

Test Monitoring Center

@ Carnegie Mellon University 6555 Penn Avenue, Pittsburgh, PA 15206, USA http://astmtmc.cmu.edu 412-365-1000

Sequence IIIG Information Letter 17-3 Sequence No. 47 May 31, 2017

ASTM consensus has not been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: Sequence III Mailing List

SUBJECT: Re-Use of Connecting Rods

As a result of a recent Sequence III Surveillance Panel conference call, the panel agreed to allow the connecting rods, part number 12593374, to be re-used as long as excessive wear or deformation is not present and they conform to the Fit-in-rod clearance. This part number has been removed from Table A5.1 and is now shown in Table A5.2 and revised Tables A5.1 and A5.2 are attached. Cleaning requirements have been added to section 9.4.1. The changes have been highlighted in red in Tables A5.1 and A5.2. This change is to be accomplished with a successful reference completing after May 18, 2017.

Michael Raney

Michael P. Raney Engine Oil Test Development and Support GM Powertrain Materials Engineering Frank M. Farber

Director

ASTM Test Monitoring Center

Attachments

c: ftp://ftp.astmtmc.cmu.edu/docs/gas/sequenceiii/procedure and ils/IIIG/IL17-3 IIIG.pdf

Distribution: Electronic Mail

Modifies Test Method D7320-17, as amended by Information Letters 17-1 and 17-2

- 9.4.1 Clean the connecting rods by soaking in solvent for a minimum of 2 h. Spray the rods with a 50/50 mixture of solvent and EF-411.
- 9.4.1.1 Connecting rods may be reused, providing that the connecting rod and bushing do not show excessive wear or deformation and meet the fit-in-rod specification of 0.0066 0.0217 mm. When re-using connecting rods, clean the connecting rods using the procedure defined for the cylinder block in section 9.5.3.2, *If Using the Ultrasonic Cleaner Parts Washer*. After cleaning, soak the rocker arms in EF-411 for a minimum of 1 h prior to installation.

