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TIP: To fasten the PTT motor lead, see "Wiring harness routing" (5-6). Install the engine ECM 2, and then tighten the engine ECM bolts 3 to the specified torque. Page 470 LOWR Lower unit Current reverse gear shim thickness = 0.65 0.20 Shim thickness = 0.65 mm + (-0.23) mm = 0.42 mm Available shim thicknesses: -0.20 0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50 -0.40 TIP: -0.60... Page 383 Propeller shaft housing (F250G) 11 10 24 25 1 N m (0.1 kgf m, 0.7 ft lb) 29 N m (2.9 kgf m, 21.4 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) Part name Q'ty... INFO General information Special service tool For all markets except U.S.A. and Canada Special service tools with Yamaha part numbers (90890/60V-\*\*\*\*\*) are distributed by the Parts Divi- sion. POWR Power unit Valve lapper 1: 90890-04101 8. 0-1 Shim location (FL250G) ......8-98... Page 137 Wiring harness routing È É È Ì Í Î Ï Ô Ó Ñ Ò × × Õ Ù Õ Before installing the intake silencer, fasten the wiring harness (to air temperature sen- sor) at the white tape using the holder on the oil filler neck. Page 463 Shimming (counter rotation model) Available shim thicknesses: 0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50 TIP: Use up to 3 shims to obtain the required shim thickness. Fully tilt the swivel bracket up, and then support it using the tilt stop lever. Connecting rod bolt 2: 4. TRBL SHTG Troubleshooting Troubleshooting the PTT unit Troubleshooting consists of the following 3 items: Symptom 1: PTT unit does not ....5-2 Fuse holder .... .. 8-64 Checking the lower unit anode .......8-64 Water pump and shift rod (FL200B) ...... TECH Technical features and description Knock control, the engine ECM receives the knock signal from the knock sensor, which is installed on the cylinder block operate, 5-1 Starboard. ...5-3 Rear... between the cylinder banks. Fuse 15 A, Spare is included. FUEL Fuel system 2. Page 522 BRKT Bracket unit 2. Page 525 PTT motor / PTT gear pump 7 N m (0.7 kgf m, 5.2 ft lb) 2 N m (0.7 kgf m, component / Wiring harness routing Wiring harness routing Port È É Ë Ì Í Î Ö Ó Ñ Ò × × Õ Ù È Install the low-pressure fuel pump coupler Ì Fasten the wiring harness guide. ness" (7-20). Install the engine ECM bolts to the specified White/Red (W/R)-Black (B) torque. Page 136 ELEC Electrical system È É Ê Ì Í Î Ô Ó Ñ Ò × × Õ Ù Î Fasten the wiring harness in the order Ñ, [#2]) and wiring harness (to fuel injector Ä and Î. The power unit features shimless valve lifters, a blowby gas reburning system, a vapor gas treatment system, a sin- gle electronic throttle body, long intake manifolds, large diameter intake valve heads, and an in- bank exhaust system. Page 271 Power unit assembly 5. Page 16 INFO General information Valve guide remover/installer Valve seat cutter 30° (exhaust) 90890-06810 90890-06326 Valve guide reamer Valve seat cutter 45° (intake) 90890-06804 90890-06804 90890-06816 Valve lapper Valve seat cutter 45° (exhaust) 90890-06325 Valve seat cutter 45° (exhaust) 90890-06325 Valve seat cutter 45° (exhaust) 90890-06325 Valve seat cutter 45° (intake) 90890-06325 Valve seat cutter 45° (exhaust) 90890-06325 Valve seat cutter 45° (intake) 90890-06 Terminal 1-e Terminal 2-a Terminal 2-f Terminal 2. GING Rigging information TIP: Cut the tube 5 to 600 mm (23.6 in). Install the shift plunger 1, slider 2, balls 3, and shift rod joint 4 into the propeller shaft housing are anodized. Disconnect the engine temperature sen- 3.12-3.48 ko at 100 °C (212 °F) sor coupler a. Page 566 — MEMO — ... ELEC Electrical system ETV motor relay input voltage: 3. Symbol Name Application Yamaha 4-stroke motor oil Lubricant Gear oil Lubricant Ge thread locking agent Symbol Name Application ThreeBond 1386B Sealant ThreeBond 16 CKing agent LOCTITE 271 (red) Thread locking agent LO Engine oil 1 Intake silencer 2 Blowby gas separator (integrated with cylinder head cover) 2-14... Page 143 Wiring harness routing È É Ë × Ì Õ Í Ô Ó N Ï Î Ó Fit the protrusion on the knock sensor Õ Make sure that the slot in the joint coupler into the hole in the engine ECM bracket fits over the rib on the engine bracket. Remove the water pump housing 1, impeller 2, and Woodruff key 3. After the engine is started, the vapor gases in the canister are drawn into the surge tank through the vapor shut-off valve, which is controlled by the engine ECM, and then sent to the intake manifolds and combustion chambers. NOTICE: Do not shaft B. Page 439 Propeller shaft housing (FL200B) TIP: Do not reuse a shim if deformed or scratched. It is impossible to provide com- • If the boat has a V shape hull, the center plete instructions for every possible boat and outboard motor combination. Install the wiring harness guide A, and then install the thermoswitch lead and engine temperature sensor lead to . Page 504 BRKT Bracket unit 7. Page 294 POWR Power unit Engine ECM 7 N m (0.7 kgf m, 5.2 ft lb) Part name Q'ty Remarks Engine ECM M6 × 20 mm Bolt Plastic tie Holder Bracket Collar Grommet M6 × 28 mm Bolt Holder Bracket M6 × 16 mm Bolt Holder Bracket... Knock sensor 8: 32 N·m (3.2 kgf·m, 23.6 ft·lb) TIP: Fasten the knock sensor lead a so that it is taut. 1-19 Bracket unit . ....1-19 PTT unit..... ...1-20 General tightening torque .......1-21... Page 251 Vapor separator and high-pressure fuel pump Vapor separator drain screw R: 2 N·m (0.2 kgf·m, 1.5 ft·lb) Vapor separator cover bolt J: 2 N·m (0.2 kgf·m, 1.5 ft·lb) 7. Checking the lower unit for air leakage 1. Check the dog clutch, shift rod joint, and slider. Page 359 Cylinder block — MEMO — 7-100... ELEC Electrical system Wiring harness continuity: a Terminal 1-b Terminal 2-b Terminal 2-b Terminal 3-b Terminal 41 a Terminal 8-b Terminal 8-b Terminal 8-b Terminal 49 8. The intake air is smoothly routed into each combustion chamber through the surge tanks and the long intake manifolds for greater power. Page 466 LOWR Lower unit Current forward gear shim thickness = 1.12 0.20 Shim thickness = 1.12 0.20 Shim thickness = 1.12 mm + (-0.20) mm = 0.92 mm Available shim thicknesses: -0.20 0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50 -0.40 TIP: -0.60... 7 N·m (0.7 kgf·m, 5.2 ft·lb) 7. Remove the flywheel magnet cover. NOTICE: Make sure that there is no clearance between the surfaces of the boat transom and the clamp brackets. Check the crankshaft journal mark a on Upper bearing Lower bearing the crankshaft and the cylinder block color color mark b on the cylinder block. lower case and the diameter of the special service tool 1 are both 40 mm (1.57 in), 2. Check that all electrical connections are secure and free from corrosion, and that the battery is fully charged. lower case. Install a new gasket 9 and the adapter plug 0, and the specified torque. Page 229 Intake manifold Intake silencer bolt 2: 8. Install the washers 6, wave washer 7, spacer 8, and collar 9. PORT STBD 57BD 7. Page 438 LOWR Lower unit 4. Wiring harness continuity: Pink (P)-m Terminal 18 12: 5 4 3 2 1 22 21 20 19 18 17 16 Vapor shut-off valve resistance (reference data): Red/Yellow (R/Y)-Green/Black (G/B) Fuel control unit and component / Charging unit and component 3. 8-6 Checking the propeller .... .... Reverse gear backlash: 0.43-0.96 mm (0.0169-0.0378 in) TIP: Adjust the shim thicknesses if the reverse gear backlash is out of specification. Otherwise, correct assembly. Cylinder block TIP: Do not place the Plastigauge (PG-1) over the oil hole in the crankpin of the crankshaft. Page 571 Engine control unit 53 62 70 78 È Joint coupler 1 24 12 Fuse box Battery 61 69 77 86 Pulser coil Engine ECM 13 1 (\*1) 27 34 40 46 33 39 45 52 8 14 20 24 12 7 13 19 26 Air pressure sensor... NOTICE: Do not over cut the valve seat. NOTICE: Secure the end of the armature shaft using a pair of pli- ers, and then install the armature along with the motor base assembly. Page 530 BRKT Bracket unit 1. 1 and drain hose 2. Page 380 LOWR Lower unit 3. STBD 21. Remove the propeller shaft housing bearings and shims. Abbreviation Description ABYC American Boat and Yacht Council Aft end American Petroleum Institute Accelerator Position Sensor Automatic Transmission Fluid American Wire Gauge Bow end BTDC Before Top Dead Center Check Engine Centerline Cold Cranking Ampere... Page 373 Water pump and shift rod (F200B) TIP: TIP: Fit the protrusions a on the insert cartridge If the engine overheated, the inside of the 4 into the slots b in the water pump housing water pump housing may be deformed. Fill the engine with the specified amount 11. Electronic control system Fail-safe control, the engine ECM enters the fail-safe control is a Terminal 1-c Terminal 1a Terminal 3-c Terminal 42 (commercially available) Page 171 Engine control system and component 6. Page 497 Upper case / Oil pan and exhaust manifold 42 N m(4.2 kgf m, 31.0 ft lb) 20 N m(2.0 kgf m, 14.8 ft lb) 12 N m(1.2 kgf m, 8.9 ft lb) Part name Q'ty Remarks M10 ×... Electronic control system VCT control In VCT control, the engine ECM determines the appropriate intake valve opening timing according to the signals from the sensors. Reduce the fuel pressure. Page 342 POWR Power unit 7 N m (0.3 kgf m, 2.2 ft lb) 33 N m (3.3 kgf m, 2.2 ft lb) 33 N m (3.3 kgf m, 2.2 ft lb) 44 314 N m (1.4 kgf m, 10.3 ft lb) 28 N m (2.8 kgf m, 2.2 ft lb) 33 N m (3.3 kgf m, 2.2 ft lb) 33 N 20.7 ft lb) 13N m (1.3 kgf m, 9.6 ft... a Throttle cable b Extension wiring harness (optional) or 6Y8 Multifunction Meter harness (optional) or 6Y8 Multifunctio head 1. Install the holder a on the wiring har-ness to the junction box 1. See "Removing the throttle body assembly" (6-23). Check the fuel filter. Drilling plate Peak voltage adapter 90890-06783 90890-03172 YDIS (CD-ROM, Ver. Page 240 FUEL Fuel system Low-pressure fuel pump 5 N m (0.5 kgf m, 3.7 ft lb) Part name Q'ty Remarks Hose Clamp Clamp Joint Bushing Low-pressure fuel pump Hose Holder Cover M6 × 15 mm Bolt 6-31... POWR Power unit Valve margin thickness a: Intake: 0.500-0.900 mm (0.0354-0.0512 in) 3. Measure the backlash before disassembly. Install a new gasket 3 and the throttle atmospheric port a and block the other damper plate 4, and then tighten the ports b with rubber plugs 2. Black/Yellow (B/Y)-Black/Yellow (B/Y)-Bla gap, the thrust bearing outer race d may not have been installed. Otherwise, burns could result. Oil pan assembly bolt N 42 N·m (4.2 kgf·m, 31.0 ft·lb) 9-26... Wiring harness routing / Circuit diagram TIP: The circled numbers in the illustration indicate the engine ECM terminal numbers. Install the neutral switch 1 and plate 2, and then tighten the neutral switch screws 3 to the specified torque. Outboard motor mounting / Outboard motor mounting height 5. 8-38 Measuring the forward gear backlash and reverse gear backlash before disassembly ......8-40 Shimming ..... . Page 544 Wire harness connec- Inspection or replace- tions/wire coupler con- ment as necessary nections (Yamaha) Meter/gauge Inspection (\*1) -: Not applicable (\*1): See "6Y8 Multifunction Meter set up manual" for the check of 6Y8 Multifunction Meter. See 5. Measure the backlash. See "Installing the intake mani-fold" (6-18). Inject grease into the set up manual" for the check of 6Y8 Multifunction Meter. See 5. Measure the backlash. See "Installing the intake mani-fold" (6-18). Inject grease into the greas . Page 272 POWR Power unit 20. Fully tilt the outboard motor up, and then É F250G and FL250G support it using the tilt stop lever 1. See steps 1-7 in "Installing the lower unit"... The water by the dynamic pressure, and the propeller damper is cooled without disturbing the exhaust gas flow. Anode bolt M: 7 N m (0.7 kgf·m, 5.2 ft·lb) Anode O: 3 N·m (0.3 kgf·m, 2.2 ft·lb) Thermostat cover plug S: 23 N·m (2.3 kgf·m, 17.0 ft·lb) 7-99... Page 124 TRBL SHTG Troubleshooting Symptom 1: High engine idle speed. Install the grommet A and shift rod assembly a. Page 442 LOWR Lower unit Removing the propeller shaft housing assembly 1. Page 405 Average 0.5425 See "Installing the water pump" (8-30). Page 507 Clamp bracket and swivel bracket Removing the clamp bracket 1. Install the cover 7 and aprons 8. Engine control system and component Oil pressure sensor output voltage Wiring harness continuity: (reference data): a Terminal 1-c Terminal 48 Pink/White (P/W)-Black (B) a Terminal 2-b Terminal 18 2.5 V at 392.0 kPa a Terminal 3-c Terminal 3-c Terminal 3-c Terminal 37 (3.92 kgf/cm, 56.8 psi) 10. Page 417 Shimming (regular rotation model) 8-54... Remove the engine oil drain bolt 1, Stopper guide stand 0: 90890-06538 cover 2, and damper 3. System diagram / Rigging recommendation Rigging recommendation Extension length

recommendation for battery cable Do not exceed the recommended extension length for the battery cable. ence only. Make sure to tighten the intake manifold bolts in the order 1, 2, and so on. Remove the cover and bolts. Drive shaft holder 6 1: Bearing separator 1: 90890-06534 90890-06534 90890-06520 Disassembling the lower case Pinion nut holder 2: 90890 06715... 13. See steps 6 and 7 in "Removing the timing belt"... Turn the drive shaft slowly clockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and counterclockwise and measure the back- lash between where the drive shaft slowly clockwise and counterclockwise and counterclockw Cylinder head cover 2 N m (0.2 kgf m, 1.5 ft lb) 8 N m (0.8 kgf m, 5.9 ft lb) 25 N m (0.8 kgf m, 5.9 ft lb) 25 N m (0.7 kgf m, 5.9 ft lb) 25 N m (0.8 kgf m, 5.9 ft lb) 25 N m (0.7 kgf m, 5.9 ft lb) 25 N m (0.8 kgf m, 45974-00 13 3/4 S-Steel 6K1-45974-02 13 3/4 S-Steel 6K1-45972-01 13 3/4 S-Steel 68G-45976-00 14 1/4 S-Steel 68G-45972-00 14 1/4... (F200B) See step 1 in "Removing the the drive shaft" (8-35) and steps 4 and 5 drive shaft" included mounting bolts 2, small wash- ers 3, large washers 4, and nuts 5. Measure the valve spring free length a. Page 419 Shimming (regular rotation model) Current reverse gear shim (T2) thickness = 1.25 mm + (-0.20) mm = 1.05 mm Available shim thicknesses: -0.20 0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50 -0.40 TIP: È... It has been written to suit the needs of persons who have the Bronze Technical Certificate of the YTA... Check the shift cable and throttle cable free play (backlash). É... Cylinder-end screw wrench 3: 90890-06568 Trim cylinder end screw 2: Pipe joint adapter 6: 160 N·m (16.0) kgf·m, 118.0 ft·lb) 20 N·m (2.0 kgf·m, 14.8 ft·lb) Pipe joint 9 and 0.... Disconnect the quick connectors. Checking the ETV 1. current shim thickness must Pinion shim (T3) selection table increased by 0.15 mm. Install the junction box wiring harness Ù Fasten the wiring harness (to fuel injector extension ground lead terminal so that it [#1]) and wiring harness (to fuel injector contacts the stopper. The actual resistance may vary depending on the envi- ronmental conditions and ambient tempera- ture. It is recommended to loosen the flywheel magnet nut before removing the power unit to improve working efficiency. See "Installing the shift rod" (8-29). Page 453 Drive shaft and lower case (FL250G) / Shimming (counter rotation model) Shimming (counter rotation model) Shimming workflow Remove the water pump assembly. 