

10. GENERAL INFORMATION

10.1 Safety

The operating of engine tests can expose personnel and facilities to a number of safety hazards. It is recommended that only personnel who are thoroughly trained and experienced in engine testing should undertake the design, installation and operation of engine test stands.

Each laboratory conducting engine tests should have their test installation inspected and approved by their safety department. Personnel working on the engines should be provided with the proper tools, be alert to common sense safety practices, and avoid contact with moving and/or hot engine parts. Guards should be installed around all external moving or hot parts. When engines are operating at high speeds, heavy duty guards are required and personnel should be cautioned against working alongside the engine and coupling shaft. Barrier protection should be provided for personnel. All fuel lines, oil lines and electrical wiring should be properly routed, guarded and kept in good order. Scraped knuckles, minor burns and cuts are common if proper safety precautions are not taken. Safety masks or glasses should always be worn by personnel working on the engines and no loose or flowing clothing should be worn near running engines.

The external parts of the engine and the floor area around the engines should be kept clean and free of oil and fuel spills. In addition, working area should be free of all tripping hazards. In case of injury, no matter how slight, first aid attention should be applied at once and the incident reported. Personnel should be alert for leaking fuel or exhaust gas. Leaking fuel represents a fire hazard and exhaust gas fumes are noxious. Containers of oil or fuel cannot be permitted to accumulate in the testing area.

The test installation should be equipped with a fuel shut-off valve which is designed to automatically cut off the fuel supply to the engine when the engine is not running. A remote station for cutting off fuel from the test stand is recommended. Suitable interlocks should be provided so that engine is automatically shut down when any of the following events occur: engine or dynamometer loses field current, engine overspeeds, exhaust system fails, room ventilation fails or the fire protection system is activated. Consider an excessive vibration pickup interlock if equipment operates unattended. Fixed fire protection equipment should be provided.

In ASTM sequence tests chemicals are used to flush engines between tests. Some of these chemicals, for example Oakite Rust Stripper, require that personnel wear face masks,

dust breathers and gloves as exothermic reactions are possible. Emergency showers and face rinse facilities should be provided when handling such materials.

The ethylene glycol type coolant used in the Sequence IID test presents a special fire hazard. Coolant hoses and clamps should be selected and installed with special care to prevent leaks and spills since ethylene glycol may ignite when it contacts hot exhaust system components. Dry chemical fire extinguishers should be available at the test stands to extinguish any coolant fires. Water is not recommended for use on these fires.

10.2 Glossary of Definitions

Blowby	That portion of the combustion reactants and unburned air to fuel mixture which leaks into the engine crankcase during operation of the engine.
Clogging	Restriction of a flow path due to the accumulation of debris along the flow path boundaries.
Corrosion	Any observed chemical attack on the metal parts. Rust is a special case of the corrosion of iron.
Lifter, stuck	Lifter plunger does not return to its original position by its own force upon removal from the engine.
Ring, free	One that falls of its own weight from side to side in its own groove.
Ring, stuck	One that is either partially or completely bound in its groove; cannot be readily moved with a reasonable amount of force applied by finger pressure.
Ring tight, sluggish	One that offers resistance to movement in its groove, but which can be pressed into or out of the groove under moderate finger pressure without springing back.
Rust	The chemical combination of oxygen with ferrous engine parts, including other iron complexes not removable by organic solvents.
Scoring	A condition resulting from metal to metal contact or foreign matter causing surface roughness in the direction of relative motion characterized by dragging and smearing of the material of one or both surfaces.
Scuffing	Adhesive wear which is the result of progressive removal of material from a rubbing surface caused by localized welding and subsequent fracture.
Sludge	A deposit, principally composed of engine oil and fuel debris, which does not drain from engine parts but can be removed by wiping with a soft cloth.
Varnish	A hard, dry, generally lustrous oil insoluble deposit which cannot be removed by wiping with a soft cloth.
Wear	The loss or relocation of material from two or more surfaces in relative motion.

