HOW TO USE THIS MANUAL

MANUAL ORGANIZATION

This manual consists of chapters for the main categories of subjects. (See “symbols”)

1st title ①: This is the title of the chapter with its symbol in the upper right corner of each page.

2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.

3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

EXPLODED DIAGRAMS

To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

1. An easy-to-see exploded diagram ④ is provided for removal and disassembly jobs.

2. Numbers ⑤ are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.

3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ⑥. The meanings of the symbol marks are given on the next page.

4. A job instruction chart ⑦ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

5. For jobs requiring more information, the step-by-step format supplements ⑧ are given in addition to the exploded diagram and the job instruction chart.
### SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑩ indicate the subject of each chapter.

<table>
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<tbody>
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<td>①</td>
<td>General information</td>
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<tr>
<td>②</td>
<td>Specifications</td>
</tr>
<tr>
<td>③</td>
<td>Periodic checks and adjustments</td>
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<tr>
<td>④</td>
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<td>⑥</td>
<td>Fuel system</td>
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<td>⑦</td>
<td>Drive train</td>
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<tr>
<td>⑧</td>
<td>Chassis</td>
</tr>
<tr>
<td>⑨</td>
<td>Electrical</td>
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<tr>
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<td>Troubleshooting</td>
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Symbols ⑪ to ⑰ indicate the following.

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<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑪</td>
<td>Can be serviced with engine mounted</td>
</tr>
<tr>
<td>⑫</td>
<td>Filling fluid</td>
</tr>
<tr>
<td>⑬</td>
<td>Lubricant</td>
</tr>
<tr>
<td>⑭</td>
<td>Special tool</td>
</tr>
<tr>
<td>⑮</td>
<td>Torque</td>
</tr>
<tr>
<td>⑯</td>
<td>Wear limit, clearance</td>
</tr>
<tr>
<td>⑰</td>
<td>Engine speed</td>
</tr>
<tr>
<td>⑱</td>
<td>Electrical data (Ω, V, A)</td>
</tr>
</tbody>
</table>

Symbols ⑲ to ⑳ in the exploded diagrams indicate the types of lubricants and lubrication points.

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<tbody>
<tr>
<td>⑲</td>
<td>Apply engine oil</td>
</tr>
<tr>
<td>⑳</td>
<td>Apply gear oil</td>
</tr>
<tr>
<td>⑳</td>
<td>Apply molybdenum disulfide oil</td>
</tr>
<tr>
<td>⑳</td>
<td>Apply wheel bearing grease</td>
</tr>
<tr>
<td>⑳</td>
<td>Apply lithium-soap-based grease</td>
</tr>
<tr>
<td>⑳</td>
<td>Apply molybdenum disulfide grease</td>
</tr>
</tbody>
</table>

Symbols ㉑ to ㉒ in the exploded diagrams indicate where to apply a locking agent ㉓ and when to install a new part ㉒.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>㉑</td>
<td>Apply the locking agent (LOCTITE®)</td>
</tr>
<tr>
<td>㉒</td>
<td>Replace</td>
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GENERAL INFORMATION

VEHICLE IDENTIFICATION NUMBER
The vehicle identification number ① is stamped into the left side of the frame.

MODEL LABEL
The model label ① is affixed to the frame. This information will be needed to order spare parts.
FEATURES

SELF-ADJUSTING PARKING BRAKE MECHANISM

Usually, for vehicles equipped with a parking brake that must be adjusted manually, it is necessary to adjust the adjusting bolt to achieve the proper clearance between the brake caliper piston and the adjusting bolt.

This adjustment procedure is unnecessary for vehicles equipped with a self-adjusting parking brake mechanism. The proper clearance is automatically maintained at all times, ensuring stable braking performance when parking the vehicle.

1. Parking brake arm
2. Parking brake arm shaft
3. Set bolt
4. Adjusting bolt sleeve
5. Adjusting bolt
6. Nut
7. Brake caliper piston
Parking Brake Operation

When the parking brake is operated, the parking brake cable turns the parking brake arm ❶. The rotation of the parking brake arm is changed to axial thrust in the parking brake arm shaft ❷ and the set bolt ❸ is pushed against the adjusting bolt sleeve ❹.

When the adjusting bolt sleeve receives the force, the dark shaded area in the above illustration is pushed together and the brake pad ❺ is pushed against the brake disc.

When the brake pad wears, the clearance between the brake caliper piston ❻ and the brake pad becomes larger and the force applied to the brake pad becomes weaker.

If this occurs, the self-adjusting parking brake mechanism adjusts automatically to achieve the proper clearance.
Parking Brake Adjustment

When the brake pedal is operated, the brake fluid pressure in the master cylinder increases and the brake caliper piston 1 and the nut 2 are pushed. When there is proper clearance between the brake caliper piston and the brake pad, no other parts move because the movement of the brake caliper piston and the nut is absorbed by the backlash of the threads of the nut and the adjusting bolt 3.

When the movement of the nut is greater than the backlash between the nut and the adjusting bolt, the parking brake adjusts automatically.

The amount of the adjustment varies with brake fluid pressure. Operating the parking brake makes no adjustment.

The adjustment operation is as follows.

1. When the brake pedal is operated, the brake fluid pressure increases and the brake caliper piston and the nut move.
2. When the movement of the brake caliper piston and the nut is greater than the backlash of the threads of the nut and the adjusting bolt, the force  will be required to pull the adjusting bolt. The force to pull the adjusting bolt will be turned into the rotation torque  by the shape of the threads of the nut and the adjusting bolt.
3. At this time, the clutch torque  between the adjusting bolt and the adjusting bolt sleeve  will decrease depending on the force required to pull the adjusting bolt. When the rotation torque exceeds the clutch torque, the adjusting bolt rotates and the clearance between the brake caliper piston and the brake pad decreases by the movement of the threads of the nut and the adjusting bolt.
IMPORTANT INFORMATION

PREPARATION FOR REMOVAL PROCEDURES

1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to “SPECIAL TOOLS”.
3. When disassembling the vehicle, always keep mated parts together. This includes gears, cylinder, piston and other parts that have been “mated” through normal wear. Mated parts must always be reused or replaced as an assembly.
4. During vehicle disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

REPLACEMENT PARTS

1. Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

GASKETS, OIL SEALS AND O-RINGS

1. Replace all gaskets, seals and O-rings when overhauling the engine. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.
EB101030
LOCK WASHERS/PLATES AND COTTER PINS
1. Replace all lock washers/plates and cotter pins after removal. Bend lock tabs along the bolt or nut flats after the bolt or nut has been tightened to specification.

EB101040
BEARINGS AND OIL SEALS
1. Install bearings and oil seals so that the manufacturer’s marks or numbers are visible. When installing oil seals, apply a light coating of lithium-soap-based grease to the seal lips. Oil bearings liberally when installing, if appropriate.

1 Oil seal

CAUTION: Do not use compressed air to spin the bearings dry. This will damage the bearing surfaces.

EB101050
CIRCLIPS
1. Check all circlips carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip, make sure that the sharp-edged corner is positioned opposite the thrust it receives. See sectional view.

1 Bearing

1 Shaft
CHECKING OF CONNECTIONS

Check the connectors for stains, rust, moisture, etc.

1. Disconnect:
   • connector

2. Check:
   • connector
     Moisture → Dry each terminal with an air blower.
     Stains/rust → Connect and disconnect the terminals several times.

3. Check:
   • connector leads
     Looseness → Bend up the pin ① and connect the terminals.

4. Connect:
   • connector terminals

**NOTE:**

The two terminals “click” together.

5. Check:
   • continuity (using a pocket tester)

**NOTE:**

- If there is no continuity, clean the terminals.
- When checking the wire harness be sure to perform steps 1 to 3.
- As a quick remedy, use a contact revitalizer available at most part stores.
- Check the connector with a pocket tester as shown.
**SPECIAL TOOLS**

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools; this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools may differ by shape and part number from country to country. In such a case, two types are provided.

When placing an order, refer to the list provided below to avoid any mistakes.