1.33) Test harness (3 pins) Page 15 Special service tool Fuel pressure gauge adapter B Flywheel magnet holder 90890-06942 90890-06522 Fuel pressure gauge Flywheel puller 90890-06563 90890-06521 Leakage tester Sheave holder 90890-06540 90890-04019 Compression gauge extension Valve spring compressor attachment 90890-06521 Leakage tester Sheave holder 90890-04019 Compression gauge Elywheel puller 90890-06521 Leakage tester Sheave holder 90890-04019 Compression gauge extension Valve spring compressor attachment 90890-06521 Leakage tester Sheave holder the high-pressure fuel pump coupler a, and then install the grommet A and high-pressure fuel pump B. See "Installing the water pump" (8-30). ELEC Electrical system TIP: Make sure that there is continuity between terminals 1 and 3 of the cam position sensor couplers a and b and one of the terminals of the fuse holder coupler m. 5 4 3 2 1 16. 5-5 .......... Page 457 Shimming (counter rotation model) Backlash indicator 9: 90890-06706 Magnet base plate 0: 90890-07003 Dial gauge set A: 90890-06844 11. (mm) TIP: Free play Shim thickness •... Starter motor Removing the starter motor 1. a Fuse (60 A) (house Wiring harness routing ... ....5-6 Port..... [accessory] battery) b Fuse (60 A) (starting battery) c Fuse (30 A) (ignition coil, fuel injector, VCT, engine ECM) d Fuse (10 A) (eTV, engine ECM) d Fuse (10 A) (starter relay) f Fuse (30 A) (starter relay) f Fuse ( Check the crate for shipping damage. Page 58 TECH Technical features and description È È From the fuel tank 1 Primer pump 2 Fuel filter assembly (with water separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 7 Pressure fuel pump 2 Fuel filter assembly (with water separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pressure fuel pump 4 Vapor separator 5 Fuel cooler 6 High-pressure fuel pump 4 Vapor separator) 3 Low-pr PTT unit. valve drive (STBD) Operate electric fuel pump Ignite ignition coil (#1-#6) (\*1) (\*3) Oil ctrl. Install the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten the wiring harness at the white tape c to the holder 1, and then fasten tape c to the holder 1, and then fasten tape c to the holder 1, and then fasten tape c to the holder 1, and then fasten tape c to the holder 1, and then fasten tape c to the holder 1, and then fasten tape c to the holder 1, and tape c to tholder 1, and tape c to the holder 1, and tape c to th name Q'ty Remarks Joint Plastic tie M8 × 40 mm Bolt Throttle body assembly M6 × 16 mm Bolt Holder Hose 22 may vary. 5 4 3 2 1 22 21 20 19 18 17 16 2. Page 450 LOWR Lower unit 142 N m (14.2 kgf m, 104.7 ft lb) Part name Q'ty Remarks Reverse gear Needle bearing Circlip Needle bearing Cir shims (T3), do not apply gear oil, grease, or sealant to the parts. ELEC Electrical system Checking the armature (starter motor) 1. Do not reuse a gasket, always replace it 3. Checking the valve seat 1. Remove intake silencer. Page 92 GING Rigging information P B P/B É Ê (\*1) Hub 1 (\*1) È (\*1) (\*1) 3-23... Remove the fuse holder 2, and then dis- 11. Page 376 LOWR Lower unit Removing the water pump and shift 1. 8-88 Disassembling the reverse gear .......... 90890-06610 Driver rod L3 4: 90890-06652 Disassembling the forward gear 1. Page 386 LOWR Lower unit 2. POWR Power unit Fuse box assembly Fuse 10 A, Spare is included. Check that the "I" marks on the VCT assembly (STBD) and driven sprocket (STBD) are aligned. Remove the engine ECM cover 1, and then remove the plug 2. NOTICE: Make sure that the rubber seal is installed properly in the engine ECM cover 1, and then remove the plug 2. NOTICE: Make sure that the rubber seal is installed properly in the engine ECM cover 1, and then remove the plug 2. NOTICE: Make sure that the rubber seal is installed properly in the engine ECM cover 1, and then remove the plug 2. NOTICE: Make sure that the rubber seal is installed properly in the engine ECM cover 1, and then remove the plug 2. NOTICE: Make sure that the rubber seal is installed properly in the engine ECM cover 1, and then remove the plug 2. NOTICE: gear backlash Adjusting the forward gear shim (T2) • Spray anti-rust lubricant on the gears and thickness bearings before installation. Stack limit: Maximum units for storage Upward Handle with care... See "Removing the PTT unit" (9-37). Page 122 TRBL SHTG Troubleshooting Symptom 2 Cause Checking step page Fuel not supplied (all — Measure the fuel pressure. Install the pressure regulator K and holder L, and then tighten the pressure regulator holder screw M to the specified torque. Disassembling the fuel filter assembly 1. Remove the engine ECM, and then dis- connect the engine ECM, and then dis- connect the engine ECM and Lubricant, sealant, and thread locking agent Symbols in an exploded diagram or illustration indicate the grade of lubricant and the lubrication points. Page 556 Maintenance 4. Remove the propeller shaft housing assembly. Remove the fuel rails. ECM bracket and the wiring harness, and É... 1.33) 1: 60V-WS853-06 YDIS USB adapter and cable assembly" (8-16). Install the intake silencer. TIP: • Do not reuse a gasket or seal set, Align the holes c and d in the plate b with always replace it with a new one. Install the flywheel magnet cover. Cover the tilt cylinder, make piston 9. Connect the Rectifier Regulator ground lead b. FUEL Fuel system PORT <sup>2</sup> ± & STBD & ± <sup>2</sup> Intake manifold bolt 5: TIP: 10 N·m (1.0 kgf·m, 7.4 ft·lb) When the protrusions on the gaskets contact the fuel rail cover, make sure that the gaskets TIP: remain installed properly. Install crankshaft journal bearings 6 into the cylinder block 7. Page 99 S-Steel 6D0-45970-00 15 1/2 S-Steel 6D0-45978-00 15 3/4 S-Steel 6D0-45978-00 15 3/4 S-Steel 6D0-45976-00 13 1/2 Aluminum 6G5-45943-01 F200B only 14 1/2 Aluminum 6G5-45947-01 F200B only 14 5/8 Aluminum 6G5-45952-00... A-2 Wiring harness ..... Wiring harness routing .......5-6 Working with crane .......0-2... Drive shaft spring (F250G and FL250G) The spring pushes the drive shaft toward the water pump and stabilizes the thrust free play of the shaft. TECH Technical features and description Vapor gas treatment Vapor gases from the vapor separator are collected in the canister, and then gradually discharged into the atmosphere after being absorbed and cleaned by the activated charcoal. FUEL Fuel system Vapor gas hose (check valve to joint) 2 Vapor gas hose (canister atmospheric port 0 Vapor gas hose (intake silencer to check to joint) valve) Page 213 Hose routing Ë È Ê É È Í Ì Ì Ê Ë Í STBD É d Pressure regulator e Canister f Vapor shut-off valve g Air pressure sensor h Intake silencer... 7-44 Short, open, or loose Measure the ignition coil input voltage. adjustment) Checking the compression pressure Spark plug: 25 N·m (2.5 kgf·m, 18.4 ft·lb) 1. Otherwise, the armature could sepa- rate from the motor base assembly due to the magnetic force of the stator 0 and damage the brushes. Install new gaskets onto the intake manifold folds. G/B R/Y 9. (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference data): 1.07-1.27 mm (0.042-0.050 in) TIP: Up-relief screw height b If the hydraulic pressure is out of specifica- (reference da screws to adjust the 1.95-2.45 mm (0.077-0.096 in) pressure. Cylinder head Valve spring compressor 2: 90890-04019 Cylinder head warpage limit: Valve spring 1. See "Installing the intake silencer"... 12. Secure the exhaust camshaft using a wrench 3, and then remove the driven sprockets 5. a Fuse (60 A) (house [accessory] battery) b Fuse (60 A) (starter relay) f Fuse (30 A) (ignition coil, fuel injector, VCT, engine ECM) d Fuse (10 A) (ETV, engine ECM) d Fuse (30 A) (starter relay) f Fuse (30 A) (starter relay) f Fuse (10 A) (low-pressure fuel pump) Page 575 Ignition unit È 53 62 70 78 B/Br Fuse box Battery 61 69 77 86 Pulser coil Engine ECM (\*1) 24 12 13 1 Joint coupler 1 27 34 40 46 24 12 33 39 45 52 13 1 Joint coupler 2 8 14 20 7 13 19 26 Air temperature sensor... Feature The YDIS provides quicker detection and analysis of engine malfunctions. Do not press the float. Place the thermoswitches in a container Engine ECM bolt: of water and heat the water slowly. Push the pinion stopper c down, and Removing the starter motor then remove the clip d. TIP: Make sure to keep the parts in the order as 3. Page 482 BRKT Bracket unit m (0.5 kgf m, 3.7 ft lb) É É Part name Q'ty Remarks Cowling lock lever (BOW) Plastic tie Grommet Hose Joint Gasket Adapter Hose Joint Hose Clamp M6 ×... Page 516 BRKT Bracket unit Battery PTT motor lead terminal Light green (Lg) Down Sky blue (Sb) 2. Page 245 Vapor separator 5. Page 410 LOWR Lower unit TIP: • Measure the gap at 4 points: e, f, g, and È P /M 0.16 0.17 0.18 0.19 • Write down the measurement data in the shimming check sheet. See "Checking PORT the fuel injector" (5-44). a Fuse (60 A) (house [accessory] battery) b Fuse (60 A) (starting battery) c Fuse (30 A) (ignition coil, fuel injector, VCT, engine ECM) d Fuse (10 A) (eTV, engine ECM) e Fuse (10 A) (starter relay) f Fuse (10 A) (eTV, engine ECM) d Fuse (10 A) (eTV, engine ECM) d Fuse (10 A) (starter relay) f Fuse (10 A) (eTV, engine ECM) e Fuse (10 A) (starter relay) f Fuse (10 A) (eTV, engine ECM) d Fu R Lg Y Br E Free START Pull Fuse box 53 62 70 78 Battery Starter motor I PTT relay I 61 69 77 86 Engine ECM (\*1) Neutral switch... Model features / Model Item Unit F200BET FL250GET F 1829.0 (72.0) mm (in) 1956.0 (77.0) Outboard motor transom height mm (in) 643.0 (25.3) mm (in) SPEC Specification Lower unit Model Item Unit F200BET FL200BET FL200BE Counter- Propeller direction (rear view) wise clockwise wise... • When assembling the lower unit after shimming is completed, make sure to apply gear oil, grease, and sealant to the specified areas. Intake and exhaust system / Lower unit The outer plate cartridge of the water pump are hard chromeplated for durability and to protect the parts from abrasion due to muddy water. Electrical system technical data Charging system Model Item Unit F200BET FL200BET FL200B Regulator Output peak voltage... Select the pinion shims (T3). Trouble Item gauge Trouble conditions to be detected code display Pulser coil... Depending on the posi- tion of the valve When the timing belt is not installed, do springs may cause the VCT assemblies and not turn the crankshaft or camshafts. Install the brushese the valve When the timing belt is not installed, do springs may cause the VCT assemblies and not turn the crankshaft or camshafts. 3 and springs 4. Page 339 Crankcase 5. Turn the engine start switch to ON, and 2. Turn the drive shaft 10 times or more to shims (T3) 8 may not have been removed. then install the fuse holder. Measure the intake and exhaust valve clearances of the specified cylinders. Do not apply backlash before disassembly"... Remove the fuel drain hose 1 from the intake manifold (PORT) 2. Align the slot a on the impeller 5 with the Woodruff key 4, and then install the impeller 5. Selecting the pinion shim (T3) • Spray anti-rust lubricant on the gears and bearings before installation. Checking the Rectifier Regulator Do not connect the battery cables in reverse. See "Removing the intake manifold" (6-17). 7-86 .. MADE IN JAPAN PAYS D'ORIGINE JAPON 1 Model name 2 Approved model code 3 Transom height 4 Serial number... Page 278 POWR Power unit Wiring harness Part name Q'ty Remarks Wiring harness Protector M6 × 30 mm Bolt M6 × 16 mm Bolt 7-19... Page 520 BRKT Bracket unit Removing the reservoir Disassembling the PTT motor 1. The fail-safe control system records the trouble codes according to the engine trouble conditions. INFO General information Safety while working ............ Camshaft / Exhaust cover 6 N·m (0.6 kgf·m, 4.4 ft·lb) 12 N·m (0.3 kgf·m, 2.2 ft·lb) 55 N·m (5.5 kgf·m, 40.6 ft·lb) Part name Q'ty Remarks M6 × 50 mm Bolt M18 × 17 mm Plug Gasket Exhaust outer cover (PORT) POWR Power unit 2. Check that the battery cables and — terminals are connected properly. Install the shift rod. .... See "Removing the intake manifold"... Page 432 LOWR Lower unit 5. Page 432 LOWR Lower unit 5. Page 235 Throttle body / Canister, throttle body, and surge tank Canister, throttle body, and surge tank 13 N m (1.3 kgf m, 9.6 ft lb) 5 N m (0.5 kgf m, 3.7 ft lb) Part name Q'ty... See "Installing 11. Install the washers 9, upper mounting nuts 0, and lower mounting nuts 0, and lower mounting nuts 0, and lower mounting nuts 0.5 kgf m, 3.7 ft lb) 5 N m (0.5 kgf m, 3.7 ft lb) See Down-relief screw depth a "Checking the hydraulic pressure" (9-38). TRBL SHTG Troubleshooting YDIS This manual contains the model-specific information. Apply positive pressure to the water 9. Checking the neutral switch 1. Install the steering yoke 9 are both facing in the same direction (a and b are aligned). Cylinder block Water Cylinder bore (D -D Valve opening a temperature 94.000-94.017 mm (3.7008-3.7014 58-62 °C Starts opening (136-144 °F) Checking the piston ring above 70 °C 4.3 mm (0.17 in) or above 1. INFO General information Special service tool bisassembly use the recommended special service tools • Use compressed air to remove dust and dirt to work safely, and to protect parts from dam- during disassembly. Short, open, or loose Check the charging circuit for proper connections and damage. Remove all of the bolts from the bottom plate, and then remove the frame. Page 425 Lower unit (FL200B) / Lower unit (FL200G) Lower unit (FL250G) É 42 N m (4.2 kgf m, 31.0 ft lb) 9 N m (0.9 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 34.7 ft lb) Part name... Page 277 Flywheel magnet TIP: • Make sure to remove any grease from the tapered portion c of the crankshaft and the inner surface d of the flywheel magnet. Turn the engine start switch to ON, and then measure the input voltage at the OCV coupler. See step 1 in "Removing the propeller shaft housing assembly" (8-73). Remove the clip 1 and bushing 2, and then remove the shift bracket assembly b, holder 3, and washer 4. Remove the crankshaft B, crankshaft F = 90 mm (3.5 in) journal bearings C, thrust bearings C, thrust bearings D, and oil seal E. Assembling the tilt ram • When assembling the PTT unit, do not use a rag. Disconnect the ignition coil couplers a. Page 23 Lower unit (counter rotation model)........... Page 325 Cylinder head b Previous contact width • If the valve seat contact area is too narrow and situated near the top edge of the valve face, cut the top edge of the valve seat using a 30° cutter to center the negative bat- tery lead to the terminal b, and then check the PTT relay for continuity. Connect the low-pressure fuel pump cou- pler b. Page 479 Shift rod and shift bracket Assembling the shift bracket 1. (F250G) 15. Page 364 LOWR Lower unit (F200B) È 9 N m (0.9 