10.3 Glossary of Symbols and Terms

<u>Symbol</u>	<u>General Meaning</u>
n	The number of test runs (observations)
k	The number of paired test runs (repeat runs made using the same oil, same procedure, same laboratory, etc.)
\bar{x}	The arithmetic mean or average
$\Delta\bar{x}$	Two results must differ by more than this amount to be significantly different at the 90 percent CL
σ or s	An estimate of the true standard deviation in a finite set; any finite set is considered to be a sub-set from the infinite set
σ^2 or s^2	An estimate of the true variance in a finite set; any finite set is considered to be a sub-set from the infinite set
df	Degrees of Freedom
V	Coefficient of Variation
d	The different (Δ) between duplicate measurements
r	Repeatability; the measure of precision within a single laboratory
R	Reproducibility; the measure of lab-to-lab precision
P	Probability
m	Multiplier of the estimate of the standard deviation for calculating the greatest difference between two results at the 95 percent confidence limit
CL	Confidence limits; 90 or 95 percent confidence limits are used in the STP and each are shown where applicable
F	The F distribution (ratio) describes the behavior of the ratio of two chi squared variables; it is used for comparing two sample variances
"t"	"Student's t;" the ratio of the difference between the averages to the standard deviation of this difference; used for comparing sample means by assuming equality of variances

The symbols and terms shown above are those generally used in the statistical analysis of results from standardized engine testing.

10.4 Document Precision Information

Reproducibility data included in this STP were developed using different guidelines from those set forth in the current ASTM D-2 Precision Manual as necessitated by the required test durations and equipment differences.

The reported reproducibility data are generally valid within the scope of the standardized engine testing procedures. Conversely, repeatability as defined in the current ASTM D-2 Precision Manual is inapplicable to engine-testing practices.

APPENDIX A

PROCUREMENT OF TEST MATERIALS

Throughout the text, references are made to necessary hardware, reagents, materials and apparatus. In many cases, for the sake of uniformity and ease of acquisition, certain suppliers are named. If substitutions are deemed appropriate for the specified suppliers, permission in writing must be obtained from the Test Monitoring Center and/or General Motors Research Laboratories before such will be considered to be "equivalent." The following entries of this appendix represent a consolidated listing of the ordering information necessary to complete the references found in the text.

A.1 GENERAL COMMUNICATIONS CONCERNING SEQUENCE IID REFERENCE TESTS

ASTM Test Monitoring Center, 4400 Fifth Avenue,
Pittsburgh, Pennsylvania 15213, Attn: P. A. Bennett,
Telephone: (412) 578-3316.

A.2 GENERAL COMMUNICATIONS CONCERNING SEQUENCE IID PROCEDURAL QUESTIONS AND CANDIDATE TESTS

General Motors Research Laboratories, Fuels and Lubri-
cants Department, Warren, Michigan 48090, Attn:
J. J. Rodgers or R. H. Kabel, Telephone: (313)-575-3267
and (313)-575-2869 respectively.

A.3 REFERENCE OILS

Reference oils may be purchased by contacting:

ASTM Test Monitoring Center, 4400 Fifth Avenue,
Pittsburgh, Pennsylvania 15213, Attn: P. R. Eisaman.
Telephone: (412)-578-3350.

A.4 TEST ENGINES

To be valid, Sequence IID tests must be conducted utilizing a 1977 350 cid (5.7 L) Oldsmobile V-8 engine, (short blocks are designated under part #556618). It is recommended that complete engine assemblies be ordered only for parts; assembled engines may have oversize bores, and cannot be used for test. Purchase orders should be placed with an Oldsmobile dealer (for short blocks and other special parts) and should contain the following statement: "Engine to be used for oil test purposes, (engines with oversize cylinder and/or lifter bores are not acceptable)," and directed to:

Order Department Supervisor, GMPD, 6060 Bristol
Road, Flint, Michigan 48554.

A.5 SPECIAL SEQUENCE IIID TEST PARTS

Special parts may be made by any capable independent machine shop or may be obtained by contacting:

General Motors Research Laboratories, Fuels and Lubricants, Department 21, Warren, Michigan 48090, Attn: C. C. Curnow, Telephone: (313)-575-6670.

A.6 EXTERNAL OIL PUMP

Viking Model GX 4154, 6 ± 0.5 gpm (0.38 ± 0.03 L/s) at 1150 rpm, no relief valve. Available through local Viking distributors or:

Viking Pump Division, Houdaille Industries, Inc., George and Wyeth Street, Cedar Falls, Iowa 50613. Telephone: (319)-266-1741.

