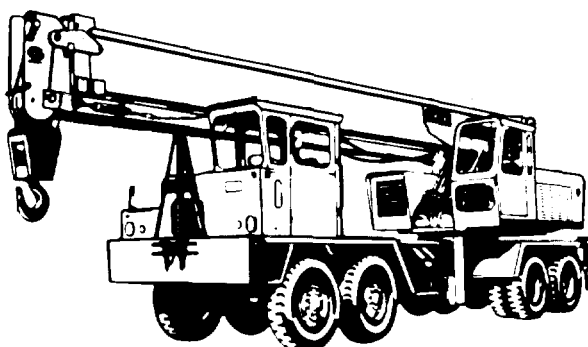


**TECHNICAL MANUAL**

**ORGANIZATIONAL, DIRECT SUPPORT AND  
GENERAL SUPPORT MAINTENANCE MANUAL  
(INCLUDING REPAIR PARTS LIST  
AND SPECIAL TOOLS LIST)**

**FOR  
CRANE, TRUCK MOUNTED  
HYDRAULIC 25 TON (CCE)  
GROVE MODEL TM S-300-5  
(NAN 3810-01-054-9779)**



**VOLUME 2  
(CARRIER)**

---

**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**8 MAY 84**

**WARNING**

**EXHAUST SYSTEM COMPONENTS CAN CAUSE SEVERE BURNS**

During normal operation the vehicle exhaust pipe and muffler can become very hot. Be careful not to touch these components with your bare hands. Do not allow your body to come in contact with the pipe or muffler. Exhaust system components may be hot enough to cause serious burns.

**WARNING**

**AVOID ACCIDENTAL ENGINE STARTS**

Accidental Engine Start-up may cause severe injuries to service personnel engaged in maintenance operations of or near moving parts (pulleys, belts, fan blades, etc.). Prevent accidental engine starts by removing battery cables from battery posts. Make sure mechanism at governor stops engine in top position (no-fuel position) to prevent accidental engine firing.

**WARNING**

**COMPRESSED AIR FOR CLEANING**

Compressed air used for cleaning purposed shall not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc).

**WARNING**

**ELECTROCUTION HAZARD**

**NEVER OPERATE** this crane within any distance of a power source or power line without first notifying the power or utility company.

**NEVER OPERATE** crane any part thereof or load within 20 feet of any electrical power line or power source or such distance as is specified or required by local or other applicable safety codes or regulations.

**NEVER OPERATE** crane without consulting local or other applicable safety codes or regulations.

**NEVER OPERATE**, service or maintain this crane without proper instructions. Remember it is the employer's responsibility to implement the above and to provide all safety devices or means that may be necessary or required for any use operation, set-up or service.

CHANGE  
NO.1

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, DC 10 April 1987

**ORGANIZATIONAL, DIRECT SUPPORT  
AND GENERAL SUPPORT MAINTENANCE MANUAL  
(INCLUDING REPAIR PARTS LIST AND SPECIAL  
TOOLS LIST)  
FOR  
CRANE, TRUCK MOUNTED, HYDRAULIC  
25 TON (CCE)  
GROVE MODEL TM S-300-5  
NSN 3810-01-054-9779**

**TM5-3810-30024&P2, 8 May 1984**, is changed as follows:

1. Addendum B, Parts Catalog (Carrier) Pages B-1 through B-183 And C-1 through C-16 of this Manual have been replaced By TM5-3810-300-20P, ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LISTS, and TM-3810-300-34P, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST.

File this change sheet in front of the publication for reference purposes.

---

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR  
*General, United States Army  
Chief of Staff*

Official:

R.L. DILWORTH  
*Brigadier General, United States Army  
The Adjutant General*

Distribution:

To be distributed in accordance with DA Form 12-25A Organizational, Direct Support and General Support Maintenance requirements for Cranes, Truck Mounted, Hydraulic, 25-T, Model TM-S-300-5.

