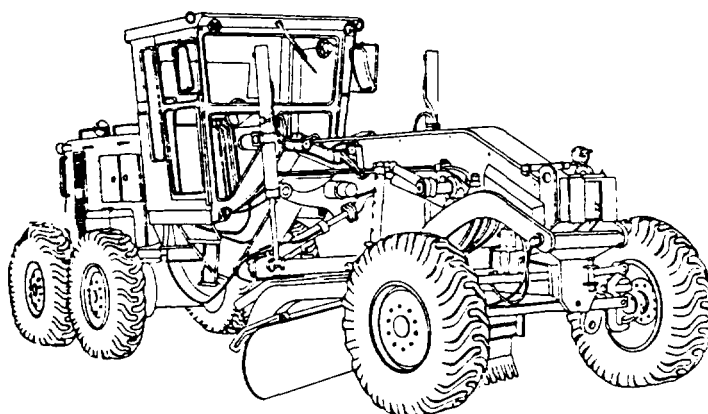


**DIRECT SUPPORT AND GENERAL
SUPPORT MAINTENANCE**

**TECHNICAL
MANUAL**



**GRADER, HEAVY, ROAD,
MOTORIZED,
CATERPILLAR MODEL 130G
(NSN 3805-01-150-4795)**

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**HEADQUARTERS, DEPARTMENT OF THE ARMY
APRIL 1989**

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON D.C., 25 APRIL 1989

DIRECT SUPPORT AND GENERAL
SUPPORT MAINTENANCE MANUAL

GRADER, HEAVY, ROAD, MOTORIZED, DED,
COMMERCIAL CONSTRUCTION EQUIPMENT (CCE),
CATERPILLAR MODEL 130G
(NSN 3805-01-150-4795)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve the manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank Automotive Command, Attn: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

This manual is designed to help you maintain the 130G Grader. It is divided into chapters, sections and appendices. The chapters contain direct support and general support maintenance procedures. The chapters are divided into a sections containing maintenance procedures for the various systems that comprise the 130G Grader.

The appendices contain supplemental information to help you maintain the 130G Grader. Included in the appendices are the Expendable Supplies and Materials List and the Manufactured Items List.

You must familiarize yourself with the entire maintenance procedure before beginning the maintenance task. The maintenance procedures contained in this manual tell you several things:

- What tools you need to do the job
- Materials or parts required
- What condition the vehicle must be in before work is started
- A step-by-step procedure of how to do the job.

In addition to the text, you will have either an assembled view or an exploded view illustration of the associated parts. Some of the illustrations will be keyed by an arrow to an overall view of the vehicle. This will help you determine the approximate location of the part. The illustration is keyed to the text by numbers. The following example will show some of the features of this manual.

EXAMPLE

An operator brings his 130G Grader into the shop with an engine problem: the engine stalls frequently or doesn't develop full power. The best way to solve this problem is by using your manual. This is what you do:

1. How do you start?
Look at the cover of the manual.

On the cover you will find a listing for TROUBLESHOOTING SYMPTOM INDEX. It tells you to go to page 2-1. To find the page fast, open the manual by using the black tab that lines up with the listing on the cover.

2. What kind of problem do you have?
Find it in the symptom index.

The symptom index is a list of problems covered by a section. It tells you that your problem, "engine misfires or runs rough," is covered in paragraph 3-2.

3. How do you determine what is causing the problem?
Go to paragraph 3-2.

There you will find the troubleshooting procedures you will need. The procedure has columns with the headings: MALFUNCTION, TEST or INSPECTION and CORRECTIVE ACTION. Starting at Step 1, read the procedure. Each step tells you what to do and what to look for. Follow the steps, in order, until you find your problem. The CORRECTIVE ACTION column will tell you what to do next.

Let's assume that the troubleshooting procedures lead you to a bad fuel injection nozzle. The replacement procedure is in paragraph 3-23. The procedure contains all the information you will need to replace the fuel injection nozzle. First, check the introductory material. It tells you what you will need before you start the job. Below the introductory material is an assembled view of the vehicle showing the approximate location of the fuel injection nozzle and an illustration which shows you how to do the job.

If, on the other hand, you know the cause of the problem, refer to the alphabetical index located at the rear of this manual. Find the name of the part to be replaced and the paragraph number for the maintenance procedure. For example, during PMCS at the organization level, it is noted that the front axle has an oil leak and the problem is referred to you. Refer to the alphabetical index. Under the listing "Front axle assembly," paragraph 5-13 is referenced. Turn to this paragraph for removal and installation procedures.

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CHAPTER 1

INTRODUCTION

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Section I. GENERAL INFORMATION

1-1. SCOPE.

a. Type of Manual. Direct Support and General Support Maintenance.

b. Model Number and Equipment Name. Grader, Heavy, Road, Motorized, DED, Commercial Construction Equipment (CCE), Caterpillar Model 130G Grader (NSN 3805-01-150-4795).

c. Purpose. The grader is designed for rough and finished grading, low and high bank sloping, flat and V-ditching, scarifying bituminous road mixes, and snow removal. Mission support role includes construction and maintenance of roads, airfields, hardstands, drainage, site preparation for pipelines and river crossings.