A.7 EXTERNAL OIL SYSTEM HEAT EXCHANGER

Harrison Model 1051-100 part #8508175 or Model #1241-100 part #8514404, available through local distributors, must be used. Order from:

General Motors Corporation, Harrison Radiator Division, Sales Department, 200 Upper Mountain Road, Lockport, New York 14094, Telephone: (716)-439-3230.

A.8 EXTERNAL OIL SYSTEM AND OTHER QUICK DISCONNECT FITTINGS

Aeroquip products are available through local distributors or:

Aeroquip Corporation, Industrial Division, 1225 W. Main St., Van Wert, Ohio 45891. Telephone: (419)-238-1190.

A.9 FUEL PRESSURE REGULATOR

A suitable regulator may be obtained from:

Fisher Governor Company, 1900 Fisher Building, Marshalltown, Iowa 50158. Telephone:(515)-754-3556.

A.10 FUEL SHUT-OFF VALVE

A satisfactory fuel shut-off valve (X5D30280) may be obtained from:

Skinner Electric Valve Division, Skinner Precision Industries, Inc., 100 Edgewood Avenue, New Britain, Connecticut 06050. Telephone: (203)-225-6421.

A.11 HUMIDITY MEASURING EQUIPMENT

Alnor 7300 Dewpointer; available through local distributors or:

Alnor Instrument Co., 7301 N. Caldwell Ave., Niles, Illinois 60648. Telephone: (312)-647-7866.

A.12 THERMOCOUPLES AND PACKING GLANDS

Thermocouples and packing glands are obtainable from:

Conax Corporation, 2302 Walden Avenue, Buffalo, New York 14225, Att'n: Sales Dep't. Telephone (716)-684-4500.

A.13 EXHAUST PIPES

Flexonic Corporation, part #RT10E; available from local distributors or:

Flexonic Division UOP, Inc., 300 E. Devon Avenue, Bartlett, Illinois 60123. Telephone: (201)-751-5050.

A.14 CRANKCASE PRESSURE GAUGE (MAGNEHELIC)

A suitable crankcase pressure gauge may be obtained from:

Dwyer Instrument Company, P. O. Box 373-T, Michigan City, Indiana 46360, Telephone: (219)-872-9141.

A.15 TEST FUEL

For ordering GMR 995 test fuel, purchase orders should be directed to:

Phillips Petroleum Company, Sales Department, 337 Adams Building, Bartlesville, Oklahoma 74003, Attn: H. C. Colopy, Telephone: (918) 661-4196.

A.16 GLYCOL

Dow regular grade ethylene glycol; available through:

Dow Chemical Co., 2020 Dow Center, Midland, Michigan 48640. Telephone: (517)-636-1000

A.17 SODIUM METABORATE

Eight mole technical grade; available through local distributors or:

United States Borax and Chemical Company, 3075 Wilshire Boulevard, Los Angeles, California 90010. Telephone: (213)-381-5311.

A.18 NACAP

Available through local distributors or:

Vanderbilt Chemical Corp., 30 Winfield St., Norwalk
Connecticut 06855. Telephone: (203)-853-1400.

A.19 CALCIUM NITRATE

Analytical reagent grade, Mallinckrodt Code No. 4236; available through local distributors
or:

Mallinckrodt, Inc., 1675-T Brown Road, St. Louis,
Missouri 63134. Telephone: (314)-885-0123.

A.20 SODIUM NITRITE

Specify DuPont Flaked (U.S.P. grade); available in 50 or 100 lb bags and 100 and 400 lb
drums:

Ashland Chemical Company, P. O. Box 2219, Columbus,
Ohio 43216. Telephone: (614)-889-3333.

A.21 PLURONIC L-61

"Regular grade for GM-MS test" must be specified and may be ordered from:

Wyandotte Chemicals, Surfactant Sales Department,
1500 Eureka, P. O. Box 319, Wyandotte, Michigan
48192. Telephone: (313)-284-3636.

A.22 DECYL ALCOHOL

Commercial grade Eastman Kodak Item 30 obtainable through local suppliers or:

Eastman Organic Chemicals, 343 State Street,
Rochester, New York 14650. Phone: (716)-724-4000.

A.23 SOLVENT S-26

Cities Service Oil Company, P. O. Box 300, Tulsa,
Oklahoma 74102. Telephone: (918)-586-2211.