**PIN: 055592-001**

**WARNING**

**CARBON MONOXIDE CAN KILL YOU!**

**DO NOT OPERATE** vehicles in an enclosed area unless carbon monoxide (exhaust) is channeled out of work area (duct).

**DO NOT OPERATE** an engine, in or out of the vehicle, in an enclosed area unless there is a way for the carbon monoxide to escape (duct; draft or fan propelled fresh air supply).

**DO NOT PERMIT** an operating vehicle outside your work area to expel carbon monoxide into the area where you work.

**WARNING**

**SERIOUS BODILY INJURY OR DEATH COULD OCCUR IF THE FOLLOWING BASIC SAFETY PROCEDURES ARE NOT OBSERVED**

Only machines with published "ON RUBBER" capacities are permitted to travel with a load.

Before elevating boom, make certain that area above and beneath boom is clear of all obstructions and personnel.

Before lowering boom, make certain that area above and beneath boom is clear of all obstructions and personnel.

Before lowering or raising cable (load) assure that area beneath load is clear of all obstructions and personnel.

Outriggers must be extended and set anytime the boom is removed from the cradle, either lifting or positioning. Outriggers may be retracted from "ON RUBBER" operation with the boom centered over the rear as indicated by the "ON RUBBER" load chart. (Outriggers must be extended and set to place the boom in the "ON RUBBER" position.)

**NOTE**

**PASSENGERS**

Passengers are not authorized to ride in the crane cab to and from work sites. The crane operator may be permitted to ride in the cab for short distances where very light loads are being relocated, provided these loads are within the limits of operation without outriggers. These limits are specified on the load and boom angle charts located inside the crane cab.

**MAKE SAFETY FIRST --- NOT LAST  
READ YOUR OPERATOR'S HANDBOOK !**

*When Working On The Engine . . .*

1. Consider the hazards of the job and wear protective gear such as safety glasses, safety shoes, hard hat, etc. to provide adequate protection.
2. When lifting an engine, make sure the lifting device is fastened securely. Be sure the item to be lifted does not exceed the capacity of the lifting device.
3. Always use caution when using power tools.
4. When using compressed air to clean a component, such as flushing a radiator or cleaning an air cleaner element, use a safe amount of air. Recommendations regarding the use of air are indicated throughout the manual. Too much air can rupture or in some other way damage a component and create a hazardous situation that can lead to personal injury.
5. Avoid the use of carbon tetrachloride as a cleaning agent because of the harmful vapors that it releases. Use perchlorethylene or trichlorethylene. However, while less toxic than other chlorinated solvents, use

these cleaning agents with caution. Be sure the work area is adequately ventilated and use protective gloves, goggles or face shield, and apron. Exercise caution against burns when using oxalic acid to clean the cooling passages of the engine.

6. Avoid excessive injection of ether into the engine during start attempts. Follow the instructions on the container or by the manufacturer of the starting aid.
7. When working on an engine that is running, accidental contact with the hot exhaust manifold can cause severe burns. Remain alert to the location of the rotating fan, pulleys and belts. Avoid making contact across the two terminals of a battery which can result in severe arcing.
8. Use extreme caution in releasing the radiator cap when engine has been running or is overheated.
9. When servicing the battery, do not smoke or allow an open flame near batteries. Batteries generate hydrogen which is a highly explosive gas.

**Key to WARNING and CAUTION Notes:**

**WARNING** precedes operating procedures or practices which, if not correctly followed could result in personal injury or death.

**CAUTION** precedes operating procedure or practice which if not strictly followed could cause damage to or destruction of equipment.

Information in this manual does not replace federal, state, or local regulations. safety codes, or insurance requirements.