For US and CDN
P/N. YM-, YU-, YS-, YK-, ACC-

Except for US and CDN
P/N. 90890-

<table>
<thead>
<tr>
<th>Tool No.</th>
<th>Tool name/Function</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolt</td>
<td>Slide hammer bolt (M6)/weight/set</td>
<td></td>
</tr>
<tr>
<td>90890-01083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01084</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YU-01083-A</td>
<td>These tools are used to remove the rocker arm shaft.</td>
<td></td>
</tr>
<tr>
<td>90890-01135</td>
<td>Crankcase separating tool</td>
<td></td>
</tr>
<tr>
<td>YU-01135-A</td>
<td>This tool is used to separate the crankcase.</td>
<td></td>
</tr>
<tr>
<td>90890-01229</td>
<td>Coupling gear/middle shaft tool</td>
<td></td>
</tr>
<tr>
<td>YM-01229</td>
<td>This tool is needed when removing or installing the coupling gear nut.</td>
<td></td>
</tr>
<tr>
<td>Pot</td>
<td>Crankshaft installer pot</td>
<td></td>
</tr>
<tr>
<td>90890-01274</td>
<td>Crankshaft installer bolt</td>
<td></td>
</tr>
<tr>
<td>Bolt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-01275</td>
<td>These tools are used to install the crankshaft.</td>
<td></td>
</tr>
<tr>
<td>90890-01304</td>
<td>Piston pin puller</td>
<td></td>
</tr>
<tr>
<td>YU-01304</td>
<td>This tool is used to remove the piston pin.</td>
<td></td>
</tr>
<tr>
<td>90890-01309</td>
<td>Spacer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is used to install the crankshaft.</td>
<td></td>
</tr>
<tr>
<td>Tool No.</td>
<td>Tool name/Function</td>
<td>Illustration</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>90890-01311 YM-08035-A</td>
<td>Tappet adjusting tool</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is necessary for adjusting the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>valve clearance.</td>
<td></td>
</tr>
<tr>
<td>90890-01312 YM-01312-A</td>
<td>Fuel level gauge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This gauge is used to measure the fuel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>level in the float chamber.</td>
<td></td>
</tr>
<tr>
<td>90890-01325 YU-24460-01</td>
<td>Radiator cap tester</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is used to check the cooling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>system.</td>
<td></td>
</tr>
<tr>
<td>90890-01348 YM-01348</td>
<td>Locknut wrench</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is needed when removing or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>installing the secondary sheave spring.</td>
<td></td>
</tr>
<tr>
<td>90890-01352 YU-33984</td>
<td>Radiator cap tester adapter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is used to check the cooling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>system.</td>
<td></td>
</tr>
<tr>
<td>Adapter 90890-01383 YM-01383</td>
<td>Adapter Spacer (crankshaft installer)</td>
<td></td>
</tr>
<tr>
<td>Spacer 90890-04081 YM-91044</td>
<td>These tools are used to install the crank-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>shaft.</td>
<td></td>
</tr>
<tr>
<td>90890-01404 YM-01404</td>
<td>Flywheel puller</td>
<td></td>
</tr>
<tr>
<td></td>
<td>These tools are needed to remove the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rotor.</td>
<td></td>
</tr>
<tr>
<td>90890-01426 YU-38411</td>
<td>Oil filter wrench</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is needed to loosen or tighten</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the oil filter cartridge.</td>
<td></td>
</tr>
<tr>
<td>Tool No.</td>
<td>Tool name/Function</td>
<td>Illustration</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>90890-01430</td>
<td>Ring nut wrench</td>
<td></td>
</tr>
<tr>
<td>YM-38404</td>
<td>This tool is needed to removing and installing the middle driven shaft bearing retainer.</td>
<td></td>
</tr>
<tr>
<td>90890-01467</td>
<td>Gear lash measurement tool</td>
<td></td>
</tr>
<tr>
<td>YM-01467</td>
<td>This tool is used to measure the gear lash.</td>
<td></td>
</tr>
<tr>
<td>90890-01474</td>
<td>Ball joint remover/installer set</td>
<td></td>
</tr>
<tr>
<td>YM-01474</td>
<td>Ball joint adapter set</td>
<td></td>
</tr>
<tr>
<td></td>
<td>These tools are used to removing or installing the ball joints.</td>
<td></td>
</tr>
<tr>
<td>90890-01701</td>
<td>Sheave holder</td>
<td></td>
</tr>
<tr>
<td>YS-01880-A</td>
<td>Primary sheave holder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is needed to hold the primary sheave when removing or installing the sheave bolts.</td>
<td></td>
</tr>
<tr>
<td>Set</td>
<td>Compression gauge</td>
<td></td>
</tr>
<tr>
<td>90890-03081</td>
<td>Adapter (compression gauge)</td>
<td></td>
</tr>
<tr>
<td>YU-33223</td>
<td>These tools are needed to measure engine compression.</td>
<td></td>
</tr>
<tr>
<td>90890-03112</td>
<td>Pocket tester</td>
<td></td>
</tr>
<tr>
<td>YU-03112-C</td>
<td>This instrument is needed for checking the electrical system.</td>
<td></td>
</tr>
<tr>
<td>90890-03113</td>
<td>Engine tachometer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is needed for observing engine rpm.</td>
<td></td>
</tr>
<tr>
<td>90890-03141</td>
<td>Timing light</td>
<td></td>
</tr>
<tr>
<td>YM-33277-A</td>
<td>Battery powered timing light</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This tool is necessary for checking ignition timing.</td>
<td></td>
</tr>
<tr>
<td>Tool No.</td>
<td>Tool name/Function</td>
<td>Illustration</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Compressor 90890-04019</td>
<td>Valve spring compressor</td>
<td></td>
</tr>
<tr>
<td>YM-04019</td>
<td>Valve spring compressor attachment</td>
<td></td>
</tr>
<tr>
<td>Attachment 90890-01243</td>
<td></td>
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<tr>
<td>YM-01253-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle driven shaft</td>
<td>Middle driven shaft bearing driver</td>
<td></td>
</tr>
<tr>
<td>bearing driver 90890-04058</td>
<td>Mechanical seal installer</td>
<td></td>
</tr>
<tr>
<td>YM-04058-1</td>
<td>Water pump seal installer</td>
<td></td>
</tr>
<tr>
<td>Mechanical seal installer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-04078 YM-33221</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve spring compressor</td>
<td>This tool is needed to remove and install</td>
<td></td>
</tr>
<tr>
<td>Valve spring compressor</td>
<td>the valve assemblies.</td>
<td></td>
</tr>
<tr>
<td>attachment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle driven shaft bearing driver 90890-04058</td>
<td>Mechanical seal installer</td>
<td></td>
</tr>
<tr>
<td>YM-04058-1</td>
<td>Water pump seal installer</td>
<td></td>
</tr>
<tr>
<td>Mechanical seal installer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90890-04078 YM-33221</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve spring compressor</td>
<td>This tool is needed to remove and install</td>
<td></td>
</tr>
<tr>
<td>Valve spring compressor</td>
<td>the valve assemblies.</td>
<td></td>
</tr>
<tr>
<td>attachment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Universal joint holder</td>
<td>This tool is needed when removing or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>installing the universal joint yoke nut.</td>
<td></td>
</tr>
<tr>
<td>Valve guide remover (ø 6)</td>
<td>This tool is needed to remove and install</td>
<td></td>
</tr>
<tr>
<td>90890-04064 YM-04064-A</td>
<td>the valve guide.</td>
<td></td>
</tr>
<tr>
<td>Valve guide installer (ø 6)</td>
<td>This tool is needed to install the valve</td>
<td></td>
</tr>
<tr>
<td>90890-04065 YM-04065-A</td>
<td>guide.</td>
<td></td>
</tr>
<tr>
<td>Valve guide reamer (ø 6)</td>
<td>This tool is needed to rebore the new valve</td>
<td></td>
</tr>
<tr>
<td>90890-04066 YM-04066</td>
<td>guide.</td>
<td></td>
</tr>
<tr>
<td>Universal clutch holder</td>
<td>This tool is needed to hold the clutch</td>
<td></td>
</tr>
<tr>
<td>90890-04086 YM-91042</td>
<td>carrier when removing or installing the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>carrier nut.</td>
<td></td>
</tr>
<tr>
<td>Bearing retainer wrench</td>
<td>This tool is needed when removing or</td>
<td></td>
</tr>
<tr>
<td>90890-04128 YM-04128</td>
<td>installing the bearing retainer.</td>
<td></td>
</tr>
<tr>
<td>Tool No.</td>
<td>Tool name/Function</td>
<td>Illustration</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>90890-04134 YM-04134</td>
<td>Sheave spring compressor</td>
<td><img src="image1" alt="Sheave Spring Compressor" /></td>
</tr>
<tr>
<td></td>
<td>This tool is needed when removing or installing the secondary sheave spring.</td>
<td></td>
</tr>
<tr>
<td>90890-04135 YM-04135</td>
<td>Sheave fixed block</td>
<td><img src="image2" alt="Sheave Fixed Block" /></td>
</tr>
<tr>
<td></td>
<td>This tool is needed when removing or installing the secondary sheave spring.</td>
<td></td>
</tr>
<tr>
<td>90890-06754 YM-34487</td>
<td>Ignition checker Pulse ignition spark checker</td>
<td><img src="image3" alt="Ignition Checker" /></td>
</tr>
<tr>
<td></td>
<td>This instrument is necessary for checking the ignition system components.</td>
<td></td>
</tr>
<tr>
<td>Bond 90890-85505 Sealant ACC-11001-05-01</td>
<td>Yamaha bond No. 1215 Sealant (Quick Gasket®)</td>
<td><img src="image4" alt="Bond Sealant" /></td>
</tr>
<tr>
<td></td>
<td>This sealant (bond) is used on crankcase mating surfaces, etc.</td>
<td></td>
</tr>
<tr>
<td>YM-01477</td>
<td>Ball joint remover/installer attachment set</td>
<td><img src="image5" alt="Ball Joint Remover/Installer" /></td>
</tr>
<tr>
<td></td>
<td>This tool is used to remove and install the ball joints.</td>
<td></td>
</tr>
<tr>
<td>YU-8036-C</td>
<td>Digital engine test tachometer</td>
<td><img src="image6" alt="Digital Tachometer" /></td>
</tr>
<tr>
<td></td>
<td>This tool is needed for observing engine rpm.</td>
<td></td>
</tr>
<tr>
<td>YU-90050</td>
<td>Crankshaft installer set</td>
<td><img src="image7" alt="Crankshaft Installer" /></td>
</tr>
<tr>
<td></td>
<td>These tools are used to install the crankshaft.</td>
<td></td>
</tr>
</tbody>
</table>
## GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model code</strong></td>
<td>5UG1</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
</tr>
<tr>
<td>Overall length</td>
<td>2,885 mm (113.6 in)</td>
</tr>
<tr>
<td>Overall width</td>
<td>1,385 mm (54.5 in)</td>
</tr>
<tr>
<td>Overall height</td>
<td>1,853 mm (73.0 in)</td>
</tr>
<tr>
<td>Seat height</td>
<td>818 mm (32.2 in)</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>1,910 mm (75.2 in)</td>
</tr>
<tr>
<td>Minimum ground clearance</td>
<td>273 mm (10.75 in)</td>
</tr>
<tr>
<td>Minimum turning radius</td>
<td>3,900 mm (153.5 in)</td>
</tr>
<tr>
<td><strong>Basic weight</strong></td>
<td></td>
</tr>
<tr>
<td>With oil and full fuel tank</td>
<td>510 kg (1,124 lb)</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td></td>
</tr>
<tr>
<td>Engine type</td>
<td>Liquid-cooled 4-stroke, SOHC</td>
</tr>
<tr>
<td>Cylinder arrangement</td>
<td>Forward-inclined single cylinder</td>
</tr>
<tr>
<td>Displacement</td>
<td>660 cm³</td>
</tr>
<tr>
<td>Bore × stroke</td>
<td>100 × 84 mm (3.94 × 3.31 in)</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>9.1 : 1</td>
</tr>
<tr>
<td>Standard compression pressure (at sea level)</td>
<td>1,324 kPa (13.24 kg/cm², 188.31 psi) at 850 r/min</td>
</tr>
<tr>
<td>Starting system</td>
<td>Electric starter</td>
</tr>
<tr>
<td><strong>Lubrication system</strong></td>
<td>Wet sump</td>
</tr>
<tr>
<td><strong>Oil type or grade</strong></td>
<td></td>
</tr>
<tr>
<td>Engine oil</td>
<td>API service SE, SF, SG type or higher</td>
</tr>
<tr>
<td>Final gear oil</td>
<td>SAE 80API “GL-4” Hypoid Gear Oil</td>
</tr>
<tr>
<td>Differential gear oil</td>
<td>SAE 80API “GL-4” Hypoid Gear Oil</td>
</tr>
<tr>
<td><strong>Oil capacity</strong></td>
<td></td>
</tr>
<tr>
<td>Engine oil</td>
<td></td>
</tr>
<tr>
<td>Periodic oil change</td>
<td>1.90 L (1.67 Imp qt, 2.01 US qt)</td>
</tr>
<tr>
<td>With oil filter replacement</td>
<td>2.00 L (1.76 Imp qt, 2.11 US qt)</td>
</tr>
<tr>
<td>Total amount</td>
<td>2.80 L (2.46 Imp qt, 2.96 US qt)</td>
</tr>
<tr>
<td>Final gear case oil</td>
<td></td>
</tr>
<tr>
<td>Periodic oil change</td>
<td>0.25 L (0.22 Imp qt, 0.26 US qt)</td>
</tr>
<tr>
<td>Total amount</td>
<td>0.28 L (0.25 Imp qt, 0.30 US qt)</td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Differential gear case oil</td>
<td>Periodic oil change 0.32 L (0.28 Imp qt, 0.34 US qt)</td>
</tr>
<tr>
<td></td>
<td>Total amount 0.33 L (0.29 Imp qt, 0.35 US qt)</td>
</tr>
<tr>
<td>Air filter</td>
<td>Wet type element</td>
</tr>
<tr>
<td>Fuel</td>
<td>Type Unleaded gasoline only</td>
</tr>
<tr>
<td></td>
<td>Fuel tank capacity 30 L (6.60 Imp gal, 7.93 US gal)</td>
</tr>
<tr>
<td>Carburetor</td>
<td>Type/quantity BSR42/1</td>
</tr>
<tr>
<td></td>
<td>Manufacturer MIKUNI</td>
</tr>
<tr>
<td>Spark plug</td>
<td>Type/manufacturer DPR8EA–9/NGK</td>
</tr>
<tr>
<td></td>
<td>Spark plug gap 0.8 ~ 0.9 mm (0.031 ~ 0.035 in)</td>
</tr>
<tr>
<td>Clutch type</td>
<td>Wet, centrifugal automatic</td>
</tr>
<tr>
<td>Transmission</td>
<td>Primary reduction system V-belt</td>
</tr>
<tr>
<td></td>
<td>Secondary reduction system Shaft drive</td>
</tr>
<tr>
<td></td>
<td>Secondary reduction ratio 41/21 × 24/18 × 33/9 (9.544)</td>
</tr>
<tr>
<td></td>
<td>Transmission type V-belt automatic</td>
</tr>
<tr>
<td></td>
<td>Operation Right hand operation</td>
</tr>
<tr>
<td></td>
<td>Single speed automatic 2.37 ~ 0.91 : 1</td>
</tr>
<tr>
<td></td>
<td>Sub transmission ratio low 35/17 (2.058)</td>
</tr>
<tr>
<td></td>
<td>high 28/19 (1.473)</td>
</tr>
<tr>
<td></td>
<td>Reverse gear 25/17 (1.471)</td>
</tr>
<tr>
<td>Chassis</td>
<td>Frame type Steel tube frame</td>
</tr>
<tr>
<td></td>
<td>Caster angle 5.0°</td>
</tr>
<tr>
<td></td>
<td>Camber angle 0°</td>
</tr>
<tr>
<td></td>
<td>Kingpin angle 12°</td>
</tr>
<tr>
<td></td>
<td>Kingpin offset 0 mm (0 in)</td>
</tr>
<tr>
<td></td>
<td>Trail 26 mm (1.02 in)</td>
</tr>
<tr>
<td></td>
<td>Tread (STD) front 1,115 mm (43.90 in)</td>
</tr>
<tr>
<td></td>
<td>rear 1,107 mm (43.58 in)</td>
</tr>
<tr>
<td></td>
<td>Toe-in 15 ~ 25 mm (0.59 ~ 0.98 in)</td>
</tr>
<tr>
<td>Tire</td>
<td>Type Tubeless</td>
</tr>
<tr>
<td></td>
<td>Size front AT25 × 8–12NHS</td>
</tr>
<tr>
<td></td>
<td>rear AT25 × 10–12NHS</td>
</tr>
<tr>
<td></td>
<td>Manufacturer front GOODYEAR</td>
</tr>
<tr>
<td></td>
<td>rear GOODYEAR</td>
</tr>
<tr>
<td></td>
<td>Type front Rawhide RS</td>
</tr>
<tr>
<td></td>
<td>rear Rawhide RS</td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Tire pressure (cold tire)</strong></td>
<td></td>
</tr>
<tr>
<td>Maximum load*</td>
<td>397 kg (876 lb)</td>
</tr>
</tbody>
</table>
| Off-road riding                     | front: 63 ~ 77 kPa (0.63 ~ 0.77 kg/cm², 9 ~ 11 psi)  
                                             rear: 91 ~ 105 kPa (0.91 ~ 1.05 kg/cm², 13 ~ 15 psi) |
| * Load in total weight of cargo, operator, passenger, accessories and tongue weight |             |
| **Brake**                           |             |
| Front brake type                    | Dual disc brake |
| Operation                           | Foot brake |
| Rear brake type                     | Single disc brake |
| Operation                           | Foot brake |
| **Suspension**                      |             |
| Front suspension                    | Double wishbone |
| Rear suspension                     | Double wishbone |
| **Shock absorber**                 |             |
| Front shock absorber                | Coil spring/oil damper |
| Rear shock absorber                 | Coil spring/oil damper |
| **Wheel travel**                    |             |
| Front wheel travel                  | 185 mm (7.28 in) |
| Rear wheel travel                   | 185 mm (7.28 in) |
| **Electrical**                      |             |
| Ignition system                     | DC. C.D.I. |
| Generator system                    | A.C. magneto |
| Battery type                        | U1L-11      |
| Battery capacity                    | 12 V, 28 AH |
| **Headlight type**                  | Krypton bulb |
| **Bulb wattage × quantity**         |             |
| Headlight                           | 12 V 30 W/30 W × 2 |
| Tail/brake light                    | 12 V 5 W/21 W × 2 |
| Indicator lights                    |             |
| Neutral                             | 12 V 1.7 W × 1 |
| Reverse                             | 12 V 1.7 W × 1 |
| Coolant temperature                 | 12 V 1.7 W × 1 |
| Parking brake                       | 12 V 1.7 W × 1 |
| Four-wheel drive                    | 12 V 1.7 W × 1 |
| Differential gear lock              | 12 V 1.7 W × 1 |
# ENGINE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cylinder head</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warp limit *</td>
<td>----</td>
<td>0.03 mm (0.0012 in)</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td><strong>Cylinder</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bore size</td>
<td>100.005 ~ 100.055 mm</td>
<td>100.10 mm (3.9410 in)</td>
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<tr>
<td></td>
<td>(3.9372 ~ 3.9392 in)</td>
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<tr>
<td>Measuring point *</td>
<td>50 mm (1.97 in)</td>
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<td></td>
</tr>
<tr>
<td><strong>Camshaft</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive method</td>
<td>Chain drive (Left)</td>
<td>----</td>
</tr>
<tr>
<td>Cam dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;A&quot;</td>
<td>35.69 ~ 35.79 mm</td>
<td>35.59 mm (1.4012 in)</td>
</tr>
<tr>
<td></td>
<td>(1.4051 ~ 1.4091 in)</td>
<td></td>
</tr>
<tr>
<td>&quot;B&quot;</td>
<td>30.06 ~ 30.16 mm</td>
<td>29.96 mm (1.1795 in)</td>
</tr>
<tr>
<td></td>
<td>(1.1835 ~ 1.1874 in)</td>
<td></td>
</tr>
<tr>
<td>Exhaust</td>
<td></td>
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<tr>
<td>&quot;A&quot;</td>
<td>36.50 ~ 36.60 mm</td>
<td>36.40 mm (1.4331 in)</td>
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<tr>
<td></td>
<td>(1.4370 ~ 1.4409 in)</td>
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</tr>
<tr>
<td>&quot;B&quot;</td>
<td>30.11 ~ 30.21 mm</td>
<td>30.01 mm (1.1815 in)</td>
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<tr>
<td></td>
<td>(1.1854 ~ 1.1894 in)</td>
<td></td>
</tr>
<tr>
<td>Camshaft runout limit</td>
<td></td>
<td>0.03 mm (0.0012 in)</td>
</tr>
</tbody>
</table>
**ENGINE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
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<tbody>
<tr>
<td><strong>Cam chain</strong></td>
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<tr>
<td>Cam chain type/No. of links</td>
<td>92RH2010J/126M</td>
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<tr>
<td>Cam chain adjustment method</td>
<td>Automatic</td>
<td>----</td>
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<tr>
<td><strong>Rocker arm/rocker arm shaft</strong></td>
<td></td>
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<tr>
<td>Rocker arm inside diameter</td>
<td>12.000 ~ 12.018 mm</td>
<td>----</td>
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<tr>
<td></td>
<td>(0.4724 ~ 0.4731 in)</td>
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</tr>
<tr>
<td>Shaft outside diameter</td>
<td>11.976 ~ 11.991 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(0.4715 ~ 0.4721 in)</td>
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</tr>
<tr>
<td>Arm-to-shaft clearance</td>
<td>0.009 ~ 0.042 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(0.0004 ~ 0.0017 in)</td>
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<tr>
<td><strong>Valve, valve seat, valve guide</strong></td>
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</tr>
<tr>
<td>Valve clearance (cold)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>0.10 ~ 0.15 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(0.0039 ~ 0.0059 in)</td>
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<tr>
<td>EX</td>
<td>0.15 ~ 0.20 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(0.0059 ~ 0.0079 in)</td>
<td></td>
</tr>
<tr>
<td><strong>Valve dimensions</strong></td>
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<td></td>
</tr>
<tr>
<td>Head Diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“A” head diameter</td>
<td>IN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>29.9 ~ 30.1 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(1.1772 ~ 1.1850 in)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EX</td>
<td></td>
</tr>
<tr>
<td></td>
<td>31.9 ~ 32.1 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(1.2559 ~ 1.2638 in)</td>
<td></td>
</tr>
<tr>
<td>“B” face width</td>
<td>IN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.25 mm (0.0900 in)</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>EX</td>
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</tr>
<tr>
<td></td>
<td>2.26 mm (0.0890 in)</td>
<td>----</td>
</tr>
<tr>
<td>“C” seat width</td>
<td>IN</td>
<td>1.6 mm</td>
</tr>
<tr>
<td></td>
<td>0.9 ~ 1.1 mm</td>
<td>(0.0354 ~ 0.0433 in)</td>
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<tr>
<td></td>
<td>EX</td>
<td>1.6 mm</td>
</tr>
<tr>
<td></td>
<td>0.9 ~ 1.1 mm</td>
<td>(0.0354 ~ 0.0433 in)</td>
</tr>
<tr>
<td>“D” margin thickness</td>
<td>IN</td>
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</tr>
<tr>
<td></td>
<td>0.85 ~ 1.15 mm</td>
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</tr>
<tr>
<td></td>
<td>(0.0335 ~ 0.0453 in)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EX</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.85 ~ 1.15 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(0.0335 ~ 0.0453 in)</td>
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<tr>
<td>Stem outside diameter</td>
<td>IN</td>
<td>5.945 mm</td>
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<tr>
<td></td>
<td>5.975 ~ 5.990 mm</td>
<td>(0.2341 in)</td>
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<tr>
<td></td>
<td>EX</td>
<td>5.930 mm</td>
</tr>
<tr>
<td></td>
<td>5.960 ~ 5.975 mm</td>
<td>(0.2335 in)</td>
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<tr>
<td>Guide inside diameter</td>
<td>IN</td>
<td>6.050 mm</td>
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<tr>
<td></td>
<td>6.000 ~ 6.012 mm</td>
<td>(0.2559 in)</td>
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<tr>
<td></td>
<td>EX</td>
<td>6.050 mm</td>
</tr>
<tr>
<td></td>
<td>6.000 ~ 6.012 mm</td>
<td>(0.2559 in)</td>
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<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Stem-to-guide clearance</td>
<td></td>
<td></td>
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<tr>
<td><strong>IN</strong></td>
<td>0.010 ~ 0.037 mm</td>
<td>0.08 mm</td>
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<tr>
<td></td>
<td>(0.0004 ~ 0.0015 in)</td>
<td>(0.0031 in)</td>
</tr>
<tr>
<td></td>
<td>0.025 ~ 0.052 mm</td>
<td>0.10 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0010 ~ 0.0020 in)</td>
<td>(0.0039 in)</td>
</tr>
<tr>
<td>EX</td>
<td></td>
<td>0.01 mm</td>
</tr>
<tr>
<td></td>
<td>0.08 mm</td>
<td>(0.0031 in)</td>
</tr>
<tr>
<td>Stem runout limit</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>Valve seat width</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IN</strong></td>
<td>0.9 ~ 1.1 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(0.0354 ~ 0.0433 in)</td>
<td></td>
</tr>
<tr>
<td><strong>EX</strong></td>
<td>0.9 ~ 1.1 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(0.0354 ~ 0.0433 in)</td>
<td></td>
</tr>
<tr>
<td>Valve spring</td>
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<td></td>
</tr>
<tr>
<td>Inner spring</td>
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</tr>
<tr>
<td>Free length</td>
<td></td>
<td></td>
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<tr>
<td><strong>IN</strong></td>
<td>32.63 mm (1.28 in)</td>
<td>31.0 mm</td>
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<tr>
<td></td>
<td>31.0 mm (1.22 in)</td>
<td></td>
</tr>
<tr>
<td><strong>EX</strong></td>
<td>36.46 mm (1.44 in)</td>
<td>34.6 mm</td>
</tr>
<tr>
<td></td>
<td>34.6 mm (1.36 in)</td>
<td></td>
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<tr>
<td>Set length (valve closed)</td>
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</tr>
<tr>
<td><strong>IN</strong></td>
<td>27.5 mm (1.08 in)</td>
<td>----</td>
</tr>
<tr>
<td><strong>EX</strong></td>
<td>31.0 mm (1.22 in)</td>
<td>----</td>
</tr>
<tr>
<td>Compressed pressure (installed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IN</strong></td>
<td>100.0 ~ 115.7 N</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(10.20 ~ 11.80 kg, 22.49 ~ 26.01 lb)</td>
<td></td>
</tr>
<tr>
<td><strong>EX</strong></td>
<td>120.6 ~ 138.3 N</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(12.30 ~ 14.10 kg, 27.12 ~ 31.09 lb)</td>
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</tr>
<tr>
<td>Tilt limit *</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IN</strong></td>
<td>----</td>
<td>2.5°/1.4 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.5°/0.055 in)</td>
</tr>
<tr>
<td><strong>EX</strong></td>
<td>----</td>
<td>2.5°/1.6 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.5°/0.063 in)</td>
</tr>
<tr>
<td>Direction of winding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(top view)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IN</strong></td>
<td>Clockwise</td>
<td>----</td>
</tr>
<tr>
<td><strong>EX</strong></td>
<td>Clockwise</td>
<td></td>
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</table>
# ENGINE SPECIFICATIONS

## Piston Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piston to cylinder clearance</td>
<td>0.050 ~ 0.070 mm</td>
<td>0.15 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0020 ~ 0.0028 in)</td>
<td>(0.0059 in)</td>
</tr>
<tr>
<td>Piston size “D”</td>
<td>99.945 ~ 99.995 mm</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>(3.9348 ~ 3.9368 in)</td>
<td></td>
</tr>
<tr>
<td>Measuring point “H”</td>
<td>2.5 mm (0.10 in)</td>
<td>----</td>
</tr>
<tr>
<td>Piston off-set</td>
<td>1.0 mm (0.0394 in)</td>
<td>----</td>
</tr>
<tr>
<td>Off-set direction</td>
<td>Intake side</td>
<td>----</td>
</tr>
<tr>
<td>Piston pin bore inside diameter</td>
<td>22.004 ~ 22.015 mm</td>
<td>22.045 mm</td>
</tr>
<tr>
<td></td>
<td>(0.8663 ~ 0.8667 in)</td>
<td>(0.8679 in)</td>
</tr>
<tr>
<td>Piston pin outside diameter</td>
<td>21.991 ~ 22.000 mm</td>
<td>21.971 mm</td>
</tr>
<tr>
<td></td>
<td>(0.8658 ~ 0.8661 in)</td>
<td>(0.8650 in)</td>
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</table>

## Piston Rings Specifications

### Top Ring

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Barrel</td>
</tr>
<tr>
<td>Dimensions (B × T)</td>
<td>1.2 × 3.8 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0472 × 0.1496 in)</td>
</tr>
<tr>
<td>End gap (installed)</td>
<td>0.30 ~ 0.45 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0118 ~ 0.0177 in)</td>
</tr>
<tr>
<td>Side clearance (installed)</td>
<td>0.04 ~ 0.08 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0016 ~ 0.0031 in)</td>
</tr>
</tbody>
</table>

### 2nd Ring

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Taper</td>
</tr>
<tr>
<td>Dimensions (B × T)</td>
<td>1.2 × 4.0 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0472 × 0.1575 in)</td>
</tr>
<tr>
<td>End gap (installed)</td>
<td>0.30 ~ 0.45 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0118 ~ 0.0177 in)</td>
</tr>
<tr>
<td>Side clearance</td>
<td>0.03 ~ 0.07 mm</td>
</tr>
<tr>
<td></td>
<td>(0.0012 ~ 0.0028 in)</td>
</tr>
</tbody>
</table>
### ENGINE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oil ring</strong></td>
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</tr>
<tr>
<td>Dimensions (B ( \times ) T)</td>
<td>2.5 ( \times ) 3.4 mm</td>
<td>0.0984 ( \times ) 0.1339 in</td>
</tr>
<tr>
<td>End gap (installed)</td>
<td>0.20 ~ 0.70 mm</td>
<td>0.0079 ~ 0.0276 in</td>
</tr>
<tr>
<td>Side clearance</td>
<td>0.06 ~ 0.15 mm</td>
<td>0.0024 ~ 0.0059 in</td>
</tr>
<tr>
<td><strong>Crankshaft</strong></td>
<td></td>
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</tr>
<tr>
<td>Crank width “A”</td>
<td>74.95 ~ 75.00 mm</td>
<td>2.9508 ~ 2.9528 in</td>
</tr>
<tr>
<td>Runout limit C1</td>
<td>0.03 mm</td>
<td>(0.0012 in)</td>
</tr>
<tr>
<td>Runout limit C2</td>
<td>0.03 mm</td>
<td>(0.0012 in)</td>
</tr>
<tr>
<td>Big end side clearance “D”</td>
<td>0.35 ~ 0.65 mm</td>
<td>0.0138 ~ 0.0256 in</td>
</tr>
<tr>
<td>Big end radial clearance “E”</td>
<td>0.010 ~ 0.025 mm</td>
<td>0.0004 ~ 0.0010 in</td>
</tr>
<tr>
<td><strong>Balancer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balancer drive method</td>
<td>Gear</td>
<td></td>
</tr>
<tr>
<td><strong>Automatic centrifugal clutch</strong></td>
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<td></td>
</tr>
<tr>
<td>Clutch shoe thickness</td>
<td>1.5 mm (0.06 in)</td>
<td>1.0 mm (0.04 in)</td>
</tr>
<tr>
<td>Clutch-in revolution</td>
<td>1,900 ~ 2,300 r/min</td>
<td></td>
</tr>
<tr>
<td>Clutch-stall revolution</td>
<td>3,350 ~ 3,850 r/min</td>
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### Transmission

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard Limit</th>
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<tbody>
<tr>
<td>Main axle deflection limit</td>
<td>0.06 mm (0.0024 in)</td>
</tr>
<tr>
<td>Drive axle deflection limit</td>
<td>0.06 mm (0.0024 in)</td>
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### Shifter

<table>
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<tr>
<th>Item</th>
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</thead>
<tbody>
<tr>
<td>Shifter type</td>
<td>Shift drum and guide bar</td>
</tr>
</tbody>
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### Air filter oil grade

<table>
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<tr>
<th>Item</th>
<th>Standard Limit</th>
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</thead>
<tbody>
<tr>
<td>Air filter oil grade</td>
<td>Yamaha foam air filter oil or other quality foam air filter oil</td>
</tr>
</tbody>
</table>

