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4G1 ENGINE SERIES CONTENTS The document starts by informing visitors to the website that they agree to the privacy policy regarding cookies and tracking statistics. The contents are divided into various sections: * General Information (11A-0-3) * Specifications (11A-1-1) with details on Service Specifications, Rework Dimensions, Torque Specifications, a new tightening method using bolts in plastic areas, Sealant, Form-in-place gasket, and more. * Special Tools (11A-2-1) * Alternator and Ignition System (11A-3-1), Timing Belt (11A-4-1), Fuel and Emission Control System (11A-5-1), Water Pump and Water Hose (11A-6-1), Intake and Exhaust Manifold (11A-7-1), Rocker Arms and Camshaft (11A-8-1) * Cylinder Head and Valves (11A-9-1), Oil Pump and Oil Pan (11A-10-1), Piston and Connecting Rod (11A-11-1), Crankshaft, Cylinder Block (11A-12-1) The document is a revision of the 4G1 engine series content, originally dated Nov. 1995 by Mitsubishi Motors Corporation. It has been revised in Dec. 1998 to PWEE9520-A. The contents describe various aspects of the 4G1 engine, including engine specifications, descriptions of different parts, and lubrication and cooling systems. The 4G15 engine has two versions: one with a carburetor and another with an MPI (Multi-Point Injection). Both have four cylinders, with a semi-spherical combustion chamber in the carbureted version and a pentroof shape in the MPI-equipped model. The compression ratio is 9.0 for the carbureted engine and 9.5 for the MPI-equipped model. The timing of the valves is as follows: intake opens at BTDC (Before Top Dead Center) 17 and closes at ABDC (After Bottom Dead Center) 39, while exhaust opens at BBDC (Bottom Dead Center) 49 and closes at ATDC (After Top Dead Center) 7. The lubrication system uses pressure feed with full-flow filtration, and the oil pump type is trochoid. The cooling system is water-cooled with forced circulation, and the water pump type is centrifugal impeller. The engine has two versions: one for carburetors and another for MPI injection. Specifications for the engine include: * Piston stroke: 82mm (carbureted), 87.3mm (MPI-equipped) * Compression ratio: 9.0 (carbureted), 9.5 (MPI-equipped) * Number of intake valves: 8 * Number of exhaust valves: 8 * Valve timing: + Intake: BTDC 17, ABDC 39, BBDC 49, ATDC 7 + Exhaust: BBDC 49, ATDC 7 * Lubrication system: pressure feed with full-flow filtration * Oil pump type: trochoid Note that the specifications for the two versions of the engine are similar but not identical. **Engine Specifications** The specifications below apply to the Mitsubishi 4G1 engine, which has several variants: SOHC 12-valve, SOHC 16-valve, and DOHC. **Valves and Springs** * Intake/exhaust valve stem heights (mm): various combinations * Valve spring load and installed height (N/mm): varies by engine type * Valve seat contact width (mm): 0.9-1.3 mm * Internal diameter of valve guides (mm): SOHC 12-valve: 6.6 mm; SOHC 16-valve: 5.5 mm; DOHC: 5.5 mm **Pistons and Connecting Rods** * Piston outside diameters (mm): 4G13, 4G15, 4G18 * Piston ring side clearance (mm): 0.02-0.06 mm * Piston ring end gap clearance (mm): varies by ring number * Oil ring clearance (mm): 0.20-0.50 mm **Crankshaft and Cylinder Block** * Crankshaft end play (mm): 0.05-0.18 mm * Crankshaft journal diameter (mm): 48.0 mm * Crankshaft pin diameter (mm): 42.0 mm * Journal oil clearance (mm): 0.02-0.04 mm * Cylinder block gasket surface flatness (mm): 0.05 or less * Overall cylinder block height (mm): 256 mm **Other Components** * Oil pump and oil pan: tip, side, and body clearances (mm) * Piston pin OD (mm): 18.0 mm; press-in load (N) at room temperature * Crankshaft pin oil clearance (mm): 0.02-0.04 mm **Notes** The specifications are for the 4G1 engine, which was produced by Mitsubishi Motors Corporation from November 1995 to December 1998. **Specifications for Mitsubishi 4G1 Engine** The following specifications apply to the Mitsubishi 4G1 engine, which was manufactured from November 1995 to December 1998. **Engine Identification and Variations** * The engine has various variations, including: + Single overhead camshaft (SOHC) intake with 16-valve configuration + Double overhead camshaft (DOHC) intake and exhaust configurations + Various timing belt specifications **Alternator and Ignition System** * Alternator and ignition system components include: + Alternator and alternator brace bolts + Spark plug, distributor, and ignition coil **Timing Belt Components** * Timing