TABLE A5.1 Parts to be Replaced Every Test

Arm. Rocker with Pivot Bearing OHT3F-048-1 BEARING, KIT, ENGINE WH3F-042-2 KIT INCLIDES: WH3F-042-01 BEARING, CONNECTING ROD, KIT, UPPER AND LOWER, OH-106 ASSY 3F042-01 MAIN BEARINS KIT, OH101 ASSY, INCLIDES: 3F042-02 Bearing, Balance Shaft Front (part of 24502388) SKF6205-22NRJEM BEARING, MAIN, LOWER, #1 AND 3 OH-102 BEARING, MAIN, LOWER, #4 OH-103 BEARING, MAIN, LOWER, #1 AND 8 OH-105 BEARING, MAIN, LOWER, #1 AND 8 OH-105 BEARING, CAM BUSHING, POSITIONS 1 & 4 3F028-09 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 BIL, Cambrid Sproket 24501366 BOIL, Cylinder Head, Long 25527831 BOIL, Cylinder Head, Long 24500062 Boil, Main Cap 24500072 BOIL, Main Cap 24500062 BOIL, Rocker Arm, Special Test 3F038-02 BOIL, Rocker Arm, Special Test 3F038-02 BOIL, Rocker Arm, Special Test 3F038-02 BOIL, Rocker Arm, Special Test, including Manganese-phosphate coating OH13F-008-8 Cap., Valve Spring Retainer	Part Description	Part Number
KIT INCLUDES: BEARING, CONNECTING ROD, KIT, UPPER AND LOWER, OH-106 ASSY \$6042-01 MAIN BEARING KIT, OH101 ASSY, INCLUDES: 3F042-02 Bearing, Balance Shaff Front (part of 24502388) SKE905E-2ZNRJEM BEARING, MAIN, LOWER, #1 AND 3 OH-102 BEARING, MAIN, LOWER, #1 AND 4 OH-103 BEARING, MAIN, LOWER, #1 AND 5 OH-105 BEARING, MAIN, LOWER, #1 AND 8 PC-20-0 BEARING, CAM BUSHING, POSITIONS 1 & 4 3F028-09 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 BOIL, Crylinder Head, Long 25527831 BOIL, Crylinder Head, Short 2450396 BOIL, Flywhed 2450397 BOIL, Flywhed 2450397 BOIL, Flywhed 2450397 BOIL, Flywhed 2450397 BOIL, Rear Cover Housing 3F-058-02 BOIL, Rear Cover Housing 2450397 BOIL, Stocker Arm, Special Test, including Manganese-phosphate coating OH13F-008-8 Cap, Valve Spring Retainer 2450468 Cap, Valve Spring Retainer 2450468 Cap, In, NICKEL PLATED,	Arm, Rocker with Pivot Bearing	OHT3F-058-1
BEARING, CONNECTING ROD, KIT, UPPER AND LOWER, OH-106 ASSY 3F042-02 MAIN BEARING KIT, OH101 ASSY, INCLIDES: 3F042-02 BEARING, MAIN, LOWER, et at AND 3 SKF6026-2ZMRJEM BEARING, MAIN, LOWER, et AND 3 OH-102 BEARING, MAIN, LOWER, ELANGE, #2 OH-104 BEARING, MAIN, LOWER, ELANGE, #2 OH-105 BEARING, CAM BUSHING, POSITIONS 1 & 4 3F028-09 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 BOIL, Camshaft 5p rocket 25527831 BOIL, Cylinder Head, Long 25527831 BOIL, Cylinder Head, Short 25533811 BOIL, Physheel 245005056 BOIL, Main Cap 24500576 BOIL, Main Cap, Side 24500576 BOIL, Roar Cover Housing 24500576 BOIL, Roar N, Special Test 3F-088-02 BOIL, Roar N, Special Test, Including Manganese-phosphate coating OH 75F-008-3 Camshaft, Special Test, Including Manganese-phosphate coating OH 75F-008-3 Chip, Retainer, Piston Pin OH 75F-033-3 Chip, Takesiner, Piston Pin OH 75F-033-3 Chip, Takesiner, Piston Pin OH 75F-033-3	BEARING, KIT, ENGINE	OHT3F-042-2
MAIN BEARING KIT, OH101 ASSY, INCLUDES: 3F042-02 Bearing, Balance Shaft Front (part of 2450238) SKF6205-2ZNR,JEM BEARING, MAIN, LOWER, #4 OH-103 BEARING, MAIN, LOWER, #4 OH-104 BEARING, CAM BUSHING, POSITIONS 1 & 4 3F028-09 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-09 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 BIOL, Cambard Sp roket 24501366 BOIL, Cylinder Head, Long 25527831 BOIL, Cylinder Head, Short 25533811 BOIL, Eylinder Head, Short 24503056 BOIL, Boil, Main Cap 24503056 BOIL, Boil, Rac Very Housing 24503056 BOIL, Rac Very Housing 24503070 Boil, Rocker Arm, Special Test 2551242 Camshaft, Special Test, Including Manganese-phosphate coating OH175-008-8 Cap, Valve Spring Retainer 24503257 Chan, Timing 2450468 Cip, Retainer, Piston Pin OH175-008-8 Cape, Valve Spring Retainer OH175-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OH175-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED	KIT INCLUDES:	
Bearing, Balance Shaft Front (part of 24502388) SKF6205-2ZNRJEM BEARINS, MAIN, LOWER, #1 AND 3 OH-103 BEARINS, MAIN, LOWER, #2 OH-104 BEARINS, MAIN, LOWER, FLANGE, #2 OH-104 BEARINS, MAIN, UPPER, FLANGE, #2 OH-105 BEARINS, CAM BUSHINS, POSITIONS 1 & 4 3F028-09 BEARING, CAM BUSHINS, POSITIONS 2 & 3 3F028-10 BOIL, Cylinder Head, Long 25527831 BOIL, Cylinder Head, Long 25527831 BOIL, Cylinder Head, Long 25533811 BOIL, Flywheel 24500306 BOIL, Main Cap 245030366 BOIL, Main Cap 245030366 BOIL, Main Cap 245030366 BOIL, Roder Arm, Special Test 3F-058-02 BOIL, Roder Arm, Special Test 3F-058-02 BOIL, Roder Arm, Special Test 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Carps, Valve Spring Retainer 24504285 Chai, Inickel PLATED, BYPASS CLOSED OHT3F-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring)	BEARING, CONNECTING ROD, KIT, UPPER AND LOWER, OH-106 ASSY	3F042-01
