ENGINE MAINTENANCE MANUAL

NO. 252C

for

MODEL 567C ENGINES

4th Edition
July, 1959

GENERAL MOTORS LOCOMOTIVES

SECTION INDEX

ELECTRO-MOTIVE DIVISION
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FORWORD

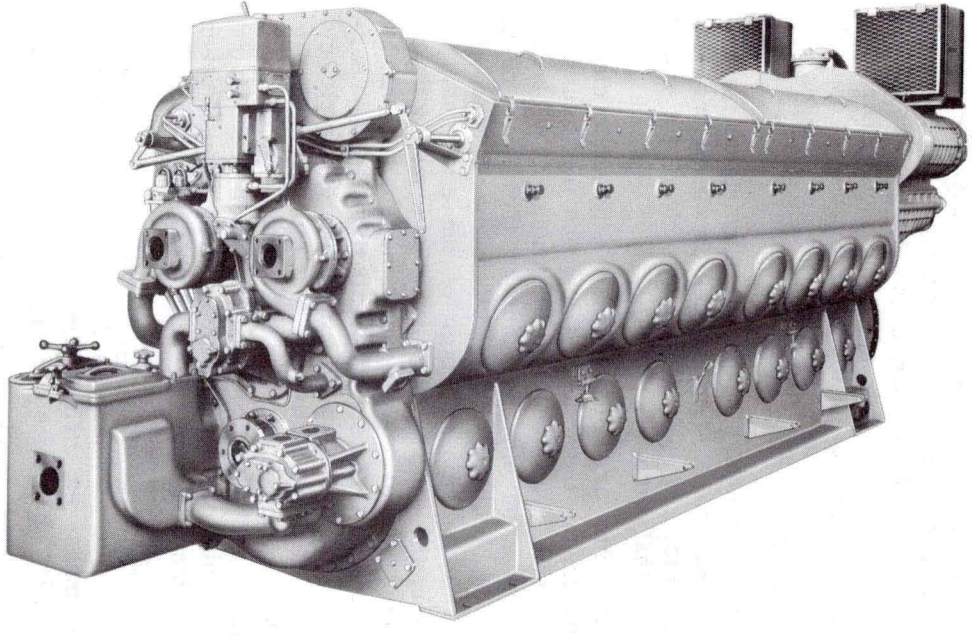
This manual is designed to cover all 6, 8, 12, and 16 cylinder Model 567C engines and attached accessories. Minor differences, between engines and the manual, due to slight refinements in specifications after the manual was sent to press may be encountered. Refinements in specifications of production engines generally are not reflected in engines already in service. Therefore, we feel it inadvisable to make revisions of manuals already distributed, except when major changes are recommended for engines already in service.

Each section of the manual consists of the Description, Operation, Maintenance, Specifications, and Equipment List on the component parts of the engine covered by that section.

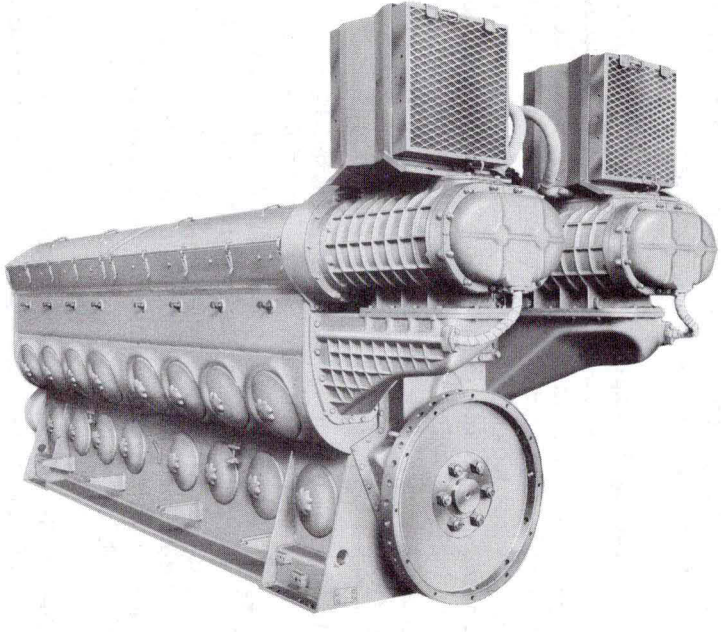
Wear limits are often given as diametric clearance. This means the total clearance on the diameter. Most diametric clearances can be measured by placing a feeler gauge on only one side of the object being checked. Other items may have to be checked by measuring the outside diameter of the shaft, using a micrometer, and subtracting this figure from the inside diameter of the bearing in which the shaft turns. A ball micrometer for measuring wall thickness of bearings, and a dial indicator for measuring diametric and longitudinal clearances will be found necessary. For measuring clearances such as piston to cylinder head, or oil pump gears to housing, the use of lead ribbon will be desirable. The lead ribbon is inserted between the parts, removed and measured to obtain the clearance.

Where radial clearance is specified it is because the nature of the part is such that diametric clearance cannot be measured. The radial clearance is always one-half of the diametric clearance.