kgf m, 40.6 ft lb) 42 N m (4.2 kgf m, 31.0 ft lb) 55 N m (5.5 kgf m, 40.6 ft lb) 42 N m (4.2 kgf m, 31.0 ft lb) 47 N m (4.2 kgf m, 40.6 ft lb) 42 N m (0.9 kgf m, 6.6 ft lb) 42 N m (4.2 kgf m, 31.0 ft lb) 45 N m (4.2 kgf m, 40.6 ft lb) 42 N m (4.2 kgf m, 40.6 ft lb) 4 m (0.9 kgf m, 6.6 ft lb) 42 N m (4.2 kgf m, 31.0 ft lb) 55 N m (5.5 kgf m, 40.6 ft lb) 9 N m (0.9 kgf m, 6.6 ft lb) Page 366 LOWR Lower unit È • Make sure to disconnect the battery cables from the battery, and remove the engine shut-off switch. Remove the engine ECM, and then disconnect the engine ECM couplers b and 12.0 V (battery voltage) 5. Cylinder head / Cooling water passage cover 3 N m (0.3 kgf m, 2.2 ft lb) 12 N m (1.2 kgf m, 8.9 ft lb) 12 N m (0.47 in) 9 mm 7 mm 12 mm (0.47 in) 9 mm 7 mm 12 m ft lb) 32 N · m (3.2 kgf · m, 23.6 ft · lb) 12 mm (0.47 in) 9 mm 7 mm 12 mm (0.35 in) (0.28 in) Cooling water passage cover Removing the cooling water passage cover 1. Fasten the wiring harness 0 using the holders. Fuel system Checking the pressure regulator 9. Page 91 Battery installation / System diagram 3-22... Cylinder block Example: If the crankshaft journal mark a is "69" g and the cylinder block mark b is "07" h, select the crankshaft journal bearing color in 99 9 06 07 08 09 f. TRBL SHTG Troubleshooting Connecting the communication cable to the outboard motor a YDIS coupler (gray) YDIS (CD-ROM, Ver. Low-pressure fuel pump Removing the low-pressure fuel pump Cover the fuel components using a rag to prevent fuel from spilling out. Remove the wiring harness guide. Loading PreviewSorry, preview is currently unavailable. alert indicator coupler, and then tighten the negative lb) 20 N m (2.0 kgf m, 14.8 ft lb) Part name Q'ty... Fuel pressure (reference data): 290.0 kPa (2.90 kgf/cm , 42.1 psi) TIP: • The fuel pressure decreases 5 seconds after the engine start switch is turned to •... Remove the water pump housing 1, col- lar 2, spacer 3, washers 4, wave washer 5, impeller 6, and Woodruff key 2. Page 499 Oil pan and exhaust manifold Disassembling the oil pan and exhaust manifold 1. Page 481 Shift rod and shift bracket / PTT switch and cowling lock lever PTT switch and cowling lock lever PTT switch and cowling lock lever m (0.5 kgf m, 3.7 ft lb) È È Part name Q'ty Remarks Gasket PTT switch and cowling lock lever PTT switch and cowling lock lever m (0.5 kgf m, 3.7 ft lb) È E Part name Q'ty Remarks Gasket PTT switch and cowling lock lever PTT switch and cowling lock lever m (0.5 kgf m, 3.7 ft lb) È E Part name Q'ty Remarks Gasket PTT switch and cowling lock lever m (0.5 kgf m, 5.2 mathematical state) and cowling lock lever m (0.5 kgf m, 5.2 mathematical stat ft lb) 10 N m (1.0 kgf m, 7.4 ft lb) Part name Q'ty Remarks M6 × 40 mm Bolt Intake manifold assembly (STBD) Gasket 6-16... Page 513 PTT unit 6. Legend symbols in the wiring diagrams 1 Double colors wire 2 No wire connector 3 A wire is not included in the selected wiring unit. FUEL Fuel system Removing the intake silencer 1. Page 104 TRBL SHTG Troubleshooting • Stationary test Operation tests can be performed while the engine is stopped. Page 404 LOWR Lower unit Backlash indicator 9: 90890-06706 Magnet base B B: 90890-06844 12. Page 435 Propeller shaft housing (FL200B) 12 11 108 N m (10.8 kgf m, 79.7 ft lb 29 N m (2.9 kgf m, 21.4 ft lb) 1 N m (0.1 kgf m, 0.7 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) Part name Q'ty Remarks... See "Checking the fuel filter assembly"... Page 187 Ignition unit and component Wiring harness continuity: a Terminal 1-c Terminal 3-c Terminal 1-c Terminal 48 8. Camshaft runout: 0.015 mm (0.0006 in) 4. Page 420 LOWR Lower unit 8-57... Check the anode. Turn the engine start switch to ON, and then measure the input voltage. Page 95 System diagram 3-26... Page 332 POWR Power unit 5. Page 332 POWR Power unit 5. Page 196 ELEC Electrical system Starter motor Part name Q'ty Remarks Stator Armature Brush holder assembly Starting motor gear assembly Washer set Bracket M4 × 15 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance outline • To obtain long product life, Yamaha strongly recommends that the specified periodic checks and maintenance be performed according to the maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance be performed according to the maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance interval charts. Remove M6 × 117 mm Bolt M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance interval charts. Remove Bracket M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance Bracket M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance Bracket M6 × 35 mm Bolt Cover assembly Bracket... Page 542 Maintenance Bracket M6 × 35 mm Bolt Cover assembly Bracket M6 × 35 mm Bolt Bracket M6 × 35 m the OCVs 2 and filters 3. Tighten the center bolt 4 to the specified Measuring the forward gear backlash torque while holding the drive shaft not to and reverse gear backlash before turn. 9-40 pressure in lower Insufficient PTT fluid. Page 468 LOWR Lower unit 8-105... See steps 12, 13, and 21 in "Measuring the • Spray antirust lubricant on the gears and forward gear backlash and reverse gear bearings before installation. Page 462 LOWR Lower unit Selecting the pinion shim (T3) " (8-45). Remove the stator 6. Disassembling the shift bracket 1. Within specification? Drain the gear oil. See "Reducing the fuel pressure" (6-7). Electrical system technical data / Power unit technical data / Power unit technical data / Power unit technical data Power unit technical data / Power unit technical data Power unit technical data / P (140 °F) with SL 10W-30 engine oil and at (kgf/cm... Page 123 Outboard motor troubleshooting Symptom 1: Unstable engine idle speed, poor acceleration, poor performance, or limited engine speed. Page 487 PTT switch and cowling lock lever / Bottom cowling Bottom cowling Part name Q'ty Remarks Bracket M6 × 30 mm Bolt Bracket M6 × 20 mm Bolt Bracket Bracket Bracket Bracket Rivet Water outlet M8 × 35 mm Bolt Grommet Collar Rubber seal Grommet... 7. Page 408 LOWR Lower unit 2. See "Disassem- bling the propeller shaft housing (FL200B) 12 11 108 N m (10.8 kgf m, 79.7 ft lb) 29 N m (2.9 kgf m, 21.4 ft lb) 1 N m (0.1 kgf m, 0.7 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) Part name Q'ty Remarks... Engine control system and component 7. Connect the tester probes to the test PORT EX leads. WARNING! The shift cable joint must be screwed in 8.0 mm (0.31 in) or more. Page 418 1. Connect the cooling water hose C, and TIP: then fasten it using the clamp D. Fuel control unit and component 15. Pass the PTT motor lead a through the hole b in the clamp bracket (STBD). See "Installing the intake manifold" (6-18). Disconnect the starter motor lead a, and then remove the plastic ties 1 and hold- ers 2. Page 379 Propeller shaft housing (F200B) Removing the propeller shaft TIP: housing assembly When removing the slider 5, make sure that 1. Exhaust cover / Cylinder head 7 N m (0.7 kgf m, 5.2 ft lb) 30 N m (3.0 kgf m, 44.3 ft lb) 12 N m (1.2 kgf m, 8.9 ft lb) (\* 1) E... To connect and operate the YDIS, see the "YDIS (Ver. 1-4 Lower unit. Forward gear backlash: 0.26-0.65 mm (0.0102-0.0256 NOTICE: 1. Connect the fuse holder couplers, and the intake silencer" (6-19). Page 208 FUEL Fuel system Hose routing .... ...... connect the fuse holder coupler e. Air pressure sensor input voltage: Orange (O)-Black (B) 4.75-5.25 V 4. Page 533 PTT cylinder 65 N m (6.5 kgf m, 47.9 ft lb) 90 N m (9.0 kgf m, 66.4 ft lb) 160 N m (16.0 kgf m, 118.0 ft lb) 15 N m (1.5 kgf m, 11.1 ft lb) 7 N m (0.7 kgf m, 5.2 ft lb) 20 N m (2.0 kgf m, 14.8 ft lb) Part name Q'ty... FUEL Fuel system Removing the fuel filter assembly Cover the power unit STBD U, gasket X, and dowels Y. Check the Rectifier Regulator for conti- nuity. Page 121 Outboard motor troubleshooting Symptom 1: Engine will not start (engine cranks). Engine control unit and component / Fuel con attachment Bearing inner race attachment 90890-06658 Drive shaft holder 6 Bearing inner race attachment 90890-06658 Drive rod LL Backlash indicator 90890-06605 90890-06605 90890-06655 90890-06655 90890-06605 06706... STBD 10. Page 552 Maintenance Checking the fuel joint and fuel hose (fuel joint to fuel injector) 1. Clogged fuel filter element for dirt 6-14 and obstructions. PORT 8. Stopper guide plate A: 90890-06501 Checking the drive shaft bushing 1. 4. Page 269 Power unit assembly 21. Cut the surface of the valve seat using a 45° cutter by turning the cutter clockwise until the valve seat face has become smooth. Use the following information as a guide for effective and quality service. The engine ECM performs these controls according to the signals sent from various sensors and switches. ELEC Electrical system 7. Select the pinion shims (T3) and propeller shafe shims (T4). Check the pinion and reverse gear. Page 518 BRKT Bracket unit PTT motor 7 N m (0.7 kgf m, 5.2 ft lb) 19 N m (1.9 kgf m, 14.0 ft lb) Part name Q'ty Remarks Spacer Filter Sheet O-ring Reservoir cap O-ring Reservoir M8 × 20 mm Bolt PTT motor assembly O-ring Ioint... Before removing the starter motor, make sure to disconnect the negative battery terminal. 8-44 Selecting the pinion shim (T3) selection table ..........8-45 Pinion shim (T3) selecting the propeller shaft shim (T4) (F250G) ...... Check the edge and face of the flange on the camshafts (PORT) and intake cam- shaft (STBD) that is used for the cam position sensor. This value is the control voltage that the engine ECM requires to set the target opening angle of the throttle valve. Page 268 POWR Power unit 10. Fasten the wiring harness using the plastic ties 6. — Throttle cable. Ignition unit and component Wiring harness continuity: a Terminal 1-b Terminal 15 a Terminal 2-b Terminal 2-b Terminal 2-b Terminal 16 10. Remove the fuse cover and relay cover, and then remove the starter relay 1. Connect the special service tool 0 il filter wrench Needle bearing attachment 90890-06653 Driver rod L3 Shift rod socket 90890-06652 Driver rod L3 Shift rod socket 90890-06653 Driver rod L3 Shift rod socket 90890-06653 Driver rod L3 Shift rod socket 90890-06652 Driver rod socket 90890-06652 Driver rod socket 90890-06652 Driver rod socket 90890-06652 D 90890-06679 Needle bearing attachment Bearing housing puller claw L 90890-06502 Needle bearing attachment Stopper guide plate 90890-06504... Page 512 BRKT Bracket unit Removing the PTT unit with the power unit installed, make sure to sus- pend the outboard motor. Page 393 Drive shaft and lower case (F200B) 3. TIP: 1. Page 197 Starter motor Part name Q'ty Remarks Washer Pinion shaft Planetary gear Plate Starter motor pinion Pinion stopper set Lever assembly Seal set Magnet switch Washer 5-68... Reverse the PTT motor leads between the battery terminals to fully retract the trim rams. Page 557 General periodic maintenance 3. Page 467 Shimming (counter rotation model) 8-104... Page 100 GING Rigging grommet mounting 3. Remove the fuse holder, and then Removing the throttle body remove the joint 7. Page 191 Ignition unit and component Lead color Switch position Free c Pushed d 8. Page 483 PTT switch wiring harness extension Counter rotation model Holder Regular rotation model É Counter rotation model... When heating the lower case, heat the Replace if cracked or worn. Remove the water pipe, cover, and bolts. Page 469 Shimming (counter rotation model) Measuring the reverse gear backlash 7. TIP: Make sure to fit the tip a of the shift rod 1 into the slot b in the shift rod joint. Fuel filter assembly Disassembling the fuel filter ..... • Leave the pin inserted into the hole f of the timing belt tensioner until the timing belt is installed again. 21. If the fluid is below the proper level, add the recommended fluid. Remove the holders 1 from the fuel hose 2, and then disconnect the fuel hose 2. Page 415 Shimming (regular rotation model) 7. Page 461 assembly 1. 5-4 Top ..... Shimming (counter rotation model) Shim location (FL250G) 8-98... Page 154 ELEC Electrical system Connecting part Color Ignition coil #5 Black/Blue ETV power source Red/Green Fuel injector #6 Purple/White ETV motor (close) Green/Black Fuel injector #5 Purple/Blue Fuel injector #4 Purple/Green ETV motor (open) Green/Red... Page 538 BRKT Bracket unit 3. Page 314 POWR Power unit 17. Install the forward gear assembly into the "Removing the drive shaft" (8-25). pump 1. 3. Uncrating procedure / Outboard motor mounting Outboard motor mounting Proper mounting of the outboard motor pro- vides better performance, maximum reliabil- ity, and the highest customer satisfaction. Page 355 Cylinder block TIP: TIP: Install the crankpin bearings in the original • Do not get any engine oil to the drive positions. ELEC Electrical system 5. Page 116 TRBL SHTG troubleshooting Symptom 1: PTT unit does not hold the outboard motor up. Apply positive pressure and check that no air comes out of the opposite end of the canister check valve. Connect the APS coupler d. Page 494 BRKT Bracket unit 4 N m (0.4 kgf m, 3.0 ft lb) 8 N m (0.8 kgf m, 3.0 ft lb) 42 N m (4.2 kgf m, 31.0 ft lb) 28 N · m (2.8 kgf · m, 20.7 ft lb) 42 N m (0.4 kgf m, 3.0 ft lb) 8 N m (0.4 kgf m, 3.0 ft lb) 8 N m (0.4 kgf m, 3.0 ft lb) 8 N m (0.4 kgf m, 3.0 ft lb) 8 N m (0.4 kgf m, 3.0 ft lb) 42 N m (4.2 kgf m, 31.0 ft lb) 28 N · m (2.8 kgf · m, 20.7 ft lb) 42 N m (0.4 kgf m, 3.0 ft lb) 8 N m (0.4 kgf m, 3.0 ft lb Ib) 20 N m (2.0 kgf m, 14.8 ft lb) 8 N m (0.8 kgf m, 5.9 ft lb) Part name... 7-2 Adjusting the valve clearance............ When tightening torque specifications indicated throughout the manual to meet the design aims of the outboard motor. 