BEARING, Main, LOWER, #1 AND 3 OH-102 BEARING, Main, LOWER, #4 OH-104 BEARING, MAIN, LOWER, FLANGE, #2 OH-105 BEARING, CAM BUSHING, POSITIONS 1 & 4 3F028-09 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 BOIL, Camshaft Sp rocket 24501366 BOIL, Clinider Head, Long 25527831 BOIL, Flywheel 24505092 BOIL, Flywheel 24505092 BOIL, Main Cap, Side 24505576 BOIL, Rear Cover Housing 24505970 BOIL, Rear Cover Housing 2551242 BOIL/ Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Yalve Spring Retainer 24504688 Cap, Valve Spring Retainer 24504688 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, Oll., NICKEL PLATED, BYPASS CLOSED OHT3F-039-2 Damper, Timing Chain (includes boit, retaining ring) 24503801 Gasket, Ki, Intake Marifold lower 89017816 Gasket, Olimer Head, Ingh 24503801 Gasket, Oli Fler Adapter 24503801	MAIN BEARING KIT, OH101 ASSY, INCLUDES:	3F042-02
BEARING, Main, LOWER, #4 OH-103 BEARING, Main, LOPER, FLANGE, #2 OH-106 BEARING, CAM BUSHING, POSTIONS 1 & 4 3F028-09 BEARING, CAM BUSHING, POSTIONS 2 & 3 3F028-10 BEOR, Cylinder Head, Long 25527831 Boil, Cylinder Head, Long 25527831 Boil, Cylinder Head, Short 25533811 Boil, Tylinder Head, Short 24500366 Boil, Main Cap 24500366 Boil, Main Cap 24500376 Boil, Main Cap 24500376 Boil, Rober Am, Special Test 3F0-88-02 Boil, Rober Am, Special Test 3F0-88-02 Boil, Rober Am, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24500468 Clip, Retainer, Piston Pin OHT3F-012-1 Cohan, Timing 24500468 Clip, Retainer, Piston Pin OHT3F-057-3 Casket Ki, Intake Manifold lower 89017816 Gasket Ki, Intake Manifold lower 99017816 Gasket, Cylinder Head, right 24503802 Gasket, Cylinder Head, right 24503802 Gasket, Oil Fan	Bearing, Balance Shaft Front (part of 24502388)	SKF6205-2ZNRJEM
BEARING, MAIN, LOWER, FLANGE, #2 OH-105 BEARING, CAM BUSHING, POSITIONS 1 & 4 37028-09 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 BOIL, Cylinder Head, Long 24501366 Boil, Cylinder Head, Long 25527831 Boil, Cylinder Head, Short 25533811 Boil, Kylinder Head, Short 24505092 Boil, Main Cap 24505076 Boil, Main Cap, Side 24503970 Boil, Rear Cover Housing 24503970 Boil, Rear Cover Housing 3F-088-02 Boil/Screw, Thrust Plate retainer 2551942 Cany, Salve Spring Retainer 24502257 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504688 Clip, Retainer, Piston Pin OHT3F-012-1 CODLER, Oll., NICKEL PLATED, BYPASS CLOSED OHT3F-057-3 Gasket, Kil, Intake Manifold lower 89017816 Gasket, Cylinder Head, Ingh 24503802 Gasket, Cylinder Head, Ingh 24503801 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Pan OHT3G-093-2	BEARING, MAIN, LOWER, #1 AND 3	OH-102
BEARING, MAIN, UPPER, FLANGE, #2 OH-105 BEARING, CAM BUSHING, POSITIONS 1 & 4 3F028-09 BeARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 Bolt, Camshaft Sp rocket 24501366 Bolt, Cylinder Head, Long 25527831 Bolt, Cylinder Head, Short 2450592 Bolt, Main Cap, Side 24500576 Bolt, Main Cap, Side 24500370 Bolt, Race Cover Housing 24503970 Bolt, Rocker Arm, Special Test 3F-058-02 Bolt, Rocker Arm, Special Test including Manganese-phosphate coating OHT3F-008-8 Carnshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Carnshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Clip, Retainer, Piston Pin 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-001-2 COOLER, Olt, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-037-3 Gasket, Erint Cover 24503801 Gasket, Cylinder Head, Iright 24503801	BEARING, MAIN, LOWER, #4	OH-103
BEARING, CAM BUSHING, POSITIONS 1 & 4 3F028-09 BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 Bolt, Cylinder Head, Long 25527831 Bolt, Cylinder Head, Short 25527831 Bolt, Cylinder Head, Short 25533811 Bolt, Hywheel 24505092 Bolt, Main Cap 24505676 Bolt, Main Cap, Side 24503056 Bolt, Rear Cover Housing 24503970 Bolt, Rear Cover Housing 3F-058-02 Bolt/Screw, Thrust Plate retainer 25518242 Camshaft, Special Test, including Manganese-phosphate coating 0HT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Cilp, Retainer, Piston Pin 0HT3F-003-2 COOLER, Oll, NICKEL PLATED, BYPASS CLOSED 0HT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC 0HT3F-03C-3 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, ight 24503802 Gasket, Oil Pan 0HT3G-093-1 Gasket, Oil Pan 0HT3G-093-1 Gasket, Oil Pan	BEARING, MAIN, LOWER, FLANGE, #2	OH-104