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**TM 5-3810-300-24 & P2**

Technical Manual



No. 5-3810-300-24 & P2

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, DC, 8 May 1984

**ORGANIZATIONAL, DIRECT SUPPORT  
AND GENERAL SUPPORT MAINTENANCE MANUAL  
(INCLUDING REPAIR PARTS LIST AND  
SPECIAL TOOLS LIST)  
FOR**

**CRANE, TRUCK MOUNTED, HYDRAULIC  
25 TON (CCE)  
GROVE MODEL TM S-300-5  
(NSN 3810-01-054-9779)**

Procured under Contract No. DSA 700-77-C-8511

**REPORTING OF ERRORS**

**You can help improve this 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, US Army Tank-Automotive Command, ATTN: DRSTA-MB, Warren, MI 48090. A reply will be furnished direct to you.**

**VOLUME II  
(CARRIER)**

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SECTION V  
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Noise Abatement Program.....A-1

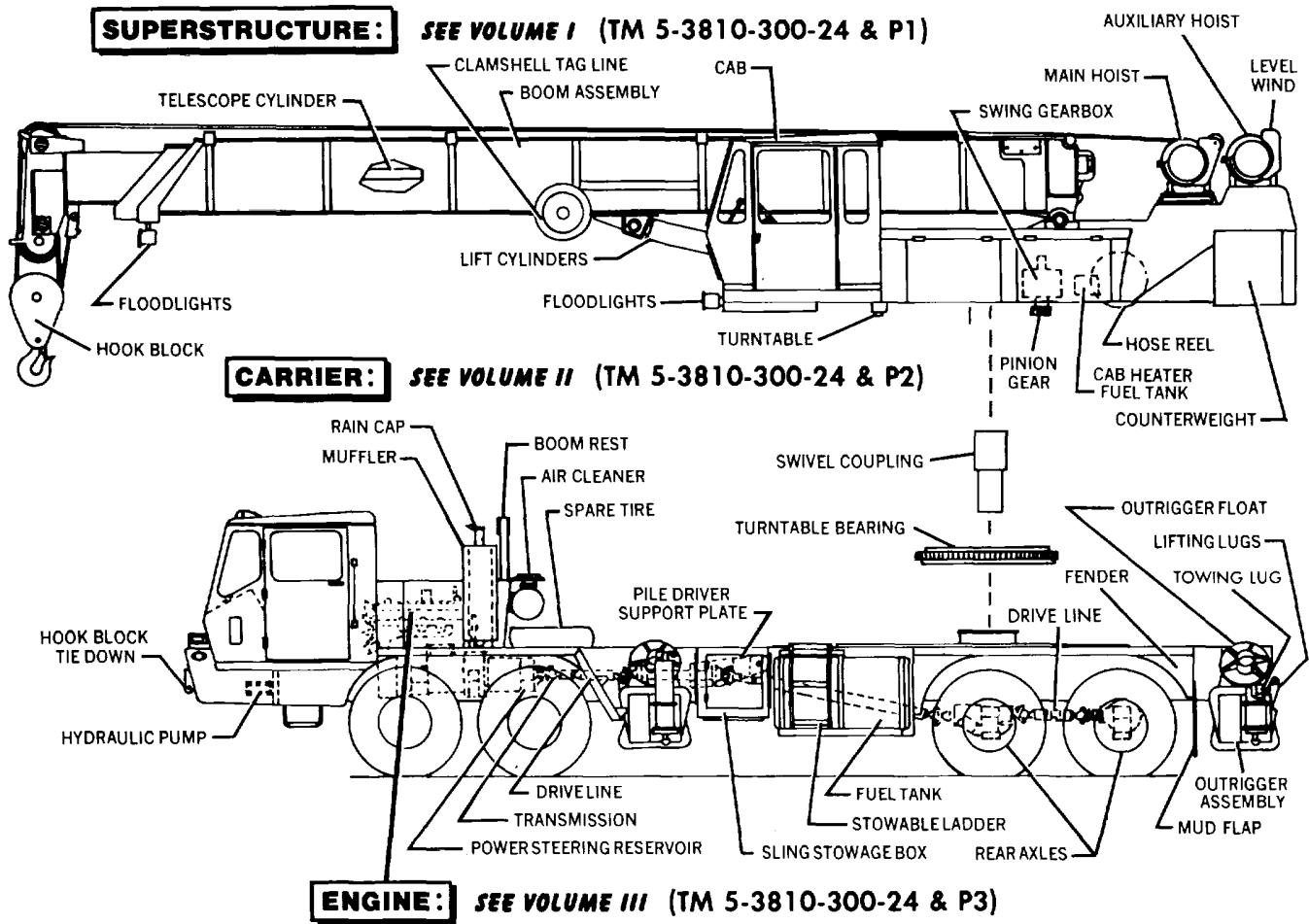
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**This technical manual is an authentication of the manufacturers commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.**

