567D-1 ENGINE

Supplement to

567C ENGINE MAINTENANCE MANUAL NO. 252C

FEBRUARY, 1960

ELECTRO-MOTIVE DIVISION
GENERAL MOTORS CORPORATION
LA GRANGE, ILLINOIS, U.S.A.

Printed In U.S.A.

INTRODUCTION

The purpose of this supplement is to provide general information on the 16-567D-1 engine during the interim period before a permanent publication is available. The current 252C Engine Maintenance Manual covering the 567C engine also covers many parts used in the 567D-1 engine. Major parts differing from the 567C engine will be covered according to the respective section in 252C manual.

SECTION O

GENERAL

Information in this section applies to the 16-567D-1 engine as well as the 16-567C engine, except the compression ratio. The compression ratio of the 16-567D-1 engine is 20:1 as compared with 16:1 with the 567C engine.

Also, the horsepower of the 16-567D-1 engine as applied in the GP18 locomotive is 1800 horsepower.

SECTION 1

CRANKCASE AND OIL PAN

The main bearing caps used on the "D" engine are thicker from the serrations to the nut face of the cap. The center section of the caps are also made stronger.

Due to the increased thickness of the main bearing caps, the main bearing studs on the "D" engine are longer. The "D" engine stud length is 15-11/16" long as compared with a 15-3/16" length of the "C" engine.

The "D" engine crankcase also has a stronger cylinder head retainer and a redesigned "H" section center crab post support.

The wing section between the retainers has been greatly strengthened on the "D" engine.

SECTION II

CYLINDER HEAD ASSEMBLY

The cylinder head used on the 567D engine provides a higher water velocity through the head and increased cooling. Since the injector dowel location is the same in 567D engine cylinder head as the 567C,

it may be used in the 567C engine. However, it is not recommended to use the current 567C engine cylinder head in the 567D engine.

The injector rocker arms used with the 567D engine have been redesigned to increase their strength by adding more metal. The 567D injector rocker arms can be used on other 567 series engines, but the injector rocker arm used on other engines should not be used on the 567D engine.

SECTION III

PISTON, CONNECTING RODS AND BEARINGS

Piston 8276379 used in the 567D-1 engine differs from a conventional 567C engine piston. The crown contour of the piston has been altered so as to provide a 20:1 compression ratio as compared with 16:1 for the 567C series engines. The compression lead readings on the 567D-1 engine, however, remain the same since the change is in the piston bowl, not at the crown rim. The piston ring belt area has been altered to provide increased strength. Also, to improve piston crown cooling, the piston has a smooth undercrown without cooling fins as used on previous piston assemblies. The 20:1 ratio piston can be identified by the number "20" on the inside wall of the piston.

There are four compression and two oil control rings used on the 567D engine piston. Each compression ring has a 3/16" thickness instead of the conventional 1/4" thickness. The piston lands separating the ring grooves vary in width; 3/8" between the first and second ring grooves, 1/4" between the second and third ring grooves, and 3/16" between the third and fourth ring grooves.

The top three compression rings of the piston are high strength chrome plated rings. The fourth compression ring is a tapered face ferrox filled ring.

A standard double hook oil ring is used in the top oil ring groove, while a spring loaded oil control ring is used in the lower oil ring groove.

There is only one row of oil drain holes at the upper oil ring groove as compared to the standard two rows at the lower oil ring groove.

The upper connecting rod bearing used on the 567D engine has been changed to provide a silver bearing surface having a lead plated overlay of .0003" to .0006" thick for the blade rod bearing. The new bearing provides a much better bearing surface.

SECTION IV

CYLINDER LINERS

The cylinder liner assembly 8262891 used with the 567D-1 engine is the same as the 567C liner using two seals at the lower liner pilot.

SECTION V

CRANKSHAFT, MAIN BEARINGS AND HARMONIC BALANCER

Same as used in the 567C engine.

SECTION VI

CAMSHAFTS AND OVERSPEED TRIP

The camshafts used on the 567D-1 engine are the "polydyne" design, which improves valve operation by a change in the camshaft exhaust cam lobes, as currently used on the 567C engine.

SECTION VII

BLOWERS

Same as used on the 567C engine.

SECTION VIII

LUBRICATING OIL SYSTEM

The engine oil system, on the 16-567D-1 engine, is similar to that of other 567 series engines described in the 252C Engine Manual. The major changes to the lubricating oil system in the 567D-1 engine are:

1. Main lubricating and piston cooling oil pump and scavenging oil pump, although similar to the respective pumps on other 16 cylinder 567 series engines are, however, larger to provide about 37% additional capacity, running at the same speed.

2. The lube oil relief valve is adjusted to provide a maximum pressure at full speed of 70 psi.

3. The 16-567D-1 engine is now furnished with oil level gauge 8285976, as are other "D" engines, to insure that the proper oil level is maintained in the engine. The oil level should be taken with the engine at idle and the oil hot, and maintained between the "low" and "full" marks on the gauge. It should be noted, that under certain conditions it is possible for oil to overflow at the oil pan handholes, even when operating at the recommended level.