BEARING, CAM BUSHING, POSITIONS 2 & 3 3F028-10 Bolt, Camshaft Sprocket 24501366 Bolt, Cylinder Head, Long 25527831 Bolt, Cylinder Head, Short 25533811 Bolt, Plywheel 24505092 Bolt, Main Cap 24500566 Bolt, Main Cap, Side 24505576 Bolt, Rear Cover Housing 24503970 Bolt, Rear Cover Housing 3F-058-02 Bolt/Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating 0HT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin 0HT3F-012-1 COOLER, Oll., NICKEL PLATED, BYPASS CLOSED 0HT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC 0HT3F-05F-3 Gasket KI, Intake Manifold lower 89017816 Gasket KI, Intake Manifold lower 24503802 Gasket, Cylinder Head, left 24503802 Gasket, Oil Pan 0HT3G-093-1 Gasket, Oil Flater Adapter 25534742 Gasket, Oil Pa	BEARING, MAIN, UPPER, FLANGE, #2	OH-105
Bolt, Camshaft Sp rocket 24501366 Bolt, Cylinder Head, Long 25527831 Bolt, Cylinder Head, Short 24505092 Bolt, Flywheel 24503056 Bolt, Main Cap 24503056 Bolt, Main Cap, Side 24503970 Bolt, Rear Cover Housing 24503970 Bolt, Rocker Arm, Special Test 3F-058-02 Bolt, Rocker Arm, Special Test 3F-058-02 Bolt/Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating 0HT3F-008-8 Cap, Valve Spring Retainer 24504668 Chain, Timing 24504668 Clip, Retainer, Piston Pin 0HT3F-012-1 COOLER, Oll, NICKEL PLATED, BYPASS CLOSED 0HT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FLITER, PRO TEC 0HT3F-057-3 Gasket, Kylinder Head, Ieft 24503802 Gasket, Cylinder Head, Ieft 24503802 Gasket, Oil Fand, right 24503801 Gasket, Oil Pan 0HT3G-093-1 Gasket, Oil Pan 0HT3G-093-2 Gasket, Oil Pan 0HT	BEARING, CAM BUSHING, POSITIONS 1 & 4	3F028-09
Bolt, Cylinder Head, Long 25527831 Bolt, Cylinder Head, Short 25533811 Bolt, Flywheel 24505092 Bolt, Main Cap 24503056 Bolt, Main Cap, Side 24505576 Bolt, Rear Cover Housing 24503970 Bolt, Rocker Arm, Special Test 3F-058-02 Bolt, Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, Oll., NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FLITER, PRO TEC GASKet, Cylinder Head, left Gasket, Cylinder Head, left 24503801 Gasket, Cylinder Head, right 24503801 Gasket, Oil Fand OHT3G-093-1 Gasket, Oil Flan OHT3G-093-1 Gasket, Oil Flan OHT3G-093-1 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 2450233 Gasket, Water	BEARING, CAM BUSHING, POSITIONS 2 & 3	3F028-10
Bolt, Cylinder Head, Short 25533811 Bolt, Plywheel 24505092 Bolt, Main Cap 24503056 Bolt, Main Cap, Side 24503970 Bolt, Rocker Arm, Special Test 3F-058-02 Bolt, Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating 0HT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin 0HT3F-012-1 COOLER, Oll., NICKEL PLATED, BYPASS CLOSED 0HT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC 0HT3F-057-3 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 25534742 Gasket, Oil Pan 0HT3G-093-1 Gasket, Oil Pan 0HT3G-093-2 Gasket, Oil Pan 0HT3G-093-2 Gasket, Water Cutlet 2450233 Gasket, Water Cutlet 2450266 Gasket, Water Cutlet 2450266 Gasket, Water Cutlet 24501566	Bolt, Camshaft Sp rocket	24501366
Bolt, Flywheel 24505092 Bolt, Main Cap 24503056 Bolt, Main Cap, Side 24503070 Bolt, Rear Cover Housing 24503970 Bolt, Rocker Arm, Special Test 3F-088-02 Bolt/Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24504688 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, Oll., NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket, Vilinder Head, left 24503802 Gasket, Cylinder Head, right 24503802 Gasket, Oil Filter Adapter 24503801 Gasket, Oil Fan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24507388 Gasket, Oil Suction Tube 24507388 Gasket, Water Cover 25502619 Gasket, Water Coulet 24502433 Gasket, Water Pump 245022608	Bolt, Cylinder Head, Long	25527831
Bolt, Main Cap 24503056 Bolt, Main Cap, Side 24505576 Bolt, Rear Cover Housing 24503970 Bolt, Rocker Arm, Special Test 3F-058-02 Bolt/Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, Oll., NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket, Cylinder Head, right 24503802 Gasket, Cylinder Head, right 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24507388 Gasket, Water Outlet 24507388 Gasket, Water Outlet 24502433 Gasket, Water Outlet 245022608	Bolt, Cylinder Head, Short	25533811