### Carburetor

<table>
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<th>Standard Limit</th>
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<tbody>
<tr>
<td>I. D. mark</td>
<td>5UG1 00</td>
</tr>
<tr>
<td>Main jet (M.J)</td>
<td>#150</td>
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<tr>
<td>Main air jet (M.A.J)</td>
<td>#70</td>
</tr>
<tr>
<td>Jet needle (J.N)</td>
<td>6JPH9-53-2</td>
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<tr>
<td>Needle jet (N.J)</td>
<td>O-0M</td>
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<tr>
<td>Pilot air jet (P.A.J.1)</td>
<td>#60</td>
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<tr>
<td>Pilot air jet (P.A.J.2)</td>
<td>1.5</td>
</tr>
<tr>
<td>Pilot outlet (P.O)</td>
<td>1.1</td>
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<tr>
<td>Pilot jet (P.J)</td>
<td>#40</td>
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<tr>
<td>Bypass 1 (B.P.1)</td>
<td>0.8</td>
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<tr>
<td>Bypass 2 (B.P.2)</td>
<td>0.8</td>
</tr>
<tr>
<td>Bypass 3 (B.P.3)</td>
<td>0.8</td>
</tr>
<tr>
<td>Valve seat size (V.S)</td>
<td>2.3</td>
</tr>
<tr>
<td>Starter jet (G.S.1)</td>
<td>#55</td>
</tr>
<tr>
<td>Starter jet (G.S.2)</td>
<td>0.8</td>
</tr>
<tr>
<td>Throttle valve size (Th.V)</td>
<td>#105</td>
</tr>
<tr>
<td>Float height (F.H)</td>
<td>13 mm (0.51 in)</td>
</tr>
<tr>
<td>Fuel level (F.L)</td>
<td>4.0 ~ 5.0 mm (0.16 ~ 0.20 in)</td>
</tr>
<tr>
<td>Engine idle speed</td>
<td>1,450 ~ 1,550 r/min</td>
</tr>
<tr>
<td>Intake vacuum</td>
<td>28.0 ~ 30.7 kPa (210 ~ 230 mmHg, 8.27 ~ 9.06 inHg)</td>
</tr>
</tbody>
</table>

### Oil pump

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil filter type</td>
<td>Foam</td>
</tr>
<tr>
<td>Oil pump type</td>
<td>Trochoid</td>
</tr>
<tr>
<td>Tip clearance</td>
<td>0.15 mm (0.0059 in)</td>
</tr>
<tr>
<td></td>
<td>0.23 mm (0.0091 in)</td>
</tr>
<tr>
<td>Side clearance</td>
<td>0.03 ~ 0.10 mm</td>
</tr>
<tr>
<td></td>
<td>0.17 mm (0.0067 in)</td>
</tr>
<tr>
<td>Body clearance</td>
<td>0.09 ~ 0.17 mm</td>
</tr>
<tr>
<td></td>
<td>0.24 mm (0.0094 in)</td>
</tr>
<tr>
<td>Bypass valve setting pressure</td>
<td>441.0 ~ 637.0 kPa</td>
</tr>
<tr>
<td></td>
<td>(4.41 ~ 6.37 kg/cm², 62.7 ~ 90.6 psi)</td>
</tr>
<tr>
<td>Oil pressure (hot)</td>
<td>65 kPa (0.65 kg/cm², 9.2 psi)</td>
</tr>
<tr>
<td></td>
<td>at 1,500 r/min</td>
</tr>
<tr>
<td>Pressure check location</td>
<td>Cylinder head</td>
</tr>
</tbody>
</table>
## ENGINE SPECIFICATIONS

### Cooling system

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiator core</td>
<td></td>
<td>---------</td>
</tr>
<tr>
<td>Width</td>
<td>380 mm (14.96 in)</td>
<td>---------</td>
</tr>
<tr>
<td>Height</td>
<td>238 mm (9.37 in)</td>
<td>---------</td>
</tr>
<tr>
<td>Thickness</td>
<td>24 mm (0.94 in)</td>
<td>---------</td>
</tr>
<tr>
<td>Radiator cap opening pressure</td>
<td>107.9 ~ 137.3 kPa</td>
<td>(1.079 ~ 1.373 kg/cm², 15.35 ~ 19.53 psi)</td>
</tr>
<tr>
<td>Radiator capacity (including all routes)</td>
<td>2.5 L (2.20 Imp qt, 2.64 US qt)</td>
<td>---------</td>
</tr>
<tr>
<td>Coolant reservoir</td>
<td></td>
<td>---------</td>
</tr>
<tr>
<td>Capacity</td>
<td>0.35 L (0.31 Imp qt, 0.37 US qt)</td>
<td>---------</td>
</tr>
<tr>
<td>From low to full level</td>
<td>0.20 L (0.15 Imp qt, 0.21 US qt)</td>
<td>---------</td>
</tr>
</tbody>
</table>

### Water pump

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Single-suction centrifugal pump</td>
<td>---------</td>
</tr>
<tr>
<td>Reduction ratio</td>
<td>32/31 (1.032)</td>
<td>---------</td>
</tr>
</tbody>
</table>

### Shaft drive

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle gear backlash</td>
<td>0.1 ~ 0.3 mm (0.004 ~ 0.012 in)</td>
<td>---------</td>
</tr>
<tr>
<td>Final gear backlash</td>
<td>0.1 ~ 0.3 mm (0.004 ~ 0.012 in)</td>
<td>---------</td>
</tr>
<tr>
<td>Differential gear backlash</td>
<td>0.05 ~ 0.25 mm (0.002 ~ 0.010 in)</td>
<td>---------</td>
</tr>
</tbody>
</table>

### Lubrication chart

```
Oil pan

Delivery pipe 1
  Delivery pipe 2
    Delivery pipe 3
      Cylinder head and related parts
      Crankshaft and related parts
      Drive axle
          Oil filter
                  Oil cooler
                          Oil pump
                              Oil strainer
```

---

www.midwestmanuals.com
Cylinder head tightening sequence
<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steering system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Rack and pinion</td>
<td>----</td>
</tr>
<tr>
<td><strong>Front suspension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock absorber travel</td>
<td>108 mm (4.25 in)</td>
<td>----</td>
</tr>
<tr>
<td>Spring free length</td>
<td>313 mm (12.32 in)</td>
<td>----</td>
</tr>
<tr>
<td>Spring fitting length</td>
<td>247.9 mm (9.76 in)</td>
<td>----</td>
</tr>
<tr>
<td>Spring rate (K1)</td>
<td>19.4 N/mm</td>
<td>----</td>
</tr>
<tr>
<td>Stroke (K1)</td>
<td>0 ~ 108 mm (0 ~ 4.25 in)</td>
<td>----</td>
</tr>
<tr>
<td>Optional spring</td>
<td>No</td>
<td>----</td>
</tr>
<tr>
<td><strong>Rear suspension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock absorber travel</td>
<td>81 mm (3.19 in)</td>
<td>----</td>
</tr>
<tr>
<td>Spring free length</td>
<td>328 mm (12.91 in)</td>
<td>----</td>
</tr>
<tr>
<td>Spring fitting length</td>
<td>273.2 mm (10.76 in)</td>
<td>----</td>
</tr>
<tr>
<td>Spring rate (K1)</td>
<td>44.1 N/mm (4.41 kg/mm, 246.95 lb/in)</td>
<td>----</td>
</tr>
<tr>
<td>Stroke (K1)</td>
<td>0 ~ 60 mm (0 ~ 2.36 in)</td>
<td>----</td>
</tr>
<tr>
<td>Optional spring</td>
<td>No</td>
<td>----</td>
</tr>
<tr>
<td><strong>Front wheel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Panel wheel</td>
<td>----</td>
</tr>
<tr>
<td>Rim size</td>
<td>12 × 6.0 AT</td>
<td>----</td>
</tr>
<tr>
<td>Rim material</td>
<td>Steel</td>
<td>----</td>
</tr>
<tr>
<td>Rim runout limit radial</td>
<td>----</td>
<td>2.0 mm (0.08 in)</td>
</tr>
<tr>
<td></td>
<td>lateral</td>
<td>2.0 mm (0.08 in)</td>
</tr>
<tr>
<td><strong>Rear wheel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Panel wheel</td>
<td>----</td>
</tr>
<tr>
<td>Rim size</td>
<td>12 × 7.5 AT</td>
<td>----</td>
</tr>
<tr>
<td>Rim material</td>
<td>Steel</td>
<td>----</td>
</tr>
<tr>
<td>Rim runout limit radial</td>
<td>----</td>
<td>2.0 mm (0.08 in)</td>
</tr>
<tr>
<td></td>
<td>lateral</td>
<td>2.0 mm (0.08 in)</td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>----------------------------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Front disc brake</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Dual</td>
<td>----</td>
</tr>
<tr>
<td>Disc outside diameter × thickness</td>
<td>200 × 3.5 mm (7.87 × 0.14 in)</td>
<td>----</td>
</tr>
<tr>
<td>Pad thickness inner</td>
<td>5.2 mm (0.20 in)</td>
<td>1.5 mm (0.06 in)</td>
</tr>
<tr>
<td>Pad thickness outer</td>
<td>5.2 mm (0.20 in)</td>
<td>1.5 mm (0.06 in)</td>
</tr>
<tr>
<td>Master cylinder inside diameter</td>
<td>17.4 mm (0.69 in)</td>
<td>----</td>
</tr>
<tr>
<td>Caliper cylinder inside diameter</td>
<td>27.0 mm (1.06 in)</td>
<td>----</td>
</tr>
<tr>
<td>Brake fluid type</td>
<td>DOT 4</td>
<td>----</td>
</tr>
<tr>
<td><strong>Rear disc brake</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Single</td>
<td>----</td>
</tr>
<tr>
<td>Disc outside diameter × thickness</td>
<td>165.0 × 5.0 mm (6.50 × 0.20 in)</td>
<td>----</td>
</tr>
<tr>
<td>Pad thickness inner</td>
<td>5.6 mm (0.22 in)</td>
<td>1.5 mm (0.06 in)</td>
</tr>
<tr>
<td>Pad thickness outer</td>
<td>5.6 mm (0.22 in)</td>
<td>1.5 mm (0.06 in)</td>
</tr>
<tr>
<td>Master cylinder inside diameter</td>
<td>17.4 mm (0.69 in)</td>
<td>----</td>
</tr>
<tr>
<td>Caliper cylinder inside diameter</td>
<td>32.0 mm (1.26 in)</td>
<td>----</td>
</tr>
<tr>
<td>Brake fluid type</td>
<td>DOT 4</td>
<td>----</td>
</tr>
<tr>
<td><strong>Brake lever and brake pedal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accelerator pedal free play</td>
<td>0 mm (0.0 in)</td>
<td>----</td>
</tr>
<tr>
<td>Brake pedal free play</td>
<td>0 mm (0.0 in)</td>
<td>----</td>
</tr>
<tr>
<td>Parking brake cable free play</td>
<td>2 ~ 3 mm (0.079 ~ 0.118 in)</td>
<td>----</td>
</tr>
</tbody>
</table>
## ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage</strong></td>
<td>12 V</td>
<td></td>
</tr>
<tr>
<td><strong>Ignition system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ignition timing (BTDC)</td>
<td>12° / 1,500 r/min</td>
<td></td>
</tr>
<tr>
<td>Advancer type</td>
<td>Digital type</td>
<td></td>
</tr>
<tr>
<td><strong>C.D.I.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magneto model/manufacturer</td>
<td>F4T46972/MITSUBISHI</td>
<td></td>
</tr>
<tr>
<td>Pickup coil resistance/color</td>
<td>459 ~ 561 Ω at 20 °C (68 °F)/White/Red – White/Green</td>
<td></td>
</tr>
<tr>
<td>Rotor rotation direction sensing coil resistance/color</td>
<td>0.063 ~ 0.077 Ω at 20 °C (68 °F)/Red – White/Blue</td>
<td></td>
</tr>
<tr>
<td>C.D.I. unit model/manufacturer</td>
<td>F8T38681/MITSUBISHI</td>
<td></td>
</tr>
<tr>
<td><strong>Ignition coil</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>2JN/YAMAHA</td>
<td></td>
</tr>
<tr>
<td>Minimum spark gap</td>
<td>6 mm (0.24 in)</td>
<td></td>
</tr>
<tr>
<td>Primary winding resistance</td>
<td>0.18 ~ 0.28 Ω at 20 °C (68 °F)</td>
<td></td>
</tr>
<tr>
<td>Secondary winding resistance</td>
<td>6.32 ~ 9.48 kΩ at 20 °C (68 °F)</td>
<td></td>
</tr>
<tr>
<td><strong>Spark plug cap</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Resin type</td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td>10 kΩ</td>
<td></td>
</tr>
<tr>
<td><strong>Charging system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>A.C. magneto generator</td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>F4T46972/MITSUBISHI</td>
<td></td>
</tr>
<tr>
<td>Nominal output</td>
<td>14 V 23 A at 5,000 r/min</td>
<td></td>
</tr>
<tr>
<td>Charging coil resistance/color</td>
<td>0.32 ~ 0.43 Ω at 20 °C (68 °F)/White – White</td>
<td></td>
</tr>
<tr>
<td><strong>Rectifier/regulator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulator type</td>
<td>Semi conductor-short circuit</td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>SH650D-11/SHINDENGEN</td>
<td></td>
</tr>
<tr>
<td>No load regulated voltage (DC)</td>
<td>14.1 ~ 14.9 V</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td>18 A</td>
<td></td>
</tr>
<tr>
<td>Withstand voltage</td>
<td>200 V</td>
<td></td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.32</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Standard</td>
<td>Limit</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Electric starter system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Constant mesh type</td>
<td></td>
</tr>
<tr>
<td>Starter motor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>SM-13/MITSUBA</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>0.8 kW</td>
<td></td>
</tr>
<tr>
<td>Armature coil resistance</td>
<td>0.025 ~ 0.035 Ω at 20 °C (68 °F)</td>
<td></td>
</tr>
<tr>
<td>Brush overall length</td>
<td>12.5 mm (0.49 in)</td>
<td>5 mm (0.20 in)</td>
</tr>
<tr>
<td>Spring force</td>
<td>7.65 ~ 10.01 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(780 ~ 1,021 g, 27.5 ~ 36.0 oz)</td>
<td></td>
</tr>
<tr>
<td>Commutator diameter</td>
<td>28 mm (1.10 in)</td>
<td>27 mm (1.06 in)</td>
</tr>
<tr>
<td>Mica undercut</td>
<td>0.7 mm (0.03 in)</td>
<td></td>
</tr>
<tr>
<td>Starter relay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>MS5F-561/JIDECO</td>
<td></td>
</tr>
<tr>
<td>Amperage rating</td>
<td>180 A</td>
<td></td>
</tr>
<tr>
<td>Coil winding resistance</td>
<td>4.18 ~ 4.62 Ω at 20 °C (68 °F)</td>
<td></td>
</tr>
<tr>
<td><strong>Radiator fan</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Running rpm</td>
<td>2,950 r/min</td>
<td></td>
</tr>
<tr>
<td><strong>Thermo switch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermo switch 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>4BA/DENSO</td>
<td></td>
</tr>
<tr>
<td>Thermo switch 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>5FU/NIPPON THERMOSTAT</td>
<td></td>
</tr>
<tr>
<td>Thermo switch 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>5GM/NIPPON THERMOSTAT</td>
<td></td>
</tr>
<tr>
<td><strong>Circuit breaker</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Fuse</td>
<td></td>
</tr>
<tr>
<td>Amperage for individual circuit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main fuse</td>
<td>30 A x 1</td>
<td></td>
</tr>
<tr>
<td>Lighting system fuse</td>
<td>15 A x 1</td>
<td></td>
</tr>
<tr>
<td>Ignition fuse</td>
<td>10 A x 1</td>
<td></td>
</tr>
<tr>
<td>Auxiliary DC jack fuse</td>
<td>10 A x 1</td>
<td></td>
</tr>
<tr>
<td>Four-wheel drive fuse</td>
<td>3 A x 1</td>
<td></td>
</tr>
<tr>
<td>Signaling system fuse</td>
<td>10 A x 1</td>
<td></td>
</tr>
<tr>
<td>Carburetor heater fuse</td>
<td>10 A x 1</td>
<td></td>
</tr>
<tr>
<td>Backup fuse (odometer)</td>
<td>10 A x 1</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>30 A x 1</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>15 A x 1</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>10 A x 1</td>
<td></td>
</tr>
<tr>
<td>Reserve</td>
<td>3 A x 1</td>
<td></td>
</tr>
</tbody>
</table>
### TIGHTENING TORQUES

#### ENGINE TIGHTENING TORQUES

<table>
<thead>
<tr>
<th>Part to be tightened</th>
<th>Part name</th>
<th>Thread size</th>
<th>Q'ty</th>
<th>Tightening torque</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nm</td>
<td>m · kg</td>
</tr>
<tr>
<td>Cylinder head</td>
<td>Bolt M6</td>
<td>1</td>
<td>10</td>
<td>1.0</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>Bolt M9</td>
<td>6</td>
<td>38</td>
<td>3.8</td>
<td>27</td>
</tr>
<tr>
<td>Spark plug</td>
<td>— M12</td>
<td>1</td>
<td>18</td>
<td>1.8</td>
<td>13</td>
</tr>
<tr>
<td>Cylinder head (exhaust pipe)</td>
<td>Stud bolt M8</td>
<td>4</td>
<td>15</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>Cylinder head cover</td>
<td>Bolt M6</td>
<td>17</td>
<td>10</td>
<td>1.0</td>
<td>7.2</td>
</tr>
<tr>
<td>Tappet cover (exhaust)</td>
<td>— M32</td>
<td>2</td>
<td>12</td>
<td>1.2</td>
<td>8.7</td>
</tr>
<tr>
<td>Tappet cover (intake)</td>
<td>Bolt M6</td>
<td>4</td>
<td>10</td>
<td>1.0</td>
<td>7.2</td>
</tr>
<tr>
<td>Oil gallery bolt</td>
<td>— M6</td>
<td>1</td>
<td>7</td>
<td>0.7</td>
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### CHASSIS TIGHTENING TORQUES

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<tr>
<td>Side frame (enclosure) and frame</td>
<td>M10</td>
<td>64</td>
<td>6.4</td>
</tr>
<tr>
<td>Support frame (enclosure) and frame</td>
<td>M10</td>
<td>64</td>
<td>6.4</td>
</tr>
<tr>
<td>Left support frame (enclosure) and right support</td>
<td>M10</td>
<td>64</td>
<td>6.4</td>
</tr>
<tr>
<td>frame (enclosure)</td>
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<td></td>
</tr>
<tr>
<td>Support frame (enclosure) and side frame (enclo-</td>
<td>M10</td>
<td>64</td>
<td>6.4</td>
</tr>
<tr>
<td>sure)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top frame (enclosure) and side frame (enclosure)</td>
<td>M10</td>
<td>64</td>
<td>6.4</td>
</tr>
<tr>
<td>Seat support and frame</td>
<td>M8</td>
<td>16</td>
<td>1.6</td>
</tr>
<tr>
<td>Select lever bracket and seat support</td>
<td>M10</td>
<td>32</td>
<td>3.2</td>
</tr>
<tr>
<td>Skid plate and frame</td>
<td>M6</td>
<td>7</td>
<td>0.7</td>
</tr>
</tbody>
</table>
HOW TO USE THE CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS. Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

** mm × 0.03937 = ** in
2 mm × 0.03937 = 0.08 in

CONVERSION TABLE

<table>
<thead>
<tr>
<th>METRIC TO IMPERIAL</th>
<th>Metric unit</th>
<th>Multiplier</th>
<th>Imperial unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque</td>
<td>m · kg</td>
<td>7.233</td>
<td>ft · lb</td>
</tr>
<tr>
<td></td>
<td>m · kg</td>
<td>86.794</td>
<td>in · lb</td>
</tr>
<tr>
<td></td>
<td>cm · kg</td>
<td>0.0723</td>
<td>ft · lb</td>
</tr>
<tr>
<td></td>
<td>cm · kg</td>
<td>0.8679</td>
<td>in · lb</td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td>2.205</td>
<td>lb</td>
</tr>
<tr>
<td></td>
<td>g</td>
<td>0.03527</td>
<td>oz</td>
</tr>
<tr>
<td>Speed</td>
<td>km/hr</td>
<td>0.6214</td>
<td>mph</td>
</tr>
<tr>
<td>Distance</td>
<td>km</td>
<td>0.6214</td>
<td>mi</td>
</tr>
<tr>
<td></td>
<td>m</td>
<td>3.281</td>
<td>ft</td>
</tr>
<tr>
<td></td>
<td>m</td>
<td>1.094</td>
<td>yd</td>
</tr>
<tr>
<td></td>
<td>cm</td>
<td>0.3937</td>
<td>in</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>0.03937</td>
<td>in</td>
</tr>
<tr>
<td>Volume/ Capacity</td>
<td>cc (cm³)</td>
<td>0.03527</td>
<td>oz (IMP liq.)</td>
</tr>
<tr>
<td></td>
<td>cc (cm³)</td>
<td>0.06102</td>
<td>cu · in</td>
</tr>
<tr>
<td></td>
<td>lt (liter)</td>
<td>0.8799</td>
<td>qt (IMP liq.)</td>
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<tr>
<td></td>
<td>lt (liter)</td>
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<td>gal (IMP liq.)</td>
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<td>Misc.</td>
<td>kg/mm</td>
<td>55.997</td>
<td>lb/in</td>
</tr>
<tr>
<td></td>
<td>kg/cm²</td>
<td>14.2234</td>
<td>psi (lb/in²)</td>
</tr>
<tr>
<td></td>
<td>Centigrade (°C)</td>
<td>9/5+32</td>
<td>Fahrenheit (°F)</td>
</tr>
</tbody>
</table>

A: Distance between flats
B: Outside thread diameter

GENERAL TIGHTENING TORQUE SPECIFICATIONS

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.