A.24 OAKITE 77, OAKITE 11, OAKITE RUST STRIPPER*, OAKITE DRYCID

Oakite Products, Inc., 50 Valley Road, Berkley Heights,
New Jersey 07922. Att'n: W. J. Wittke.
Telephone (201)-464-6900.

* Order must specify "Rust stripper O.F. for GM
Engine Oil Sequence Tests"

A.25 SOVASOL #5

Available from local suppliers of Stoddard Solvent.

A.26 PERFECT SEAL NO. 4 SEALING COMPOUND

Part #1050026 (available in 40 oz, pint, or gallon containers) must be used and may be ordered from:

P. O. B. Sealants Div., Allied Technology, Inc., 11102
Kenwood Road, Cincinnati, Ohio 45242. Att'n: Order
Department. Telephone: (513)-793-6332.

A.27 PERMATEX, NO. 2 NON-HARDENING AND PERMATEX 6BR

Available from local distributors of Permatex which may be found by contacting:

Permatex Co., Inc., (Loctite Corp.), 18731-T Cranwood
Parkway, P. O. Box 7183, Cleveland, Ohio 44128.
Telephone: (216)-475-3600.

A.28 3M SUPER WEATHERSTRIP ADHESIVE

#051135-08001 must be specified and may be ordered from:

Minnesota Mining and Manufacturing Co., AC & S
Division, Dept. TR, 3M Center, 223-6 N. E., St. Paul,
Minnesota 55101. Telephone: (612)-733-1110.

A.29 ANTI-SEIZURE COMPOUND

Fel-Pro, Inc., 7450 N. McCormick Boulevard, Skokie,
Illinois 60076. Telephone: (312)-674-7700.

or

E/M Lubricants, Inc., 6940 Farmdale, N. Hollywood,
California 91605.

A.30 3M CLOTH

400 grit 3M cloth or 3M Elek-tro-Cut Cloth 400J or equivalent

A.31 BREATHER TUBE GASKETS

Part #2G-3A, 901 must be used and may be ordered through:

American Standard, Industrial Products Division, P. O.
Box 76, Dearborn, Michigan 48121. Telephone: (313)-
931-4000.

A.32 SAE 10W MINERAL OIL (EF 411)

Oil EF 411 (When ordering, refer to product code No. 47503-8) may be ordered from:

Mobil Oil Corp., 15565 Northland Drive, Southfield,
Michigan 48074

or

Mobil Oil Corp., Woodhaven Plant, Woodhaven,
Michigan 48183. Telephone: 1-800-492-2178. Att'n:
Paul Mouton.

or

Mobil Oil Corp., P. O. Box 226286, Dallas, Texas 75266

or

Mobil Oil Corp., 150 E. 42nd St., New York, New
York 10017. Telephone: (212)-883-4242.

A.33 DESICCATOR FOR PAINT ROLLER

A Sargent-Welch #S-25140 desiccator may be ordered from:

Sargent-Welch Scientific Co., 7300 N. Linder Avenue,
P. O. Box 1026, Skokie, Illinois 60077. Telephone:
(312)-677-0600.

A.34 INTAKE AND EXHAUST MANIFOLD GASKETS

McCord Gasket Company, Sales Department,
191-T Labodie Street, Wyandotte, Michigan 48192,
Att'n: H. G. Wilson, or J. J. Hungerman. Telephone:
(313)-284-3600.

A.35 PISTON RINGS

Muskegon Piston Ring Company, 1839 6th, Muskegon,
Michigan 49443, Att'n: Roger Knop, Manager, Special
Products Division. Telephone: (616)-726-5226.

A.36 PISTONS

General Motors Parts Division, Order Department,
Supervisor, 6060 Bristol Road, Flint, Michigan 48554.

A.37 VALVE LIFTERS

Diesel Equipment Division, GMC, Grand Rapids,
Michigan 49501, Att'n: Clarence Carter.

A.38 VALVE STEM SEALS

TRW VP-66 may be used and ordered from:

TRW Valve Division, 8001 E. Pleasant Valley,
Cleveland, Ohio 44131, Att'n: R. M. Burt.
Telephone: (216)-383-5746.

or

Crane #99820 may be used and ordered from:

Crane Cams, Inc., 100 N. W. 9th Terrace, Hallandale,
Florida 33009. Att'n: H. C. Grackstetter. Telephone:
(305)-457-8888.