Bolt, Main Cap, Side 24505576 Bolt, Rocker Housing 24503970 Bolt, Rocker Arm, Special Test 3F-056-02 Bolt/Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, Oll., NICKEL PLATED, BYPASS CLOSED OHT3F-032-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Oli Plan 24503801 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Suction Tube 24507388 Gasket, Oil Suction Tube 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Outlet 24502260B or 24502260S	Bolt, Flywheel	24505092
Bolt, Rear Cover Housing 24503970 Bolt, Rocker Arm, Special Test 3F-058-02 Bolt/Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-067-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24501259 or 12581570 Gasket, Rear Cover Housing 24502433 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501260 or 24502260S	Bolt, Main Cap	24503056
Bolt, Rocker Arm, Special Test 3F-058-02 Bolt/Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, Oll., NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, Iright 24503802 Gasket, Cylinder Head, Iright 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rear Cover Housing 24502433 Gasket, Water Outlet 24502433 Gasket, Water Pump 245022608 or 24502260S	Bolt, Main Cap, Side	24505576
Bolt/Screw, Thrust Plate retainer 25519242 Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 245022608 or 24502260S	Bolt, Rear Cover Housing	24503970
Camshaft, Special Test, including Manganese-phosphate coating OHT3F-008-8 Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24501259 Gasket, Water Pump 24501260 Head, Cylinder 24502260B or 24502260S	Bolt, Rocker Arm, Special Test	3F-058-02
Cap, Valve Spring Retainer 24502257 Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24507388 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Pump 24502433 Gasket, Water Pump 245022608 or 245022608	Bolt/Screw, Thrust Plate retainer	25519242
Chain, Timing 24504668 Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 245012608	Camshaft, Special Test, including Manganese-phosphate coating	OHT3F-008-8
Clip, Retainer, Piston Pin OHT3F-012-1 COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24507388 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Cap, Valve Spring Retainer	24502257
COOLER, OIL, NICKEL PLATED, BYPASS CLOSED OHT3F-030-2 Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 245012605 Head, Cylinder 24502260S	Chain, Timing	24504668
Damper, Timing Chain (includes bolt, retaining ring) 24503893 FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Suction Tube 0HT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24501265 Gasket, Water Pump 24501260 or 24502260S	Clip, Retainer, Piston Pin	OHT3F-012-1
FILTER, PRO TEC OHT3F-057-3 Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 245022608 or 24502260S	COOLER, OIL, NICKEL PLATED, BYPASS CLOSED	OHT3F-030-2
Gasket kit, Intake Manifold lower 89017816 Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 245022608 or 24502260S	Damper, Timing Chain (includes bolt, retaining ring)	24503893
Gasket, Cylinder Head, left 24503802 Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	FILTER, PRO TEC	OHT3F-057-3
Gasket, Cylinder Head, right 24503801 Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket kit, Intake Manifold lower	89017816
Gasket, Front Cover 12587003 Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 245022608 or 24502260S	Gasket, Cylinder Head, left	24503802
Gasket, Oil Filter Adapter 25534742 Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket, Cylinder Head, right	24503801
Gasket, Oil Pan OHT3G-093-1 Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket, Front Cover	12587003
Gasket, Oil Pan OHT3G-093-2 Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket, Oil Filter Adapter	25534742
Gasket, Oil Suction Tube 24501259 or 12581570 Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket, Oil Pan	OHT3G-093-1
Gasket, Rear Cover Housing 24507388 Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket, Oil Pan	OHT3G-093-2
Gasket, Rocker Cover 25532619 Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket, Oil Suction Tube	24501259 or 12581570
Gasket, Water Outlet 24502433 Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket, Rear Cover Housing	24507388
Gasket, Water Pump 24501565 Head, Cylinder 24502260B or 24502260S	Gasket, Rocker Cover	25532619
Head, Cylinder 24502260B or 24502260S	Gasket, Water Outlet	24502433
·	Gasket, Water Pump	24501565
Key, Camshaft Sprocket 24500618	Head, Cylinder	24502260B or 24502260S
	Key, Camshaft Sprocket	24500618