6-37 Disassembling the vapor separator... . Checking the electrical system A blowby gas reburning system removes any unburned fuel from the blowby gases and sends it to the combustion chambers to be burned. Page 424 LOWR Lower unit 1. Install the engine ECM, and then tighten the engine ECM bolts to the specified torque. Checking the trim sensor 1. You can download the paper by clicking the button above. (F200B) 1. Page 444 LOWR Lower unit 142 N m (14.2 kgf m, 104.7 ft lb) Part name Q'ty Remarks Needle bearing Pinion Nut 8-81... Wiring harness routing Bottom cowling È Ê Ì Í Ó Î Ò Ñ Ï É Ï Ó Î Ò Î Š I Shift cut switch 9 Isolator coupler 2 Neutral switch 0 Water detection switch coupler 3 PTT switch A PTT switch wiring harness extension 4 Trim sensor coupler B Wiring harness... FL200BET 1000001- FL250GET 1000001- FL250GET 1000001- YAMAHA MOTOR CO., LTD. cylinders) Pinched or kinked fuel hose. ECM coupler layout / Checking the electrical component When measuring peak voltage Using the YDIS between the terminals of an electrical When checking the ETV, TPS, OCV, ignition component using the digital tester, make spark, APS, high-pressure fuel pump, fuel sure that the leads do not contact any injector, or each sensor, use the YDIS. Page 464 LOWR Lower unit Propeller shaft shim (T4) selection table The shim thickness does not have to be adjusted for the gray-colored cell. Maintenance chart 2... Page 443 Propeller shaft and lower case (FL200B) Drive shaft and lower case (FL200B) Drive shaft and lower case (FL200B) 142 N m (14.2 kgf m, 104.7 ft lb) Part name Q'ty Remarks Thrust bearing Pinion shim (T3) — O-ring Needle bearing Oil seal housing M8 ×... Connect the and lower case (FL200B) .. • When the timing belt is not installed, do not turn the crankshaft or camshafts. Page 79 Rigging grommet mounting 7. Page 395 Drive shaft and lower case (F200B) È Propeller nut A: 55 N·m (5.5 kgf·m, 40.6 ft·lb) 7. Page 540 Maintenance Outline ...... ....10-1 Maintenance chart 1.. ..10-1 Maintenance chart .10-3 Predelivery check.......... Install a new valve guide 3 using the Valve guide installer 5.504–5.522 mm (0.2167–0.2174 in) 4 to the specified height a. TECH Technical features and description ETV control. the engine ECM determines the appropriate throttle valve opening according to the signals from the sensors, and controls the throttle valve. Page 1 F200B FL200B assembly (STBD) and driven sprocket (STBD) are aligned. Checking the fuel filter 1. Remove the E-clip 0, and then remove the Electrical system Electrical system Electrical component Port 1 Air temperature sensor 7 Water detection switch (in fuel cup 2 YDIS coupler assembly) 3 Fuel injector 8 Air pressure sensor 4 High-pressure fuel pump 9 ETV 5 Low-pressure fuel pump 6 Condenser (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 2 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 3 Fuse holder 3 Starter motor 4 Diode (connect to the air pressure sensor) Electrical component Starboard 1 PTT relay 3 Fuse holder 3 Fuse ho Power unit 21. Remote control box and switch panel installation / Battery installation / Battery installation specified tightening torques are provided for specific nuts, bolts, and screws. Do not reuse an O-ring, always replace it with a new one. Page 285 Wiring harness 35. See steps 2 and 3 in "Assembling positive, the current shim thickness must the lower case"... 2 Stator assembly lead É... Install the intake manifold (STBD). Page 539 PTT cylinder Recommended PTT fluid: ATF Dexron II 4. Checking battery (for electric start models) Battery electrolyte is dangerous; it con- tains sulfuric acid, which is poisonous 2. Fuel control unit and component 4. 26. 36. Remove the propeller shaft housing gear oil to the parts. YDIS / Outboard motor troubleshooting Troubleshooting Troubleshooting Troubleshooting Troubleshooting Troubleshooting Procedure 1. Fasten the YDIS/diagnostic flash indica- tor connector lead using the holder J. Replace the quick connector if an O-ring is cracked or damaged. Connect the isolator coupler a. disassemble stator. Page 428 LOWR Lower unit Water pump and shift rod (FL200B) Part name Q'ty Remarks Seal Shift rod M6 × 20 mm Bolt Oil seal Plate O-ring Spring E-clip Woodruff key Dowel Gasket Outer plate cartridge Impeller Washer Wave washer Spacer Collar 8-65... Page 558 Index Bracket unit technical data ...... Page 433 Water pump and shift 1. Connect the knock sensor coupler. Page 560 Disconnector..... • Confirm that the quick connector is installed properly by making sure there is a small amount of free play when the quick connec- tor is pulled and pushed. Fasten the PTT motor lead a and trim sensor lead using the flushing hose and trim sensor lead using the flushing hose and trim sensor lead using the plastic ties 9. Page 397 Drive shaft and lower case (F250G) 142 N m (14.2 kgf m, 104.7 ft lb) Part name Q'ty Remarks Pinion nut 8-34... È STBD Removing the flushing hose and É... Remove the oil pan assembly bolt 1. Page 115 Outboard motor troubleshooting 4-14... Shimming is not required. Check the wiring harness for continuity. Replace if out of specification. Page 564 Index Water pump and shift rod (F200B)...8-7 Water pump and shift rod (F200B)...8-7 Water pump and shift rod (F200B)...8-65 Water pump and shift rod (F200B)...8-7 Water pu rod (FL250G) ..8-68 Wiring diagram......... NOTICE: When tightening the VCT bolt, do not secure the driven sprocket. External dimensions / Crate top cover pictograph description The following pict N m (5.5 kgf m, 40.6 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 6.6 ft lb) 47 N m ( clearance (cold): Intake f: 0.205 ± 0.035 mm (0.0081 ± 0.0014 Exhaust g: 0.345 ± 0.035 mm (0.0136 ± 0.0014 TIP: Write down the measurement data. Connect ignition coil couplers (PORT IX) Y. Cylinder block 6. Page 431 Water pump and shift rod (FL200B) Water pump and shift rod (FL250G) Water pump and shift rod (FL250G) Part name Q'ty Remarks Seal Shift rod M6 × 20 mm Bolt Oil seal Plate O-ring Spring E-clip Woodruff key Dowel Gasket Outer plate cartridge Impeller... However, do not operate the engine at •... Page 437 Propeller shaft housing (FL200B) Assembling the propeller shaft housing assembly • Use heat-resistant gloves. the shift cable 5. Page 521 PTT motor Bearing splitter 7: (commercially available) TIP: Before removing the bearing depth a. Tighten the cylinder head bolts 6 and 7 to the specified torques in 2 stages and in the order 9, 0, and so on. 1-16 Abbreviation ..... 4 N·m (0.4 kgf·m, 3.0 ft·lb) 17. (F200B) Select the pinion shims (T3) and propeller shaft shim (T4). Disconnect the fuel hose 1 from the vapor separator assembly 1. Page 318 POWR Power unit 7 N m (0.7 kgf m, 5.2 ft lb) 30 N m (3.0 kgf m, 44.3 ft lb) 12 N m (1.2 N kgf m, 8.9 ft lb) (\* 1) È... age. • In the 3rd tightening stage for the connect- ing rod bolts K, mark the connecting rod bolts and the connecting rod bolts and the connecting rod bolts 40°... Engine control system and component F200B and FL200B: È É APS output voltage (reference data): Fully closed c Fully open d Item APS 1 0.550-0.850 V Above 3.250 V APS 2 0.400-1.000 V F250G and FL250G: APS output voltage (reference data):... Disconnect the throttle body assembly wiring harness extension coupler a. Check the engine idle speed using the Yamaha genuine tachometer (on-board meter) or the YDIS. Otherwise, a fire could result. Remove the fuel cup assembly 1, Oring 2, and fuel filter element 3, and then remove the clip 4 and float 5. Adjust the trim sensor. Keep gaso- To prevent an accident or injury and to pro- line and all flammable products away from vide quality service, observe the following heat, sparks, and open flames. Replace if the intake manifolds. Otherwise, correct measurements cannot be obtained. Install a new taper roller bearing. 10-7 Actuator, sensor, and switch.......2-3 Adjusting the forward gear shim (T1) thickness ........8-102 Changing engine oil........ FUEL Fuel system Assembling the vapor separator 4. Page 555 Do not reuse an O-ring, always replace it with a new one. Remove the blowby hose 4. Page 183 Ignition unit and component Wiring harness continuity: Ignition coil #1 a Terminal 1-b Terminal 1-b Terminal 2-Ground a Terminal 3- 8 Page 498 BRKT Bracket unit 42 N m(4.2 kgf m, 31.0 ft lb) 20 N m(2.0 kgf m, 14.8 ft lb) 12 N m(1.2 kgf m, 8.9 ft lb) Part name Q'ty Remarks M8 × 90 mm Bolt Rubber seal Gasket... connect the Rectifier Regulator couplers and ground lead. The fuel injection amount is controlled by the fuel injector actuation time GING Rigging information Uncrating procedure 1. Adjust the forward gear shim... Page 529 PTT gear pump 3. POWR Power unit 2. Measure the camshaft runout. Loosen the vapor separator drain screw 2 to drain the fuel into a drain pan. Page 281 Wiring harness 33. TIP: a Diagnostic test lead (Blue/White) When more than 1 trouble code is detected,... Remove the muffler 2, plate 3, and then remove the exhaust manifold 4. NOTICE: Apply force in the direction of the arrow to prevent the special service tool 1 from slipping off easily. SPEC Specification Lower unit Holding pressure (kgf/cm 68.6 (0.686, 9.9) psi) Forward gear backlash (\*1) mm (in) 0.26-0.65 (0.0102-0.0256) Reverse gear backlash (\*1) mm (in) 0.23-0.88 (0.0091-0.0346) Pinion shim (T3) 0.10, 0.12, 0.15, 0.18, 0.30, 0.40, 0.50... Sb: Sky blue Lg: Light green Motor base assembly continuity: Terminal c-Terminal g 3. Set the gear shift to the N position, and then remove the plate, oil seal, O-ring, and shift rod. Unloaded Loaded r/min Engine ECM bolt: Cranking 1500 3500 7 N·m (0.7 kgf·m, 5.2 ft·lb) DC V 14.5 17.8... Remove the top cover. Fasten the knock sensor lead a and flushing hose 6 using the plastic tie 9. Page 389 Drive shaft and lower case (F200B) Checking the drive shaft TIP: 1. Turn the engine start switch to ON, and then measure the TPS output voltages and throttle valve... 1. Page 503 Steering arm 1. Page 454 (B) TPS output voltage and throttle valve... 1. Page 503 Steering arm 1. Page 454 (B) TPS output voltages and throttle valve... 1. Page 503 Steering arm 1. Page 454 (B) TPS output voltages and throttle valve... 1. Page 503 Steering arm 1. Page 454 (B) TPS output voltages and throttle valve... 1. Page 503 Steering arm 1. Page 454 (B) TPS output voltages and throttle valve... 1. Page 454 (B) TPS output voltages and throttle valve... 1. Page 503 Steering arm 1. Page 454 (B) TPS output voltages and throttle valve.... 1. Page 454 (B) TPS output voltages and throttle LOWR Lower unit Shimming check sheet Lower case deviation Serial number Remarks Pinion height (mm) Measuring point #1 Measuring point #2 Measuring point #3... Page 239 Canister, throttle body, and surge tank 8. Install the propeller shaft housing assem- bly, and then tighten the propeller shaft housing assem- bly, and then tighten the propeller shaft housing bolts 6 to the specified torque. Remove the rigging grommet 3. Page 506 BRKT Bracket unit 22 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 3 N m (0.3 kgf m, 2.2 ft lb) 24 26 24 Part name Q'ty Remarks... Installing the flywheel magnet Do not turn the flywheel magnet counter- clockwise. POWR Power unit Checking the out- • If the outboard motor. Check the drive shaft. Page 110 TRBL SHTG Troubleshooting... Page 448 LOWR Lower unit TIP: Make sure to fit the tip a of the shift rod 1 into the slot b in the shift rod joint. Install the dowels 6. TECH Technical features and description Power unit system These models are equipped with a V6, 4-stroke engine that has 60° cylinder banks. Turn the engine start switch to ON, and then measure the input voltage at the throttle body assembly wiring harness extension coupler. ELEC Electrical system Checking the engine temperature sensor (reference data): 1. 2. Do not apply 1. P1 P2P3 P4 P5 P6 • Insert the protrusion a of each bearing into the slots in the cylinder block. ...9-45 Removing the PTT motor ...... ....9-45 Disassembling the PTT motor .........9-45 Checking the armature (PTT motor)........ Remove the engine ECM 1. Check and 11. 1.33 or later) Instruction Manual.".... POWR Power unit É É M10 × 102 mm Crankshaft journal diameter a: É M8 × 93 mm 62.968-62.992 mm (2.4791-2.4800 Crankcase bolt diameter difference limit: Crankpin diameter b: É: a - b = Less than 0.20 mm (0.0079 49.976-50.000 mm (1.9676-1.9685 É: a -... Lower unit technical data / Bracket unit technical data PTT system Model Item Unit F200BET F250GET FL250GET Hydraulic pressure (\*1) Down (kgf/cm 6.7-8.7 (67.0-87.0, 971.5-1261.5) psi) (kgf/cm 13.0-15.0 (130.0-150.0, 1885.0-2175.0) psi) Motor brush Standard length mm (in) 11.5 (0.45) Wear limit... Model features Model designation F 250 G E T X None: 2-stroke E: Enduro F: 4-stroke L: Counter rotating propeller Model category T: High thrus (4-stroke) D: Twin rotating propeller K: Kerosene Z: HPDI Output horsepower Example: 6/9.9/75/150/250/300 Model generation A/B/C/D/F/G/H/J/L/N/P/Q/R/S/T/U/V/X/Y (Repeat from A) Level 1: Starting method M: Manual start... See "Disassembling the propeller shaft assembly" (8-16). Heat the installation area of the taper TIP: roller bearing outer race in the propeller If a high-pitched metallic sound is produced shaft housing 3 using a gas torch, and when the special service tool is struck, the then installed new taper roller bearing 5. Check the PTT body 1 and tilt cylinder 2. Connect the starter motor lead c and brown lead of the wiring harness, and 2. Disconnect the low-pressure fuel pump coupler a. 16. Remove the manual valve 1, and then remove the gear pump assembly 2. Install the extension (U-transom model), lower unit, trim tab, and propeller. TECH Technical features and description Intake and exhaust system The single electronic throttle valve, which is operated by the engine ECM, enables precise control of the intake air. Valve spring compressor 6: 90890-04019 NOTICE: Do not apply grease, oil, or Valve spring compressor attachment 7:... È U-transom model Lower case mounting bolt 5: 47 N m (4.7 kgf m, 34.7 ft lb) Page 396 LOWR Lower unit Drive shaft and lower case (F250G) 142 N m (14.2 kgf m, 104.7 ft lb) Part name Q'ty Remarks Thrust bearing Pinion shim (T3) — O-ring Needle bearing Pinion valves or intake and exhaust valves could collide with each other and be damaged. Engine control unit, Fuel unit, Ignition unit, Charging and starting unit, and PTT unit and control unit, Fuel unit, Ignition unit, Charging and starting unit, and PTT unit and control unit, Fuel unit, Ignition unit, Charging and starting unit, and PTT unit and control unit, Ignition unit, Charging and starting unit, Ignition u (FL200B) Part name Q'ty Remarks O-ring Water pump housing M8 × 45 mm Bolt Cover Seal Insert cartridge O-ring 8-66... • When removing the lower unit installed, make sure to sus- pend the outboard motor. Page 411 Shimming (regular rotation model) Pinion shim (T3) selection table (mm) E 0.01 0.02 0.03 0.04 0.05 0.06 0.07 bearing attachment 90890-06531 90890-06531 90890-06531 90890-06533 90890-06603 Bearing buller assembly Bearing attachment 90890-06535 90890-06640 Stopper guide stand Bearing buller assembly Bearing attachment 90890-06538 90890-06604 Bearing buller assembly Bearing buller bearing 0-13... Page 502 BRKT Bracket unit Steering arm Part name Q'ty Remarks Steering arm Washer Bushing O-ring Bushing (F250G) Removing the propeller shaft housing assembly assembly assembly assembly 1. POWR Power unit 3. Remove the plastic tie B, and then dis- pler r from the wiring harness guide, connect the thermoswitch connectors (STBD) A. Tighten the trim sensor screws 2 to the specified torque. See "Adjusting the trim sensor" (9-34). Page 313 Camshaft VCT cap O: 32 N·m (3.2 kgf·m, 23.6 ft·lb) 15. Outline / Predelivery check Predelivery check To make the delivery process smooth and efficient, complete the predelivery checks as explained in the following procedures. Tighten the oil pan assembly bolt N to the specified torque. Page 256 FUEL Fuel system 6. Turn the engine start switch to OFF, and then disconnect the specified torque. fuel injection control, the engine ECM calculates the precise air and fuel mixture required in each combustion chamber depending on the load and engine speed in order to increase