A.39 ROCKER COVER GASKETS

Rocker cover gaskets, part #393573, will be manufactured semi-annually (order cut-off dates are January 1 and July 1) and must be ordered from:

Crotty Corporation, 848 W. Chicago, Quincy, Michigan
49082. Attention: R. J. Pickering. Telephone: (517)-
639-8787.

A.40 VALVE SPRINGS

Associated Spring Corporation, BGR Division, East
Stadium Boulevard, Ann Arbor, Michigan 48103, Attn:
J. Tucker or D. H. Poike. Telephone: (313)-665-8686.

A.41 CYLINDER HONE

Sunnen model CK-10 may be purchased from:

Sunnen Products Company, 7910 Manchester Avenue,
St. Louis, Missouri 63143. Telephone: (314)-781-2100.

A.42 RING GAP FEELER GAUGE

Range 0.020 in. or smaller to 0.050 in. (0.0508 to 1.27 mm) by 0.001 in. (0.0259 mm) increments, part #X467X:

Sterling Supply Company, 1220 East Nine Mile Road,
Ferndale, Michigan 48220, Att'n: Paul DeFaun.
Telephone: (313)-546-3200.

A.43 RING GRINDER

Sanford SG-48 (with Oldsmobile 350 head) may be ordered from:

Sanford Manufacturing Co., P. O. Box 318, Roselle,
New Jersey 07203. Att'n: Jon Meadows.
Telephone: (201)-245-0505.

A.44 CAM BEARING INSTALLATION TOOL

A Burroughs cam bearing installation tool, part #BT6409, may be ordered from:

Burroughs Tool and Equipment Co., 2429 N. Burdick
Street, Kalamazoo, Michigan 49002. Telephone:
(616)-345-5163 or (616)-345-2700.

A.45 VALVE GUIDE CUTTER FOR VALVE STEM SEALS

TRW #VP-503 for 11/32 in, may be ordered from:

TRW Valve Division, 8001 E. Pleasant Valley,
Cleveland, Ohio 44131, Att'n: R. M. Burt.
Telephone: (216)-383-5746.

or

Crane #97017 for 11/32 in. may be ordered from:

Crane Cams, Inc., 100 N. W. 9th Terrace, Hallandale,
Florida 33009. Att'n: H. C. Grackstetter. Telephone:
(305)-457-8888.

A.46 SPARK PLUG WIRE REMOVAL TOOL

Spark plug removal tool OTC 7078 may be ordered from:

Owatonna Tool Co., 376 North Street, Owatonna,
Minnesota 55060. Telephone: (507)-451-5813.

or

BT 7604 may be ordered from:

Burroughs Tool and Equipment Co., 2429 N. Burdick
Street, Kalamazoo, Michigan 49007. Telephone:
(616)-345-5163 or (616)-345-2700.

A.47 DRIVESHAFT

Dana Corp., Spicer Universal Joint Division,
P. O. Box 986, Toledo, Ohio 43696. Telephone:
(419)-476-3200.

A.48 TERI-TOWELS®

Available from local suppliers of Kimberley Clark products.

A.49 CRC RATING MANUALS

Rating Manuals #9 and #12 may be ordered from:

Coordinating Research Council, Inc., 219 Perimeter
Center Parkway, Suite 400, Atlanta, Georgia 30346.
Telephone: (404)-396-3400.

