front roller.*—Check freedom of rotation; inspect springs and supporting brackets for breaks.

(4) *Radiator shutters.*—Inspect for breaks in armor plate and loose screws; open right door and operate louver lever to check opening and closing of shutters.

(5) *Radiator.*—Examine underneath for leaks; inspect front of core for plugged air passages.

(6) *Headlight guards.*—Shake to determine looseness; inspect for breaks and fractures.

(7) *Tires.*—Inspect for serviceability; examine for indications of improper inflation or use, cuts, blisters, breaks, uneven wear, etc.; record defects for each tire.

(8) *Toe-in.*—Check (see sec. V, TM 9–1705).

(9) *Caster and camber.*—Check (see sec. V, TM 9–1705).

(10) *Hood.*—Inspect for breaks in armor plate and loose screws; examine fasteners and hinges; inspect lacings for breaks; open and shut to check for fit.

(11) *Running boards and fenders.*—Examine for cracks and dents; shake up and down to test for looseness; use wrench to test mounting bolts for tightness; inspect support brackets for breaks.

(12) *Doors.*—Open and close to test for fit; shake up and down while open to test for loose hinges; turn handles and check locks and latches; inspect for loose and missing screws; check operation and securement of observation slot covers.

(13) *Glass.*—Inspect windshields for cracks and fit; check mounting detail; examine for leaks and defective seals.

(14) *Body.*—Inspect for breaks in armor plate and loose screws; examine under side for bent or broken frame, angles, battens, and welds; check for loosened floor plates; check securement of grab handles.

(15) *Paint.*—Inspect for chipped paint, rust spots, scratches, bright metal, gloss, peelings, and cracks.

(16) *Top and curtains.*—Inspect for breaks in material and indications of leaks; examine straps and keepers.

(17) *Pintle.*—Inspect towing device for securement; examine latch effectiveness; check operation; use wrench to test tightness of pintle hook retaining nut.

(18) *Lights.*—Inspect for broken glass and reflectors; check wire connections; use wrench to test tightness of headlamp mounting stud nuts; check securement of taillamps, turn on lights and check all bulbs for different positions of light switch: be sure to turn off lights.

(19) *Ammunition racks.*—Check covers; inspect shelves.

(20) *Battery and compartment.*—Remove top housing plate; check level and specific gravity of electrolyte in each cell; check voltage drop across cells with tong tester; examine terminals for looseness and corrosion; inspect cables and ground straps; check vents and tighten plugs.

b. External inspection of chassis components.—(1) *Front axle.*—Inspect for straightness; shake wheels to check for "wobble"; inspect cross tube; check for oil leaks and cracked housings; test all nuts with wrench; inspect brush guards and universal joint dust shields; check presence of necessary plugs and lubrication fittings and evidence of proper lubrication; inspect breather.

(2) *Wheels.*—Check all wheel nuts with wrench; check lubrication of bearings.

(3) *Springs.*—Inspect for broken leaves, loose clips, worn or damaged shackles, and misalinement; check shackle lubrication; test all shackle bolts with wrench; use pry bar to check flexing of springs.

(4) *Shock absorbers.*—Check fluid level; examine linkage; inspect securement and lubrication.

(5) *Frame.*—Inspect frame side rails and cross members for distortion and fractures; examine front end for evidence of stress due to overhang of loads; inspect all rivets and especially those for the roller brackets, spring brackets, engine supports, and steering gear bracket; examine battery tray support rivets for corrosion.

(6) *Steering gear housing.*—Test all nuts with wrench; while someone turns steering wheel, observe housing for leaks, shimmy or looseness; check lubrication.

(7) *Steering gear linkage.*—Inspect drag link for straightness; check lubrication and presence of boots; test all nuts with wrench.

(8) *Transfer case.*—Inspect for leaks and cracked case; test all bolts with wrench; check presence of necessary plugs, lubrication of fittings and evidence of proper lubrication; inspect breather.

(9) *Transmission.*—Inspect for leaks and cracked case; test all bolts with wrench; check presence of necessary plugs and lubrication of fittings and evidence of proper lubrication; inspect breather.

(10) *Propeller shafts.*—Inspect for distortion and fractures; examine flanges; test all nuts with wrench; tighten dust caps; check lubrication and relief valves.

(11) *Brake linkage.*—Check all clevis pins for lubrication, presence of cotter pins, and looseness; inspect rods for straightness, cracks, rust, and corrosion.

(12) *Brake lines.*—Check for leaks, breaks, and loose connections; examine flexible tubing for cracks.

(13) *Vacuum booster.*—Examine linkage and securement.

(14) *Fuel lines.*—Check for leaks, breaks, and loose connections.

(15) *Rear axle.*—Check for oil leaks and cracked housing; test all nuts with wrench; check presence of necessary plugs and lubrication fittings and evidence of proper lubrication; inspect breather.

(16) *Muffler and tail pipe.*—Check for breaks, dents, and corrosion; examine and tighten supporting details; inspect for any obstacles in exhaust pipe.

c. Engine compartment (engine stopped).—(1) *Radiator.*—Examine for leaks, rust, corrosion, and clear air passages; shake to observe if it is loose in the frame; tighten all stud nuts with wrench; check clearance of fan blades; check vent; check for presence of radiator cap and proper water level; test antifreeze solution with suitable hydrometer.

(2) *Fan.*—Inspect blades for breaks, looseness, and proper pitch; shake to test for looseness and worn bearings.