<table>
<thead>
<tr>
<th>A (nut)</th>
<th>B (bolt)</th>
<th>General tightening torques</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>10 mm</td>
<td>6 mm</td>
<td>6</td>
</tr>
<tr>
<td>12 mm</td>
<td>8 mm</td>
<td>15</td>
</tr>
<tr>
<td>14 mm</td>
<td>10 mm</td>
<td>30</td>
</tr>
<tr>
<td>17 mm</td>
<td>12 mm</td>
<td>55</td>
</tr>
<tr>
<td>19 mm</td>
<td>14 mm</td>
<td>85</td>
</tr>
<tr>
<td>22 mm</td>
<td>16 mm</td>
<td>130</td>
</tr>
</tbody>
</table>
## LUBRICATION POINTS AND LUBRICANT TYPES

### ENGINE

<table>
<thead>
<tr>
<th>Lubrication points</th>
<th>Lubricant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil seal lips</td>
<td>LS</td>
</tr>
<tr>
<td>Bearings</td>
<td>E</td>
</tr>
<tr>
<td>O-rings</td>
<td>LS</td>
</tr>
<tr>
<td>Piston, piston ring</td>
<td>LS</td>
</tr>
<tr>
<td>Piston pin</td>
<td>E</td>
</tr>
<tr>
<td>Buffer boss and balancer drive gear</td>
<td>E</td>
</tr>
<tr>
<td>Crankshaft seal and spacer</td>
<td>C</td>
</tr>
<tr>
<td>Valve stem</td>
<td>C</td>
</tr>
<tr>
<td>Valve stem end</td>
<td>C</td>
</tr>
<tr>
<td>Rocker arm shaft</td>
<td>E</td>
</tr>
<tr>
<td>Rocker arm</td>
<td>M</td>
</tr>
<tr>
<td>Camshaft lobe and journal</td>
<td>M</td>
</tr>
<tr>
<td>Oil pump assembly</td>
<td>M</td>
</tr>
<tr>
<td>Oil filter cartridge O-ring</td>
<td>LS</td>
</tr>
<tr>
<td>Starter idle gear shaft</td>
<td>M</td>
</tr>
<tr>
<td>Starter wheel gear</td>
<td>E</td>
</tr>
<tr>
<td>Clutch housing assembly shaft end</td>
<td>LS</td>
</tr>
<tr>
<td>Clutch carrier assembly</td>
<td>E</td>
</tr>
<tr>
<td>One-way clutch bearing</td>
<td>M</td>
</tr>
<tr>
<td>Middle driven shaft splines</td>
<td>E</td>
</tr>
<tr>
<td>Drive axle, driven sprocket, high wheel gear, and low wheel gear</td>
<td>E</td>
</tr>
<tr>
<td>Middle drive gear and clutch dog shift fork groove</td>
<td>E</td>
</tr>
<tr>
<td>Timing chain/sprocket</td>
<td>E</td>
</tr>
<tr>
<td>Shift drum</td>
<td>E</td>
</tr>
<tr>
<td>Shift fork guide bar</td>
<td>E</td>
</tr>
<tr>
<td>Shift drum stopper ball</td>
<td>E</td>
</tr>
<tr>
<td>Shift lever 2 assembly</td>
<td>LS</td>
</tr>
<tr>
<td>Shift lever 1</td>
<td>E</td>
</tr>
<tr>
<td>Shift lever 1 and shift lever 2 assembly mating surface</td>
<td>E</td>
</tr>
</tbody>
</table>

### Sealant
- Crankcase mating surface: Sealant (Quick Gasket®) Yamaha Bond No.1215
- A.C. magneto lead grommet: Sealant (Quick Gasket®) Yamaha Bond No.1215
COOLANT FLOW DIAGRAMS

1. Radiator
2. Thermo switch 3
3. Radiator outlet hose
4. Radiator inlet hose
5. Radiator outlet pipe
6. Radiator inlet pipe
1. Coolant breather hose
2. Coolant breather pipe
3. Radiator outlet pipe
4. Water pump inlet hose
5. Water pump outlet pipe
6. Water pump outlet hose
7. Coolant outlet hose
8. Radiator inlet pipe
1 Coolant outlet hose
2 Radiator inlet pipe
OIL FLOW DIAGRAMS

1. Camshaft
2. Oil delivery pipe 2
3. Oil delivery pipe 3
4. Crankshaft
1. Oil delivery pipe 1
2. Oil delivery pipe 2
3. Oil delivery pipe 3
4. Oil pump
5. Oil strainer
1 Oil filter cartridge
2 Oil pipe adapter
3 Oil delivery pipe 2
4 Oil delivery pipe 1
5 Drive axle
6 Relief valve
7 Oil pump
8 Oil strainer
1 Oil outlet pipe
2 Oil inlet pipe
3 Oil outlet hose
4 Oil inlet hose
5 Oil cooler inlet pipe 2
6 Oil cooler outlet pipe 2
Oil cooler
2 Oil cooler inlet pipe 2
3 Oil cooler outlet pipe 2
4 Oil cooler inlet hose
5 Oil cooler outlet hose
6 Oil cooler inlet pipe 1
7 Oil cooler outlet pipe 1
CABLE ROUTING

1. Left headlight lead
2. Wire harness
3. Throttle cable
4. Brake light switch lead
5. Radiator fan motor breather hose
6. Starter cable
7. Starter (choke) knob
8. Light switch
9. Coolant reservoir breather hose
10. Parking brake switch lead
11. Parking brake cable
12. Crankcase breather hose
13. Gear position switch
14. Reverse switch lead
15. Front brake hoses
16. Differential gear case breather hose
17. Reverse switch terminal
18. Gear position switch lead
A 30 ~ 60 mm (1.18 ~ 2.36 in)  
B 160 ~ 190 mm (6.30 ~ 7.48 in)  
C Fasten the wire harness to the frame with the plastic bands.  
D Pull the excess of the hoses through the guide in the upper instrument panel so that there is no slack in the hoses.  
E Fasten the throttle cable, parking brake switch lead, and parking brake cable to the air duct assembly 1 with the plastic band.  
F Fasten the throttle cable to the air duct assembly 1 with the plastic band.  
G Fasten the radiator inlet hose and throttle cable with the plastic bands.  
H 20 mm (0.79 in) or less  
I 5 mm (0.20 in) or less  
J 15°
1. Float chamber breather hose
2. Throttle cable
3. Parking brake cable
4. Thermo switch 1
5. Vacuum hose
6. Spark plug cap
7. Wire harness
8. Tail/brake light lead
9. Starter motor lead
10. Carburetor heater leads
11. Carburetor heater

**A** Fasten the parking brake switch lead and parking brake cable to the air duct assembly 1 with the plastic band.

**B** 55 ~ 65 mm (2.17 ~ 2.56 in)

**C** Fasten the wire harness to the frame with the plastic bands.

**D** Pass the tail/brake light lead through the grommet.

**E** Pass the wire harness through the loop in the guide.

---

**Diagram Description:**

- **A** shows the parking brake switch lead and parking brake cable.
- **B** indicates the wire harness fastened to the frame.
- **C** highlights the tail/brake light lead passing through the grommet.
- **D** demonstrates the wire harness passing through the loop in the guide.
Fasten the parking brake cable to the air duct assembly 2 with the plastic band.

Fasten the parking brake cable and float chamber breather hose with the plastic clip.

20 ~ 40°

Fasten the starter motor lead, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, and parking brake switch lead with the plastic band.

Fasten the wire harness with the plastic holders.

K Fasten the tail/brake light lead with the plastic holders.

Push the excess tail/brake light lead into the rear fender so that there is no slack in the lead.
1. Main switch
2. Starter (choke) knob
3. Starter (choke) cable
4. Rectifier/regulator
5. Wire harness
6. Coolant reservoir breather hose
7. Right headlight lead
8. Radiator fan motor breather hose
9. Radiator fan motor coupler
10. Differential gear case breather hose
11. Thermo switch 3
12. Gear motor couplers
13. Coolant reservoir hose
14. Speed sensor coupler
15. A.C. magneto couplers
16. Parking brake switch lead
17. Parking brake cable
18. Throttle cable
19. Radiator inlet pipe
20. Rear brake pipe
21. Radiator outlet pipe
22. Gear motor lead
23. Brake light switch lead
24. Indicator light assembly leads
25. Auxiliary DC jack lead
A 70 ~ 80 mm (2.76 ~ 3.15 in)  
B Fasten the wire harness with the plastic bands.  
C Fasten the wire harness to the frame with the plastic locking ties.  
D 30 ~ 60 mm (1.18 ~ 2.36 in)  
E 160 ~ 190 mm (6.30 ~ 7.48 in)  
F Fasten the radiator outlet hose and coolant reservoir hose with the plastic clip.  
G 12 ~ 22 mm (0.47 ~ 0.87 in)  
H Fasten the wire harness, starter motor lead, ground lead, and starter (choke) cable to the frame with the plastic band.  
I Fasten the wire harness, starter motor lead, and ground lead to the frame with the plastic band.  
J Fasten the wire harness, speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with the plastic band.
K 70 ~ 90 mm (2.76 ~ 3.54 in)
L Fasten the throttle cable with the plastic band.
M Fasten the radiator inlet pipe with the plastic band.
N Fasten the rear brake pipe with the plastic band.
O Fasten the radiator outlet pipe with the plastic band.
P Fasten the wire harness, starter (choke) cable, starter motor lead, and ground lead with the plastic bands.
Q Fasten the gear motor lead with the plastic band.
R Fasten the wire harness, brake light switch lead, and starter (choke) cable with the plastic band.
CABLE ROUTING

1. Ignition coil lead
2. Spark plug lead
3. Final gear case breather hose
4. Vacuum hose
5. Fuel hoses
6. Air vent hoses
7. Starter (choke) cable
8. Crankcase breather hose
9. Ground lead
10. Rear brake hose
11. Parking brake cable

- Ignition coil
- Rear brake pipe
- Wire harness
- Fuel tank breather hose
- Rollover valve
- Fuel return hose
- Fuel suction hose

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Fasten the spark plug lead with the plastic holder.

Pass the final gear case breather hose through the grommet.

Fasten the starter (choke) cable, starter motor lead, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, parking brake switch lead, and air vent hose with the metal holder.

Fasten the A.C. magneto leads, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, and parking brake switch lead with the plastic bands.

Fasten the wire harness with the plastic band.

Fasten the parking brake cable and wire harness with the plastic clip.
K Fasten the parking brake cable with the metal holder.
L Fasten the wire harness, ignition coil lead, and rear brake hose with the plastic band.
M Fasten the final gear case breather hose and fuel hose with the plastic clip.
N Fasten the fuel filter with the plastic band.
O Fasten the fuel hose with the plastic clip.
P Fasten the final gear case breather hose with the plastic holders.
Q Fasten the parking brake cable and final gear case breather hose with the plastic holders.
R Fasten the rear brake hose with the plastic bands.
S Fasten the rear brake pipe with the plastic bands.
T Fasten the wire harness with the plastic bands.
1. Throttle cable
2. Rear brake pipe
3. A.C. magneto couplers
4. Starter (choke) cable
5. Rear brake hose
6. Fuel hose
7. Vacuum hose
8. Spark plug lead
9. Parking brake cable

A. Pass the throttle cable through the cable guide.
B. Fasten the speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with the plastic band.
C. Fasten the wire harness and A.C. magneto lead with the plastic band.
D. Fasten the wire harness with the plastic band.
E. Fasten the fuel hose with the metal holder.
**CABLE ROUTING**

- **F** Fasten the fuel hose and vacuum hose with the plastic clip.
- **G** Make sure that the spark plug lead does not contact the frame.
- **H** Fasten the final gear case breather hose with the plastic holder.
- **I** 105 ~ 115 mm (4.13 ~ 4.53 in)
- **J** Fasten the wire harness with the plastic bands.
- **K** The end of the spark plug cap boot must face towards the passenger side of the vehicle.
- **L** Pass the spark plug lead through the cutout in the protective cover as shown.
- **M** Fasten the rear brake pipe with the plastic band.
- **N** Fasten the wire harness, speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with the plastic band.
1 Battery
2 Negative battery lead
3 Rectifier/regulator
4 Starter (choke) cable
5 Indicator light assembly couplers
6 On-Command four-wheel drive switch and differential gear lock switch leads
7 On-Command four-wheel drive switch and differential gear lock switch
8 Main switch
9 Starter (choke) knob

3 Light switch
10 Differential gear case breather hose
11 Radiator fan motor breather hose
12 Left headlight lead
13 Throttle cable
14 Right headlight lead
15 Starter motor lead
16 Starter relay lead
17 Four-wheel drive relay 1
18 Four-wheel drive relay 2
19 Starter relay
Fasten the wire harness with the plastic bands.

Pass the radiator fan motor breather hose, differential gear case breather hose, coolant reservoir breather hose, and brake light switch lead through the guide.

Pass the radiator fan motor breather hose, differential gear case breather hose, throttle cable, and brake light switch lead through the guide.
D Fasten the throttle cable with the plastic holder.
E Fasten the left headlight lead, differential gear case breather hose, and radiator fan motor breather hose with the plastic holder.
F Fasten the left headlight lead and differential gear case breather hose with the plastic holder.
G Fasten the starter motor lead and starter relay lead with the plastic holder.
H Fasten the positive battery lead with the plastic holder.
I 60 mm (2.36 in)
J 4 mm (0.16 in) of clearance or more is required around the boot.
K Make sure that the washer is installed on the side of the pedal assembly bracket towards the boot.
1. Auxiliary DC jack
2. Auxiliary DC jack lead
3. Coolant reservoir breather hose
4. Throttle cable
5. Radiator fan motor breather hose
6. Differential gear case breather hose
7. Starter (choke) cable
8. Wire harness
9. Front brake hoses
10. Coolant reservoir hose
11. Ground lead
12. Starter relay lead

A. Fasten the coolant reservoir breather hose with the plastic band.
B. Fasten the front brake hose with the plastic band.
C. Fasten the front brake hose with the plastic band.
D. Fasten the radiator outlet hose with the plastic band.
E Fasten the wire harness and ground lead with the plastic band.
F Fasten the differential gear case breather hose, coolant reservoir hose, radiator fan motor lead, and thermo switch 3 lead with the plastic holder.
PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE/LUBRICATION

NOTE:

- For vehicles not equipped with an odometer or hour meter, follow the month maintenance intervals.
- For vehicles equipped with an odometer or an hour meter, follow the km (mi) or hours maintenance intervals. However, keep in mind that if the vehicle isn’t used for a long period of time, the month maintenance intervals should be followed.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ROUTINE</th>
<th>WHICHEVER COMES FIRST</th>
<th>INITIAL</th>
<th>EVERY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 3 6 6 12</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>km (mi)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>320 (200)</td>
<td>1,200 (750)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>75</td>
</tr>
</tbody>
</table>

Valves*
- Check valve clearance.
- Adjust if necessary.

Cooling system
- Check coolant leakage.
- Repair if necessary.
- Replace coolant every 24 months.

Spark plug
- Check condition.
- Adjust gap and clean.
- Replace if necessary.

Air filter element
- Clean.
- Replace if necessary.
- Every 5 to 8 hours (more often in heavy dust or sand). 12 maximum if very low dust.

Carburetor*
- Check idle speed/starter operation.
- Adjust if necessary.

Crankcase breather system*
- Check breather hose for cracks or damage.
- Replace if necessary.

Exhaust system*
- Check for leakage.
- Tighten if necessary.
- Replace gasket(s) if necessary.

Sparks arrester
- Clean.

Fuel line*
- Check fuel hose for cracks or damage.
- Replace if necessary.

Engine oil
- Replace (warm engine before draining).

Engine oil filter cartridge
- Replace.

Final gear oil
- Check oil level/oil leakage.
- Replace.

Differential gear oil
- Replace.

Front brake*
- Check operation/brake pad wear/fluid leakage/see NOTE page 3-2.
- Correct if necessary. Replace pads if worn to the limit.

Rear brake*
- Check operation/brake pad wear/fluid leakage/see NOTE page 3-2.
- Correct if necessary. Replace pads if worn to the limit.
### PERIODIC MAINTENANCE/LUBRICATION

**ITEM** | **ROUTINE** | **Whichever comes first** | **INITIAL** | **EVERY** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>km</strong>&lt;br&gt;(mi)</td>
<td><strong>hours</strong>&lt;br&gt;(min)</td>
</tr>
<tr>
<td>Accelerator pedal*</td>
<td>• Check operation and free play.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2,400&lt;br&gt;(1,500)</td>
<td>150</td>
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<td></td>
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<td>2,400&lt;br&gt;(1,500)</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4,800&lt;br&gt;(3,000)</td>
<td>300</td>
</tr>
<tr>
<td>V-belt*</td>
<td>• Check operation.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Check for wear, cracks, or damage.</td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
</tr>
<tr>
<td>Wheels*</td>
<td>• Check balance/damage/runout.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Repair if necessary.</td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
</tr>
<tr>
<td>Wheel bearings*</td>
<td>• Check bearing assemblies for looseness/damage.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Replace if damaged.</td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
</tr>
<tr>
<td>Front and rear suspension*</td>
<td>• Check operation and for leakage.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Correct if necessary.</td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
</tr>
<tr>
<td>Steering system*</td>
<td>• Check operation and for looseness/Replace if damaged.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Check toe-in/Adjust if necessary.</td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
</tr>
<tr>
<td>Rear upper and lower knuckle pivots*</td>
<td>• Lubricate with lithium-soap-based grease.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td>Drive shaft universal joint*</td>
<td>• Lubricate with lithium-soap-based grease.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td>Engine mount*</td>
<td>• Check for cracks or damage.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Check bolt tightness.</td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
</tr>
<tr>
<td>Front and rear axle boots*</td>
<td>• Check operation.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Replace if damaged.</td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
</tr>
<tr>
<td>Stabilizer bushings*</td>
<td>• Check for cracks or damage.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td>Fittings and fasteners*</td>
<td>• Check all chassis fittings and fasteners.</td>
<td></td>
<td>320&lt;br&gt;(200)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>• Correct if necessary.</td>
<td></td>
<td>1,200&lt;br&gt;(750)</td>
<td>75</td>
</tr>
</tbody>
</table>

* Since these items require special tools, data and technical skills have a Yamaha dealer perform the service.

**NOTE:**
- Recommended brake fluid: DOT 4
- Brake fluid replacement:
  - When disassembling the master cylinder or caliper, replace the brake fluid. Normally check the brake fluid level and add fluid as required.
  - On the inner parts of the master cylinder and caliper, replace the oil seals every two years.
  - Replace the brake hoses every four years, or if cracked or damaged.
ADJUSTING THE VALVE CLEARANCE

ENGINE

ADJUSTING THE VALVE CLEARANCE

NOTE:  
- The valve clearance must be adjusted when the engine is cool to the touch.
- Adjust the valve clearance when the piston is at the Top Dead Center (TDC) on the compression stroke.