Longitudinal or thrust clearances are listed throughout the manual with all of the clearances removed at one end of the part being measured. Where it is not convenient to take out all of the thrust at one end, the thrust at each end should be measured and added, to give the total longitudinal clearance.



Front Three-Quarter View Model 16-567C Engine
Fig. 0-1



Rear Three-Quarter View Model 16-567C Engine
Fig. 0-2

OPERATING DESCRIPTION

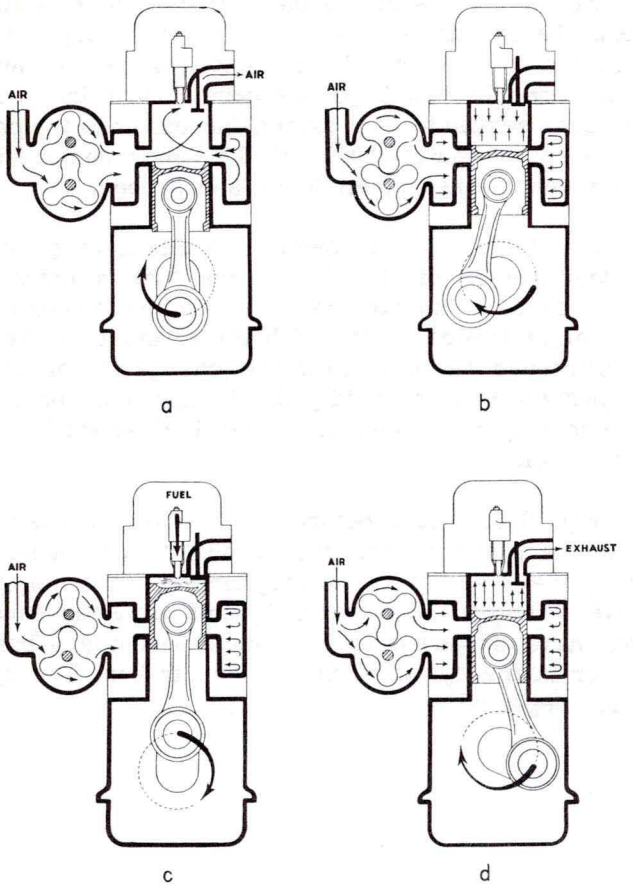
In a four-cycle engine, four strokes of the piston are required to complete one cycle of events: the intake stroke, compression stroke, power stroke and exhaust stroke. The crankshaft will make two revolutions per cylinder for each power stroke. During the intake and exhaust strokes the piston functions as an air compressor, which operation consumes power.

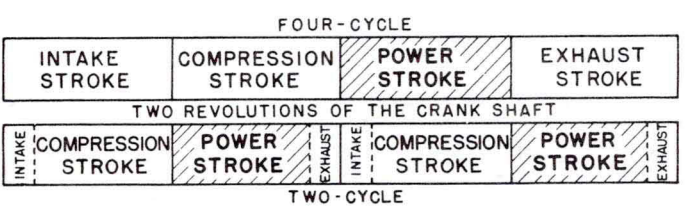
In a two-cycle engine, such as the model 567C, only two strokes of the piston are required to complete the cycle of events. Intake and exhaust takes place during part of the power and compression strokes. Each downward (power) stroke of the piston delivers a power impulse to the crankshaft. Therefore, a two-cycle engine has twice as many power impulses as a four-cycle engine, with the same number of cylinders and operating at the same speed.

As the piston in a two-cycle engine is not required to function as an air pump, an external means of supplying air must be provided. A specially designed blower, handling a large volume of air at low pressure, is used for this purpose. The blower forces air into the cylinder through ports in the cylinder liner wall, thus expelling the exhaust gases and filling the cylinder with a fresh charge of air for combustion.

The cycle of events of the two-cycle engine and operation of the blower are graphically described on Fig. 0-3 and explained in the following paragraphs.

Fig. 0-3a. At the lower end of its downward stroke the piston uncovers a row of ports in the cylinder liner admitting the scavenging air to the cylinder. This flow of air through the ports and exhaust valves produces complete scavenging, leaving the cylinder full of clean air when the piston covers the ports on its upward stroke.





Cycle Of Events Of Engine
Fig. 0-3

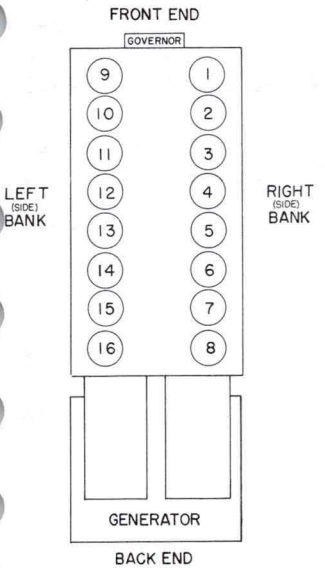
Fig. 0-3b. As the piston continues on the upward stroke the exhaust valves close and the charge of air is compressed to about one-sixteenth of its initial volume, or about 600 pounds per square inch. Air, when compressed to this extent, increases in temperature to approximately 1000° F. This high compression ratio is maintained at all loads and speeds.