Part Description	Part Number
Key, Valve Stem Keeper	10166345
Lifter, Test ACI w/Flat (25338738A)	OHT3F-029-3
PISTON, TEST, RUNS 1 & 2, GRADE 12	OHT3F-053-1
PISTON, TEST, RUNS 3 & 4, GRADE 34	OHT3F-054-1
PISTON, TEST, RUNS 5 & 6, GRADE 56	OHT3F-055-1
PLATE, CAMSHAFT THRUST, .1520 in. THICKNESS	OHT3F-011-2
Plug, Engine Block Core Hole	24500867
Plug, Cylinder Head Cup	24502262
Plug, Engine Block, Oil Gallery	3835577
Plug, Ignition Spark	NGK TR-6
Plunger, Oil Relief	25530949
PUSHROD, SPECIAL LENGTH, PKG. OF 12	OHT3F-007-1
RETAINER CLIP, PISTON PIN PKG. OF 12	OHT3F-012-1
1 EA. RING, PISTON, RUN 1, ENGINE SET	OHT3F-050-RUN1
1 EA. RING, PISTON, RUN 2, ENGINE SET	OHT3F-050-RUN2
1 EA. RING, PISTON, RUN 3, ENGINE SET	OHT3F-051-RUN3
1 EA. RING, PISTON, RUN 4, ENGINE SET	OHT3F-051-RUN4
1 EA. RING, PISTON, RUN 5, ENGINE SET	OHT3F-052-RUN5
1 EA. RING, PISTON, RUN 6, ENGINE SET	OHT3F 052 RUN6
Rod, Connecting (powdered metal)	12593374
Seal, Crankshaft Front Oil (24504098)	OHT3G-092-1
Seal, Crankshaft Rear Oil (25534760)	OHT3G-091-1
SEAL, EXHAUST VALVE STEM	OHT3F-061-1
SEAL, INTAKE VALVE STEM	OHT3F-060-1
Spring, Oil Relief Valve	1262505
SPRING, VALVE Special Test (COLOR CODE PINK)	OHT3G-059-1
Sprocket, Camshaft	24505306
Valve, Exhaust (STD)	12579949
Valve, Intake (STD)	12569550