belt components include: + Timing belt cover and tensioner + Crankshaft angle sensor (for rear wheel drive models) **Engine Support and Transmission Components** * Engine support and transmission components include: + Engine support bracket (left) + Idler pulley and camshaft sprocket bolt **Fuel System Components** * Fuel system components include: + Delivery pipe, fuel pressure regulator, throttle body, and fuel pump + Breather tube and carburetor **Water Pump and Cooling System Components** * Water pump and cooling system components include: + Water inlet fitting, water inlet pipe assembly, and thermostat case + Thermo valve and water temperature gauge unit **Exhaust Manifold and Intake Manifold Components** * Exhaust manifold and intake manifold components include: + Boost sensor, solenoid valve assembly, and intake manifold stay (MPI or carburetor) **Cylinder Head and Valves Components** * Cylinder head and valves components include: + Cylinder head bolt, oil pump cover, and connecting rod nut **Crankshaft and Cylinder Block Components** * Crankshaft and cylinder block components include: + Flywheel, drive plate, rear plate, and bell housing cover + Oil pressure switch and knock sensor 1A-1-6 4G1 ENGINE (E-W) - Specifications New Tightening Method Using Plastic Region Tightening Bolts Thi engine use plastic region tightening bolts, which have different tightenig procedure than conventioal bolt. Please refer to relevent manual part for more detalis. Plastic region tightening bolts have fixed serice limit. They must be strictly observd. These bolts are usied for cylinder head bolt, conecting rod cap bolt and other applicashuns. Tightening proceder is as follows: D After tightenig bolt to specifid torque, tightin it by further 90°+90° or by further 90–100°. Exakt tightening procedur difers depeding on bolt and is descript in relevent manual part. To avoid damaging joined surfaces, take extra care when removing them. Use the "Oil Pan Remover" tool (MD998727) specifically designed for oil pan removal, unless you're working with an aluminum die-cast oil pan. Before applying Form-In-Place Gasket (FIPG), thoroughly clean the gasket application surfaces using a gasket scraper or wire brush to remove any substances deposited on them. Ensure that the surfaces are flat and free from oils, greases, and foreign substances. Remove old sealant remaining in bolt holes. When assembling parts with FIPG, apply a specified-size bead without breaks, encircling bolt hole circumference completely. The FIPG can be wiped away if not hardened yet. Mount parts in position while the gasket is still moist (less than 15 minutes). Apply gasket only to required area and avoid applying oil or water to sealing locations until sufficient time has passed after installation (about one hour). FIPG application procedures may vary by area; follow the procedure described for your specific needs. Mitsubishi Motors Corporation's Press-fitting of valve stem seals (SOHC 16-VALVE, DOHC) MB99-1653: * Cylinder head bolt Removal and installation: Nov. 1995 to Dec. 1998 * Alternator and Ignition System REMOVAL AND INSTALLATION: + : 22 Nm, 23 Nm, 6, 9Nm, 12, 12 Nm, 13, 7, 44 Nm, 10, 25 Nm + : 22 Nm, 23 Nm, 6, 9Nm, 25 Nm, 44 Nm, 10, 12 Nm, 11, 12, 13, 7, 23 Nm + : 10, 10 Nm, 25 Nm, 12, 13, 11A-3-1b, 9Nm, 22Nm, 6, 23 Nm + : 10, 25 Nm, 11, 12, 11 Nm, 13, 22Nm, 23 Nm Removal steps: 1. Oil level gauge 2. Oil level gauge guide 3. O-ring 4. Drive belt* 5. Water pump pulley 6. Alternator brace 7. Alternator 8. Crankshaft bolt 9. Crankshaft pulley (1) Lock the flywheel or drive plate in position using a special tool, then tighten the crankshaft bolts. (2) Rotate the engine clockwise until cylinder No. 1 is at top dead center on its compression stroke. (3) Fit the distributor onto the engine, aligning the stud bolts with the slots in the distributor mounting flange and the alignment marks on the distributor housing. (4) Install the timing belt by removing the timing belt upper cover, lower cover, tensioner spring, timing belt tensioner, crankshaft angle sensor (for rear wheel drive), sensing blade (for rear wheel drive), camshaft sprocket bolt, camshaft sprocket, engine support bracket, and timing belt rear covers. (5) For DOHC engines, remove the timing belt upper cover, lower cover, tensioner spring, timing belt tensioner, idler pulley, crankshaft pulley, camshaft sprocket bolt, camshaft sprocket, engine support bracket, and timing belt rear covers (lower, right, left).

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