**Illustration 1 TMS300-5 Component Location.**



**IMPORTANT MAINTENANCE INFORMATION**

The quarterly Equipment Improvement Report and Maintenance Digest TB 43-0001-41 series contains valuable field information on the equipment covered in this manual. The information in TB 43-0001-41 series is compiled from some of the Equipment Improvement Reports (SF 368) that you prepared on the vehicle covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that you submitted to the EIR program. The TB 430001-41 series contains information on equipment improvements, minor alternations, proposed Modification Work Orders (MWO's), actions taken on some of your DA Form 2028's, and advance information on proposed changes that may affect this manual.

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**SECTION IV**

**CARRIER**

INTRODUCTION. (Illus. 4-1).

This section provides descriptive and maintenance information for the Carrier. The descriptive text describes the operation of the Carrier Components. When required, cutaway and block diagrams are provided to support the text. Also, maintenance information is provided to help personnel repair and service the Carrier. Descriptive and maintenance information for major optional equipment is given.

**4-1 (4-2 blank)**

DESCRIPTION. (Illus. 4-2).

Controls, Gages and Indicators.

The items that follow identify the controls, gages, and indicators in the Carrier Cab. Also, the paragraphs specify the purpose of each control, indicator, and gage. The index numbers on the illustration correspond to the numbers in the paragraphs.

1. Remote Throttle Control. Controls operation of the Superstructure throttle. When in the ON position allows the Superstructure air throttle system to control engine rpm.
2. Voltmeter. Indicates the battery condition, when alternator is not producing electromotive force (volts). Also, shows condition of the charging system when engine is operating.
3. Engine Oil Pressure Gage. Normal operating pressures should remain in a range of 40 to 60 psi.
4. Engine Water Temperature Gage. Normal temperature indication should be in the range of 170 to 185°F. If temperature indication is abnormal, operation of automatic radiator shutters and/or the thermostat should be checked.
5. Engine Tachometer. Indicates revolutions per minute at which engine is operating.

Main Air System Pressure Gage. (Not Shown). Indicates pressure in main air tank. Operating range is normally between 95 and 125 psi. If pressure drops below 75 psi, a low pressure warning buzzer will operate and the red warning light will illuminate.

Fuel Gage. (Not Shown). Indicates fuel tank quantity in fractions of the total tank capacity.

6. Low Air Pressure Warning Light. This light activates simultaneously with the warning buzzer. If traveling, immediate stop should be made to avoid automatic application of spring brakes.
7. Speedometer and Odometer. Indicates road speed and total mileage vehicle has traveled.
8. Light Beam Indicator Light. Indicates whether lights are on LOW or HIGH beam.
9. Differential Lock Indicator Light. Indicates when the inter-axle differential control is in the LOCK position.
10. Inter-Axle Differential Control Lever. When positioned to LOCK engages (LOCK OUT) the inter-axle differential.
11. Cab Light Switch. Controls overhead light.