combustion efficiency. Remove the steering voke by striking it with a copper hammer. Engine control system and component 3. Install the engine ECM cover. Propellers greatly affect boat speed, acceleration, engine life, fuel economy, and even boating and steering capabilities. sensor 2 Thermoswitch (STBD) E Thermoswitch (PORT) 3 APS F OCV (PORT) 4 Neutral switch G Cam position sensor (PORT IN) 5 Shift cut switch H Fuel injector (STBD) I High-pressure fuel pump 7 Cam position sensor (STBD IN) TECH Technical features and description Actuator, sensor, and switch Engine ECM Determines the engine operating conditions according to the input signals from the sensors, which are installed at various locations on the engine, and sends output signals to operate the actuators to perform the various control functions. Fuel injector 2. Page 311 Camshaft PORT STBD 5. Fasten the air temperature sensor lead using the holder 0. Page 472 LOWR Lower unit 8-109... Install the washer 1, spring 2, thrust 2. Fuel leakage Check for fuel leakage. Page 178 ELEC Electrical system 13. Page 447 Drive shaft and lower case (FL200B) Assembling the reverse gear Installing the propeller shaft housing assembly Do not reuse a bearing or circlip, always replace it with a new one. 6-35 forward gear TIP: shims (T1) and taper roller bearing outer • If the shim thickness adjustment value is race. Check the hydraulic pressure within 5 seconds. Page 367 Lower unit (F200B) / Lower unit (F250G) È 42 N m (4.2 kgf m, 31.0 ft lb) 9 N m (0.9 kgf m, 6.6 ft lb) 55 N m (5.5 kgf m, 40.6 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (4.7 kgf m, 34.7 ft lb) 9 N m (4.7 kgf m, 34.7 detent bolt 7: 18 N·m (1.8 kgf·m, 13.3 ft·lb) 3. Turn the engine start switch to ON, and then measure the input voltage between the terminals 1-10 and ......... Loosen the pipe joints 4, and then remove the pipe joint at end b. Disconnect the throttle body assembly 6. Check that the gear shift operates smoothly when the remote control lever is moved from the N position to the F or R position. GING Rigging information Propeller selection The propeller 16-22 may vary. Page 475 Bleeding the PTT unit.... sizes listed in the propeller list indicate the following information: The size and type of propeller that is used will affect the performance of a boat and out- board motor critically. Adjust if out of specification. Battery installation STBD PORT Outboard Motor Critically. ON/OFF ON/OFF Black Blac 90890-06531 Puller head 2: 90890-06514 Disassembling the propeller shaft... Page 546 Maintenance Checking the engine oil level Checking the engine oil level Checking the engine start switch and 1. Measure the vapor shut-off valve resis- tance. Page 390 LOWR Lower unit Ball bearing attachment 6: 90890-06555 Bearing outer race puller assembly 7: 90890-06523 TIP: The needle bearing contains 24 rollers. TIP: If the fluid is at the proper level, a small amount of fluid should flow out of the filler hole. Installing the shift rod 1. Consult your dealer or have a Yamaha trained person experienced in proper rigging mount the outboard motor. FL200BET F250GET FL250GET FL250GET Valve spring Free length mm (in) 48.1 (1.89) Tilt mm (in) 48.1 (1.89) Tilt mm (in) 0.020-0.055 (0.0008-0.0022) Camshaft Cam lobe height Intake mm (in) 46.311-46.411 (1.8233-1.8272) Page 37 Power unit technical data Model Item Unit F200BET FL200BET FL200BE transom model). Otherwise, the pistons and valves or intake and exhaust valves could col- lide with each other and be damaged. Therefore, make sure to reduce the fuel pressure before performing the dis- assembly 4 N m (0.4 kgf m, 3.0 ft lb) 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Power unit Gasket Dowel M6 × 20 mm Bolt Cable holder M6 ×... Page 526 BRKT Bracket unit 7 N m (0.7 kgf m, 5.2 ft lb) 7 N m (0. pump and high-pressure fuel pump 1. See "Wiring harness routing" (5-6). ELEC Electrical system 15. Installing the Rectifier Regulator 2. Check the spark plug. Crankcase cover 1. Page 427 Lower unit (FL250G) Removing the lower unit 1. Model data Battery requirement Model Item Unit F200BET FL200BET FL20 the specified torque. Installing the engine ECM 1. Page 401 Shimming (regular rotation model) Shimming check sheet Lower case deviation Serial number Remarks Pinion height (mm) Measuring point #2 Measurements Before disassembly After disassembly Measuring point #1 Measuring point #2 Measuring point #3... FUEL Fuel system Draining the fuel 1. Before troubleshooting the outboard motor, check that fresh fuel of the specified type has been used. Replace the motor base assembly if there is no continuity. Replace if cracked or damaged. Page 243 Low-pressure fuel pump / Vapor separator Vapor separator Part name Q'ty Remarks Hose Clamp Bolt M6 × 35 mm Collar Vapor separator assembly Grommet Bracket Vapor separator wiring harness extension Plastic tie Hose Clamp Hose Joint 6-34... 9-41 PTT motor .... ...... POWR Power unit Measuring point a (reference data): 20.0 mm (0.8 in) Piston ring end gap b (reference data): Top ring: 0.200-0.300 mm (0.0079-0.0118 in) Second ring: 0.300-0.450 mm (0.0059-0.0236 in) Piston ring side clearance: TIP: Top ring a: The figures are for reference only. Page 125 Outboard motor troubleshooting Symptom 1: Discharged battery. • Install each thrust bearing with its grooves r facing outward. TECH Technical features and description Cooling system Cooling system Cooling diagram Thermostat (STBD) Cylinder block Exhaust cover (STBD) Cylinder head (STBD) Cylinder block É Flushing device Upper Exhaust guide Muffler Fuel cooler Rectifier Regulator Lower Exhaust guide Upper case... Ignition unit and component / Starting unit and component / Starter relay input voltage) 6. Install the knock sensor 8, and then tighten it to the specified torque. Check the inner surface of the PTT body 1 and tilt cylinder 2. Page 478 BRKT Bracket unit Removing the shift rod and shift bracket 1. Page 358 POWR Power unit 20. Install the oil filter 7, and then tighten it to the specified torque. Ignition unit and component Knock sensor resistance (reference data): Wiring harness continuity: 504.0-616.0 kΩ at 20 °C (68 °F) a Terminal 12 a Terminal 2-e Terminal 18 4. NOTICE: When heating the propeller shaft housing, heat the entire installation area evenly. Page 394 LOWR Lower unit TIP: While turning the drive shaft clockwise, push the water pump housing down to install it. Remove the water pump housing down to install it. the N position. Page 369 Lower unit (F250G) Removing the lower unit 1. Page 400 Measure the backlash before disassembly. Check the fuel injector" (6-45). Heat the installation area of the retainer in the lower case using a gas torch, and gear then install the retainer 5. Remove the fuel hoses 1 and 2. Connect the 51 Ignition unit and component ........... TIP: When installing the slider C, make sure that the balls D do not fall out of position. Remove the thermostats 3 and anodes 4. See step 1 in 1. Canister, throttle body, and surge tank Removing the canister, throttle body, and surge tank 1. Install the needle valve assembly 1, and then tighten the needle valve assembly screw 2 to the specified torque. Page 41 Specified torque Serve 2 to the specified torque assembly screw 2 to the specified torque assembly screw 2 to the specified torque. Page 41 Specified torque assembly screw 2 to the specified torque assembly 460 LOWR Lower unit Shimming • Before selecting the forward gear shims (T2) and reverse gear shims (T1), make sure to select the pinion shims (T3). Page 142 ELEC Electrical system È É Ê E × Ì Õ Í Ô Ó Ò Ñ Ï Î Í Fasten the wiring harness at the white N Fasten the wiring harness at the white N Fasten the select the pinion shims (T3). stator 0, and then tighten the bolts A. A-9 PTT unit and control unit ......A-11... Install the camshaft cap bolts C, D, E, Camshaft cap bolt D, E, and F: and F the PCV ......9-20 10-14 Checking the engine shut-off switch ...5-65 Checking the engine start switch to ON, and bisassembling the cylinder head bolts 4, 5, and 6 in the order 1, 2, and so on, and Disassembling the cylinder head then remove the cylinder heads 7 and... Turn the engine start switch to ON, and then measure the input voltage at the oil pressure sensor coupler. • Improper mounting of the outboard motor could result in hazardous conditions, such as poor handling, loss of control, or fire hazards. Ô Point the end of the plastic tie to star-board. Cylinder head cover 1. Page 139 Wiring harness routing Û È É Ú Ê Ú Ô × Ë Ì Í Î Ô Ï Ñ Ó Ò Ë Fasten the starter motor lead and junction Î Route the wiring harnesses and PTT box wiring harness extension using the motor tilts up and down smoothly when the PTT switch is operated. Install the trim ram assemblies into the PTT body 1, and then tighten the trim cylinder end screws 2 to the specified torque. Page 300 POWR Power unit TIP: • When turning the tilt piston assembly into the tilt cylinder, and then tighten the tilt cylinder end screw 1 to the specified torque. Page 554 Remove the water pump assembly and outer plate cartridge. In Operate the engine at any engine speed. Assembling the propeller shaft assembly 1. Remove the float chamber cover A, gas- Disassembling the vapor separator ket B, high-pressure fuel pump C, and 1. Checking the ignition spark 2. Fully screw in the shift cable joint 6 to 12. Turn the engine start switch to ON, and tool to the ignition coil so that sparks do then measure the input voltage at the not leak out. Page 21 Special service tool Tilt rod wrench 90890-06569 0-16... È 10-13... NOTICE: Before installing the oil pump assembly, make sure to fill it with engine oil through the oil pas- sages a. Connect the special service tool 1 to the opposite canister check valve port. 2011 - \*\* × 1 CR... Page 360 Removing the upper case Bearing puller assembly 9: 90890-06535 1. Page 360 Removing the lower unit...... Page 549 Predelivery check / General periodic maintenance 3. GING Rigging information Clamp bracket mm (in) 180 (7.1) 163.5 (6.4) 163.5 (6.4) 79 (3.1) 20 (0.8) 13 (0.5) 13 (0.5) 102 (4.0) 102 (4.0) 102 (4.0) 125.4 (4.9) 125.4 (4.9) TIP: The dimension values may include reference values. Other- wise, the VCT assembly could be damaged. FUEL Fuel system Installing the low-pressure fuel 6. 29. Page 416 LOWR Lower unit 8-53... 9-40 Installing the PTT unit.... . Install the through tube A with its flat cor- ner d pointing down. Remove the shift cut switch coupler a. Remove the engine ECM cover. NOTICE: Make sure that the ground lead a is routed through the gap between the aprons and is 9. Disconnect the water detection switch coupler a. Page 568 Engine control unit (\*1) Depending on the outboard motor, the locations of terminals 1-10 and 16-22 may vary. Cam position Voltage g, k More than 4.8 Less than 1.0 15. Yellow Green Green Blue Blue J2 J1 2. Fuel control unit and component Checking the water detection switch 1. Replace if eroded. Page 150 ELEC Electrical system È Ê Ì Í Ó Î Ò Ñ Ï É Ï Ó Ô Ñ Ï É Ï Ó Ô Ñ Ï É Ï Ó Ô Ñ Ï É Ï Ó Ô N I É Ï Ó Î Ò N I É Ï Ó I Ò N I É I O Î O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N I E I O I O N aligned with the edge lead using the holder. Remove the outer plate cartridge 8 and gasket 9. Page 328 POWR Power unit Tightening procedure when using new cylin- der head bolts: Cylinder head bolts: N·m (6.0 kgf·m, 44.3 ft·lb) 6th: 90°... SPEC Specification Electrical system technical data Ignition timing control system Model Item Unit F200BET FL250GET FL250FET FL250FET

Output peak voltage At cranking (unloaded) Electrical system technical data Fuel injection control system Model Item Unit F200BET FL200BET Resistance (\*1) SPEC Specification Model Item Unit F200BET FL200BET FL200BE it with a new one. Page 407 Shimming (regular rotation model) Shim location (F250G) 8-44... Remove the bracket 6. Page 477 Shift rod and shift bracket 18 N·m (0.2 kgf·m, 1.5 ft·Ib) 1 N·m (0. ×... Pull the inner cable so that there is no 21. Page 430 LOWR Lower unit Removing the water pump and shift 1. Check the brush holder assembly for Replace the armature if below specifica- continuity. Page 534 BRKT Bracket unit Removing the tilt ram 7. The crankshaft journal bearing color is blue. F200BET 1002876- bracket. Symptom 2 Cause Checking step page Engine ECM does not Blown fuse Check the fuse. Rigging grommet mounting 1. Page 224 FUEL Fuel system Intake manifold 7 N m (0.7 kgf m, 5.2 ft lb) 10 N m (1.0 kgf m, 7.4 ft lb) Part name Q'ty Remarks M6 × 25 mm Bolt Intake silencer Grommet M6 × ... Page 224 FUEL Fuel system Intake manifold 7 N m (0.7 kgf m, 5.2 ft lb) 10 N m (1.0 kgf m, 7.4 ft lb) Part name Q'ty Remarks M6 × 25 mm Bolt Intake silencer Grommet M6 × ... Page 224 FUEL Fuel system Intake manifold 7 N m (0.7 kgf m, 5.2 ft lb) 10 N m (1.0 kgf m, 5.2 ft lb) 10 N 283 Wiring harness 12. Motor commutator standard diameter a: 23.0 mm (0.91 in) Wear limit: 22.0 mm (0.87 in) 3. PTT gear pump / PTT cylinder PTT cylinder PTT cylinder PTT cylinder 65 N m (6.5 kgf m, 47.9 ft lb) 160 N m (16.0 kgf m, 11.1 ft lb) 7 N m (0.7 kgf m, 5.2 ft lb) 20 N m (2.0 kgf m, 14.8 ft lb) Part name... Remove the check screw 1, and then connect the special service tool 2. • Face the protrusion b on the connecting Clean if there is grease, oil, or scales. Page 340 POWR Power unit Cylinder block 7 N m (0.3 kgf m, 2.2 ft lb) 33 N m (3.3 kgf m, 24.3 ft lb) 44 43 14 N m (1.4 kgf m, 10.3 ft lb) 28 N Install the OCVs. See step 4 in "Installing the cylinder head" (7-68). Page 515 PTT unit Battery PTT motor lead terminal Sky blue (Sb) Light green (Lg) Hydraulic pressure (up) (reference data): 13.0-15.0 MPa (130.0-150.0 kgf/cm, 1885.0-2175.0 psi) 16. 8-6 Checking the lower unit anode .......... FUEL Fuel system Fuel filter assembly 5 N m (0.47 in) (0.47 in) (0.47 in) (0.47 in) (0.47 in) 12 mm 12 mm 9 mm (0.47 in) (0.47 Checking the lower unit for air leakage .......8-85 Installing the lower unit........... See steps 3 and 4 in ing assembly".... SPEC Specification Gauge/sensor Model Item Unit F200BET FL200BET psi) Speed sensor Input voltage 4.75-5.25 Output voltage (\*1) At 392.0 kPa (3.92 kgf/cm... Remove the intake manifold (STBD). Move the hook 2 up or down slightly to TIP: adjust its position. Check the pulser coil. Cut off the tip a of the nipple 2. Page 377 Water pump and shift rod (F250G) / Propeller shaft housing (F200B) Propeller shaft housing (F200B) 20 21 18 19 1 N m (0.1 kgf m, 0.7 ft lb) 29 N m (2.9 kgf m, 21.4 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) Part name Q'ty... Page 165 Engine control system and component 14. Route the battery cable through the bot- tom cowling. See "Fuel hose and blowby hose" (6-1). Cooling water passage cover / Crankcase 18 N m (1.8 kgf m, 13.3 ft lb) and component 14. Route the battery cable through the bot- tom cowling. See "Fuel hose and blowby hose" (6-1). 