

TM 9-1879

WAR DEPARTMENT TECHNICAL MANUAL

ORDNANCE MAINTENANCE

MOTORCYCLE SOLO

(HARLEY-DAVIDSON
MODEL WLA)

WAR DEPARTMENT TECHNICAL MANUAL

**TM 9-1879*

ORDNANCE MAINTENANCE

MOTORCYCLE, SOLO
(HARLEY-DAVIDSON MODEL WLA)



WAR DEPARTMENT

29 March 1944

*This manual, together with TM 9-879, 18 October 1943, supersedes TM 10-1175, 11 September 1941; TM 10-1177, 11 September 1941; TM 10-1331; TM 10-1359, 25 November 1941; and TM 10-1361, 25 November 1941.

WAR DEPARTMENT
Washington 25, D. C., 29 March 1944

TM 9-1879—Ordnance maintenance: Motorcycle, Solo (Harley-Davidson Model WLA), is published for the information and guidance of all concerned.

[A.G. 300.7 (3 Sep. 43)]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION: R 9 (4); Bn 9 (2); C 9 (5).

(For explanation of symbols, see FM 21-6.)

CONTENTS

| | | Paragraphs | Pages |
|------------|---|------------|-------|
| CHAPTER 1. | INTRODUCTION..... | 1-2 | 6 |
| CHAPTER 2. | OVERHAUL OF ENGINE IN VEHICLE..... | 3-18 | 7-42 |
| SECTION | I Description and engine data.... | 3 | 7 |
| | II Removal of cylinders and piston assemblies..... | 4-6 | 8-14 |
| | III Disassembly, cleaning, inspection, repair and assembly..... | 7-14 | 15-32 |
| | IV Installation..... | 15 | 33-35 |
| | V Adjustment and tests..... | 16-17 | 36-40 |
| | VI Fits and tolerances..... | 18 | 41-42 |
| CHAPTER 3. | ENGINE..... | 19-39 | 43-86 |
| SECTION | I Engine disassembly into sub- assemblies..... | 19-20 | 43-49 |
| | II Disassembly, cleaning, inspection and repair and assembly of cylinders and pistons, and con- necting rod alignment..... | 21 | 50 |
| | III Disassembly, cleaning and inspec- tion, fitting crank pin and mainshaft roller bearings, and assembling flywheel assembly..... | 22-27 | 51-62 |
| | IV Cleaning, inspection, and repair of crankcase assemblies and gear case cover..... | 28-35 | 63-75 |
| | V Fitting and assembly of flywheel and crankcase assembly..... | 36-37 | 76-78 |
| | VI Engine assembly..... | 38 | 79-83 |
| | VII Fits and tolerances..... | 39 | 84-86 |

MOTORCYCLE, SOLO (HARLEY-DAVIDSON MODEL WLA)

| | | Paragraphs | Pages |
|------------|--|------------|---------|
| CHAPTER 4. | FUEL, INTAKE, AND EXHAUST SYSTEMS..... | 40-53 | 87-100 |
| SECTION | I Description of systems..... | 40-41 | 87-90 |
| | II Carburetor..... | 42-47 | 91-97 |
| | III Fuel strainer and fuel supply valve..... | 48-49 | 98 |
| | IV Intake pipe, air cleaner, and fittings..... | 50-51 | 99 |
| | V Exhaust system..... | 52-53 | 100 |
| CHAPTER 5. | IGNITION SYSTEM..... | 54-60 | 101-106 |
| CHAPTER 6. | GENERATING SYSTEM..... | 61-68 | 107-125 |
| CHAPTER 7. | HORN AND LIGHTING SYSTEM... | 69-78 | 126-134 |
| SECTION | I Switches and instrument panel.. | 69-73 | 126-130 |
| | II Horn and lights..... | 74-78 | 131-134 |
| CHAPTER 8. | CLUTCH..... | 79-86 | 135-143 |
| SECTION | I Description and data..... | 79-80 | 135-136 |
| | II Removal, disassembly, cleaning, inspection, and repair..... | 81-83 | 137-139 |
| | III Assembly, installation, and adjustment..... | 84-85 | 140-142 |
| | IV Fits and tolerances..... | 86 | 143 |
| CHAPTER 9. | TRANSMISSION..... | 87-92 | 144-166 |
| SECTION | I Description and data..... | 87 | 144 |
| | II Disassembly, cleaning, inspection, and repair..... | 88-90 | 145-155 |
| | III Assembly..... | 91 | 156-164 |
| | IV Fits and tolerances..... | 92 | 165-166 |