12. Hourmeter. Provides a digital readout of engine operating hours. Controlled by a pressure switch in the engine oil system.
13. Ignition On Indicator Light. Indicates that the ignition switch is positioned to ON or ACC.
14. Push-Pull Parking Brake Control. Pulling control button out releases air in the spring loaded automatic brake units on the rear tandem axles. Pushing button in compresses the springs, releasing the brakes. Do NOT use to stop vehicle except in an emergency as a severe sudden stop will occur.
15. Defroster Push-Pull Control. Pulling the control allows air from the heater to flow to the windshield for defrost. Pushing the control allows air to flow out of the heater vents into the cab.
16. Cab Heater Fan Control. Variable speed control adjusts air output as desired.
17. Heat Push-Pull Control. Pulling the control opens a valve in the heater inlet water line to control the temperature of the air.
18. Windshield Wiper Switch. This switch has three positions OFF LOW HIGH with built-in circuit breaker.  
Parking Brake Warning Light. (Not Shown). When RED, indicates parking brake is "on".
19. Engine Emergency Stop Control. Used only when engine does not stop with normal ENGINE STOP CONTROL. This control shuts off the air supply at the engine air box for positive stop. The valve must be manually reset at the air box.
20. Engine Stop Button. Depressing button energizes a solenoid valve which places the injector racks in the "no fuel" position.
21. Ignition Switch. Provides for controlling electrical power to the Carrier and for starting the engine.
22. Lights Switch. Three position switch controls parking-marker lights, head-tail lights, and indirect instrument panel lights.
23. Hydraulic Pump Indicator Light. Indicates if the hydraulic pumps constant speed drive is engaged or disengaged.
24. Roadranger Gear Shift Lever. Shift pattern shown on decal.  
Gear Range Selector Valve. (Not Shown). Range positions shown on shift lever knob and decal.  
Countershaft Brake Control Button. (Not Shown). Used only to assist initial engagement when vehicle is standing still.
25. Accelerator Pedal. Controls engine speed by mechanical linkage to the governor control shaft. Depress to increase engine speed.

26. Air Brake Pedal. Controls air valve in line from air system tank to wheel air brakes. Because of light force required to actuate pedal, extreme care should be taken during initial familiarization.
27. Clutch Pedal. Hydraulic master and slave system provides easier clutch operation. First 1 1/2 inches of free pedal travel provides clutch release bearing clearance.
28. Windshield Washer Control. Bulb type located to the left of the clutch pedal. Non-freezing type windshield washer fluid should be used at all times.
29. High-Low Beam Light Switch. Conventional foot button type with high beam indicator on panel.
30. Directional Signal Switch. Push lever up for right turn indication and pull down for left indication. Lever will automatically return to neutral when wheels are straightened out after turn.

Quick Start Button. (Not Shown). Can only be energized while starter is held in "on" position.

Hazard Light Switch. (Not Shown). Move switch forward to actuate four-way flasher when required. Move switch backward for OFF.

Turn Signal Indicator. (Not Shown). Blinking light indicates turn switch is in signal position and signal lights are working properly.

Constant Speed Pump Drive Disconnect Handle. (Not Shown). Pulling handle disengages the constant speed pump drive.



Illustration 4-2. Carrier Cab



## DRIVE TRAIN.

Engine. (Illus. 4-3).

The GM6-71N Diesel Engine is standard. The GM6-71N Diesel Engine has 6 cylinders. The general specifications for the engine is listed below. The paragraphs to follow describe the Engine Systems that provide fuel, coolant, lubricating oil, electric, and air. For detailed descriptions, refer to IN-LINE 71 OPERATORS MANUAL.

## General Specifications:

NUMBER OF CYLINDERS	6	TOTAL DISPLACEMENT CU. IN.	426
BORE	4 1/4 in.	FIRING ORDER R.H. ROTATION	1-5-3-6-2-4-
STROKE	5 in.	L.H. ROTATION	1-4-2-6-3-5
COMPRESSION RATIO	18.7 to 1		

## Fuel System Components. (Illus. 4-4).

The Fuel System consists of fuel injectors, fuel piping, fuel pump, fuel strainer, and fuel filters. A restricted elbow is located in the outlet manifold to maintain pressure in the fuel system between the inlet and outlet fuel passages.