15 N m (1.5 kgf m, 11.1 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 12 N m (1.2 kgf m, 8.9 ft lb) 34 N m (3.4 kgf m, 25.1 ft lb) 14 N m (1.4 kgf m, 13.3 ft lb) 15 N m (1.5 kgf m, 11.1 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 12 N m (1.2 kgf m, 8.9 ft lb) 34 N m (3.4 kgf m, 25.1 ft lb) 14 N m (1.4 kgf m, 13.3 ft lb) 15 N m (1.5 kgf m, 11.1 ft lb) 4 N m (1.2 kgf m, 8.9 ft lb) 34 N m (3.4 kgf m, 25.1 ft lb) 14 N m (1.4 kgf m, 13.3 ft lb) 15 N m (1.5 kgf m, 13.3 ft lb) 15 N m (1.5 kgf m, 13.3 ft lb) 15 N m (1.5 kgf m, 13.3 ft lb) 14 N m (1.4 kgf m, 25.1 ft lb) 14 N m (1.4 kgf m, 13.3 ft lb) 15 N m (1.5 kgf m, 13.3 ft lb) 15 N m ( N m (1.4 kgf m, 10.3 ft lb) 28 N m (2.8 kgf m, 20.7 ft lb) Part name... Install the fuel rail covers 7 and 8. Drain the remained engine cil. tab on the bracket. In addition, the engine ECM has a self-diagnosis function to perform troubleshooting using the YDIS. Tighten the self-locking nut B tempo- rarily. 69 68 Main relay input voltage: Terminal e-Terminal g 12.0 V (battery voltage) 6. Install the shift plunger B, slider C, balls D, and shift rod joint E. Do not apply gear oil to the parts. Page 234 FUEL Fuel system 6. Before installing the timing belt, make sure that the marks on the crankshaft and cylinder block are aligned. Remove the 10-pin coupler e from the holders on the bracket A, and then dis- connect the 10-pin coupler. Page 257 POWR Power unit Power unit (check and adjustment).......7-1 Checking the compression pressure ......... Install the relay cover and fuse cover. É PTT relay continuity: È... Spread apart the ends of the locking line or vapor separator, make sure to slider a, and then move the locking reduce the fuel pressure in the fuel line. Flushing hose adapter screw C: 5 N·m (0.5 kgf·m, 3.7 ft·lb) 1. Remove the knock sensor, and then dis- connect the flushing hose. Connect engine coupler. 39. Loosen flywheel magnet nut. Page 455 Shimming (counter rotation model) Forward gear shim (T2) thickness measurement in 2 places (mm) Number of shim(s) Subtotal 0.10 0.12 0.15 0.18 0.30 0.40 0.50 Total Reverse gear shim (T1) thickness measurement in 2 places (mm) Number of shim(s) Subtotal 0.10 0.12 0.15... Page 519 PTT motor 7 N m (0.7 kgf m, 5.2 ft lb) 19 N m (1.9 kgf m, 14.0 ft lb) Part name Q'ty Remarks Spring O-ring Motor base assembly Oil seal 9-44... Remove the rubber seal m, lever n, and pinion shaft assembly p. 10-14 chamber of PTT PTT fluid leakage... Driver rod L3 2: 90890-06652 Needle bearing attachment 5: 90890-06652 Needle bearing attachment 5: 90890-06652 Needle bearing attachment 5: 90890-06607... Replace if cracked or corrosion. Install the bushings 1, collar 2, distance collar assembly b, and tilt stop levers 3 and 4. 5-27 Short, open, or loose Check for wiring continuity between 5-28 connection in engine ECM the main relay and the engine ECM. Page 20 INFO General information Magnet base plate Ring nut wrench 90890-06578 Dial gauge set Ball bearing attachment 90890-06578 Dial gauge cylinderend screw wrench 90890-06672 90890-06568 Puller head PTT piston vice attachment 90890-06572 0-15... Timing belt is not installed, do not turn the crankshaft or driven sprock- ets. Fully screw in the throttle cable joint B to Throttle cable locknut D: the throttle cable A. (FL200B) See steps 1 and 2 in "Remov- ing the propeller shaft housing assembly"... Connect the PTT motor leads to the bat- tery terminals to fully retract the PTT rams. • Apply engine oil to the contact surfaces of moving parts before assembly. Shim location (F200B) 8-43... ELEC Electrical system 2. 5-53 spark (some cylinders) Check the spark plug. Disconnect the oil pressure sensor cou- pler R and water detection switch cou- 4. operate Main relay malfunction Check the main relay. See step 1 in "Removing the propeller shaft housing assembly" (8-16). Page 89 Battery installation STBD PORT Outboard motor motor Isolator lead Black Black Battery switch ON/OFF Installing the lower unit 1. • Make sure that the belt position marks are aligned with the "" marks. Install the original reverse gear shims See "Removing the propeller shaft hous- and ETV coupler a and Starter relay 2 Fuse (30 A) (ignition coil, fuel injector, 0 Main relay VCT, engine ECM) A ETV motor relay 3 Fuse (20 A) (engine start switch, PTT B High-pressure fuel pump relay switch) 4 Fuse (30 A) (starter relay) Electrical component Rear 1 Cam position sensor (PORT EX) 9 Joint relay VCT, engine start switch, PTT B High-pressure fuel pump relay switch) 4 Fuse (30 A) (starter relay) Electrical component Rear 1 Cam position sensor (PORT EX) 9 Joint relay Starter relay) Electrical component Rear 1 Cam position sensor (PORT EX) 9 Joint Rear 1 Cam position coupler 2 3 Condenser (connect to the cam position 0 Knock sensor coupler sensor [PORT EX]) 4 Engine ECM 5 Ignition coil 6 Cam position sensor (STBD IN) 7 Knock sensor... Remove the fuel cooler cover 3 and gasket 4. Remove the PTT motor bolts 1, and then removing sure that the PTT rams are fully extended. Oil filter 7: 18 N·m (1.8 kgf·m, 13.3 ft·lb) Oil filter wrench 8: 90890-06830 7-80... NOTICE: Before removing the reservoir, make sure Secure the end of the armature shaft that the PTT rams are fully extended. Page 108 TRBL SHTG Troubleshooting diagnosis code flash indicator sis record Normal — Pulser coil malfunction Engine temp sensor malfunction (\*1) Knock sensor malfunction (\*2) Cam position sensor (EXH) malfunction Water in fuel... Remove the cover 1 and bolts 2. Fuel injector #1 Pulser coil Fuel injector #2 Fuel injector #3 Fuel injector #4 Fuel injector #5 Cam position sensor... Page 537 PTT cylinder Installing the PTT unit, do not use a rag. Page 548 Maintenance Checking the PTT system 1. Intake manifold 3. Install the original propeller shaft shim 3 and propeller shaft assembly 4 into the propeller shaft housing assembly 5. • Apply engine oil to the threads e of the fly- wheel magnet nut and upper and lower sur- faces f of the washer Flywheel magnet 240 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf magnet Stator assembly M6 × 35 mm Bolt Dowel Holder... Page 553 General periodic maintenance Recommended gear oil: Hypoid gear oil: Hypoid gear oil: 1.150 L (1.216 US qt, 1.012 lmp qt) Counter rotation model: 1.000 L (1.057 US qt, 0.880 lmp qt) Check screw 3: 9 N·m (0.9 kgf·m, 6.6 ft·lb) 8. E... Page 148 ELEC Electrical system È Ê İ Í Ó Î Ó Ñ Ï É Ï Ó Î Ó Ñ Ï É Ï Ő Î Ô Î Ñ È Regular rotation model E Fasten the flushing hose, cooling water É Counter rotation model hose, trim sensor lead, and speedometer Ê... When measuring or adjusting the valve clear- ances, the fuel line must be disconnected, so make sure to reduce the fuel pressure before performing the disassembly procedure. FUEL Fuel system Removing the fuel injector STBD Cover the fuel components using a rag to prevent fuel from spilling out. See "Checking the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Lower unit 16. Junction box Removing the Rectifier Regulator 1. 6-36... disassembly Two pieces of Rectifier Regulator 1. 6-36... washers (90201-31M00) are required to measure the reverse gear back- lash for the shim adjustment on the counter rotation model. • Fit the protrusion on each thrust bearing into the slot in the crankcase. Replace if the electrodes are eroded, or there is carbon or other deposits. Connect the quick connector. Remove the ground leads 2 and 3. NOTICE: Be careful not to damage the outboard motor. Outboard motor installation / External dimensions F200BET, FL200BET, FL20 twin or triple installation (\*2) Transom height TIP: The dimension values may include reference values. Install the water pump. 22. Checking the check valve 1. Page 486 BRKT Bracket unit Installing the PTT switch Do not reuse a gasket, always replace it with a new one. POWR Power unit Disassembling the oil pump Driver rod L3 2: 90890-06652 Needle bearing attachment 3: assembly 90890-06613 1. See steps 1 and 2 in "Removing the water pump and shift rod"... • In the 3rd tightening stage for the connecting rod bolts 1, mark the connecting rod bolts and the connecting rod bolts 1, mark the connecting rod Checking the pulser coil 1. Install a new needle bearing, the original "Removing the drive shaft" (8-25). (F250G) Assemble the lower unit. Check the lower unit for air leakage. Rigging information Tightening torques Part to be tightened Screw size... Wiring diagram How to use the wiring diagram Composition of the wiring diagrams. diagram consists of five categories. Test harness (2 pins) 1: 90890-06867 Shift cut switch resistance (reference data): 11. Tighten the tilt ram 0 to the specified torque. Remove the outer plate cartridge 4 and gasket 5. Read the notice and understand what each pictograph means to prevent damage to the outboard motor when handling, transporting. kgf·m, 20.7 ft·lb) specified torques in 2 stages and in the 2nd: 90° order 1, 2, and so on. TECH Technical features and description Propeller damper is incorporated in the lower case. Check the fuel joint and fuel hose con- nections. addition, check the ground lead. Remove lb) 8 N m (0.8 kgf m, 5.9 ft lb) 17 N m (1.7 kgf m, 12.5 ft lb) 17 N m (1.7 kgf m, 12.5 ft lb) 17 N m (1.7 kgf m, 12.5 ft lb) 18 N m (0.8 kgf m, 5.9 ft lb) 17 N m (1.7 kgf m, 12.5 ft lb) 18 N m (0.8 kgf m, 5.9 ft lb) 17 N m (1.7 kgf m, 12.5 ft lb) 18 N m (0.8 kgf m, 5.9 ft lb) 17 N m (1.7 kgf m, 12.5 ft lb) 18 N m (0.8 kgf m, 5.9 ft lb) 18 N m (0.8 kgf m, 5.9 ft l sprocket and TIP: camshaft Be careful when turning the VCT assemblies and driven sprockets. See steps 1-5 in "Changing grommet mounting Rigging grommet mounting Remarks O-ring Spacer Filter O-ring Manual valve Circlip 9-52... If trouble code is detected, see "Trouble code and checking step" (4-9). Page 414 "Installing the drive shaft" (8-28). PTT piston vice attachment 9: •... NOTICE: Make sure that the rubber seal is installed properly in each engine ECM coupler. Page 500 BRKT Bracket unit 4. Page 505 Steering arm / Clamp bracket and swivel bracket 22 N m (0.3 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft coupler and isolator coupler, see "Wiring harness 31. • If replacement parts are necessary, use only genuine Yamaha parts of equivalent design and quality. Installing the junction box PTT relay terminal nut 4: 4 N·m (0.4 kgf·m, 3.0 ft·lb) 1. (F200B) See steps 1 and 2 in "Removing the water pump and shift rod" (8-13). Install the speed sensor. fuel feed Operate injector (#1-#6) (\*2) pump (\*4) Page 105 YDIS (\*1) Intake air pressure (\*2) This item shows the target output voltage of the TPS. Recheck the valve seat contact area of the valve. Disconnect the air temperature sensor coupler, and then remove the blowby .....1-2 Serial number .... battery terminal or battery switch, over-cur- rent protection in compliance with ABYC (E-11) must be provided. Page 488 BRKT Bracket unit Part name Q'ty Remarks Grommet Bottom cowling 9-13... Connect the vapor separator wiring har- ness extension 9. Page 293 Junction box 4. Page 296 POWR Power unit Timing belt 39 N m (3.9 kgf m, 28.8 ft lb) 39 N m (3.9 kgf m, 28.8 ft lb) Part name Q'ty Remarks Timing belt tensioner M10 × 55 mm Bolt Washer Pulley Collar M6 × ... Determine the gap average, and then 1.12 round down the average to the 1/100 place. INFO General information Abbreviations are used in this service manual. Symptom 2 Cause Checking step page Air leakage (throttle valve- Check the gaskets of the intake 6-15 cylinder head) manifolds, surge tank, and throttle 6-26 body. 18. Page 509 Clamp bracket and swivel bracket Self-locking nut B: 22 N·m (0.3 kgf·m, 16.2 ft·lb) Friction plate screw G: 4 N·m (0.4 kgf·m, 3.0 ft·lb) 12. • Using this software while there is not enough free space on the hard disk could cause errors and result in insufficient memory. Page 543 Outline Initial Every Item Actions 20 hours 500 hours 5 sembled) ment as necessary Fuel line (High pressure) Inspection or replace.... INFO General information Safety while working Handling of gasoline • Gasoline is highly flammable. Page 456 LOWR Lower unit 5. Remove the bearing 8. System diagram 3-24... TIP: Make sure to keep the parts in the order as they were removed. 10-5 Checking the engine start switch and engine shut-off switch...... Remove the engine ECM cover D, and coupler f from the bracket E. Install the washer 1 and engine temper- STBD PORT ature sensor 2, and then tighten the engine temperature sensor to the speci- fied torque. the balls 7 do not fall out of position. Safety while working / How to use this manual How to use this manual How to use this manual has been designed to make service procedures clear and easy to under- stand. Replace the 2. Page 372 LOWR Lower unit Removing the water pump and replace it with a new one. 10-4 Checking battery (for electric start models).....10-4 Checking the engine oil level....... Checking the engine shut-off switch 1. Apply water resistant grease to the spec- ified lubrication points. valve drive (PORT) Operate elect. Fasten the knock sensor lead a using the holder 1. holder. Page 576 Charging unit and starting unit (\*1) Depending on the outboard motor, the locations of terminals 1-10 and 16-22 may vary. Page 114 TRBL SHTG Troubleshooting 4-13... Fuse 20 A, Spare is included. Install the crankshaft journal bearings 1 P1 P2 and crankshaft 2 into the cylinder block P5 P6 TIP: • Install the crankshaft journal bearings 1 in the original positions. ing plate [. Page 449 Drive shaft and lower case (FL250G) / Drive shaft and lower case (FL250G) 142 N m (14.2 kgf m, 104.7 ft lb) Part name Q'ty Remarks Thrust bearing Pinion shim (T3) — O-ring Needle bearing Oil seal housing M8 ×... See "Installing the starter motor" (7-28). General torque Width Screw specifications across size (B) flats (A) N·m kgf·m ft·lb 8 mm 10 mm 12. Mm 26.6 17 mm... Page 501 Oil pan and exhaust manifold 8. Symptom 2 Cause Checking step page Spark plug does not Spark plug malfunction Check the ignition spark. TECH Technical features and description Digital ignition control In digital ignition control, the engine ECM determines the optimum ignition timing according to the signals from the sensors and sends the primary current to the ignition coils. "Removing the intake silencer" (6-17). Remove the dog clutch. GING Rigging information 5. Page 528 BRKT Bracket unit 4. Crankcase Installing the crankcase cover Do not reuse a gasket, always replace it with a new one. Remove the engine ECM, and then dis- connect the engine ECM coupler n. Page 387 Propeller shaft and lower case (F200B) 142 N m (14.2 kgf m, 104.7 ft lb) Part name Q'ty Remarks Thrust bearing Pinion shim (T3) — Oring Needle bearing Oil seal housing M8 ×... Repeat steps 12 and 13 to measure the reverse gear backlash. Page 96 GING Rigging information P B P/B È É Hub 3 (\*1) (\*1) Hub 2 (\*1) (\*1) Hub 2 (\*1) (\*1) Hub 4 3-27... PORT STBD 8. Page 508 BRKT Bracket unit 2. Page 290 POWR Power unit 4 N m (0.4 kgf m, 3.0 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) 12 N m (1.2 kgf m, 8.9 ft lb) 3 N m (0.3 kgf m, 2.2 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) 12 N m (1.2 kgf m, 8.9 ft lb) Part name Q'ty... Page 384 LOWR Lower unit 11 10 24 25 1 N m (0.1 kgf m, 0.7 ft lb) 29 N m (2.9 kgf m, 21.4 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) 7 N m (1.2 kgf m, 8.9 ft lb) 7 N m (0.1 kgf m, 0.7 ft lb) 29 N m (2.9 kgf m, 21.4 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) 7 N m (0.1 kgf m, 0.7 ft lb) 7 N m (0.1 kgf m, Terminal c -Terminal d 9.0-11.0 Ω 6. YDIS TIP: • The amount of memory and the amount of free space on the hard disk differs depending on the computer. Secure the intake camshaft using a wrench I, and then tighten the VCT bolts M to the specified torque. 