APPENDIX B

B.I Numerical

PRINT LISTING

GENERAL MOTORS PRINT NUMBER	TITLE OF PRINT
RX-116169-C	Flow Meter (Multiple Orifice Plate)
RX-116415-B	Adapter/Carburetor Inlet
(Print Nos RX-116645-D through RX-116649-A are detail prints of Print No. RX-116650-D)	
* RX-116645-D	Sharp Edge Orifice Water Flow Meter, Upper Tube Section
* RX-116646-D	Sharp Edge Orifice Water Flow Meter, Lower Tube Section
* RX-116647-A	Sharp Edge Orifice Water Flow Meter, Bottom Support
* RX-116648-B	Sharp Edge Orifice Water Flow Meter, Top Flange
* RX-116649-A	Sharp Edge Orifice Water Flow Meter, Plate
RX-116650-D	Sharp-Edge Orifice Water Flow Meter
RX-116680-C	Oil Temperature Control System
RX-116681-D	Schematic, Cooling Water to and from Engine
RX-116728-C	Piston Ring Grinder Assembly, Alteration
(Print Nos RX-116729-C through RX-116733-A are detail prints of Print No. RX-116728-C)	
* RX-116729-C	Piston Ring Grinder, Bracket
* RX-116730-B	Piston Ring Grinder, Shaft
* RX-116731-B	Piston Ring Grinder, Back-up Plate
* RX-116732-A	Piston Ring Grinder, Screw
* RX-116733-A	Piston Ring Grinder, Retaining Ring
RX-116903-B	Rework Oil Pump
RX-116924-C	Flushing Tank
RX-116933-E	Piston Ring Grinder Assembly
(Print Nos RX-116934-C through RX-116957-A are detail prints of Print No. RX-116933-E)	
* RX-116934-C	Piston Ring Grinder, Base Plate
* RX-116935-C	Piston Ring Grinder, Top Plate

* Denotes detail print

* RX-116936-C	Piston Ring Grinder, Rotating Table
* RX-116937-B	Piston Ring Grinder, Supports
* RX-116938-D	Piston Ring Grinder, Motor Shield
* RX-116940-B	Piston Ring Grinder, Table Mechanism Assembly
* RX-116941-B	Piston Ring Grinder, Slide
* RX-116942-A	Piston Ring Grinder, Slide Bar
* RX-116943-A	Piston Ring Grinder, Locking Plate
* RX-116944-A	Piston Ring Grinder, End Plate
* RX-116945-A	Piston Ring Grinder, Cover
* RX-116946-A	Piston Ring Grinder, Rod
* RX-116947-A	Piston Ring Grinder, Crank
* RX-116948-A	Piston Ring Grinder, Handle
* RX-116949-A	Piston Ring Grinder, Washer Adapter
* RX-116951-A	Piston Ring Grinder, Locating Pin
* RX-116952-A	Piston Ring Grinder, Inner Flange
* RX-116953-A	Piston Ring Grinder, Ring Supports
* RX-116954-A	Piston Ring Grinder, Ring Clamp
* RX-116955-A	Piston Ring Grinder, Stop
* RX-116956-B	Piston Ring Grinder, Drive Gear Assembly
* RX-116957-A	Piston Ring Grinder, Table Locator
* RX-117052-C	Piston Ring Grinder, Wheel Guard
RX-117152-C	Valve Calibration Fixture
RX-117157-B	Coupling Adapter
RX-117161-C	Auto-Water Flow Circuit
RX-117162-C	Auto-Carburetor Air Circuit
RX-117167-E	Engine Flywheel Guard
RX-117168-D	Safety Housing-Flywheel Housing
RX-117224-D	Engine Front Cover
RX-117225-C	1967 and 1977 Olds Flywheel Rework
RX-117227-A	Oil Filter Mounting Block
RX-117228-A	Rework-Bolt-Camshaft Gear, 1967 Olds
RX-117230-E	Flushing Tank System Piping Layout
RX-117231-C	Flushing Tank Schematic

* Denotes detail print

RX-117261-A	Water Outlet
RX-117262-A	Fuel Pump Plate, 1967 Olds
RX-117284-A	1967 Olds Exhaust Collar
RX-117286-C	Exhaust Manifold Pressure Tap Location, 1967 Olds
RX-117287-A	Spacer Washer, 1967 Olds Rocker Cover Bolt
RX-117288-A	Stanchion, Rocker Cover Deflector Stanchions
RX-117289-B	Rocker Cover Deflectors, Stainless Steel
RX-117290-C	Schematic, Rocker Cover System, 1967 Olds IIB
RX-117294-A	Bushing, Blowby Adapter, IIB-IIC
RX-117319-B	Front Cover Deflector, 1967 Olds
RX-117326-B	Dipstick Tube Gauge, 1967 Olds
RX-117329-B	Ring Depth Gauge, 1967 Olds
RX-117348-B	Dipstick Guide Driver
RX-117349-A	Dipstick Cap
RX-117350-D	Coolant Mixing Tank
RX-117370-B	1967 Olds Front Seal Driver
RX-117374-R	Flushing Tank-Oil Heat Exchanger and Rocker Cover
RX-117375-C	Automatic Dew Point Control
RX-117376-C	Automatic Carburetor Air Temperature Control Schematic
RX-117377-A	Driver-Cup Plug, 1967 Olds. Cylinder Head
RX-117379-D	Front Support, (Part of RX-117379-D) IIB, IIC and IIC
RX-117382-A	Oil Slinger Spacer Washer Modification
RX-117431-C	Blowby Gas Surge Tank
RX-117462-C	Auto-Exhaust Back Pressure Circuit, 1967 Olds
RX-117464-A	Washer-Retainer, 1967 Olds Timing Gear Deflector
RX-117470-D	Water Cooled Rocker Arm Cover, 1964-1967 Olds