1-2. MAINTENANCE FORMS, RECORDS AND REPORTS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System.

1-3. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE. Refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

GENERAL INFORMATION. (cont)

1-4. PREPARATION FOR STORAGE AND SHIPMENT. Refer to TM 740-90-1, "Administrative Storage of Equipment"; TB 740-97-2, "Preservation of USAMECOM Mechanical Equipment for Shipment and Storage"; TM 38-230-1&2, "Preservation and Packing of Military Supplies and Equipment"; MIL-V-62038, "Shipment and Limited Storage", and SB 740-98-1, "Storage and Serviceability Standard: Tracked Vehicles, Wheeled Vehicles and Component Parts".

1-5. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC).

a. No particular quality assurance or quality control technical manuals pertain specifically to the 130G Grader. Use standard QA/QC procedures.

b. Defective material received through the supply system should be reported on a Quality Deficiency Report (QDR), SF368. QDR's should be mailed directly to Commander, U.S. Army Tank Automotive Command, ATTN: AMSTA-MB, Warren, Michigan 48397-5000. A reply will be furnished directly to you.

1-6. NOMENCLATURE CROSS REFERENCE. This listing includes nomenclature cross-references used in this manual.

<u>Common term</u>	<u>Military Term</u>
Lube Order	LO
O Ring	Packing, Preformed
Dipstick	Level Indicator, Oil Level Gage
Grader	Grader, Road
Technical Manual-	TM
Sight Gage	Level Indicator
Servicemeter	Hourmeter
Blade	Moldboard Assembly
Circle Drive	Circle Turn Assembly
Transmission	XMSN
Hydraulic Tank	Hydraulic Reservoir

1-7. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If the 130G Grader needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on a DA Form 2407, Maintenance Request. Instructions for preparing EIR's are provided in DA PAM 738-750, The Army Maintenance Management System. EIR's should be mailed directly to: Commander, U.S. Army Tank Automotive Command, ATTN: AMSTA-MB, Warren, Michigan 48397-5000.

1-8. WARRANTY INFORMATION. The Caterpillar 130 Grader is warranted by Caterpillar Inc. for 15 months or 1500 hours of operation, whichever occurs first. The warranty starts on the date found on DA Form 2408-9 in the logbook. Report all defects in material or workmanship to your supervisor, who will take appropriate action through your organizational maintenance shop.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES. Refer to the separate Operator's Manual, TM 5-3805-261-10, for the following tabulated data: Equipment Characteristics, Capabilities, and Features.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. Refer to the separate Operator's Manual, TM 5-3805-261-10, for location and description of major components.

1-11. EQUIPMENT DATA. Refer to the separate Operator's Manual, TM 5-3805-261-10, for the following equipment data: Capacities, Dimensions, and Weight.

a. Engine.

Manufacturer	Caterpillar Inc.
Model number	3304
Part number	2W821
Type	4 stroke
	Turbocharged diesel
Horsepower (SAE Net at 2200 rpm)	135 hp
Number of cylinders	4
Bore	4.75 inch
Stroke	6.0 inch
Displacement	425 cubic inch
Firing order	1-3-4-2
Number of main bearings	5
Oil filter	Full flow, spin on
Full load rating	330 hp (246 kW)

EQUIPMENT DESCRIPTION AND DATA. (cont)**1-11. EQUIPMENT DATA. (cont)**

Engine Speeds	
Full load	1895 rpm
High idle	2309 rpm
Low idle	775 rpm
Stabilized	2011 rpm
Torque check	1200 rpm
Set point	1915 rpm
Torque values	
Stabilized engine rpm	869 16 ft (1175 N.m)
Torque check rpm	
Torque rise	8.4
Inlet manifold pressure at full load	35.6 in. Hg (120 kPa)
Fuel timing	
Static at zero rpm	26.50
at low idle (700 rpm)	19.50 to 21.90
at full load stop (2300 rpm)	21.10 to 23.50
Piston travel	0.444 in. (11.28 mm)
Static fuel setting	
Full load	0.160 in. (4.06 mm)
Torque rise	0.160 in. (4.06 mm)
Dynamic fuel settings	
Full load	0.180 in. (4.56 mm)
Torque rise	0.180 in. (4.56 mm)
Fuel consumption rates	
at full load 2.073 lbs/min,	17.1 gal/hr, (940 gm/min), (66 l/hr)
Brake specific	
at full load 0.377 lbs/hphr	(229 gm/kwhr)
Valve clearance	
Exhaust	0.030 in. (0.76 mm)
Intake	0.015 in. (0.38 mm)

b. Fuel System.

Air cleaner	
Manufacturer	Donaldson
Part number	EGB11-0026
Type	Dry, centrifugal particulate pre-cleaner
Governor	Hydrochemical