7-49 Checking the valve lifter ..... ..7-49 Checking the camshaft. Power unit TIP: • Install each thrust bearing with its grooves t facing outward. Remove the water pipe 1. Page 536 BRKT Bracket unit 4. Page 476 BRKT Bracket unit Shift rod and shift bracket 18 N · m (1.5 kgf · m, 13.3 ft · Ib) 2 N · m (0.2 kgf · m, 1.5 ft · Ib) 2 N · m (0.2 kgf m, 1.5 ft · Ib) 1 N ·... Page 378 LOWR Lower unit 20 21 18 19 1 N m (0.1 kgf m, 0.7 ft lb) 29 N m (2.9 kgf m, 21.4 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) Fart name Q'ty Remarks Washer M8 × 33 mm Bolt O-ring Needle bearing... Connect the trim sensor coupler g, and 15. Remove the holder 1 (regular rotation model) or holder 2 (counter rotation model) and holder 3, and then remove the PTT switch 4 and gasket 5. Checking the APS 1 and APS 2 are a single unit, which 7. Install the spark plugs, and then tighten them to the specified torque. TECH Technical features and description Electronic fuel injection control, VCT control, knock con- trol, over-rev control, alert control, and fail-safe control. 9. Connect the fuel injector couplers, and then install the fuel rail covers. Checking the cylinder head anode 1. Check that there is no abnormal noise produced when the outboard motor is tilted up or down. FUEL Fuel system 5. Remove the propeller, trim tab, lower unit, and extension (U-transom model). Cylinder head 2. See "Pinion shim (T3) selection table" (8-48). Page 493 Upper case and mounts / Upper case 4 N m (0.8 kgf m, 5.9 ft lb) 8 O-rings a in the quick con- nector 1. Page 491 Upper case and mounts Removing the upper case 1. Page 426 LOWR Lower unit È 42 N m (4.7 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 34.7 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 34.7 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 34.7 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 47 N • 6Y8 Multifunction Meter for easy rigging and precision engine information • Low emission in compliance with EU regulation a Power unit •... See "Removing the drive shaft" (8-25). Install the adapter 8. NOTICE: If the outboard 1. Page 485 PTT switch and cowling lock lever TIP: Align the white paint mark c on the flushing hose 1 and the white tape d on the PTT motor lead b with the inner end of the grom- met 2. Remove the fuel filter assembly. 8-59... Page 264 POWR Power unit 17. Page 370 LOWR Lower unit 17. Page 370 LOWR Power unit 17. Page 370 LOWR Lower unit 1 Handling of gasoline...... .. Page 221 Fuel filter assembly 5 N m (0.5 kgf m, 3.7 ft lb) 12 mm (0.47 in) 12 mm 12 mm 9 mm (0.47 in) (0.47 in) (0.47 in) (0.47 in) (0.47 in) (0.47 in) 2 mm 12 mm 9 mm (0.47 in) (0.47 in) 4 mm 12 mm 9 mm (0.47 in) 12 mm 12 mm 12 mm 9 mm (0.47 in) 12 mm .....0-1 Ventilation... 6, and then tighten the 1. Turn the engine start switch to ON, and minal b and ground. assembly. ELEC Electrical system 12. Page 118 TRBL SHTG Troubleshooting 4-17... Remove the self-locking nut 4 and through tube 5, and then disassemble the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clamp brackets 6 and 7. See steps 1-4 in "Assembling to be a set of the clam Check that the forward gear backlash average is within specification. Install the Rectifier Regulator couplers a to the junction box. Turn the engine start switch to ON, and then measure the input voltage between the terminals a and c. See in TIP: "Installing the intake manifold" (6-18). Install new O-rings C and D and the crankcase E onto the cylinder block, and then tighten the crankcase bolts F and G to the specified torques in 2 stages STBD... Select the propeller shaft shim (T4) thick- ness from the following table according (T4) (F250G) to the free play measurement. Start the engine and check that the oil of the recommended engine oil through pressure alert indicator does not come the oil filler hole. Flywheel magnet Removing the flywheel magnet counter- clockwise. POWR Power unit 28. Vapor separator and high-pressure fuel pump Float height, it should be rest- ing on the needle valve. Connect the extension hose 3 to the speed sensor adapter 0, and then fas- ten the extension hose using the plastic 6. See "Installing the intake manifold"... Replace if dam- • Since the diameter of the passage in the aged or worn. Page 319 Cylinder head 7 N m (0.7 kgf m, 5.2 ft lb) 30 N m (3.0 kgf m, 22.1 ft lb) 60 N m (6.0 kgf m, 44.3 ft lb) 12 N m (1.2 kgf m, 8.9 ft lb) (\* 1) È... Pulser coil Fuel injector Engine temperature sensor Oil pressure sensor Engine Ignition coil Thermoswitch Shift cut switch 6Y8 Multifunction... Remove the screws 1 and disassemble the oil pump. Install a new cotter pin B. Install the engine ECM, and then tighten the engine ECM bolts to the specified Air temperature sensor input voltage: torque. Check the commutator. There are 2 types of fuel injection and asynchronous fuel injection and asynchronous fuel injection. Page 86 GING Rigging information STBD PORT Outboard motor motor motor Isolator lead Isolator lead Black Black ON/OFF ON/OFF Battery switch Black 3-17... •... a Fuse (60 A) (house [accessory] battery) b Fuse (30 A) (ignition coil, fuel injector, VCT, engine ECM) d Fuse (10 A) (starter relay) f Fuse (10 A) (low-pressure fuel pump) Page 577 Charging unit and starting unit E Rectifier Regulator Fuse box 53 62 70 78 Battery House (accessory) battery 61 69 77 86 Starter motor Engine ECM (\*1) 24 12 27 34 40 46 13 1 Joint coupler 1 33 39 45 52 24 12 8 14 20 13 1... Page 371 Water pump and shift rod (F200B) Part name Q'ty Remarks O-ring Water pump housing M8 × 45 mm Bolt Cover Seal Insert cartridge O-ring... Connect the thermoswitch connectors, vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors, vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors, vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the thermoswitch connectors (PORT) A and vapor separator wiring harness extension coupler B, and then tighten the tighten the thermoswitch connectors (PORT) A and the tighten the tight gear pump bracket bolts B temporarily. Armature continuity: Checking the brush holder and brush 2. Page 63 Cooling system É È È Cooling water flow É F(L)200B Ê F(L)200B E F(L)2 .A-5 Ignition unit . Disconnect the shift cut switch coupler m, and then remove the wiring harness and neutral switch lead from the holders J and 5 in "Install- ing the water pump" (8-30). (mm) È 0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 É -0.28 -0.25 -0.22 -0.20 for the crankshaft journal bearing from the "Crankshaft journal bearing selection table."... Otherwise, dust and particles could get on the PTT unit components, PTT motor bolt 4: causing poor performance. Cylinder block TIP: • When checking the big end inside diame- ter, reuse the removed connecting rod bolt. Install the rigging tube retainer 3, and then fasten it using the plastic tie 4. Make sure to keep the parts in the order as they were removed. Clean if there is grease, oil, or scales. FUEL Fuel system Vapor separator and high-pressure fuel pump 2 N m (0.2 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kg Q'ty... ELEC Electrical system 1 Thermoswitch (STBD) 9 Stator assembly 2 OCV (STBD) 3 Joint coupler 1 4 OCV (PORT) 5 Thermoswitch (PORT) 5 Thermoswitch (PORT) 5 Thermoswitch (PORT) 6 Engine temperature sensor 7 Pulser coil 8 Vapor shut-off valve... (\*3) Reference TPS voltage This item shows the criterion output voltage of the TPS. at the specified temperatures. See "Removing the PTT" motor" (9-45). Page 202 ELEC Electrical system TIP: TIP: Align the protrusion u on the stator assembly not come out from the pinion shaft 8. reverse gear shim, and retainer. Installing the rigging grommet 2. Remove the PTT unit 7. Also, make sure that the marks on the VCT assemblies and driven sprockets are aligned. Page 145 Wiring harness routing È Ò É Ñ Ï Ì Ê Î Í Ì Ê Ô Ő Ó Ë Install the pulser coil coupler layout ECM coupler layout Connecting part Color Cam position sensor White/Black Battery power Red/Yellow (STBD IN) Cam position sensor White/Black (PORT IN) Cam system OCV (STBD) Water pressure sensor Engine temperature sensor High-pressure fuel pump Trim sensor Thermoswitch Vapor shut-off valve Thermoswitch Vapor shut-off valve Thermoswitch Oil pressure alert indicator Shift cut switch c... Remove the thermoswitches 1. Page 310 POWR Power unit • Do not reuse a gasket, oil seal, or seal washer, always replace it with a new one. SPEC Specification Tightening torques Part to be tightened Screw size N·m kgf·m ft·lb 10.3 Crankcase bolt (length: 55 mm) 20.7 Anode bolt Anode — Thermostat cover plug 17.0 Connecting rod bolt 17.0 90° Lower resistance values shown are the values taken before the engine is started. Remove the knock sensor lead a from the holder 2. Page 11 How to use this manual Abbreviation Description Throttle Position Sensor Upside Variable Camshaft Timing Water in Fuel YDIS Yamaha Diagnostic System... A-7 Charging unit and starting unit .... (check and adjustment) 2. Connect the speed sensor coupler. See steps 1 and 2 in "Removing the pro-Assembling the propeller shaft housing assembly"... • Make sure to install the special service 3. Page 550 1. Heat the installation area of the retainer in the lower case using a gas torch, and 1. Page 451 Drive shaft and lower case (FL250G) Removing the drive shaft Assembling the lower case 1. Page 374 LOWR Lower unit Water pump and shift rod (F250G) Part name Q'ty Remarks Seal Shift rod M6 × 20 mm Bolt Cover 8-11... Measure the reverse gear backlash. Page 94 GING Rigging information P B P/B (\*1) (\*1) È É (\*1) Hub 3 Hub 2 (\*1) Hub 1 3-25... Replace if scratched. Do not reuse a shim if deformed or scratched. Then measure the input voltage between the terminal a and ground, and the ter- 3. Page 352 POWR Power unit 1. Page 111 Outboard motor troubleshooting 4-10.. Check the piston ring dimensions B and (158 °F) Checking the piston diameter 1. Remove the pinion nut. Page 490 BRKT Bracket unit 54 N m (7.2 kgf m, 53.1 ft lb) È 72 N m (7.2 kgf m, 53.1 ft lb) Part name Q'ty Remarks M14 × 190 mm Upper mounting bolt M6 ×... Remove the throttle body assembly. Replace if cracked or worn. Fuel system / Lubrication system Lubrication system Lubrication diagram Piston Camshaft VCT assembly passage hole Crankpin (connecting rod big end) Cylinder head Camshaft journal Valve and related parts Main gallery Oil pressure sensor Oil filter Oil pump with relief valve Oil strainer Oil pan... Page 446 LOWR Lower unit Checking the pinion and reverse 3. 5-15 Bottom cowling ...... Disconnect the neutral switch coupler a. Page 402 LOWR Lower unit Forward gear shim (T1) thickness measurement in 2 places (mm) Number of shim(s) Subtotal 0.10 0.12 0.15 0.18 0.30 0.40 0.50 Total Reverse gear shim (T2) thickness measurement in 2 places (mm) neutral switch lead a using the plastic tie 4. Page 109 Outboard motor troubleshooting Trouble Diagnostic YDIS diagno- Item YDIS diagnosis code flash indicator sis record 131, 132, 133, Accelerator position sensor malfunction (\*2) Air temperature sensor malfunction (\*3) Neutral switch malfunction (\*3) Neu (\*4) Air pressure sensor malfunction (\*5) Oil pressure sensor malfunction (\*6) Engine shut-off switch ON... Page 207 PTT electrical system — MEMO — 5-78... SPEC Specification Model features General feature F200B, F250G, and FL250G Overall feature • Electronic fuel injected, 60° V6, DOHC, 24-valves, VCT, 3352.0 cm (204.5 cu. Check the operation of the low-pressure fuel pump and high-pressure fuel pump using the YDIS "Stationary test"... safety procedures. Page 3 Contents General information Rigging information SPEC TECH Technical features and description Rigging information Rigging information Rigging information Rigging information Rigging Lower unit LOWR Bracket unit BRKT Maintenance Index Appendix... STBD 7-55... The engine ECM is equipped with a learn- ing function that records all of the compensations made by the control to the throttle valve opening for the operating conditions up to that point. POWR Power unit STBD PORT Bearing splitter plate G: (commercially available) Gear puller H: (commercially available) General cylindrical tool I: e = 19 mm (0.7 in) 8. 8-43 Shim location (F250G) ...... TRBL SHTG Troubleshooting consists of the following 3 items: Symptom 1: Specific trouble conditions Symptom 2: Trouble conditions of an area or individual part Cause: Trouble causes of symptom 2 -: Not applicable Symptom 1: Engine does not crank. a Fuse (60 A) (house [accessory] battery) b Fuse (10 A) (ETV, engine ECM) e Fuse (30 A) (starter relay) f Fuse (10 A) (low-pressure fuel pump) Page 573 Part name ... Install a new gasket B, the exhaust man- ifold C, and a new rubber seal D, and then tighten the exhaust manifold bolts E temporarily. 6. Page 64 TECH Technical features and description G C D E E Cooling water hose (joint to Rectifier Regulator) 1 Cooling water hose (cylinder block to joint) B Cooling water hose (Rectifier Regulator to 2 Cooling water hose (joint to joint) 3 Cooling water hose (joint to joint) C Cooling water hose (joint to fuel cooler) Page 65 Cooling water passage cover) J Speedometer hose a Fuel cooler b Rectifier Regulator c Cooling water pilot hole (on the bottom cowling) d Adapter (water pressure sensor) e Water passage cover (on the cylinder block) 2-20... Page 361 Shimming check sheet ............ Terminal stud bolt 2: 26 N·m (2.6 kgf·m, 19.2 ft·lb) 3. Page 112 TRBL SHTG Troubleshooting 4-11... Page 231 Throttle body Part name Q'ty Remarks Joint #3 mm Dowel Holder Joint Hose Hose Hose Hose Joint Hose 6-22... GING Rigging information 16. Check that the engine starts when the motor is not level, the oil level indi- engine start switch is turned to START. Page 547 Predelivery check É Check screw 1: 9 N·m (0.9 kgf·m, 6.6 ft·lb) START Checking the gear shift and throttle operation 1. Disconnect the air temperature sensor coupler a, and then remove the air tem- perature sensor 1. Page 473 Shimming (counter rotation model) — MEMO — 8-110... 