SECTION IX

COOLING SYSTEM

The cooling system of the 567D engine is similar to the 567C engine.

SECTION X

FUEL SYSTEM

A new increased output needle valve type fuel injector 5228540 shown in this section is used in the 567D-1 engine.

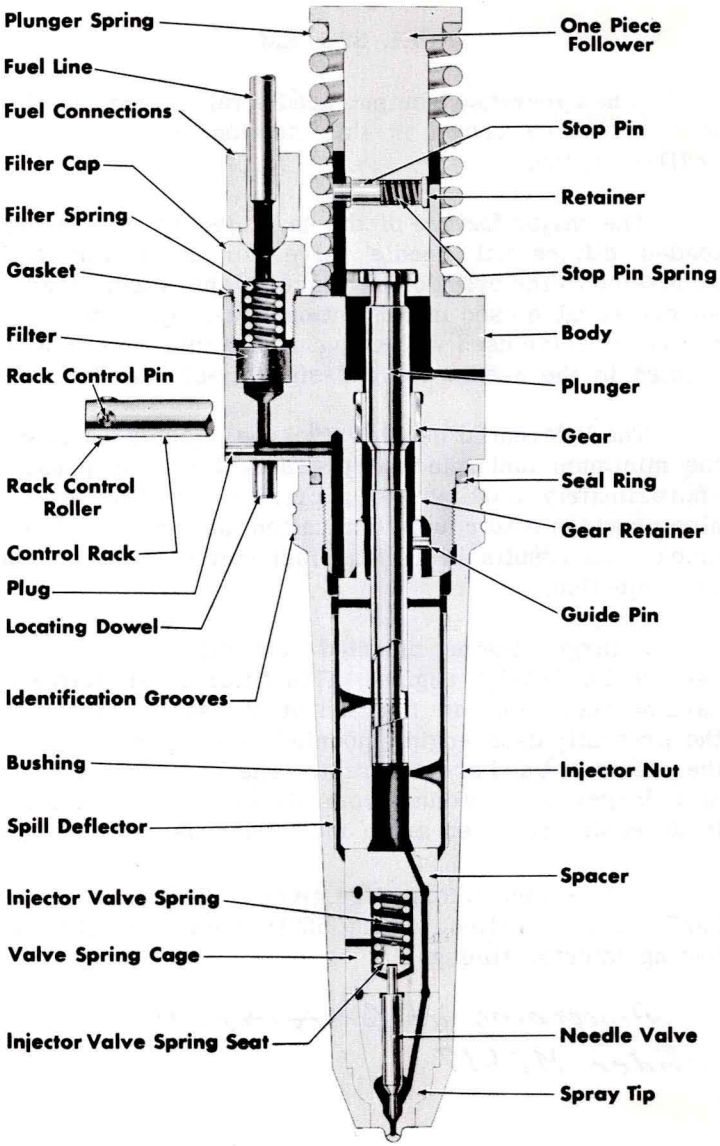
The major feature of the new injector is a spring loaded differential needle valve for controlling fuel admission to the cylinder in place of the spring loaded spherical valve used in conventional fuel injectors. The flat check valve used with conventional injectors is also deleted in the needle valve design injectors.

The differential needle valve type injector increases the minimum fuel injection pressure from the present approximately 1000 psi to approximately 3000 psi. It also provides better fuel atomization, decreases exhaust smoke and results in a clean fuel cutoff at the end of fuel injection.

A larger engine mounted fuel oil filter is also used on the 567D-1 engine. This filter is similar regarding operation and function of the sight glasses to the presently used engine mounted fuel filter, however, the elements used are different. The 567D engine filter uses larger cotton wound elements which are contained in an easily removed angle mounted housing.

Maintenance information given in Section X of the 252C manual applies to the 567D engine, relative to setting injector timing.

Afprøvning af forstøverpumper: se under MI 417



Needle Valve Type Fuel Injector

SECTION XI

GOVERNOR, ENGINE SPEED CONTROL

The governor used on the 16-567D-1 engine is 8216206, which is adjusted to provide 275 RPM idle speed and 835 RPM in full speed.

Information on the GP9 locomotive governor in Section XI, applies also to the GP18 locomotive governor, except the GP18 locomotive is rated at 1800 horsepower.

SECTION XII

PILOT VALVE, PILOT VALVE LINKAGE SETTING INJECTOR RACK AND LINKAGE

Information outlined in Section XII pertains to the 16-567D-1 engine as well as the 567C engine, regarding setting of the injector racks and pilot valve function and adjustment, covering locomotive installation.

Full load injector rack setting is given as .96" for the 16-567D-1 engine used in the GP18 locomotive. The pilot valve setting is set for maximum field to provide modified maximum field in conjunction with the overriding solenoid. The pilot valve is set to balance as outlined in Section XII, at the .96" rack setting at 835 RPM speed setting. Also, the pilot valve is set for maximum field, .040" below balance at 275 RPM setting, using dimension "A" of Table A of approximately 45/64".