TABLE A5.2 Parts to be Replaced As Needed

Part Description	Part Number
ADAPTER, BLOWBY BREATHER TUBE	OHT3F-040-1
ADAPTER, OIL FILTER	OHT3F-035-1
Adapter, Oil Filter, with External Bypass	OHT3F-080-1
Adapter, Throttle Body, Air Inlet	OHT3F-001-2
Balancer, Harmonic	12563267
Bearing, Balance Shaft Front (part of 24502388)	SKF6205-2ZNRJEM
Block, Engine Assembly	24502286
Bolt, Connecting Rod	11610158
Bolt, Counter Balance Gear	24501367
Bolt, Counter Balance Shaft Retainer	24500055
Bolt, Engine Front Cover	24504712
Bolt, Harmonic Balancer	24504736
Bolt, Lower Intake	9440227
Bolt, Oil Filter Adapter	24504713
Bolt, Oil Pan	1160052
Bolt, Oil Suction Tube	24505570
Bolt, Rear Cover Housing	11518075
Bolt, Rocker Cover	24502164
Bolt, Screw Camshaft Sensor	25526395

Part Description	Part Number
Bolt, Screw, Oil Gearotor, Cover	25519242
Bolt, Stud Type, Front Cover & Crankshaft Sensor (long)	24504718
Bolt, Stud Type, Front Cover & Crankshaft Sensor (short)	24504717
Bolt, Upper Intake Long	24505205
Bolt, Upper Intake Short	24506498
Bolt, Upper Intake, Stud	24502453
BRACKET, BREATHER TUBE	OHT3F-041-1
BREATHER TUBE, S.S. MATERIAL	OHT3F-075-1
Bushing, Balance Shaft Rear	24503193
BUSHING, ROCKER COVER	OHT3F-028-1
BUSHING, ROCKER COVER	OHT3F-028-2
Coil, Ignition	10472401 or 89056799
CONNECTOR, MODIFIED FOR LENGTH, GM PN 24502883	OHT3F-039-2
COVER, FRONT, IMPREGNATED	OHT3G-085-1
COVER, Rear, crankshaft rear seal housing	OHT3G-088-1
Cover, Oil Gearotor	25521935
Cover, Rocker Arm Valve Cover Left Side Plastic	12590366
Crankshaft	24502168
Cylinder Head	24502260S
DIP STICK, METRIC, EXTENDED LENGTH	OHT3G-064-1
FITTING, OIL FILTER ADAPTER	OHT3F-043-1
FLYWHEEL, MANUAL, MODIFIED P.N. 24503285	OHT3F-020-2
GASKET, EXHAUST, END PLATE	OHT3F-009-1
GASKET, EXHAUST, FLANGE, METAL	OHT3F-018-1
Gasket, Manifold, Upper Intake	89017556
GASKET, OIL COOLER, PKG. OF 50	OHT3F-074-1
GASKET, OIL FILTER, PKG. OF 50	OHT3F-062-1
Gear, Balanceshaft Drive	24504792
Gear, Balanceshaft Driven	24503524
Gear, Counter Balance Drive	24504792
Gear, Counter Balance Shaft	24503524
Grommet, Rocker Arm Valve cover bolt	25534749
HARNESS, COIL PACK SEGMENT	3F022-2
HARNESS, FUEL INJECTOR SEGMENT	3F022-1
HARNESS, WIRING, DYNO W/ OHT3F-056-1 SENSOR	OHT3F-022-1
HOUSING, ASSEMBLY, BYPASS VALVE	OHT3F-084-1
Injector, Fuel	17120601
Key, Crankshaft	12563282
Magnet, Camshaft Position Sensor	10456195
MANIFOLD, CAST IRON	OHT3F-003-0
MANIFOLD, EXHAUST, WATER COOLED ASSY (ONE BANK)	OHT3F-003-1
ASSEMBLY INCLUDES:	311101 300 1
1 EA. RUNNER, EXHAUST MANIFOLD	OHT3F-004-1
1 EA. PLATE, REAR, EXHAUST MANIFOLD	OHT3F-005-1
1 EA. ELBOW, EXHAUST, MODIFIED	OHT3F-005A-1
1 EA. PLATE, FRONT, EXHAUST MANIFOLD	OHT3F-006-1
2 EA. GASKET, EXHAUST, END PLATE	OHT3F-009-1
1 EA. GASKET, EXHAUST, FLANGE, METAL	OHT3F-018-1
Manifold, Lower Intake	24508923
Manifold, Upper Intake	89017272
METER, BLOWBY	RX-116169-A1 REV N
Module, Coil Pack	12617924
modulo, Joli i don	12011727