1. Remove:
   - driver seat
   - passenger seat
   - console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

2. Lift the cargo bed up.

3. Remove:
   - tappet cover (intake) ①
   - tappet covers (exhaust) ②

4. Disconnect:
   - spark plug cap ③

5. Remove:
   - spark plug

6. Remove:
   - air shroud ①
ADJUSTING THE VALVE CLEARANCE

7. Remove:
   - engine cooling fan 1

8. Remove:
   - timing plug 1

9. Check:
   - valve clearance
     Out of specification → Adjust.

<table>
<thead>
<tr>
<th>Valve clearance (cold)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake</td>
</tr>
<tr>
<td>0.10 ~ 0.15 mm</td>
</tr>
<tr>
<td>(0.0039 ~ 0.0059 in)</td>
</tr>
<tr>
<td>Exhaust</td>
</tr>
<tr>
<td>0.15 ~ 0.20 mm</td>
</tr>
<tr>
<td>(0.0059 ~ 0.0079 in)</td>
</tr>
</tbody>
</table>

a. Turn the crankshaft counterclockwise with a wrench.

b. Align the “I” mark 1 on the rotor with the stationary pointer 2 on the A.C. magneto cover. When the “I” mark is aligned with the stationary pointer, the piston is at the Top Dead Center (TDC).

**NOTE:**
- When the piston is at the Top Dead Center (TDC) on the compression stroke, there should be clearance between the valve stem tips and their respective rocker arm adjusting screws.
- If there is no clearance, rotate the crankshaft counterclockwise one turn.

c. Measure the valve clearance using a thickness gauge 3.
10. Adjust:
• valve clearance

Loosen the locknut ①.

b. Insert a thickness gauge ② between the adjuster end and the valve end.

c. Turn the adjuster ③ clockwise or counterclockwise with the tappet adjusting tool ④ until the proper clearance is obtained.

d. Hold the adjuster to prevent it from moving and then tighten the locknut.

e. Measure the valve clearance.

f. If the clearance is incorrect, repeat the above steps until the proper clearance is obtained.

11. Install:
• all removed parts

NOTE: Install all removed parts in the reverse order of their disassembly. Note the following points.

12. Install:
• engine cooling fan

13. Install:
• air shroud ①

14. Install:
• spark plug ②
• tappet covers (exhaust) ③
• tappet cover (intake)

15. Lower the cargo bed.

16. Install:
• console
• passenger seat
• driver seat

Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
ADJUSTING THE TIMING CHAIN
Adjustment free.

ADJUSTING THE IDLING SPEED
1. Start the engine and let it warm up for several minutes.
2. Remove:
   - driver seat
   - passenger seat
   - console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
3. Lift the cargo bed up.
4. Attach:
   - tachometer
     (to the spark plug lead)

5. Check:
   - engine idling speed
     Out of specification → Adjust.

6. Adjust:
   - engine idling speed

   a. Turn the throttle stop screw ① in or out until the specified idling speed is obtained.

<table>
<thead>
<tr>
<th>Turning in</th>
<th>Idling speed becomes higher.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning out</td>
<td>Idling speed becomes lower.</td>
</tr>
</tbody>
</table>

Engine idling speed
1,450 ~ 1,550 r/min
ADJUSTING THE IDLING SPEED
ADJUSTING THE THROTTLE CABLE

7. Detach:
   • tachometer
8. Lower the cargo bed.
9. Install:
   • console
   • passenger seat
   • driver seat

Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

ADJUSTING THE THROTTLE CABLE

NOTE:
Throttle cable free play should be adjusted properly before adjusting the engine idling speed.

1. Remove:
   • driver seat
   • passenger seat
   • console
2. Remove:
   • throttle valve cover ①
3. Check:
   • throttle cable ③
     Slack → Remove the slack.

4. Adjust:
   • throttle cable

Turning in | Slack is increased.
Turning out | Slack is decreased.

4. Adjust:
   • throttle cable

a. Loosen the locknut ①.
b. Turn the adjuster ② in or out until there is no slack.
c. Tighten the locknut.

NOTE:
After adjusting the throttle cable, depress the accelerator pedal a few times and make sure that the throttle valve ③ closes completely after releasing the accelerator pedal.
ADJUSTING THE STARTER CABLE

1. Remove:
   - driver seat
   - passenger seat
   - console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

2. Adjust:
   - starter cable

   a. Disconnect the starter cable ① from the carburetor body.

   **NOTE:** Do not remove the starter plunger ② from the starter cable.

   b. Measure the starter plunger stroke distance ③ of the starter (choke) knob ④ fully close to fully open position. If the distance is out of specification adjust it as described below.

   ![Starter plunger stroke distance](image)

   **Starter plunger stroke distance**
   13 mm (0.51 in)

   [A] Fully closed position
   [B] Fully open position

   c. Pull back the boot ④.
   d. Loosen the locknut ⑤.
   e. Turn the adjuster ⑥ in or out until the correct distance is obtained.
   f. Tighten the locknut ⑤.
   g. Push in the boot ④.
   h. Connect the starter cable to the carburetor.

5. Remove:
   - throttle valve cover

6. Install:
   - console
   - passenger seat
   - driver seat
3. Install:
- console
- passenger seat
- driver seat
Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

CHECKING THE SPARK PLUG
1. Lift the cargo bed up.
2. Remove:
   - spark plug
3. Check:
   - spark plug type
   Incorrect → Replace.
4. Check:
   - electrode ①
   Wear/damage → Replace.
   - insulator ②
     Abnormal color → Replace.
     Normal color is a medium-to-light tan color.
5. Clean the spark plug with a spark plug cleaner or wire brush.
6. Measure:
   - spark plug gap ③
   Use a wire gauge or thickness gauge.
   Out of specification → Regap.
7. Install:
   - spark plug 18 Nm (1.8 m · kg, 13 ft · lb)
NOTE: Before installing a spark plug, clean the gasket surface and plug surface.
8. Lower the cargo bed.
CHECKING THE IGNITION TIMING

NOTE:

Engine idling speed and throttle cable free play should be adjusted properly before checking the ignition timing.

1. Remove:
   • driver seat
   • passenger seat
   • console
   Refer to "SEATS, ENCLOSURE, HOOD AND CARGO BED" in chapter 8.

2. Lift the cargo bed up.

3. Attach:
   • tachometer
   • timing light
   (to the spark plug lead)

4. Remove:
   • air shroud 1

5. Remove:
   • engine cooling fan

Digital engine test tachometer
P/N. YU-8036-C

Engine tachometer
P/N. 90890-03113

Timing light
P/N. 90890-03141

Battery powered timing light
P/N. YM-33277-A
6. Check:
   • ignition timing

   a. Warm up the engine and keep it at the specified speed.

   b. Remove the timing plug ①.
   c. Visually check the stationary pointer ② to verify it is within the required firing range ③ indicated on the flywheel.
      Incorrect firing range → Check the pulser coil assembly.
   d. Install the timing plug.

7. Install:
   • engine cooling fan

   Engine speed
   1,450 ~ 1,550 r/min

8. Install:
   • air shroud ①

9. Detach:
   • timing light
   • tachometer

10. Lower the cargo bed.
11. Install:
   • console
   • passenger seat
   • driver seat

   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

MEASURING THE COMPRESSION PRESSURE

NOTE: Insufficient compression pressure will result in a loss of performance.

1. Check:
   • valve clearance
      Out of specification → Adjust.
      Refer to “ADJUSTING THE VALVE CLEARANCE”.

2. Start the engine and let it warm up for several minutes.
3. Stop the engine.
4. Lift the cargo bed up.
MEASURING THE COMPRESSION PRESSURE

5. Remove:
- spark plug
6. Attach:
- adapter
- compression gauge

7. Measure:
- compression pressure

Above the maximum pressure:
Check the cylinder head, valve surfaces, and piston crown for carbon deposits.

Below the minimum pressure:
Squirt a few drops of oil into the affected cylinder and measure again.
Refer to the table below.

---

<table>
<thead>
<tr>
<th><strong>Compression pressure</strong></th>
<th><strong>Diagnosis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher than without oil</td>
<td>Worn or damaged pistons</td>
</tr>
<tr>
<td>Same as without oil</td>
<td>Defective ring(s), valves, cylinder head gasket or piston is possible.</td>
</tr>
</tbody>
</table>

---

**Compression pressure (at sea level)**
Standard:
- 1,324 kPa (13.24 kg/cm², 188.31 psi)
- Minimum: 1,150 kPa (11.5 kg/cm², 163.57 psi)
- Maximum: 1,480 kPa (14.8 kg/cm², 210.50 psi)

---

a. Crank over the engine with the electric starter (be sure the battery is fully charged) with the throttle wide-open until the compression reading on the gauge stabilizes.
When cranking the engine, ground the spark plug lead to prevent sparking.

8. Install:
   - spark plug \( \leq 18 \text{ Nm (1.8 m \cdot \text{kg}, 13 \text{ ft \cdot lb})} \)

9. Lower the cargo bed.

CHECKING THE ENGINE OIL LEVEL

1. Place the vehicle on a level surface.
2. Remove:
   - driver seat
   - passenger seat
   - console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

3. Check:
   - engine oil level
   Oil level should be between the maximum \( 1 \) and minimum \( 2 \) marks.
   Oil level low → Add oil to the proper level.

   **NOTE:**
   Do not screw the dipstick \( 3 \) in when checking the oil level.

**Recommended oil**
Follow the left chart.

**NOTE:**
Recommended oil classification:
API Service “SE”, “SF”, “SG” type or equivalent (e.g. “SF—SE—CC”, “SF—SE—SD” etc.)

**CAUTION:**
Do not allow foreign material to enter the crankcase.

4. Start the engine and let it warm up for several minutes.
5. Stop the engine and check the oil level again.

**NOTE:**
Wait a few minutes until the oil settles before checking the oil level.

**WARNING**
Never remove the dipstick just after high speed operation because the heated oil could spurt out. Wait until the oil cools down before removing the dipstick.

6. Install:
- console
- passenger seat
- driver seat
Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

**CHANGING THE ENGINE OIL**
1. Start the engine and let it warm up for several minutes.
2. Stop the engine and place an oil pan under the engine.
3. Remove:
   - driver seat
   - passenger seat
   - console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
4. Remove:
   - engine oil filler plug (dipstick) ①
   - engine oil drain bolt ②
   Drain the engine oil from the crankcase.

5. If the oil filter cartridge is also to be replaced, perform the following procedure.

\[\text{Oil filter wrench}
\]
\[\text{P/N. YU-38411, 90890-01426}\]
b. Lubricate the O-ring of the new oil filter cartridge with a thin coat of lithium-soap-based grease.

**CAUTION:** Make sure that the O-ring is positioned correctly in the groove of the oil filter cartridge.

c. Tighten the new oil filter cartridge to specification with an oil filter wrench.

| Oil filter cartridge | 17 Nm (1.7 m · kg, 12 ft · lb) |

6. Install:
- engine oil drain bolt

7. Fill:
- crankcase (with sufficient oil to reach the specified level)
  Refer to “CHECKING THE ENGINE OIL LEVEL”.

8. Install:
- engine oil filler plug

9. Warm up the engine for a few minutes, then stop the engine.

10. Check:
- engine (for engine oil leaks)
- oil level
  Refer to “CHECKING THE ENGINE OIL LEVEL”.

---

**Oil quantity**

<table>
<thead>
<tr>
<th>Periodic oil change</th>
<th>1.90 L (1.67 Imp qt, 2.01 US qt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With oil filter replacement</td>
<td>2.00 L (1.76 Imp qt, 2.11 US qt)</td>
</tr>
<tr>
<td><strong>Total amount</strong></td>
<td>2.80 L (2.46 Imp qt, 2.96 US qt)</td>
</tr>
</tbody>
</table>

---
11. Check:
   • engine oil pressure

   Slightly loosen the oil gallery bolt ①.
   a. Start the engine and keep it idling until engine oil starts to seep from the oil gallery bolt. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
   b. Check the engine oil passages, the oil filter cartridge and the oil pump for damage or leakage. Refer to “CRANKSHAFT AND OIL PUMP” in chapter 4.
   c. Start the engine after solving the problem(s) and check the engine oil pressure again.
   d. Tighten the oil gallery bolt to specification.

Oil gallery bolt
7 Nm (0.7 m·kg, 5.1 ft·lb)

12. Install:
   • console
   • passenger seat
   • driver seat

   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

CLEANING THE AIR FILTER

NOTE: _______________________

There is a check hose ① at the bottom of the air filter case. If dust and/or water collects in this hose, clean the air filter element and air filter case.

1. Remove:
   • driver seat
   • passenger seat
   • console

   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
2. Remove:
   - air filter case cover

3. Remove:
   - air filter element assembly
   - air filter element cap
   - air filter element

   **CAUTION:**
   Never operate the engine with the air filter element removed. This will allow unfiltered air to enter, causing rapid wear and possible engine damage. Additionally, operation without the filter element will affect carburetor tuning with subsequent poor performance and possible engine overheating.

4. Check:
   - air filter element
     Damaged → Replace.

5. Clean:
   - air filter element

     **WARNING**
     Use a cleaning solvent which is designed to clean parts only. Never use gasoline or low flash point solvents as they may cause a fire or explosion.

     a. Wash the element gently, but thoroughly in solvent.

     **CAUTION:**
     Do not twist or wring out the element. This could damage the foam material.

     b. Squeeze the excess solvent out of the element and let it dry.
c. Apply Yamaha foam air filter oil or other quality foam air filter oil.
d. Squeeze out the excess oil.

**NOTE:**
The element should be wet but not dripping.

6. Install:
- air filter element
- air filter case cover

**NOTE:**
To prevent air leaks make sure that the sealing surface of the element matches the sealing surface of the case.

7. Install:
- console
- passenger seat
- driver seat

Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

---

**CHECKING THE COOLANT LEVEL**

1. Place the vehicle on a level surface.
2. Lift the hood up.
3. Check:
   - coolant level
     The coolant level should be between the minimum level mark a and maximum level mark b.
     Below the minimum level mark → Add the recommended coolant to the proper level.

**CAUTION:**
- Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant, check and if necessary, correct the antifreeze concentration of the coolant.
- Use only distilled water. However, soft water may be used if distilled water is not available.
4. Start the engine, warm it up for several minutes, and then turn it off.

5. Check:
   • coolant level

**NOTE:**
Before checking the coolant level, wait a few minutes until the coolant has settled.

6. Close the hood.

**CHANGING THE COOLANT**
1. Remove:
   • driver seat
   • passenger seat
   • console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
2. Lift the hood up.

3. Remove:
   • coolant reservoir cap ①
4. Disconnect:
   • coolant reservoir hose ②

5. Drain:
   • coolant
     (from the coolant reservoir)
6. Connect:
   • coolant reservoir hose

7. Remove:
   • coolant drain bolt (water pump) ①
     (along with the copper washer)
8. Remove:
   • radiator cap ①

**WARNING**
A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:
Place a thick rag or a towel over the radiator cap and slowly turn the radiator cap counterclockwise toward the detent to allow any residual pressure to escape. When the hissing sound has stopped, turn the radiator cap counterclockwise while pressing down on it and then remove it.

9. Drain:
   • coolant

10. Disconnect:
   • coolant outlet hose ①
   • water pump inlet hose ②

11. Drain:
   • coolant

12. Check:
   • copper washer ①
   • coolant drain bolt ②
   Damage → Replace.

13. Install:
   • coolant drain bolt (water pump)

   \[\times 10 \text{ Nm (1.0 m} \cdot \text{kg, 7.2 ft} \cdot \text{lb)}\]
CHANGING THE COOLANT

14. Connect:
- water pump inlet hose
- coolant outlet hose

15. Remove:
- air bleed bolt

16. Fill:
- cooling system
  (with the specified amount of the recommended coolant)

Recommended antifreeze
High-quality ethylene glycol antifreeze containing corrosion inhibitors for aluminum engines
Mixing ratio
1 : 1 (antifreeze : water)
Quantity
- Total amount:
  2.5 L (2.20 Imp qt, 2.64 US qt)
- Coolant reservoir capacity:
  0.35 L (0.31 Imp qt, 0.37 US qt)

NOTE: The specified amount of coolant is a standard amount. Fill the cooling system with coolant until coolant comes out of the hole for the air bleed bolt.

Handling notes for coolant
Coolant is potentially harmful and should be handled with special care.

WARNING
- If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.
- If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.
- If coolant is swallowed, induce vomiting and get immediate medical attention.
CAUTION:

- Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant, check, and if necessary, correct the antifreeze concentration of the coolant.
- Use only distilled water. However, soft water may be used if distilled water is not available.
- If coolant comes into contact with painted surfaces, immediately wash them with water.
- Do not mix different types of antifreeze.

17. Install:
   - air bleed bolt

18. Install:
   - radiator cap

19. Fill:
   - coolant reservoir
     (with the recommended coolant to the maximum level mark ⑧)

20. Install:
   - coolant reservoir cap

21. Start the engine, warm it up for several minutes, and then turn it off.

22. Check:
   - coolant level
     Refer to “CHECKING THE COOLANT LEVEL”.

NOTE: 
Before checking the coolant level, wait a few minutes until the coolant has settled.

23. Close the hood.

24. Install:
   - console
   - passenger seat
   - driver seat
     Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
CHECKING THE COOLANT TEMPERATURE WARNING LIGHT

1. Coolant temperature indicator light

CHECKING THE COOLANT TEMPERATURE WARNING LIGHT checking method

- Turn the main switch “ON”.
- Coolant temperature warning light does not come on.
  - Turn the main switch to “START” with the transmission in neutral position.
  - Coolant temperature warning light comes on momentarily.
  - Coolant temperature and electrical circuit are OK. Go ahead with riding.
- Coolant temperature warning light does not come on.
  - Check the electrical circuit.

CHECKING THE V-BELT

1. Remove:
   - driver seat
   - passenger seat
   - console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
   - drive belt cover
   Refer to “PRIMARY AND SECONDARY SHEAVES” in chapter 4.
CHECKING THE V-BELT

2. Check:
   - V-belt 1
     Cracks/wear/scaling/chipping \(\rightarrow\) Replace.
     Oil/grease \(\rightarrow\) Check primary sheave and secondary sheave.

3. Measure:
   - V-belt width 2
     Out of specification \(\rightarrow\) Replace.

4. Replace:
   - V-belt

   a. Install the bolts 1 (90101-06016) into the secondary fixed sheave hold.
      
      **NOTE:**
      Tightening the bolts 1 will push the secondary sliding sheave away, causing the gap between the secondary fixed and sliding sheaves to widen.

   b. Remove the V-belt 1 from the primary sheave and secondary sheave.
   c. Install the V-belt.
      
      **NOTE:**
      Install the V-belt so that its arrow faces the direction shown in the illustration.

   d. Remove the bolts.
CHECKING THE V-BELT/
CLEANING THE SPARK ARRESTER

5. Remove:
- drive belt cover
  Refer to “PRIMARY AND SECONDARY SHEAVES” in chapter 4.
- console
- passenger seat
- driver seat
  Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

CLEANING THE SPARK ARRESTER
1. Clean:
- spark arrester

-------------------

WARNING

- Select a well-ventilated area free of combustible materials.
- Always let the exhaust system cool before performing this operation.
- Do not start the engine when removing the tailpipe from the muffler.

-------------------

a. Remove the bolts ①.
b. Remove the tailpipe ② by pulling it out of the muffler.
c. Tap the tailpipe lightly with a soft-face hammer or suitable tool, then use a wire brush to remove any carbon deposits from the spark arrester portion of the tailpipe and the inner contact surfaces of the muffler.
d. Insert the tailpipe ② into the muffler and align the bolt holes.
e. Insert the bolt ① and tighten it.
f. Start the engine and rev it up approximately twenty times while momentarily creating exhaust system back pressure by blocking the end of the muffler with a shop towel.
g. Stop the engine and allow the exhaust pipe to cool.

-------------------
CHASSIS

ADJUSTING THE BRAKE PEDAL

1. Check:
   • brake pedal free play 
     Out of specification → Adjust.

NOTE: 
The end of the brake rod ① should lightly contact the brake master cylinder ②.

Brake pedal free play
0 mm (0.0 in)

2. Adjust:
   • brake pedal free play

- Loosen the locknut ①.
- Turn brake rod ② in or out until the correct free play is obtained.
- Tighten the locknut to specification.

Turning in | Free play is increased.
Turning out | Free play is decreased.