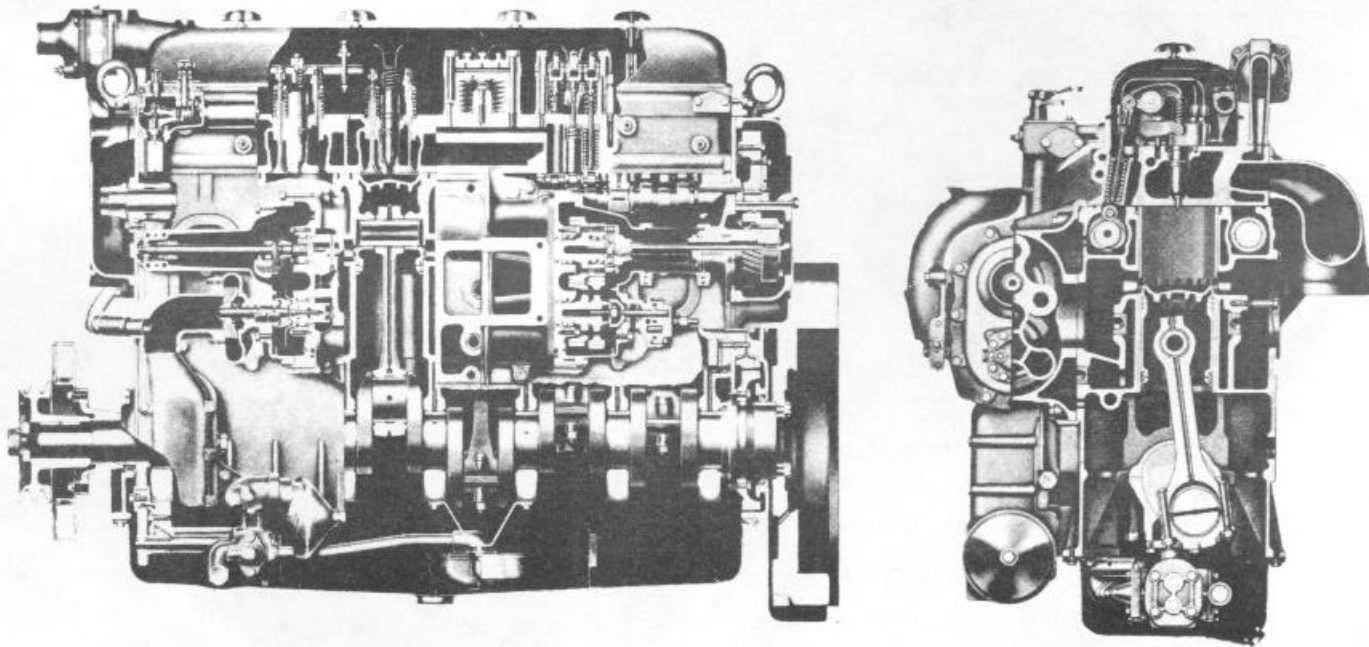
Fuel is drawn from the supply tank through the fuel strainer and enters the fuel pump at the inlet side. Upon leaving the pump under pressure, the fuel is forced through the fuel filter and into the fuel inlet manifold where it passes through fuel pipes into the inlet side of each fuel injector. The fuel is filtered through elements in the injectors and atomized through small spray tip orifices into the combustion chamber. Surplus fuel, returning from the injectors, passes through the fuel return manifold and connecting fuel lines back to the fuel tank.

The continuous flow of fuel through the injectors helps to cool the injectors and remove air from the fuel system.