CONTENTS

| | | Paragraphs | Pages |
|----------------------|---|------------|---------|
| CHAPTER 10. | BRAKES | 93-102 | 167-175 |
| SECTION | I Rear wheel brake | 93-97 | 167-171 |
| | II Front wheel brake | 98-102 | 172-175 |
| CHAPTER 11. | CHAINS, SPROCKETS, WHEELS, AND HUBS | 103-117 | 176-190 |
| SECTION | I Wheel rims and spokes | 103-107 | 176-178 |
| | II Wheel hubs | 108-114 | 179-185 |
| | III Chains and sprockets | 115-117 | 186-190 |
| CHAPTER 12. | STEERING SYSTEM | 118-125 | 191-195 |
| SECTION | I Fork | 118-122 | 191-193 |
| | II Handlebars and controls | 123-125 | 194-195 |
| CHAPTER 13. | CHASSIS PARTS AND EQUIPMENT | 126-144 | 196-202 |
| SECTION | I Frame and tanks | 126-128 | 196-197 |
| | II Mudguards, chain guards, stands, and skid plate | 129-132 | 198-199 |
| | III Battery box, tool box, and foot- boards | 133-135 | 200 |
| | IV Saddle and saddle post | 136-137 | 201 |
| | V Equipment | 138-144 | 202 |
| CHAPTER 14. | ROAD TEST OF ENGINE, TRANS- MISSION, AND CLUTCH | 145-156 | 203-207 |
| SECTION | I Engine | 145-151 | 203-206 |
| | II Transmission and clutch | 152-156 | 207 |
| CHAPTER 15. | SPECIAL TOOLS | 157 | 208-210 |
| REFERENCES | | | 211-212 |
| INDEX | | | 213-216 |

MOTORCYCLE, SOLO (HARLEY-DAVIDSON MODEL WLA)

CHAPTER 1

INTRODUCTION

1. SCOPE.

a. The instructions contained in this manual are for the information and guidance of personnel charged with the maintenance and repair of Harley-Davidson motorcycle, model WLA. These instructions are supplementary to field and technical manuals prepared for the using arm. This manual does not contain information which is intended primarily for the using arm, since such information is available to ordnance maintenance personnel in 100-series TM's or FM's.

b. This manual contains a description of, and procedure for, disassembly, inspection and repair of engine, fuel system, ignition system, generating system, transmission and clutch, and chassis.

c. TM 9-879 contains the replacement instructions of many components of this vehicle. This information is not repeated in this manual.

2. MWO AND MAJOR UNIT ASSEMBLY REPLACEMENT RECORD.

a. **Description.** Every vehicle is supplied with a copy of A.G.O. Form No. 478, which provides a means of keeping a record of each MWO completed or major unit assembly replaced. This form includes spaces for the vehicle named and U.S.A. Registration No., instructions for use, and information pertinent to the work accomplished. It is very important that the form be used as directed and that it remain with the vehicle until the vehicle is removed from service.

b. **Instructions for Use.** Personnel performing modifications or major unit assembly replacements must record clearly on the form a description of the work completed and must initial the form in the columns provided. When each modification is completed, record the date, hours and/or mileage, and MWO number. When major unit assemblies, such as engines, transmissions, transfer cases, are replaced, record the date, hours and/or mileage and nomenclature of the unit assembly. Minor repairs and minor parts and accessory replacements need not be recorded.

c. **Early Modifications.** Upon receipt by a third or fourth echelon repair facility of a vehicle for modification or repair, maintenance personnel will record the MWO numbers of modifications applied prior to the date of A.G.O. Form No. 478.