Locknut
17 Nm (1.7 m·kg, 12 ft·lb)

NOTE: 
Make sure that there is no brake drag on the front or rear wheels.
ADJUSTING THE PARKING BRAKE

1. Shift the drive select lever into low gear “L”.
2. Remove:
   - driver seat
   - passenger seat
   - console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

3. Check:
   - parking brake cable free play
     Out of specification → Adjust.

4. Adjust:
   - parking brake cable free play
     a. Pull back the adjuster cover ①.
     b. Loosen the locknut ②.
     c. Turn the adjuster ③ in or out until the correct free play is obtained.
     d. Tighten the locknut ②.
     e. Slide the adjuster cover ① to its original position.

5. Install:
   - console
   - passenger seat
   - driver seat
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
CHECKING THE BRAKE FLUID LEVEL

1. Place the vehicle on a level surface.

**NOTE:**

When checking the brake fluid level, make sure that the top of the brake fluid reservoir top is horizontal.

2. Lift the hood up.

3. Check:
   - brake fluid level
     Fluid level is under “MIN” level line \( \rightarrow \) Fill up.

**CAUTION:**

Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

**WARNING**

- Use only the designed quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in a vapor lock.

4. Close the hood.
CHECKING THE FRONT BRAKE PADS
1. Remove:
   • front wheels
2. Check:
   • brake pads
   Wear indicator groove ① almost disappeared → Replace the brake pads as a set.
   Refer to “FRONT AND REAR BRAKES” in chapter 8.

3. Operate the brake pedal.
4. Install:
   • front wheels

CHECKING THE REAR BRAKE PADS
1. Check:
   • brake pads
   Wear indicator groove ① almost disappeared → Replace the brake pads as a set.
   Refer to “FRONT AND REAR BRAKES” in chapter 8.

2. Operate the brake pedal.

CHECKING THE BRAKE HOSES AND BRAKE PIPES
1. Remove:
   • driver seat
   • passenger seat
   • console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
2. Lift the hood up.
3. Lift the cargo bed.
4. Check:
   • front brake hoses
   • rear brake pipes
   • rear brake hoses
   Cracks/wear/damage → Replace.
   Fluid leakage → Replace all damaged parts.
   Refer to “FRONT AND REAR BRAKES” in chapter 8.

NOTE: ______________________________________________________________________
Hold the vehicle in an upright position and apply the brake pedal.

5. Check:
   • brake hose clamps
     Loosen → Tighten.
6. Lower the cargo bed.
7. Close the hood.
8. Install:
   • console
   • passenger seat
   • driver seat
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

BLEEDING THE HYDRAULIC BRAKE SYSTEM

⚠️ WARNING ______________________________________________________________________
Bleed the brake system if:
• The system has been disassembled.
• A brake hose or brake pipe have been loosened or removed.
• The brake fluid has been very low.
• The brake operation has been faulty.
A loss of braking performance may occur if the brake system is not properly bled.
BLEEDING THE HYDRAULIC BRAKE SYSTEM

1. Bleed:
   • brake system

   ▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶şı
ADJUSTING THE SELECT LEVER SHIFT ROD

1. Adjust:
   - Select lever shift rod

   a. Make sure the select lever is in NEUTRAL.
   b. Loosen both locknuts ①.

   **CAUTION:**
   The select lever shift rod locknut (select lever side) has left-handed threads. To loosen the locknut, turn it clockwise.

   c. Adjust the shift rod length for smooth and correct shifting.
   d. Tighten the locknuts ①.

   | Locknut | 15 Nm (1.5 m · kg, 11 ft · lb) |

ADJUSTING THE BRAKE LIGHT SWITCH

**NOTE:**
- The brake light switch is operated by movement of the brake pedal.
- The brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.
ADJUSTING THE BRAKE LIGHT SWITCH/ CHECKING THE FINAL GEAR OIL LEVEL

1. Check:
   - brake light operation timing
     Incorrect → Adjust.

2. Adjust:
   - brake light operation timing

Hold the main body ① of the brake light switch so that it does not rotate and turn the adjusting nut ② in direction ③ or ④ until the brake light comes on at the proper time.

<table>
<thead>
<tr>
<th>Direction ③</th>
<th>Brake light comes on sooner.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction ④</td>
<td>Brake light comes on later.</td>
</tr>
</tbody>
</table>

CHECKING THE FINAL GEAR OIL LEVEL

1. Place the vehicle on a level surface.
2. Remove:
   - oil filler plug ①
3. Check:
   - oil level
     Oil level should be up to the brim of the hole.
     Oil level low → Add oil to the proper level.

**CAUTION:**
Take care not allow foreign material to enter the final gear case.

4. Install:
   - oil filler plug ①
     [23 Nm (2.3 m·kg, 17 ft·lb)]
CHANGING THE FINAL GEAR OIL
1. Place the vehicle on a level surface.
2. Place a container under the final gear case to collect the used oil.
3. Remove:
   • oil filler plug ①
   • drain plug ②
4. Drain:
   • final gear oil
5. Install:
   • drain plug ②

NOTE:
Check the drain plug gasket. If it is damaged, replace it with a new one.

6. Fill:
   • final gear case

Periodic oil change
0.25 L (0.22 Imp qt, 0.26 US qt)
Total amount
0.28 L (0.25 Imp qt, 0.30 US qt)
Recommended oil
SAE 80 API “GL-4” Hypoid gear oil

CAUTION:
Take care not to allow foreign material to enter the final gear case.

7. Install:
   • oil filler plug

CHECKING THE DIFFERENTIAL GEAR OIL
1. Place the vehicle on a level surface.
2. Remove:
   • oil filler plug ①
3. Check:
   - oil level
   Oil level should be up to the brim of hole.
   Oil level low → Add oil to proper level.

<table>
<thead>
<tr>
<th>Recommended oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE 80 API “GL-4” Hypoid gear oil</td>
</tr>
</tbody>
</table>

**CAUTION:**
Take care not allow foreign material to enter the differential gear case.

4. Install:
   - oil filler plug  
   Recommended oil

   **23 Nm (2.3 m·kg, 17 ft·lb)**

---

**CHANGING THE DIFFERENTIAL GEAR OIL**

1. Place the vehicle on a level surface.
2. Place a receptacle under the differential gear case.
3. Remove:
   - oil filler plug  
   - drain plug  
4. Drain:
   - differential gear oil
5. Install:
   - drain plug  

**NOTE:**
Check the gasket (drain plug). If it is damaged, replace it with new one.
6. Fill:
   • differential gear case

**NOTE:**
If gear oil is filled to the brim of the oil filler hole, oil may start leaking from the differential gear case breather hose. Therefore, check the quantity of the oil, not its level.

**CAUTION:**
Take care not to allow foreign material to enter the differential gear case.

7. Install:
   • oil filler plug \( 23 \text{ Nm (2.3 m·kg, 17 ft·lb)} \)

---

**CHECKING THE CONSTANT VELOCITY JOINT DUST BOOTS**

1. Check:
   • dust boots ①
     Damage → Replace.
     Refer to “FRONT CONSTANT VELOCITY JOINTS, DIFFERENTIAL GEAR AND DRIVE SHAFT” in chapter 7.

   - Front
   - Rear
CHECKING THE STEERING SYSTEM
1. Place the vehicle on a level surface.
2. Check:
   • steering assembly bearings
     Try to move the steering wheel up and down, and back and forth.
     Excessive play → Replace the steering shaft assembly.

3. Check:
   • tie-rod ends
     Turn the steering wheel to the left and right until it stops completely, and then move the steering wheel slightly in the opposite direction.
     Tie-rod end(s) have vertical play → Replace the tie-rod end(s).

4. Raise the front end of the vehicle so that there is no weight on the front wheels.
5. Check:
   • ball joints and/or wheel bearings
     Move the wheels laterally back and forth.
     Excessive free play → Replace the front arms (upper and lower) and/or wheel bearings.

ADJUSTING THE TOE-IN
1. Place the vehicle on a level surface.
2. Measure:
   • toe-in
     Out of specification → Adjust.

\[\text{Toe-in} \quad 15 ~ 25 \text{ mm} \ (0.59 ~ 0.98 \text{ in}) \quad \text{(with tires touching the ground)}\]

\[\text{NOTE:} \quad \text{Before measuring the toe-in, make sure that the tire pressure is correct.}\]

a. Mark both front tire tread centers.
b. Face the steering wheel straight ahead.
c. Measure distance $\overline{A}$ between the marks.

d. Rotate the front tires $180^\circ$ until the marks are exactly opposite one another.

e. Measure distance $\overline{B}$ between the marks.

f. Calculate the toe-in using the formula given below.

$$\text{Toe-in} = B - A$$

g. If the toe-in is incorrect, adjust it.

**WARNING**

- Be sure that both tie-rods are turned the same amount. If not, the vehicle will drift right or left even though the steering wheel is positioned straight. This may lead to mishandling and an accident.

- After setting the toe-in to specification, run the vehicle slowly for some distance with both hands lightly holding the steering wheel and check that the steering wheel responds correctly. If not, turn either the right or left tie-rod within the toe-in specification.

a. Mark both tie-rods ends.

This reference point will be needed during adjustment.

b. Loosen the locknut (tie-rod end) ① on each tie-rod.

c. The same number of turns should be given to both the right and left tie-rods ② until the specified toe-in is obtained. This is to keep the length of the rods the same.

d. Tighten the rod end locknut on each tie-rod.

**LOCKNUT (ROD END)**

40 Nm (4.0 m·kg, 29 ft·lb)
ADJUSTING THE FRONT SHOCK ABSORBERS

**WARNING**
Always adjust both shock absorber spring preload to the same setting. Uneven adjustment can cause poor handling and loss of stability.

**NOTE:**
The spring preload of the shock absorbers can be adjusted to suit the operator’s preference, weight, and the operating conditions.

1. Adjust:
   - spring preload
   Turn the adjuster 1 to increase or decrease the spring preload.

<table>
<thead>
<tr>
<th>Standard position: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum (Soft) position: 1</td>
</tr>
<tr>
<td>Maximum (Hard) position: 5</td>
</tr>
</tbody>
</table>

ADJUSTING THE REAR SHOCK ABSORBERS

**WARNING**
Always adjust both shock absorber spring preload to the same setting. Uneven adjustment can cause poor handling and loss of stability.

**NOTE:**
The spring preload of the shock absorbers can be adjusted to suit the operator’s preference, weight, and the operating conditions.

1. Adjust:
   - spring preload
   Turn the adjuster 1 to increase or decrease the spring preload.

<table>
<thead>
<tr>
<th>Standard position: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum (Soft) position: 1</td>
</tr>
<tr>
<td>Maximum (Hard) position: 5</td>
</tr>
</tbody>
</table>
CHECKING THE TIRES

WARNING

• TIRE CHARACTERISTICS
1) Tire characteristics influence the handling of vehicle’s. The tires listed below have been approved by Yamaha Motor Manufacturing corporation of America for this model. If other tire combinations are used, they can adversely affect your vehicle’s handling characteristics and are therefore not recommended.

<table>
<thead>
<tr>
<th></th>
<th>Manufacturer</th>
<th>Size</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>GOODYEAR</td>
<td>25 × 8-12 NHS</td>
<td>Rawhide RS</td>
</tr>
<tr>
<td>Rear</td>
<td>GOODYEAR</td>
<td>25 × 10-12 NHS</td>
<td>Rawhide RS</td>
</tr>
</tbody>
</table>

• TIRE PRESSURE
1) Recommended tire pressure
   Front 70 kPa (0.70 kg/cm², 10 psi)
   Rear 98 kPa (0.98 kg/cm², 14 psi)
2) Tire pressure below the minimum specification could cause the tire to dislodge from the rim under severe riding conditions.
   The following are minimums:
   Front 63 kPa (0.63 kg/cm², 9 psi)
   Rear 91 kPa (0.91 kg/cm², 13 psi)
3) Use no more than
   Front 250 kPa (2.5 kg/cm², 36 psi)
   Rear 250 kPa (2.5 kg/cm², 36 psi)
   when seating the tire beads. Higher pressures may cause the tire to burst.
   Inflate the tires slowly and carefully.
   Fast inflation could cause the tire to burst.

• MAXIMUM LOADING LIMIT
1) Vehicle loading limit (total weight of cargo, operator, passenger and accessories, and tongue weight): 397 kg (876 lb)
2) Cargo bed: 181 kg (400 lb)
3) Trailer hitch:
   Pulling load (total weight of trailer and cargo): 550 kg (1,212 lb)
   Tongue weight (vertical weight on trailer hitch point): 50 kg (110 lb)
   Be extra careful of the vehicle balance and stability when towing a trailer.
1. Measure:
   - tire pressure (cold tire pressure)
     Out of specification → Adjust.

**NOTE:**
- The tire pressure gauge ① is included as standard equipment.
- If dust or the like is stuck to this gauge, it will not provide the correct readings. Therefore, take two measurements of the tire’s pressure and use the second reading.

<table>
<thead>
<tr>
<th>Cold tire pressure</th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>70 kPa (0.70 kg/cm², 10 psi)</td>
<td>98 kPa (0.98 kg/cm², 14 psi)</td>
</tr>
<tr>
<td>Minimum</td>
<td>63 kPa (0.63 kg/cm², 9 psi)</td>
<td>91 kPa (0.91 kg/cm², 13 psi)</td>
</tr>
<tr>
<td>Maximum</td>
<td>77 kPa (0.77 kg/cm², 11 psi)</td>
<td>105 kPa (1.05 kg/cm², 15 psi)</td>
</tr>
</tbody>
</table>

**WARNING**
Uneven or improper tire pressure may adversely affect the handling of this vehicle and may cause loss of control.
- Maintain proper tire pressures.
- Set tire pressures when the tires are cold.
- Tire pressures must be equal in both front tires and equal in both rear tires.

2. Check:
   - tire surfaces
     Wear/damage → Replace.

**Tire wear limit ②**
Front and rear: 3.0 mm (0.12 in)

**WARNING**
It is dangerous to ride with a worn-out tire. When tire wear is out of specification, replace the tire immediately.
CHECKING THE WHEELS

1. Check:
   • wheels
     Damage/bends → Replace.

NOTE: _____________
Always balance the wheel when a tire or wheel has been changed or replaced.

WARNING _____________
• Never attempt even small repairs to the wheel.
• Ride conservatively after installing a tire to allow it to seat itself properly on the rim.

CHECKING AND LUBRICATING THE CABLES

WARNING _____________
A damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result so replace a damaged cable as soon as possible.

1. Check:
   • cable sheath
     Damage → Replace.

2. Check:
   • cable operation
     Unsmooth operation → Lubricate or replace.

Recommended lubricant
Yamaha chain and cable lube or engine oil

NOTE: _____________
Hold the cable end up and apply several drops of lubricant to the cable.

3. Apply:
   • lithium-soap-based grease
     (onto end of the cable)
LUBRICATING THE PEDAL, ETC.

1. Lubricate the pivoting parts.

<table>
<thead>
<tr>
<th>Recommended lubricant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium-soap-based grease</td>
</tr>
</tbody>
</table>
WARNING

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.
- KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.
- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

FIRST AID IN CASE OF BODILY CONTACT:

EXTERNAL

- Skin — Wash with water.
- Eyes — Flush with water for 15 minutes and get immediate medical attention.

INTERNAL

- Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.

CAUTION:

- This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.
- Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.
NOTE: Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Lift the hood up.
2. Remove:
   • battery case cover
3. Disconnect:
   • battery leads

CAUTION: First, disconnect the negative battery lead ①, and then the positive battery lead ②.

4. Remove:
   • battery
5. Check:
   • battery charge

a. Connect a pocket tester to the battery terminals.

Positive tester probe → positive battery terminal
Negative tester probe → negative battery terminal

NOTE: The charge state of an MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive terminal is disconnected).

• No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

b. Check the charge of the battery, as shown in the charts and the following example.

Example
  c. Open-circuit voltage = 12.0 V
  d. Charging time = 6.5 hours
  e. Charge of the battery = 20 ~ 30%
6. Charge:
   • battery
      (refer to the appropriate charging method illustration)

   **WARNING**
   Do not quick charge a battery.

   **CAUTION:**
   • Never remove the MF battery sealing caps.
   • Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
   • If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
   • When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative battery lead from the battery terminal.)
   • To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
   • Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
   • Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
   • If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!
   • As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.
CHECKING AND CHARGING THE BATTERY

Charging method using a variable-current (voltage) charger

Measure the open-circuit voltage prior to charging.

Connect a charger and ammeter to the battery and start charging.

Is the amperage higher than the standard charging amperage written on the battery?

Adjust the charging voltage to 20 ~ 25 V.

Monitor the amperage for 3 ~ 5 minutes. Is the standard charging amperage exceeded?

If the amperage does not exceed the standard charging amperage after 5 minutes, replace the battery.

Adjust the voltage to obtain the standard charging amperage.

Set the timer to the charging time determined by the open-circuit voltage. Refer to "CHECKING AND CHARGING THE BATTERY".

If the required charging time exceeds 5 hours, it is advisable to check the charging amperage after 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging amperage.

Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

12.8 V → Charging is complete.
12.0 ~ 12.7 V → Recharging is required.
Under 12.0 V → Replace the battery.

NOTE:
Leaving the battery unused for more than 30 minutes before measuring its open-circuit voltage.

NOTE:
Set the charging voltage to 16 ~ 17 V. If the charging voltage is lower, charging will be insufficient; if it is higher, the battery will be over-charged.

YES

NO

YES

NO
CHECKING AND CHARGING THE BATTERY

Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

Connect a charger and ammeter to the battery and start charging.

Is the amperage higher than the standard charging amperage written on the battery?

YES

Charge the battery until the charging voltage reaches 15 V.

NOTE: Leave the battery unused for more than 30 minutes before measuring its open-circuit voltage.

12.8 V → Charging is complete.
12.0 ~ 12.7 V → Recharging is required.
Under 12.0 V → Replace the battery.

NOTE: Set the charging time to a maximum of 20 hours.

CAUTION: Constant amperage chargers are not suitable for charging MF batteries.

NO

This type of battery charger cannot charge an MF battery. A variable voltage charger is recommended.

Leaves the battery unused for more than 30 minutes before measuring its open-circuit voltage.

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CHECKING AND CHARGING THE BATTERY

CHECKING THE BATTERIES

7. Install:
   - battery
8. Connect:
   - battery leads

**CAUTION:**
First, connect the positive battery lead ①, and then the negative battery lead ②.

9. Check:
   - battery terminals
   - Dirt → Clean with a wire brush.
   - Loose connection → Connect properly.

10. Lubricate:
    - battery terminals

Recommended lubricant
Dielectric grease

11. Install:
    - battery case cover

12. Close the hood.

CHECKING THE FUSES

**CAUTION:**
Always turn off the main switch when checking or replacing a fuse. Otherwise, a short circuit may occur.

1. Lift the hood up.
2. Remove:
   - battery case cover
3. Check:
   - fuses

a. Connect the pocket tester to the fuse and check it for continuity.

**NOTE:**
Set the tester to the “Ω × 1” position.

Pocket tester
P/N. YU-03112-C, 90890-03112

b. If the tester indicates “∞”, replace the fuse.
4. Replace:

- blown fuse


a. Turn off the ignition.
b. Install a new fuse of the proper amperage.
c. Turn on switches to verify operation of the related electrical devices.
d. If the fuse immediately blows again, check the electrical circuit.


WARNING

Never use a fuse with a rating other than that specified. Never use other materials in place of a fuse. An improper fuse may cause extensive damage to the electrical system, a malfunction of the lighting and ignition systems and could possibly cause a fire.

5. Install:
- battery case cover

6. Close the hood.
ADJUSTING THE HEADLIGHT BEAM

1. Adjust:
   - headlight beam (vertically)
     Turn the adjuster ① in or out.

<table>
<thead>
<tr>
<th>Turning in</th>
<th>Headlight beam raised.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning out</td>
<td>Headlight beam lowered.</td>
</tr>
</tbody>
</table>

CHANGING THE HEADLIGHT BULB

1. Lift the hood up.
2. Remove:
   - headlight bulb holder cover ①
3. Remove:
   - headlight bulb holder (with bulb) ①
   - bulb

**NOTE:**
Remove the defective bulb by unhooking the headlight bulb holder tabs ②.

**WARNING**
Keep flammable products and your hands away from the bulb while it is on, since it will be hot. Do not touch the bulb until it cools down.

4. Install:
   - bulb [New]
     Secure the new bulb with the headlight bulb holder.

**CAUTION:**
Avoid touching the glass part of the bulb. Keep it free from oil; otherwise, the transparency of the glass, life of the bulb, and luminous flux will be adversely affected. If oil gets on the bulb, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.
5. Install:
   - headlight bulb holder (with bulb)
   - headlight bulb holder cover
6. Close the hood.