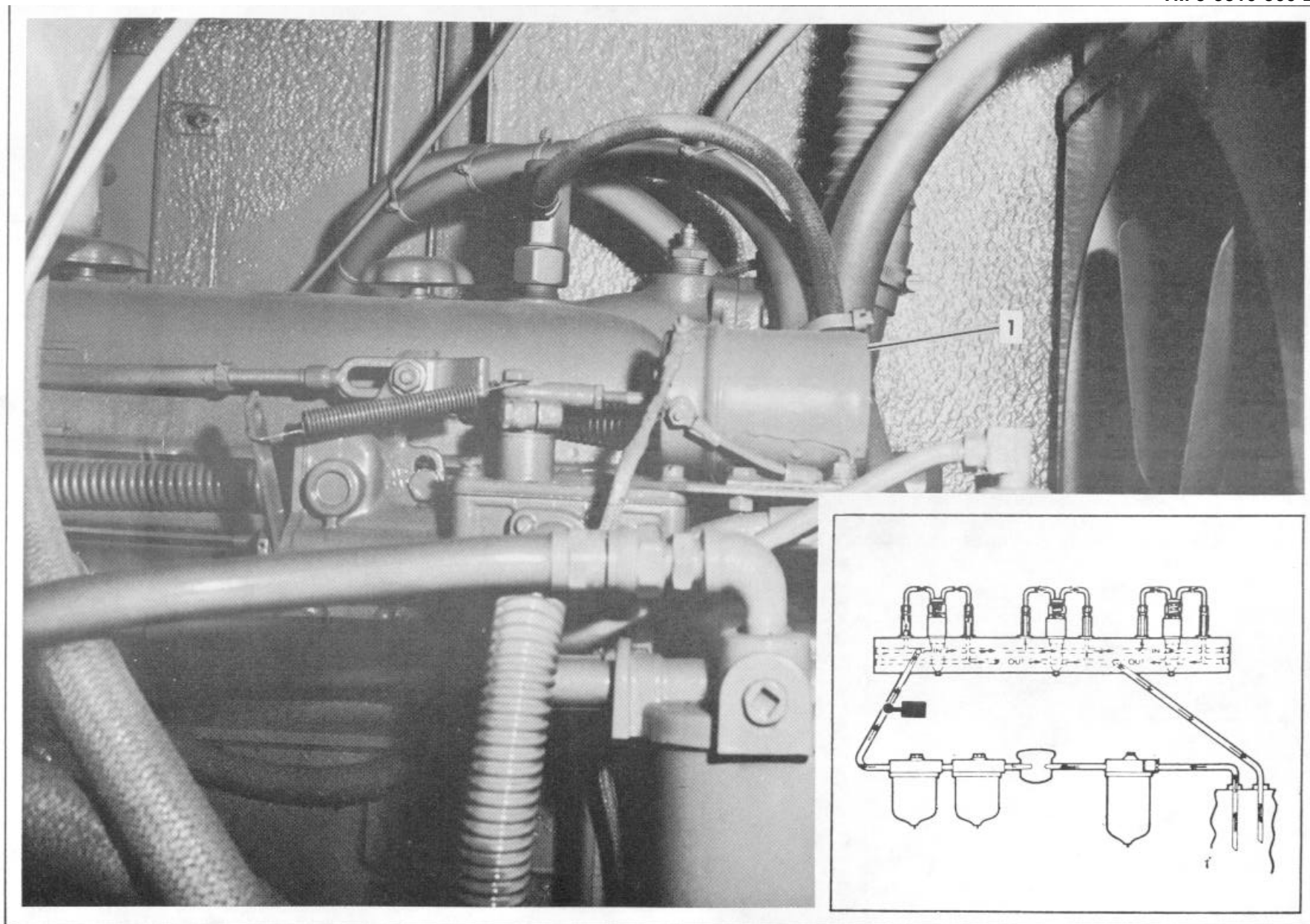
A check valve may be installed between the fuel strainer and the source of supply as optional equipment to prevent fuel drain back when the engine is not running.

Fuel Injectors.

The fuel injector combines in a single unit all of the parts necessary to provide complete and independent fuel injection at each cylinder. The injector creates the high pressure necessary for fuel injection, meters the proper amount of fuel, atomizes the fuel, and times the injection into the combustion chamber.