Fig. 0-3c. Shortly before the piston reaches the top dead center of its stroke, the fuel, atomized by high pressure is injected into the combustion chamber. The fuel is ignited by the high temperature of the air and continues to burn until the charge is consumed. The burning charge rapidly builds up a high pressure which acts upon the piston, forcing it downward on the power stroke.

Fig. 0-3d. Just before the piston reaches the end of the power stroke, the exhaust valves open, releasing the gases to the atmosphere. The piston then uncovers the air inlet ports. By this time the exhaust gases have expanded to the point where the pressure is lower in the cylinder than in the air-box. The cycle is then repeated.

GENERAL DESCRIPTION AND DATA

The Model 567C Diesel engine is a "V" type, two-cycle engine, incorporating the advantages of low weight per horsepower, fully scavenging air system, solid unit injection and high compression.



The accompanying sketch serves to identify the cylinder locations, ends and banks of the engine as referred to in this manual. The governor, water pumps and lube oil pumps are mounted at the "Front End." The blowers, oil separator and generator are at the "Back End."

GENERAL DATA

Bore		8-1/2"
Stroke		10"
Compression Ratio		16:1
Idling Speed		275 RPM
Starting Speed		75-100 RPM
Rotation (Facing Back End)		Counter-Clockwise
Angle Between Banks		45°
Weight (Approx.)	6-567C	15,660 lbs.
	8-567C	17,970 lbs.
	8-567CR	18,500 lbs.
	12-567C	24,660 lbs.
	16-567C	32,106 lbs.

Rated Horsepower

Horsepower ratings for various applications of 567C engines are given in Table "B," Section XI.

Firing Order

6-567C	1-4-3-6-2-5
8-567C	1-5-3-7-2-6-4-8
8-567CR	1-5-3-7-4-8-2-6
12-567C	1-12-7-4-3-10-9-5-2-11-8-6
16-567C	1-8-9-16-3-6-11-14-4-5-12-13-2-7-10-15

Displacement per Cylinder	567 cubic inches
Number of Exhaust Valves (per cylinder)	4
Crankpin Diameter	6-1/2"
Crankshaft Journal Diameter	7-1/2"
Number of Main Bearings	
6-567C	4
8-567C	5
8-567CR	5
12-567C	7
16-567C	10

TORQUE VALUES FOR 567 SERIES ENGINES

	Foot Pounds
Cylinder Head Nuts	
"C" Engine type liners	200
Liner design #1 and #2	290-300
Liner design #3	200
Liner Stud Application (Min.)	50
Connecting Rod to Piston Pin Bolts	450
Fork Rod Basket Capscrews (at serrations)	190-200
Fork Rod Basket Capscrews (at serrations) (checking ONLY, see Section 3)	175-185
Split Basket Bottom Bolts (1/2" × 20)	75
Main Bearing Nuts	500-800
Main Bearing Studs	250
Crab Stud Nuts	1800
Engine Flywheel Mounting Bolts	1200
Flywheel Coupling Bolts (3/4" × 16)	295
Injector Crab Nuts	50
Blower Timing Gear Cover Nuts	35-40
Oil Pan to Crankcase Mounting Bolts	450
Front and Rear 1/2" Mounting Capscrews	
Hardened (with mark on head)	85
Not Hardened (without any mark on head)	65
Aux. Gen. Drive Assy. 3/4" Mounting Bolts	175
Cylinder Head Frame Capscrews	30
Rocker Arm Shaft Nuts	300
Injector Fuel Lines	40
Camshaft and Injector Shaft Capscrews	20-25
Fuel Manifold Blocks	25
Exhaust Manifold Capscrews (5/8" × 18)	130
Exhaust Manifold Stud Nuts (5/8" × 11)	90
Exhaust Manifold Connecting Clamp Bolt	70 in. lbs.
Harmonic Balancer Capscrews (Mounting)	400
Accessory Drive Gear Capscrews (Mounting)	250
Cylinder Head Elbow Capscrews ("C" Engine)	30
Water Pump Impeller	80
Water Pump Gear	265
Water Manifold Strap Nuts	15

Liner Water Inlet Tube Capscrews (in liner)	30
"Pee" Tubes	20
Bolted Crankshaft Counterweights	200
Engine Hold Down Bolts	450
8-567CR Rework	
Bolts - Camshaft Counterweight to Stubshaft	
Stubshaft Bracket to Crankcase	
1/2"-20 dry	105
5/8"-18 dry	170-190
Camshaft Bearing Blocks (3/8"-24)	27

NOTE: All single values given may vary plus or minus five percent of the value.

TORQUE WRENCHES

	Part No.
Crab Nut Powerench (ratio 12:1)	8211089
Torque Wrench (25 ft. lbs.) 1/2" Drive	8157122
Torque Wrench (100 ft. lbs.) 1/2" Drive	8157120
Torque Wrench (300 ft. lbs.) 3/4" Drive	8157121
Torque Wrench (200 ft. lbs.) 3/4" Drive	8173332