CHANGING THE TAIL/BRAKE LIGHT BULB
1. Remove:
   - cargo bed panel ①
2. Remove:
   - tail/brake light bulb holder (with bulb) ①
   - bulb

   **NOTE:**
   Turn the bulb holder counterclockwise and remove the defective bulb.

---

**WARNING**

Keep flammable products and your hands away from the bulb while it is on, since it will be hot. Do not touch the bulb until it cools down.

---

3. Install:
   - bulb **New**
   Secure the new bulb with the tail/brake light bulb holder.

   **CAUTION:**

Avoid touching the glass part of the bulb. Keep it free from oil; otherwise, the transparency of the glass, life of the bulb, and luminous flux will be adversely affected. If oil gets on the bulb, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.
4. Install:
   - tail/brake light bulb holder (with bulb)
5. Install:
   - cargo bed panel

\[ 7 \text{Nm (0.7 m} \cdot \text{kg, 5.1 ft} \cdot \text{lb) } \]
ENGINE REMOVAL
AIR DUCTS, MUFFLER AND EXHAUST PIPE

Removing the air ducts, muffler and exhaust pipe
- Engine oil
- Coolant
- Driver seat/passenger seat/console/air duct end cover/left protector
- Engine cooling fan air duct assembly
- Carburetor assembly/air filter case

Remove the parts in the order listed.
- Drain.
- Refer to “CHANGING THE ENGINE OIL” in chapter 3.
- Drain.
- Refer to “CHANGING THE COOLANT” in chapter 3.
- Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
- Refer to “ENGINE COOLING FAN AND A.C. MAGNETO”.
- Refer to “CARBURETOR” in chapter 6.
**Order** | **Job/Part** | **Q'ty** | **Remarks**
--- | --- | --- | ---
Fuel tank | | | Refer to “FUEL PUMP AND FUEL TANK” in chapter 6.
1 | Heat protector | 1 | 
2 | Muffler stay | 1 | 
3 | Muffler damper | 1 | 
4 | Muffler bracket | 1 | 
5 | Muffler/gasket | 1/1 | 
6 | Exhaust pipe/gasket | 1/2 | 
7 | Air duct assembly 1 | 1 | For installation, reverse the removal procedure.
8 | Air duct assembly 2 | 1 |
## SELECT LEVER UNIT AND COOLANT RESERVOIR

![Diagram of select lever unit and coolant reservoir]

### Table

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Removing the select lever unit and coolant reservoir</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Shift arm</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Select lever shift rod</td>
<td>1</td>
<td><strong>CAUTION:</strong> The select lever shift rod locknut (select lever side) has left-handed threads. To loosen the locknut, turn it clockwise.</td>
</tr>
<tr>
<td>3</td>
<td>Select lever unit</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

**For installation, reverse the removal procedure.**
### HOSES AND LEADS

Removing the hoses and leads

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water pump inlet hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>2</td>
<td>Coolant outlet hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>3</td>
<td>Oil inlet hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>4</td>
<td>Oil outlet hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>5</td>
<td>Vacuum hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>6</td>
<td>Spark plug lead</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>7</td>
<td>Crankcase breather hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>8</td>
<td>Thermo switch 1 lead</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>9</td>
<td>Starter motor lead</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>10</td>
<td>A.C. magneto lead coupler</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>11</td>
<td>Speed sensor lead coupler</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>12</td>
<td>Gear position switch lead coupler</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
</tbody>
</table>

Remove the parts in the order listed.

![Diagram of engine components with labels](image-url)
<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Reverse switch lead</td>
<td>1</td>
<td>Green/White</td>
</tr>
<tr>
<td>14</td>
<td>Engine ground lead</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

For installation, reverse the removal procedure.

10 Nm (1.0 m·kg, 7.2 ft·lb)
## ENGINE MOUNTING BOLTS

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Removing the engine mounting bolts</td>
<td></td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td></td>
<td>Front skid plate/center skid plate/rear</td>
<td></td>
<td>Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.</td>
</tr>
<tr>
<td></td>
<td>skid plate</td>
<td></td>
<td>Refer to “REAR WHEELS AND BRAKE DISC” in chapter 8.</td>
</tr>
<tr>
<td></td>
<td>Rear wheels</td>
<td></td>
<td>Refer to “REAR CONSTANT VELOCITY JOINTS, FINAL DRIVE GEAR AND DRIVE SHAFT” in chapter 7.</td>
</tr>
<tr>
<td></td>
<td>Final drive gear assembly</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Torque Specifications**

- 52 Nm (5.2 m·kg, 37 ft·lb)
- 10 Nm (1.0 m·kg, 7.2 ft·lb)
- 33 Nm (3.3 m·kg, 24 ft·lb)
**ENGINE REMOVAL**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rubber damper nut (rear)</td>
<td>2</td>
<td>NOTE: Remove the engine assembly from the top of the vehicle.</td>
</tr>
<tr>
<td>2</td>
<td>Engine mounting bolt (front-upper)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Engine mounting bolt (front-lower)/nut</td>
<td>1/1</td>
<td>CAUTION: Install all of the bolts/nuts and then tighten them to full torque specifications.</td>
</tr>
<tr>
<td>4</td>
<td>Engine assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rubber damper nut (front)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Rubber damper (front)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Rubber damper (rear)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Engine mounting bolt (rear)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Engine bracket (left)</td>
<td>1</td>
<td>Refer to “INSTALLING THE ENGINE”. For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>10</td>
<td>Engine bracket (right)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**CAUTION:**

Install all of the bolts/nuts and then tighten them to full torque specifications.

52 Nm (5.2 m·kg, 37 ft·lb)

10 Nm (1.0 m·kg, 7.2 ft·lb)

33 Nm (3.3 m·kg, 24 ft·lb)

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INSTALLING THE ENGINE

1. Install:
   - engine mounting bolt (rear) ①
   - rubber damper (rear) ②
   - rubber damper nut (front) ③
   - engine assembly ④
   - engine mounting bolt (front lower)/nut ⑤
   - engine mounting bolt (front upper) ⑥
   - rubber damper nut (rear) ⑦

   **NOTE:**
   Do not fully tighten the bolts and nuts.

2. Tighten:
   - engine mounting bolt (rear) ① 33 Nm (3.3 m·kg, 24 ft·lb)
   - rubber damper nut (front) ③ 52 Nm (5.2 m·kg, 37 ft·lb)
   - engine mounting bolt (M10, front lower)/nut ⑤ 56 Nm (5.6 m·kg, 40 ft·lb)
   - engine mounting bolt (M6, front upper) ⑥ 10 Nm (1.0 m·kg, 7.2 ft·lb)
   - rubber damper nut (rear) ⑦ 52 Nm (5.2 m·kg, 37 ft·lb)
Removing the cylinder head cover

Driver seat/passenger seat/console

- air shroud 1/engine cooling fan/timing plug

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Union bolt</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Copper washer</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Oil delivery pipe 3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Oil delivery pipe 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Spark plug</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Tappet cover (intake)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Tappet cover (exhaust)</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Remove the parts in the order listed. Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8. Refer to “ADJUSTING THE VALVE CLEARANCE” in chapter 3.
**CYLINDER HEAD COVER**

**Order** | **Job/Part** | **Q'ty** | **Remarks**
--- | --- | --- | ---
8 | Cylinder head cover | 1 | Refer to “REMOVING THE CYLINDER HEAD COVER” and “INSTALLING THE CYLINDER HEAD COVER”.
9 | Dowel pin | 2 | For installation, reverse the removal procedure.
Removing the Cylinder Head Cover

1. Align:
   "I" mark
   (with stationary pointer)

   a. Turn the crankshaft counterclockwise with a wrench.
   b. Align the "I" mark on the rotor with the stationary pointer on the A.C. magneto cover. When the "I" mark is aligned with the stationary pointer, the piston is at the Top Dead Center (TDC).

   NOTE:
   When the piston is at the top dead center (TDC) on the compression stroke, there should be clearance between the valve stem tips and their respective rocker arm adjusting screws.
   If there is no clearance, rotate the crankshaft counterclockwise one turn.

2. Remove:
   - cylinder head cover

   NOTE:
   Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all the bolts are loosened, remove them.

Checking the Cylinder Head Cover

1. Check:
   - cylinder head cover
     Cracks/damage → Replace the cylinder head cover and cylinder head as a set.

Checking the Tappet Covers

1. Check:
   - tappet cover (intake)
   - tappet cover (exhaust)
     Cracks/damage → Replace.
   - O-rings

   New
INSTALLING THE CYLINDER HEAD COVER

1. Apply:
   - sealant (Quick Gasket®) (to the mating surfaces of the cylinder head and cylinder head cover)

2. Install:
   - cylinder head cover
   - washers
   - bolts

<table>
<thead>
<tr>
<th>Bolt:</th>
<th>Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
</tr>
<tr>
<td>5</td>
<td>55</td>
</tr>
<tr>
<td>6</td>
<td>55</td>
</tr>
<tr>
<td>7</td>
<td>115</td>
</tr>
<tr>
<td>8</td>
<td>130</td>
</tr>
</tbody>
</table>

**NOTE:**
Tighten the cylinder head cover bolts in stages, using a crisscross pattern.
Removing the rocker arms

Cylinder head cover

1. Plug/O-ring 1/1
2. Rocker arm shaft stopper 2
3. Rocker arm shaft 2 1
4. Rocker arm 3 1
5. Rocker arm shaft 3/O-ring 1/1
6. Rocker arm 4 1
7. Rocker arm shaft 1/O-ring 1/1
8. Rocker arm 1 1
9. Rocker arm 2 1

Remove the parts in the order listed. Refer to “CYLINDER HEAD COVER”.

Refer to “REMOVING THE ROCKER ARMS” and “INSTALLING THE ROCKER ARMS”.

14 Nm (1.4 m·kg, 10 ft·lb)

10 Nm (1.0 m·kg, 7.2 ft·lb)
For installation, reverse the removal procedure.
REMOVING THE ROCKER ARMS

1. Remove:
   - rocker arm shafts
   - rocker arms

NOTE:
Use a slide hammer bolt and weight to remove the rocker arm shafts.

---

CHECKING THE ROCKER ARMS

1. Check:
   - rocker arm lobes
   - valve adjusters
     Blue discoloration/pitting/scratches → Replace.

2. Check:
   - rocker arms
   - rocker arm shafts
     Damage/wear → Replace.

a. Check the two contact areas on the rocker arms for signs of abnormal wear.
   1) Rocker arm shaft hole
   2) Camshaft lobe contact surface
     Excessive wear → Replace.

b. Check the surface of the rocker arm shafts.
   Blue discoloration/pitting/scratches → Replace/check lubrication.

c. Measure the inside diameter of the rocker arm holes.
   Out of specification → Replace.

---

Rocker arm inside diameter
12.000 ~ 12.018 mm
(0.4724 ~ 0.4731 in)
d. Measure the outside diameter $\text{b}$ of the rocker arm shafts.
   Out of specification $\rightarrow$ Replace.

<table>
<thead>
<tr>
<th>Rocker arm shaft outside diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.976 ~ 11.991 mm</td>
</tr>
<tr>
<td>(0.4715 ~ 0.4721 in)</td>
</tr>
</tbody>
</table>

e. Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.
   Out of specification $\rightarrow$ Replace the defective part(s).

<table>
<thead>
<tr>
<th>Rocker arm to shaft standard clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.009 ~ 0.042 mm</td>
</tr>
<tr>
<td>(0.0004 ~ 0.0017 in)</td>
</tr>
</tbody>
</table>

INSTALLING THE ROCKER ARMS

1. Install:
   - rocker arms ①
   - rocker arm shafts ②

NOTE:
- The thread hole ③ of the rocker arm shaft must face to the outside.
- After installation, make sure that the thread hole ② of the rocker arm shaft is positioned correctly, as shown in the illustration.
Removing the camshaft and cylinder head

- Carburetor
- Coolant outlet joint breather hose
- Muffler/exhaust pipe/thermo switch 1
- Cylinder head cover

1. Timing chain tensioner cap bolt
2. Timing chain tensioner/gasket
3. Timing chain guide (exhaust side)
4. Decompressor cam guide plate
5. Camshaft sprocket
6. Camshaft

Order | Job/Part                                | Q'ty | Remarks
-----|-----------------------------------------|------|---------------------------------
1    | Removing the camshaft and cylinder head |      | Remove the parts in the order listed.

Refer to “CARBURETOR” in chapter 6.
Refer to “WATER PUMP” in chapter 5.
Refer to “ENGINE REMOVAL”.
Refer to “CYLINDER HEAD COVER”.
Refer to “REMOVING THE CAMSHAFT AND CYLINDER HEAD” and “INSTALLING THE CAMSHAFT AND CYLINDER HEAD”. 
For installation, reverse the removal procedure.
REMOVING THE CAMSHAFT AND CYLINDER HEAD

1. Loosen:
   - camshaft sprocket bolts

2. Loosen:
   - timing chain tensioner cap bolt

3. Remove:
   - timing chain tensioner
   - timing chain guide (exhaust side)
   - decompressor cam guide plates
   - camshaft sprocket
   - camshaft

**NOTE:**
- Fasten a safety wire to the timing chain to prevent it from falling into the crankcase.
- When removing the camshaft sprocket, it is not necessary to separate the timing chain.

4. Remove:
   - cylinder head

**NOTE:**
- Loosen the bolts in the proper sequence.
- Follow the numerical order shown in the illustration. Loosen each bolt 1/4 of a turn at a time until all of the bolts are loose.

CHECKING THE CAMSHAFT

1. Check:
   - cam lobes
     Pitting/scratches/blue discoloration → Replace.

2. Measure:
   - cam lobe dimensions \( a \) and \( b \)
     Out of specification → Replace.

<table>
<thead>
<tr>
<th>Camshaft lobe limit</th>
<th>Intake</th>
<th>Exhaust</th>
</tr>
</thead>
<tbody>
<tr>
<td>( a ) 35.59 mm (1.4012 in)</td>
<td>( b ) 29.96 mm (1.1795 in)</td>
<td>( a ) 36.40 mm (1.4331 in)</td>
</tr>
<tr>
<td>( b ) 30.01 mm (1.1815 in)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHECKING THE CAMSHAFT SPROCKET
1. Check:
   - camshaft sprocket
     Wear/damage → Replace the camshaft sprocket and timing chain as a set.
     a) 1/4 of a tooth
     b) Correct
     ① Timing chain
     ② Sprocket

CHECKING THE DECOMPRESSION SYSTEM
1. Check:
   - decompression system

.removeAllProperties();

CHECKING THE TIMING CHAIN GUIDE (EXHAUST SIDE)
1. Check:
   - timing chain guide (exhaust side)
     Wear/damage → Replace.

CHECKING THE TIMING CHAIN TENSIONER
1. Check:
   - timing chain tensioner
     Cracks/damage/rough movement → Replace.

   a. Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.

   NOTE: ________________
   While pressing the timing chain tensioner rod, wind it clockwise with a thin screwdriver ① until it stops.
b. Removing the screwdriver and slowly release the timing chain tensioner rod.
c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

CHECKING THE CYLINDER HEAD
1. Eliminate:
   • carbon deposits (from the combustion chamber)
     Use a rounded scraper.

   NOTE: Do not use a sharp instrument to avoid damaging or scratching:
   • spark plug threads
   • valve seats

2. Check:
   • cylinder head
     Scratches/damage → Replace the cylinder head cover and cylinder head as a set.
   • cylinder head water jacket
     Mineral deposits/rust → Eliminate.

3. Measure:
   • cylinder head warpage
     Out of specification → Resurface.

   Cylinder head warpage
   Less than 0.03 mm (0.0012 in)

   a. Place a straightedge and a thickness gauge across the cylinder head.
b. Use a thickness gauge to measure the warpage.
c. If the warpage is out of specification, resurface the cylinder head.
d. Place a 400 ~ 600 grit wet sandpaper on the surface plate, and resurface the head using a figure-eight sanding pattern.

**NOTE:**
To ensure an even surface rotate the cylinder head several times.

### INSTALLING THE CAMSHAFT AND CYLINDER HEAD

1. Install:
   - cylinder head gasket
   - cylinder head
   - bolts (M9: 1 ~ 6)
   - bolt (M6: 7)

   **NOTE:**
   - Tighten the bolts in the proper sequence.
   - Follow the numerical order shown in the illustration. Tighten the bolts in two stages.

2. Install:
   - camshaft
   - camshaft sprocket

   **CAUTION:**
   Do not turn the crankshaft during the camshaft installation.
c. Temporarily install the camshaft sprocket on the camshaft. (Do not install the bolts.) Then, install the timing chain on the camshaft sprocket.

**NOTE:**
Make sure the small holes 3 on the camshaft face upward.

d. Align the notches 4 on the decompressor cams with the projections 5 on the decompressor spring lever, then install the camshaft sprocket on the camshaft.

**NOTE:**
Check that each part is positioned as shown in the illustration.

![Diagram of camshaft and cylinder head](image)

- Small holes on camshaft sprocket
- Punch mark on decompressor spring lever
- Top front of cylinder head

e. Install the decompressor cam guide plates 9 and camshaft sprocket bolts 10.

**Camshaft sprocket bolt**

20 Nm (2.0 m·kg, 14 ft·lb)

**NOTE:**
Insert a screwdriver into the timing chain tensioner hole and push the timing chain guide (intake side) inward.

f. Remove the retaining wire.

---

3. Install:
- timing chain guide (exhaust side)

---

4. Install:
- timing chain tensioner

---

a. Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.
b. While pressing the timing chain tensioner rod, wind it clockwise with a thin screwdriver 1 until it stops.
c. With the screwdriver still inserted into the timing chain tensioner, install the timing chain tensioner and gasket onto the cylinder block. Then, tighten the timing chain tensioner bolts to the specified torque.

**WARNING**

Always use a new gasket.

**NOTE:**

The “UP” mark on the timing chain tensioner should face up.

---

Timing chain tensioner bolt 10 Nm (1.0 m·kg, 7.2 ft·lb)

Timing chain tensioner cap bolt 7 Nm (0.7 m·kg, 5.7 ft·lb)

---

d. Remove the screwdriver, make sure that the timing chain tensioner rod releases, and tighten the cap bolt to the specified torque.

---

5. Check:

- small holes on camshaft sprocket
- rotor “I” mark

Out of alignment → Adjust.
Removing the valves and valve springs

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Valve cotter</td>
<td>10</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Valve spring retainer</td>
<td>5</td>
<td>Refer to “CAMSHAFT AND CYLINDER HEAD”.</td>
</tr>
<tr>
<td>3</td>
<td>Intake valve spring</td>
<td>3</td>
<td>Refer to “REMOVING THE VALVES AND VALVE SPRINGS” and “INSTALLING THE VALVES AND VALVE SPRINGS”.</td>
</tr>
<tr>
<td>4</td>
<td>Exhaust valve spring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Intake valve</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Exhaust valve</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Valve stem seal</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Valve spring seat</td>
<td>5</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
REMOVING THE VALVES AND VALVE SPRINGS

1. Check:
   - valve sealing
   Leakage at the valve seat → Check the valve face, valve seat and valve seat width.
   Refer to “CHECKING THE VALVES AND VALVE SPRINGS”.

2. Remove:
   - valve cotters

   **NOTE:**
   Attach a valve spring compressor ① and valve spring compressor attachment ② between the valve spring retainer and the cylinder head to remove the valve cotters.

---

**Valve spring compressor set**
P/N. YM-04019

**Valve spring compressor**
P/N. 90890-04019

**Valve spring compressor attachment**
P/N. YM-01253-1, 90890-01243
CHECKING THE VALVES AND VALVE SPRINGS

1. Measure:
   - stem-to-guide clearance

   **Stem-to-guide clearance =**
   
   valve guide inside diameter \( a \) –
   
   valve stem diameter \( b \)

   Out of specification → Replace the valve guide.

   **Stem-to-guide clearance**
   
   **Intake**
   
   0.010 ~ 0.037 mm
   
   (0.0004 ~ 0.0015 in)
   
   <Limit>: 0.08 mm (0.0031 in)
   
   **Exhaust**
   
   0.025 ~ 0.052 mm
   
   (0.0010 ~ 0.0020 in)
   
   <Limit>: 0.10 mm (0.0039 in)

2. Replace:
   - valve guide

   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

   **NOTE:**

   To ease guide removal, installation and to maintain correct fit, heat the cylinder head to 100 °C (212 °F) in an oven.

   a. Remove the valve guide using a valve guide remover \( 1 \).
   
   b. Install the new valve guide using a valve guide remover \( 1 \) and valve guide installer \( 2 \).
   
   c. After installing the valve guide, bore the valve guide using a valve guide reamer \( 3 \) to obtain proper stem-to-guide clearance.