Print Nos RX-117506-B and RX-117507-B are detail prints of Print No. RX-116933-E)

* Denotes detail print

* RX-117506-B	Piston Ring Grinder, Upper Gear
* RX-117507-B	Piston Ring Grinder, Lower Gear
RX-117520-D	Cylinder Block Honing Adapter Plate
RX-117529-D	Engine Dynamometer Installation
RX-117593-C	Flushing Tank
RX-117622-B	Cup Plug Driver, 1967 Olds MS Engine
RX-117636-A	Washer-Cylinder Head Honing Plate
RX-117726-C	Assembly Automatic Blowby, RX-117727-1967 Olds. IIIC
RX-117727-C	Automatic Blowby Measurement
RX-117729-C	Breather Tube, 1967 Olds
RX-117730-C	Mounting Plate and Blowby, 1967 Olds. IIIC
RX-117731-C	Schematic, Breather Tube Temperature Control System, IIID
RX-117802-C	Intake Manifold Flushing Adapter
RX-117813-A	Exhaust Crossover Coolant Adapter
RX-117814-C	Dual Rocker Cover System (Manual)
RX-117815-C	Dual Rocker Cover System (Pneumatic)
RX-117936-A	Oil Pump Screen Position, 1967 Olds
RX-117990-B	Engine Mount (Front Support Bracket)
RX-118135-D	Water Inlet Adapter
RX-118136-A	Lock Clip (Evertite Connector)
RX-118137-C	Water In and Out Coolant and Flushing Tank-Evertite, 1967 Olds
RX-118209-B	2 x 4 Barrel Adapter Carburetor Adapter
RX-118211-C	Modification of Engine Block for Camshaft Thrust Washer
RX-118212-B	Camshaft Thrust Surface Cutter Guide Shaft
RX-118213-A	Thrust Washer
RX-118301	Lifter Ball Magnetic Holder
RX-118304-D	Rocker Cover Spacers
RX-118305-D	Rework 1977 350 cid Olds Oil Pan
RX-118306-A	Timing Gear Deflector, 1967 Olds

* Denotes detail print

RX-118315-D	350 Olds Intake Manifold Exhaust Crossover and Coolant Schematic, Seq. IID
RX-118316-A	350 Olds EGR Opening Cover
RX-118317-B	350 Olds Harmonic Balancer Mod.
RX-118318-A	350 Olds Engine Timing Indicator
RX-118319-D	2 Barrel Carburetor Modifications for Seq. Test IID and IID
RX-118322-B	Camshaft Thrust Washer Pilot
RX-118332-B	Oil Pan Baffle
RX-179649-D	Carburetor Air Supply System, Schematic of Controlled
RX-179650-D	Layout of Controlled Carburetor Air Supply System
RX-179651-D	Humidity Cabinet for Carburetor Air Supply System
RX-179652-D	Spray Nozzle Plumbing for Carburetor Air Supply System
RX-179653-D	Miscellaneous Details for Carburetor Air Supply System

* Denotes detail print

B.2 Alphabetical

PRINT LISTING

TITLE OF PRINT	GENERAL MOTORS PRINT NUMBER
Adapter/Carburetor Inlet	RX-116415-B
Assembly Automatic Blowby, RX-117727-1967 Olds. IIIC	RX-117726-C
Auto-Carburetor Air Circuit	RX-117162-C
Auto-Exhaust Back Pressure Circuit, 1967Olds	RX-117462-C
Automatic Blowby Measurement	RX-117727-C
Automatic Carburetor Air Temperature Control Schematic	RX-117376-C
Automatic Dew Point Control	RX-117375-C
Auto-Water Flow Circuit	RX-117161-C
Back-up Plate, Piston Ring Grinder	* RX-116731-B
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