6-35 Vapor separator and high-pressure fuel pump ..... Install a new O-ring and the reservoir cap 6. Page 398 LOWR Lower unit Removing the drive shaft 1. POWR Power unit TIP: • When turning the timing belt tensioner, apply a force of 15 N·m (1.5 kgf·m, 11.1 ft·lb) or less. Loosen the exhaust cover bolts 1 in the exhaust cover bolts 7 to the specified order 1, 2, and so on, and then remove torques in 2 stages and in the order 1, the exhaust covers 2 and 3. Fuel system TIP: • If the quick connector 1 is not installed completely onto the fuel rail or vapor sepa- rator, the locking slider a cannot be moved to the lock position. Page 247 Vapor separator and high-pressure fuel pump 2 N m (0.2 kgf m, 1.5 ft lb) 4 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 2 N m (0.2 kgf m, 1.5 ft lb) 4 N m (0.4 kgf m, 3.0 ft lb) 4 N m (0.4 kgf m, 1.5 ft lb) 4 N Assembling the starter motor • Do not apply grease or oil to the com- mutator of the armature. Cylinder-end screw 1: 90 N·m (9.0 kgf·m, 66.4 ft·lb) 5. See "Con- necting the quick connector" (6-8). Otherwise, the elec- trical system could be damaged or operate improperly. Check the motor base assembly for con- tinuity. Check the drive shaft bushing. Power unit system Fuel system Fuel system Fuel system Fuel system Fuel filter (with water separator and water detection switch) Check valve Eilter Surge tank... 9-29... ELEC Electrical system Using the digital tester The electrical technical data apply to the measurements taken using the Yamaha-rec- ommended tester. Wrap a rag around the quick connector Before servicing the high-pressure fuel 4. Connect the cooling water hoses c and 8. Page 302 POWR Power unit 2 N m (0.2 kgf m, 1.5 ft lb) 8 N m (0.8 kgf m, 5.9 ft lb) 8 N m (0.8 kgf m, 5.9 ft lb) 25 N m (2.5 kgf m, 18.4 ft lb) 7 N m (0.7 kgf m, 5.2 ft lb) 23 N m (2.3 kgf m, 17.0 ft lb) Part name Q'ty... Checking the ignition coil 1. Install the connector 1. ELEC Electrical system Ignition unit and component Checking the ignition coil 1. Install the connector 1. ELEC Electrical system Ignition unit and component Checking the ignition coil 1. Install the connector 1. ELEC Electrical system Ignition unit and component Checking the ignition coil 1. Install the connector 1. ELEC Electrical system Ignition unit and component Checking the ignition coil 1. Install the connector 1. ELEC Electrical system Ignition unit and component Checking the ignition coil 1. Install the connector 1. ELEC Electrical system Ignition unit and component Checking the ignition coil 1. Install the connector 1. ELEC Electrical system Ignition unit and component Checking the ignition coil 1. Install the connector 1. ELEC Electrical system Ignition unit and component Checking the ignition coil 1. Install the connecting rod a and con-1st: 13 N·m (1.3 kgf·m, 9.6 ft·lb) necting rod cap b onto the crankpin c. Page 382 LOWR Lower unit 4. Remove the taper roller bearing. This chapter contains the specifications nec- essary to mount the outboard motor, and may vary slightly depending on applications. or more points to be suspended, support it... NOTICE: When removing the driven sprocket, do not turn the exhaust camshaf requirements in the tables for your battery capac- ity, cable size, and ambient temperature. wiring harness extension coupler b. By connecting your computer to the engine ECM of an outboard motor using the communication cable, this software can be used to display sensor data and data stored in the engine ECM on the computer monitor. Page 391 Drive shaft and lower case (F200B) Depth a: 4.25-4.75 mm (0.167-0.187 in) 2. FUEL Fuel system Hose routing Fuel hose (cylinder block to joint) 3 Blowby hose (cylinder block to joint) 3 Blowby hose (cylinder block to joint) 4 Blowby hose (cylinder block to joint) 3 Blowby hose (cylinder block to joint) 4 Blo Fuel hose (joint to low-pressure fuel a Primer pump pump) Page 211 Hose routing k Fuel rail (STBD) m Fuel rail (PORT) n Joint... Remove the air pressure sensor 0. Engine ECM 1. Page 445 Drive shaft and lower case (FL200B) Removing the drive shaft 2. Adjust the shift cable joint 6, and then install the shift cable joint 6 to the pin h. Remote control box and switch panel installation See the Remote Control Box Operation Man- ual or Rigging Guide for the installation pro- cedures. Remove the trim sensor, and then dis- connect the trim sensor coupler a. Page 76 GING Rigging information TIP: TIP: • Make sure that the distance g is equal to This mounting height information is for refer- distance h. 5-18 Circuit diagram ..... above the ribs on the wiring harness guide. 5. Page 484 BRKT Bracket unit Removing the PTT switch 1. See 2, and then tighten the reservoir cap 2 steps 5-29 in "Removing the shift lever 9 with the mark c on the bottom cowling. See "Reduc- ing the fuel pressure" (6-7). Specified tightening torque Tightening torque Sart to be tightened Screw size N m kgf m ft lb Upper mounting nut 53.1 — Lower mounting nut 53.1 — Lo PORT Part name Q'ty Remarks M6 × 20 mm Bolt Cover (STBD) M6 × 35 mm Bolt Plastic tie Fuel rail assembly (STBD) Fuel rail (STBD) Fuel rail (STBD) Fuel rail (STBD) Fuel rail assembly (STBD) Fuel rail assembly (STBD) Fuel rail assembly (STBD) Fuel rail (STBD) Fuel rail assembly (STBD) Fuel rail assembly (STBD) Fuel rail assembly (STBD) Fuel rail assembly (STBD) Fuel rail (STBD) Fuel rail assembly (STBD) Fuel rail (STBD) Fuel rail assembly (STBD) Fuel rail (STBD) F install the reverse gear assembly 0. Wiring harness Removing the wiring harness When removing the wiring harness and wir- ing harness guide, the fuel line must be dis- connected. Starter motor / PTT electrical system Installing the starter motor 1. See "Removing the fuel filter assembly" (6- 13). To prevent chatter marks, make sure to turn the cutter evenly using a downward force of 40-50 N (4.0-5.0 kgf, 8.8-11.0 lbf). NOTICE: Do not turn the VCT assembly (STBD) and driven... Page 174 ELEC Electrical system Wiring harness continuity: Fuel injector #1 a Terminal 1- b Terminals 1-b 10 and 16-22 a Terminal 2-c Terminal 59 Fuel injector #2 a Terminal 1- b Terminal 1- b Terminal 2-c Terminal 60 Fuel injector #3 10. Page 266 POWR Power unit 4 N m (0.4 kgf m, 3.0 ft lb) 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Apron (STBD) Cover O-ring M6 × 16 mm Bolt Dipstick Holder M6 × 10 mm Bolt Engine ECM cover M6 ×... Disconnect the cooling water hoses a NOTICE: Do not apply grease, oil, or and b. pressure sensor slowly, and then mea- sure the output voltage at the specified pressures. Remove the pinion nut and washer. Page 357 Cylinder block TIP: • Make sure that the protrusions x on the connecting rod cap w face toward the flywheel magnet end of the crankshaft. Move the stator assembly leads away from the area covered by the intake manifold (STBD). Battery PTT motor lead terminal Light green (Lg) Down Sky blue (Sb) Page 517 PTT unit 9. Speed sensor adapter bolt A: 10 N·m (1.0 kgf·m, 7.4 ft·lb). 9. Clean the power unit mating surface, and then the install the dowels 1 and a new gasket 2. POWR Power unit Starter motor 26 N · m (2.6 kgf · m, 19.2 ft · lb) Part name Q'ty Remarks Starter motor M8 × 45 mm Bolt Holder Plastic tie M8 × 16 mm Bolt Terminal M8 × 20 mm Bolt Terminal stud bolt Collar... Remove the oil seal housing and drive then remove the retainer 1 and reverse shaft. Page 253 Fuel injector STBD PORT Part name Q'ty Remarks Fuel hose assembly 6-44... Page 440 LOWR Lower unit Propeller shaft housing (FL250G) 15 14 108 N m (10.8 kgf m, 79.7 ft lb) 29 N m (2.9 kgf m, 21.4 ft lb) 1 N m (0.1 kgf m, 0.7 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) Part name Q'ty Remarks... Page 280 POWR Power unit PORT 17. If the gap is 1 mm (0.04 in) or more, the pinion 8. Fasten the Rectifier Regulator leads using the plastic tie 8. Disconnect the special service tool from the pressure sensor 3 to the water pressure sensor adapter 4, 1. Install the bracket G, and then tighten the canister bracket bolts H to the speci- fied torque. È F200B and FL200B 1. Page 578 PTT unit and control unit (\*1) Depending on the outboard motor, the locations of terminals 1-10 and 16-22 may vary. Install the original propeller shaft shim. Remove the connecting rod caps a, and they were removed. Align the "II" marks h on the VCT assembly (PORT) and driven sprocket (PORT) by turning them counterclock- wise 60° gradually. Install the clip 0. Baffle plate screw 8: 4 N·m (0.4 kgf·m, 3.0 ft·lb) 4. SPEC Specification General tightening torque This chart indicates the tightening torques for standard fasteners with a standard ISO thread pitch. According to the engine operating conditions, the OCVs are oper- ated and the VCT assemblies advance and retard the intake valve opening timing in order to increase the intake and exhaust efficiency at low and mid-range engine speeds and obtain greater acceleration. Electronic control system Over-rev control and alert control, the engine ECM decreases the engine ECM decreases the engine from damage. Page 452 LOWR Lower unit (FL200B) È 42 N m (4.2 kgf m, 31.0 ft lb) 55 N m (5.5 kgf m) 40.6 ft Ib) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 6.6 ft lb) 47 N m (4.7 kgf m, 34.7 ft lb) 9 N m (0.9 kgf m, 6.6 ft lb) Part name... Place the outboard motor in an upright engine shut-off switch position. Install the baffle plate 7, and then Oil pan assembly bolt (M8) B: tighten the baffle plate screws 8 to the 20 N·m (2.0 kgf·m, 14.8 ft·lb) specified torque. Page 459 Shimming (counter rotation model) 20. Page 511 Clamp bracket and swivel bracket / PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bushing Bushing PTT unit 42 N m (4.2 kgf m, 31.0 ft lb) Part name Q'ty Remarks Shaft Circlip Plastic tie Bushing Bush (F200B) Assembling the propeller shaft housing assembly • Use heat-resistant gloves. Remove the engine ECM, and then dis- connect the engine ECM bolt: 7 N·m (0.7 kgf·m, 5.2 ft·lb) 12. and then disconnect the low-pressure fuel pump coupler Measure the commutator diameter a. Page 88 GING Rigging information Outboard motor Isolator lead Black Battery switch Black House battery 3-19... See "Checking the valve seat" (7-64). Preface This manual has been prepared by Yamaha primarily for use by Yamaha dealers and their trained mechanics when performing maintenance procedures and repairs to Yamaha equipment. Tighten the muffler bolts M to the speci- fied torque. Check the propeller shaft. Oth- using a pair of pliers, and then remove erwise, fluid could be expelled forcefully the armature 3 along with the motor... Otherwise, dust and particles could get on the PTT unit components, causing poor performance. Connect the engine ECM couplers. FUEL Fuel system Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water are 2 Cooling water hose 1 Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water hose 1 Cooling water hose 1 Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water hose 1 Cooling water hose 1 Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water hose 1 Cooling water hose 1 Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water hose 1 Cooling water hose 1 Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water hose 1 Cooling water hose 1 Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water hose 1 Cooling water hose 1 Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water hose 1 Cooling water hose 1 Cooling water hose 1 Cooling water hose 1 Cooling water hose (joint to joint) joint) 0 Flushing hose (joint to cooling water 2 Cooling water hose 1 Cooling wat hose (joint to Rectifier passage cover) A Flushing hose (flushing hose (joint to joint) a Fuel cooling water pilot hole) I Cooling water pilot hole (joint to joint) a Fuel cooler (vapor separator) b Rectifier Regulator c Cooling water pilot hole (on the bottom data ......1-15 Propeller shaft housing (F250G) .....8-20 Low-pressure fuel pump ......6-31 Propeller shaft housing (FL200B)..... Start the engine and warm it up for 5-10 minutes. Remove the thermoswitch lead and engine temperature sensor

lead from the holder E on the wiring harness guide, and then remove the wiring harness guide G. Symptom 2 Cause Checking step page Battery performance Check the battery capacity and specific 10-4 decrease gravity. 8. STBD PORT Oil filter union bolt 4.... ELEC Electrical system Starboard U E E U E U O × E I I O I N O O E Fit the stator assembly lead into the 1 Wiring harness groove in the junction box. Page 218 FUEL Fuel system Fuel pressure gauge 4: 90890-06786 8. Recommended PTT fluid: ATF Dexron II 5. See steps 3-5 in "Disconnecting the quick connector" (6-7). Remove the holder 1 and canister 2. b b b b b b b b 5. 8-23... Page 441 Propeller shaft housing (FL250G) 15 14 108 N m (10.8 kgf m, 79.7 ft lb) 29 N m (2.9 kgf m, 21.4 ft lb) 1 N m (0.1 kgf m, 0.7 ft lb) 6 N m (0.6 kgf m, 4.4 ft lb) Part name Q'ty Remarks... The engine ECM retards the ignition tim- ing and decreases the engine speed according to the amount of knocking to protect the engine from damage. Install a new gasket 1, the PTT switch Installing the cowling lock lever 2, and the holder 3. assembly 1. ELEC Electrical system È O É N Ï Ì Ê Î Ì I Ë O Õ O È Fit the protrusion on the plastic tie into the 1 Stator assembly lead 2 Thermoswitch connector hole in the wiring harness guide. Page 375 Water pump and shift rod (F250G) Part name Q'ty Remarks Seal Insert cartridge O-ring 8-12... rod a in the same direction as the mark c NOTICE: Do not apply grease, oil, or on the piston crown. Otherwise, the intake and exhaust valves could col- lide with each other and be damaged. Fuse 30 A, Spare is included. Disassemble the propeller shaft assem- bly. Clean using 600- grit sandpaper and compressed air if dirty. Page 524 BRKT Bracket unit Reservoir bolt 6: 19 N·m (1.9 kgf·m, 14.0 ft·lb) Reservoir cap 8: 7 N·m (0.7 kgf·m, 5.2 ft·lb) Installing the PTT motor • When assembling the PTT unit, do not use a rag.

The detectors can be directly connected to the DB (distribution board) or an existing wiring like outlet. After installation, put the battery and switch on the main breaker to check if it works properly. Related Post: Difference Between Conventional and Addressable Fire Alarm; Wiring Diagram of Heat Detector in Home (AC) Expatica is the international community's online home away from home. A must-read for English-speaking expatriates and internationals across Europe, Expatica provides a tailored local news service and essential information on living, working, and moving to your country of choice. With in-depth features, Expatica brings the international community closer together. Full membership to the IDM is for researchers who are fully committed to conducting their research in the IDM, preferably accommodated in the IDM complex, for 5 ... My car is a 1989 Chrysler lebaron turbo. Can you please send me a wiring diagram for the ignition coil to the SMEC(engine computer)? Can you also send me the wiring diagram of the pick-up coil to the SMEC? Thank you. Email freedomfrancisxxx13@gmail.com. Thank you #197. Francois Tabi (Monday, 21 December 2020 00:01)

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