Part Description	Part Number
MOUNT FRONT ENGINE W/ BOLT PATTERN FOR COIL PACK	OHT3F-026-1
MOUNT, REAR ENGINE HOUSING W/AIR STARTER, MUFFLER & SHIM PACK	OHT3F-025-1
ASSEMBLY INCLUDES:	
STARTER, AIR	3F025-03
MUFFLER, STARTER, AIR	3F025-04
SHIM PACK, STARTER, AIR	3F025-05
MUFFLER, STARTER, AIR	3F025-04
Nut, Throttle Body Fuel Rail Retainer	3530297
Nut, Throttle body Retainer	3530297
DIL FILTER HOUSING ASSEMBLY, NO BYPASS, IMPREGNATED	OHT3G-080-1
OUTLET, COOLANT	OHT3F-034-1
PAN, IIIF TEST, NICKEL PLATED	OHT3F-073-1
PCM, SPECIAL	OHT3F-021-1
PCV, DUMMY	OHT3F-002-1
Pin, Cylinder Head Locating	25536320
Pin, Front Cover Lower	25536323
Pin, Front Cover Upper	25536323
PIN, PISTON WRIST, PKG. OF 6	OHT3F-014-1
PLATE, EGR BLOCKOFF	OHT3F-024-1
PLATE, FRONT, EXHAUST MANIFOLD	OHT3F-006-1
	OHT3F-005-1
PLATE, REAR, EXHAUST MANIFOLD PLATE, WATER PUMP HOUSING	OHT3F-031-1
Plug, Auto Hex, Socket, (Main Oil Gallery Block Off)	444777 OUTOF 005 4
PLUG, DIP STICK	OHT3F-065-1
PLUG, DRAIN, MODIFIED	OHT3F-063-1
Pump, Oil, Gearoter Set	24505433
Rail, Fuel Injector	12587077
REAMER, DIP STICK AND DIP STICK HOLE PLUG	OHT3F-071-1
Regulator, Fuel Pressure, on Rail	89017530 or 89060416
Retainer, Counter Balance, Timing Chain Oiler	24500374
Retainer, Rocker arm (replace after 6 tests)	24502278
ROCKER ARM ASSEMBLY (Includes: 3F058-02)	OHT3F-058-1
Rod, Connecting (powdered metal)	12593374
RUNNER, EXHAUST MANIFOLD	OHT3F-004-1
Screen, Oil pump (w/suction pipe)	24505569
Seal, Ignition Coil	1989579
Seal, oil pan drain plug (o ring)	3536966
Sensor, Camshaft Position	10456148
Sensor, Crankshaft Position	10456161
Sensor, MAF	19112543 or 19179715
SENSOR, MODIFIED COOLANT TEMPERATURE	OHT3F-056-1
Shaft Assembly, Counter Balance	24506557
Shield, Crankshaft Position Sensor	24506440 or 12591982
SHIM PACK, STARTER, AIR	3F025-05
SHIM, STEEL, 0.127 mm THICK, 10 PER PKG.	OHT3F-072-005
SHIM, STEEL, 0.254 mm THICK, 10 PER PKG.	OHT3F-072-010
SHIM, STEEL, 0.381 mm THICK, 10 PER PKG.	OHT3F-072-015
SHIM, STEEL, 0.508 mm THICK, 10 PER PKG.	OHT3F-072-020
SHIM, STEEL, 0.787 mm THICK, 10 PER PKG.	OHT3F-072-031
SLEEVE, VALVE STEM PROTECTORS (PKG. OF 100)	OHT3F-070-1
SPROCKET, CRANKSHAFT, SPECIAL 2 PC	OHT3F-036-1
STARTER, AIR	3F025-03

Part Description	Part Number
Stud, front cover (2)	24504717
Stud, front cover (2)	24504718
Support, throttle body	24504697
Throttle Body (2 Bolt Mass Air Flow Sensor)	24507235
TOOL, CAMSHAFT BUSHING INSTALLATION	OHT3F-019-2
TOOL, OIL PUMP PRIMER	OHT3F-038-1
Tube, throttle body to fuel pressure regulator	24505671