CHAPTER 2 OVERHAUL OF ENGINE IN VEHICLE

Section I

DESCRIPTION AND ENGINE DATA

3. DESCRIPTION AND ENGINE DATA.

a. **Description.** The vehicle is powered by a two-cylinder, V-type, L-head gasoline engine, operating on four-stroke, four-cycle principle. The bearings, pistons and rings, cylinder walls, bushings and gears are lubricated by a force-feed circulating oil system. Engine oil supply is maintained in a separate tank. Tolerances and fits are held to close standards, calling for precise and fine workmanship on the part of the mechanic.

b. Engine Data.

| | |
|------------------------------------|------------------------|
| Engine type | V-type, L-head |
| Number of cylinders | 2 |
| Engine cooling | Air |
| Cylinder bore | 2 $\frac{3}{4}$ in. |
| Stroke | 3 $\frac{13}{16}$ in. |
| Displacement | 45.12 cu in. |
| Horsepower (N.A.C.C. rating) | 6.05 |
| Compression ratio | 5.0 to 1 |
| Inclination of cylinders | 45 deg |
| Lubrication | Circulating oil system |
| Fuel, gasoline | 72 octane or higher |
| Engine (power unit) weight | 114 lb |
| Rotation (sprocket side) | Counterclockwise |
| Ignition | Battery |

MOTORCYCLE, SOLO (HARLEY-DAVIDSON MODEL WLA)

CHAPTER 2

OVERHAUL OF ENGINE IN VEHICLE (Cont'd)

Section II

REMOVAL OF CYLINDERS AND PISTON ASSEMBLIES

4. PRELIMINARY INSTRUCTIONS.

a. **General.** When an engine needs repair, it is not always possible to definitely determine beforehand whether repair can be made with only upper end disassembled, or whether engine must be completely disassembled for lower end repair. Most commonly only upper end repair is needed (valves, rings, pistons, etc.) and it is recommended procedure to first disassemble upper end only, allowing engine base to remain in frame. After disassembling upper end only, be sure to inspect connecting rod bearings for wear (par. 6). If connecting rod bearings are worn and must be replaced, refer to chapter 3.

b. **Emergency Piston and Ring Service.** Need of replacement of rings, or possibly pistons and rings, is indicated by loss of normal compression, loss of power, abnormal oil consumption, excessive exhaust smoke and piston slap or knock. When pistons develop excessive clearance and slap due to wear or damage, and cylinders are found worn more than 0.002-inch, smooth and true up cylinder bore by honing, or boring and honing, to the next regular oversize piston step. However, piston slap alone, due to wear and excessive cylinder-piston clearance, does not necessarily mean poor and undependable performance. A good compression seal is the requirement for good performance. Good compression depends on smooth cylinders and proper clearance between piston rings and grooves.

c. **Test for Leaky Valves and Worn Piston Rings.** Before making this test, see that oil is in the tank, spark plugs are tight, cylinder head bolts are tight, valve tappets have sufficient clearance and that engine is warm. It is difficult to determine whether valves or rings (or both) are at fault when compression is poor. In either case, the cylinders must be removed to do a first class job.

(1) **COMPRESSION TEST.** Operate engine until it is thoroughly warmed up and with the ignition switch off, crank the engine slowly, placing entire weight of the body on the starter crank. Engine compression should offer some resistance to the weight of an average-size rider before the starter crank passes through complete range of its travel. If the engine offers little resistance to the starter crank in testing either or both cylinders, it is an indication that compression is not adequate in one or both cylinders. In vehicle operation engine will lack power, overheat, fuel and oil consumption will be excessive and engine performance will be sluggish in general.

d. **Abnormal Engine Noise.** Owing to constructional design of the motorcycle (power and drive units are exposed) certain mechanical noises not noticeable in a motorcar or truck are evident in normal