(3) *Fan belt.*—Inspect for matching of belts and play; examine for fraying, tears, and presence of grease or oil; check alinement of pulleys.

(4) *Shroud.*—Inspect for fit and securement; check clearance of fan blades; tighten screws.

(5) *Water pump.*—Check for end play of pulleys and alinement; inspect housing for cracks and leaks; examine securement of housing to engine.

(6) *Oil filter.*—Check for securement; examine cartridge.

(7) *Engine lubrication.*—Check oil level.

(8) *Fuel filter.*—Inspect for leaks; examine securement; examine bowl for sediment and water; check filter element.

(9) *Carburetor.*—Inspect for leaks; examine securement; check control linkage.

(10) *Air cleaner.*—Examine cleaning element and bowl for excessive dirt; check oil level; inspect hose to carburetor and connector to engine; examine securement.

(11) *Fuel pump.*—Inspect for fuel and oil leaks; examine securement; examine bowl for sediment; check screen.

(12) *Distributor.*—Examine cap for cracks, condensation, and dirt; inspect motor; separate and examine points for pits and burns; inspect cams; check shaft for "wobble"; examine insertion and connection of wires in cap.

(13) *Shielding.*—Examine conduit for breaks and securement; disconnect from spark plugs; examine and tighten latter; inspect interior of caps for condensation; check cable and terminals; tighten clamp nuts.

d. Interior inspection (engine started).—(1) *Switches.*—Check operation; examine securement; inspect wiring.

(2) *Meters.*—Check operation; examine securement; inspect connections.

(3) *Gages.*—Check operation; examine securement; inspect connections; feel tachometer and speedometer cables for excessive heat and vibration.

(4) *Windshield wipers.*—Check operation.

(5) *Panel lights.*—Check operation.

(6) *Horn.*—Check operation.

(7) *Fire extinguisher.*—Check securement; inspect for full charge.

(8) *Choke and ventilator controls.*—Check free operation and note movement of ventilator slides; have an assistant note movement of choke valve in carburetor.

(9) *Accelerator.*—Check for proper alinement and operation.

(10) *Pedals.*—Check for proper operation.

(11) *Brake fluid.*—Remove floor cover in front of driver's seat and inspect master cylinder; examine fluid; check securement and connections.

(12) *Louver control lever.*—Operate lever to check movement and position of radiator shutters.

(13) *Seats.*—Inspect for breaks, damaged brackets, and upholstery.

(14) *Gun rail pads.*—Inspect.

(15) *Gun rail.*—Inspect for breaks, cracks, and rust; examine securement around entire circumference and operate gun carriage around each corner to check alinement.

(16) *Top bows.*—Inspect bows for breaks and securement.

e. Engine compartment (engine running).—(1) *Engine noises.*—Accelerate engine sharply and listen for knocks and unusual noises; listen for valve chatter.

(2) *Engine smoothness.*—Accelerate engine slowly to different speeds and check smoothness of running.

(3) *Engine mounting.*—Inspect front and rear supports for securement.

(4) *Gaskets.*—Inspect all cover, housing, and accessory mounting gaskets for oil and water leaks.

(5) *Fuel leaks.*—Inspect carburetor, fuel pump, and fuel lines for leaks.

(6) *Oil leaks.*—Inspect under vehicle and bottom of oil pan for evidence of oil drippings.

(7) *Water leaks.*—Inspect hose connections to radiator, water pump, and heater for leaks; feel hose for condition of fabric and flow of fluid; examine radiator for leaks.

(8) *Wiring.*—Inspect wires around engine and along frame; tug on wires to check for loose connections evidenced by sparking; examine terminal board connections.

(9) *Voltage regulator.*—Disconnect lead to battery and use voltmeter to check for correct cut-out and open-circuit voltages.

f. Road test.—(1) *Body noises.*—Listen for any unusual body noises, squeaks, or rattles, and identify location and cause.

(2) *Drive shaft brake.*—Test by pulling on hand brake lever and gently engaging clutch to stall the engine; note any unusual noises or signs of loose parts; do not attempt to stop rolling vehicle with this brake.

(3) *Service brakes.*—Test by applying pressure to foot pedal and observing results, including tendency of vehicle to swerve or stall.

(4) *Clutch.*—Check for smoothness of operation. Test for effectiveness by setting drive shaft brake, or using the service brakes, putting the vehicle in low gear, and releasing the clutch pedal gradually; if the clutch is efficient, the engine should stall.

(5) *Gear box.*—Listen to transmission and transfer case gears for a high pitched whine or squeal which indicates internal misalinement or improper adjustment. In shifting gears, it is usual for the two lower speeds to be much noisier in operation, than high gear; unusual noises in the transmission where operating in the high gears should be investigated immediately to avoid severe damages.

(6) *Gear shift.*—Check to see that the gear shift levers are firmly fastened in their retaining sockets and that the gear shift forks on the lower end of the levers move properly through all gear changes selected.

(7) *Speedometer and tachometer cables.*—Observe instruments to note registering. Feel cable; if hot, internal friction is developing due to improper adjustment or lack of lubricant; if a slight click or thump is heard, remove the cable and inspect for distortion, incorrect length or diameter, or breaks.

(8) *Steering mechanism.*—Note if steering wheel has a tendency to jerk; such action indicates a looseness in the steering mechanism connection from the front axle to the wheel, or an error in steering geometry. Note any tendency on the part of the vehicle to wander or drive to the right or left, indicating improper adjustment or an error in steering gear geometry. If a thump or knocking is felt in the steering wheel, a part is probably loose in the steering gear worm.