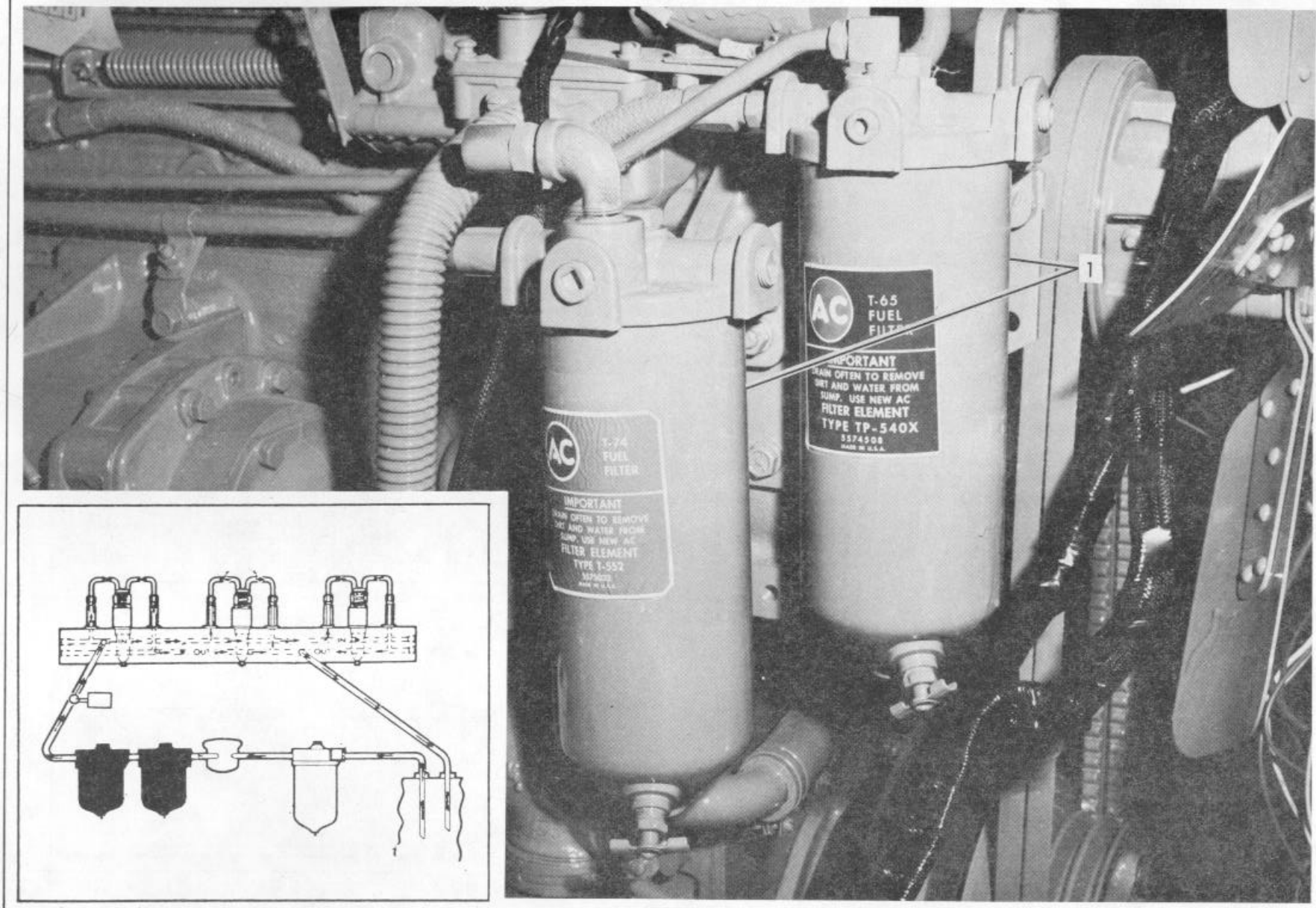
*Illustration 4-3. Cross Section Views of Typical In-line Engine.*



1. Fuel Stop Switch

Illustration 4-4. Engine Fuel System Components. (Sheet 1 of 4)





1. Fuel Filter

Illustration 4-4. Engine Fuel System Components. (Sheet 2 of 4)