   **Valve guide remover (ø 6)**
   
   P/N. YM-04064-A, 90890-04064
   
   **Valve guide installer (ø 6)**
   
   P/N. YM-04065-A, 90890-04065
   
   **Valve guide reamer (ø 6)**
   
   P/N. YM-04066, 90890-04066

   **NOTE:**

   After replacing the valve guide reface the valve seat.

   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
3. Check:
- valve face
  Pitting/wear → Grind the face.
- valve stem end
  Mushroom shape or diameter larger than the body of the stem → Replace.

4. Measure:
- margin thickness
  Out of specification → Replace.

<table>
<thead>
<tr>
<th>Margin thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake</td>
</tr>
<tr>
<td>0.85 ~ 1.15 mm</td>
</tr>
<tr>
<td>(0.0335 ~ 0.0453 in)</td>
</tr>
<tr>
<td>Exhaust</td>
</tr>
<tr>
<td>0.85 ~ 1.15 mm</td>
</tr>
<tr>
<td>(0.0335 ~ 0.0453 in)</td>
</tr>
</tbody>
</table>

5. Measure:
- valve stem runout
  Out of specification → Replace.

<table>
<thead>
<tr>
<th>Runout limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 mm (0.0004 in)</td>
</tr>
</tbody>
</table>

**NOTE:**
- When installing a new valve always replace the guide.
- If the valve is removed or replaced always replace the oil seal.

6. Eliminate:
- carbon deposits
  (from the valve face and valve seat)

7. Check:
- valve seats
  Pitting/wear → Reface the valve seat.
8. Measure:
   - valve seat width \( a \)

Out of specification → Reface the valve seat.

<table>
<thead>
<tr>
<th>Valve seat width</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intake</strong></td>
</tr>
<tr>
<td>0.9 ~ 1.1 mm</td>
</tr>
<tr>
<td>(0.0354 ~ 0.0433 in)</td>
</tr>
<tr>
<td><strong>Exhaust</strong></td>
</tr>
<tr>
<td>0.9 ~ 1.1 mm</td>
</tr>
<tr>
<td>(0.0354 ~ 0.0433 in)</td>
</tr>
</tbody>
</table>

<Limit>: 1.6 mm (0.0630 in)

---

a. Apply Mechanic’s blueing dye (Dykem) \( b \) to the valve face.
b. Install the valve into the cylinder head.
c. Press the valve through the valve guide and onto the valve seat to make a clear pattern.
d. Measure the valve seat width. Where the valve seat and valve face made contact, blueing will have been removed.
e. If the valve seat is too wide, too narrow, or the seat is not centered, the valve seat must be refaced.

---

9. Lap:
   - valve face
   - valve seat

**NOTE:**

After refacing the valve seat or replacing the valve and valve guide, the valve seat and valve face should be lapped.

---

a. Apply a coarse lapping compound to the valve face.

**CAUTION:**

Do not let the compound enter the gap between the valve stem and the guide.

b. Apply molybdenum disulfide oil to the valve stem.
c. Install the valve into the cylinder head.
d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the compound.

**NOTE:**
For best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.

e. Apply a fine lapping compound to the valve face and repeat the above steps.

**NOTE:**
After every lapping operation be sure to clean off all of the compound from the valve face and valve seat.

f. Apply Mechanic's blueing dye (Dykem) to the valve face.
g. Install the valve into the cylinder head.
h. Press the valve through the valve guide and onto the valve seat to make a clear pattern.
i. Measure the valve seat width again. If the valve seat width is out of specification, reface and relap the valve seat.

---

10. Measure:
- valve spring free length 📏
  - Out of specification → Replace.

### Valve spring free length

<table>
<thead>
<tr>
<th>Type</th>
<th>Measurement</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake</td>
<td>32.63 mm (1.28 in)</td>
<td>&lt;Limit&gt;: 31.0 mm (1.22 in)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exhaust</td>
</tr>
<tr>
<td></td>
<td>36.46 mm (1.44 in)</td>
<td>&lt;Limit&gt;: 34.6 mm (1.36 in)</td>
</tr>
</tbody>
</table>
11. Measure:
- compressed spring force
  - Out of specification → Replace.
- Installed length

```
Compressed spring force
Intake
100.0 ~ 115.7 N at 27.5 mm
(10.20 ~ 11.80 kg,
22.49 ~ 26.01 lb at 1.08 in)
Exhaust
120.6 ~ 138.3 N at 31.0 mm
(12.30 ~ 14.10 kg,
27.12 ~ 31.09 lb at 1.22 in)
```

12. Measure:
- spring tilt
  - Out of specification → Replace.

```
Spring tilt limit
Intake
2.5°/1.4 mm (0.055 in)
Exhaust
2.5°/1.6 mm (0.063 in)
```

INSTALLING THE VALVES AND VALVE SPRINGS

1. Apply:
   - molybdenum disulfide oil
     (onto the valve stem and valve stem seal)

2. Install:
   - valve spring seats
   - valve stem seals
   - valves
   - valve springs
   - valve spring retainers

NOTE:
Install the valve springs with the larger pitch facing upwards.

\(\hat{b}\) Smaller pitch
3. Install:
   • valve cotters

**NOTE:** Install the valve cotters while compressing the valve spring with the valve spring compressor ① and valve spring compressor attachment ②.

Valve spring compressor set
P/N. YM-04019
Valve spring compressor
P/N. 90890-04019
Valve spring compressor attachment
P/N. YM-01253-1, 90890-01243

4. To secure the valve cotters onto the valve stem, lightly tap the valve tip with a piece of wood.

**CAUTION:** Hitting the valve tip with excessive force could damage the valve.
## CYLINDER AND PISTON

### Removing the cylinder and piston

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coolant inlet joint</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Cylinder/O-ring</td>
<td>1/1</td>
<td>Refer to “WATER PUMP” in chapter 5. Referring to “CAMSHAFT AND CYLINDER HEAD”.</td>
</tr>
<tr>
<td>3</td>
<td>Cylinder gasket</td>
<td>1</td>
<td>Refer to “INSTALLING THE CYLINDER”.</td>
</tr>
<tr>
<td>4</td>
<td>Dowel pin</td>
<td>2</td>
<td>Refer to “REMOVING THE PISTON” and “INSTALLING THE PISTON”.</td>
</tr>
<tr>
<td>5</td>
<td>Piston pin clip</td>
<td>2</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>6</td>
<td>Piston pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Piston</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Piston ring set</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

*42 Nm (4.2 m·kg, 30 ft·lb)*

*10 Nm (1.0 m·kg, 7.2 ft·lb)*

*10 Nm (1.0 m·kg, 7.2 ft·lb)*
REMOVING THE PISTON
1. Remove:
   • piston pin clips ①
   • piston pin ②
   • piston ③

NOTE: Before removing piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and the piston pin is still difficult to remove, use the piston pin puller ④.

CAUTION: Do not use a hammer to drive the piston pin out.

2. Remove:
   • piston rings

NOTE: Spread the end gaps apart while at the same time lifting the piston ring over the top of the piston crown.

CHECKING THE CYLINDER AND PISTON
1. Check:
   • cylinder and piston walls
     Vertical scratches → Rebore or replace the cylinder and the piston.

2. Measure:
   • piston-to-cylinder clearance

1st step:
a. Measure the cylinder bore “C” with a cylinder bore gauge ①.
   ① 50 mm (2.0 in) from the top of the cylinder

NOTE: Measure cylinder bore “C” in parallel to and at right angles to the cylinder matching surface. Then, find the average of the measurements.
b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.

2nd step:

a. Measure piston skirt diameter “P” with a micrometer.  
   - 2.5 mm (0.10 in) from the piston bottom edge  

b. If out of specification, replace the piston and piston rings as a set.

3rd step:

a. Find the piston-to-cylinder clearance with the following formula.

Piston-to-cylinder clearance =  
Cylinder bore “C” – Piston skirt diameter “P”

b. If out of specification, rebore or replace the cylinder, and replace the piston and piston rings as a set.
CHECKING THE PISTON RINGS

1. Measure:
   - ring side clearance
     Use a thickness gauge.
   Out of specification → Replace the piston and rings as a set.

**NOTE:**
Clean carbon from the piston ring grooves and rings before measuring the side clearance.

<table>
<thead>
<tr>
<th>Side clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Standard</strong></td>
</tr>
<tr>
<td>Top ring</td>
</tr>
<tr>
<td>0.04 ~ 0.08 mm</td>
</tr>
<tr>
<td>(0.0016 ~ 0.0031 in)</td>
</tr>
<tr>
<td>2nd ring</td>
</tr>
<tr>
<td>0.03 ~ 0.07 mm</td>
</tr>
<tr>
<td>(0.0012 ~ 0.0028 in)</td>
</tr>
</tbody>
</table>

2. Position:
   - piston ring
     (in cylinder)

**NOTE:**
Insert a ring into the cylinder and push it approximately 50 mm (2.0 in) into the cylinder. Push the ring with the piston crown so that the ring will be at a right angle to the cylinder bore.

![Image of piston ring](image)

@ 50 mm (2.0 in)

3. Measure:
   - ring end gap
     Out of specification → Replace.

**NOTE:**
You cannot measure the end gap on the expander spacer of the oil control ring. If the oil control ring rails show excessive gap, replace all three rings.

<table>
<thead>
<tr>
<th>End gap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Standard</strong></td>
</tr>
<tr>
<td>Top ring</td>
</tr>
<tr>
<td>0.30 ~ 0.45 mm</td>
</tr>
<tr>
<td>(0.0118 ~ 0.0177 in)</td>
</tr>
<tr>
<td>2nd ring</td>
</tr>
<tr>
<td>0.30 ~ 0.45 mm</td>
</tr>
<tr>
<td>(0.0118 ~ 0.0177 in)</td>
</tr>
<tr>
<td>Oil ring</td>
</tr>
<tr>
<td>0.20 ~ 0.70 mm</td>
</tr>
<tr>
<td>(0.0079 ~ 0.0276 in)</td>
</tr>
</tbody>
</table>

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CHECKING THE PISTON PIN

1. Check:
   - piston pin
     Blue discoloration/grooves → Replace, then check the lubrication system.

2. Measure:
   - piston pin-to-piston clearance

   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼

   a. Measure the piston pin outside diameter a. If out of specification, replace the piston pin.

   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼

   b. Measure the piston pin bore inside diameter b.

   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼

   c. Calculate the piston pin-to-piston clearance with the following formula.

   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼

   d. If out of specification, replace the piston.

   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼

INSTALING THE PISTON

1. Install:
   - piston rings
     (onto the piston)

   NOTE:
   - Be sure to install the piston rings so that the manufacturer’s marks or numbers are located on the upper side of the rings.
   - Lubricate the piston and piston rings liberally with engine oil.
2. Position:
- top ring
- 2nd ring
- oil ring

Offset the piston ring end gaps as shown.

- a) Top ring end
- b) Upper oil ring rail end
- c) Oil ring expander end
- d) Lower oil ring rail end
- e) 2nd ring end
- f) 20 mm (0.79 in)

3. Install:
- piston ①
- piston pin ②
- piston pin clips ③

**NOTE:**
- Apply engine oil onto the piston pin, piston rings and piston.
- Be sure that the arrow mark ③ on the piston points to the exhaust side of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean rag to prevent the piston pin clip from falling into the crankcase.

4. Lubricate:
- piston
- piston rings
- cylinder

**NOTE:**
Apply a liberal coating of engine oil.
INSTALLING THE CYLINDER

1. Install:
   - cylinder
   - O-ring [New]
   - bolts (M10)
   - bolts (M6)

   **NOTE:**
   Install the cylinder with one hand while compressing the piston rings with the other hand.

   **CAUTION:**
   - Be careful not to damage the timing chain guide during installation.
   - Pass the timing chain through the timing chain cavity.
## Removing the engine cooling fan and A.C. magneto

Driver seat/passenger seat/console

Drive belt cover

Engine oil

Coolant

Water pump assembly

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Engine cooling fan air duct assembly</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Air shroud 1</td>
<td>1</td>
<td>Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to “PRIMARY AND SECONDARY SHEAVES”.</td>
</tr>
<tr>
<td></td>
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<td>Drain.</td>
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<tr>
<td></td>
<td></td>
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<td>Refer to “CHANGING THE ENGINE OIL” in chapter 3.</td>
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<td>Refer to “CHANGING THE COOLANT” in chapter 3.</td>
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<td>Refer to “WATER PUMP” in chapter 5.</td>
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<tr>
<td>Order</td>
<td>Job/Part</td>
<td>Q'ty</td>
<td>Remarks</td>
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<tr>
<td>-------</td>
<td>---------------------------------------</td>
<td>------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>Engine cooling fan</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Air shroud 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>A.C. magneto coupler</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>6</td>
<td>Engine cooling fan pulley base</td>
<td>1</td>
<td>Refer to “REMOVING THE A.C. MAGNETO”.</td>
</tr>
<tr>
<td>7</td>
<td>A.C. magneto cover/gasket</td>
<td>1/1</td>
<td>“INSTALLING THE A.C. MAGNETO”.</td>
</tr>
<tr>
<td>8</td>
<td>Dowel pin</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Stator lead holder</td>
<td>1</td>
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</tr>
<tr>
<td>10</td>
<td>Pickup coil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Stator assembly</td>
<td>1</td>
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</tr>
<tr>
<td>12</td>
<td>A.C. magneto rotor</td>
<td>1</td>
<td>Refer to “REMOVING THE A.C. MAGNETO”.</td>
</tr>
<tr>
<td>13</td>
<td>Woodruff key</td>
<td>1</td>
<td>“INSTALLING THE A.C. MAGNETO”.</td>
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<tr>
<td>14</td>
<td>Starter wheel gear</td>
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<tr>
<td>15</td>
<td>Washer</td>
<td>1</td>
<td></td>
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<tr>
<td>16</td>
<td>Starter idle gear shaft</td>
<td>1</td>
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</tr>
<tr>
<td>17</td>
<td>Bearing</td>
<td>1</td>
<td></td>
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<td>Order</td>
<td>Job/Part</td>
<td>Q'ty</td>
<td>Remarks</td>
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<td>-------</td>
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<td>------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>18</td>
<td>Starter idle gear</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
ENGINE COOLING FAN AND A.C. MAGNETO

REMOVING THE A.C. MAGNETO

1. Remove:
   • engine cooling fan pulley ①

NOTE: Use the sheave holder ② to hold the primary sheave.

   Primary sheave holder
   P/N. YS-01880-A
   Sheave holder
   P/N. 90890-01701

2. Remove:
   • A.C. magneto cover
   • gasket
   • dowel pins

NOTE: Working in a crisscross pattern, loosen each bolt 1/4 of a turn. Remove them after all of them are loosened.

3. Remove:
   • A.C. magneto rotor ①

NOTE: Use the flywheel puller ②.

   Flywheel puller
   P/N. YM-01404, 90890-01404

CHECKING THE A.C. MAGNETO

1. Check:
   • stator coil
   • pickup coil
   Damage → Replace.
CHECKING THE STARTER CLUTCH

1. Check:
   • starter clutch
     Cracks/damage → Replace.
   • starter clutch bolts
     Loose → Replace with new ones, and clinch the end of the bolts.

**NOTE:**
The arrow mark on the starter clutch must face inward, away from the A.C. magneto rotor.

---

Starter clutch bolts
30 Nm (3.0 m·kg, 22 ft·lb)
LOCTITE®

a. Install the starter wheel gear onto the starter clutch, and hold the starter clutch.

**NOTE:**
Install the starter wheel gear with the groove facing the A.C. magneto rotor.

b. Turn the starter wheel gear counterclockwise to check that the starter clutch and wheel gear engage.
   If the starter clutch and wheel gear do not engage, replace the starter clutch.

c. Turn the starter wheel gear clockwise to check the starter wheel gear for smooth operation.
   If operation is not smooth, replace the starter clutch.

---

2. Check:
   • starter idle gear teeth
   • starter wheel gear teeth
     Burrs/clips/roughness/wear → Replace.

3. Check:
   • starter wheel gear
     (contacting surface)
     Damage/pitting/wear → Replace.
CHECKING THE ENGINE COOLING FAN
1. Check:
   - engine cooling fan
   - air shroud 1
   - air shroud 2
     Cracks/damage → Replace.

INSTALLING THE A.C. MAGNETO
1. Apply:
   - sealant (Quick Gasket®)
     (into the slit)

2. Install:
   - woodruff key
   - A.C. magneto rotor

NOTE: 
- Before installing the rotor, clean the outside of the crankshaft and the inside of the rotor.
- After installing the rotor, check that the rotor rotates smoothly. If not, reinstall the key and rotor.
3. Install:
- dowel pins
- gasket
- A.C. magneto cover

**NOTE:**
- When installing the A.C. magneto cover, use a long rod to hold the A.C. magneto rotor in position from the outside. This will make assembly easier. Be careful not to damage the oil seal.
- Apply sealant (Quick Gasket®) to the thread of the bolt shown in the illustration.
- Tighten the bolts in stages, using a criss-cross pattern.

![Image of engine cooling fan and A.C. magneto]

**Sealant (Quick Gasket®)**
P/N. ACC-11001-05-01
Yamaha bond No. 1215
P/N. 90890-85505

4. Install:
- engine cooling fan pulley

**NOTE:**
Use a sheave holder to hold the primary sheave.

![Image of engine cooling fan pulley]

**Primary sheave holder**
P/N. YS-01880-A
Sheave holder
P/N. 90890-01701

**NOTE:**
Before installing the engine cooling fan pulley, do not forget to install the O-ring.

![Image of sheave holder installation]

**Primary sheave holder**
P/N. YS-01880-A
Sheave holder
P/N. 90890-01701

**NOTE:**
Before installing the engine cooling fan pulley, do not forget to install the O-ring.
5. Connect:
   • A.C. magneto couplers

6. Install:
   • engine cooling fan ①

   ![Image of engine cooling fan ①]

   **NOTE:**
   Install the bolts in the holes in the collar of the engine cooling fan.

   ![Image of engine cooling fan ①]

7. Install:
   • air shroud 1
   • engine cooling fan air duct assembly ①

   **NOTE:**
   Install the engine cooling fan air duct assembly with the arrow mark ② towards the air shroud 1.

   ![Image of engine cooling fan air duct assembly ①]
### Removing the balancer gears and oil pump gears

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nut/lock washer</td>
<td>1/1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Balancer driven/oil pump drive gear</td>
<td>1</td>
<td>Refer to “ENGINE COOLING FAN AND A.C. MAGNETO”.</td>
</tr>
<tr>
<td>3</td>
<td>Chain</td>
<td>1</td>
<td>Refer to “REMOVING THE BALANCER DRIVE GEAR AND BALANCER DRIVEN GEAR”</td>
</tr>
<tr>
<td>4</td>
<td>Straight key</td>
<td>1</td>
<td>and “INSTALLING THE BALANCER DRIVE GEAR AND BALANCER DRIVEN GEAR”.</td>
</tr>
<tr>
<td>5</td>
<td>Oil pump driven gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Balancer drive gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Spring</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>
For installation, reverse the removal procedure.

Order | Job/Part | Q'ty | Remarks
--- | --- | --- | ---
9 | Pin | 4 | For installation, reverse the removal procedure.
**BALANCER GEARS AND OIL PUMP GEARS**

**REMOVING THE BALANCER DRIVE GEAR AND BALANCER DRIVEN GEAR**

1. Straighten the lock washer tabs.
2. Loosen:
   - balancer driven gear nut

**NOTE:**

Place an aluminum plate between the teeth of the balancer drive gear and balancer driven gear.

3. Remove:
   - circlip
   - plate
   - balancer drive gear
   - springs
   - pins

**CHECKING THE OIL PUMP DRIVE GEAR AND OIL PUMP DRIVEN GEAR**

1. Check:
   - oil pump drive gear
   - oil pump driven gear

Cracks/wear/damage → Replace.

**CHECKING THE BALANCER DRIVE GEAR AND BALANCER DRIVEN GEAR**

1. Check:
   - balancer drive gear
   - balancer driven gear

Damage/wear → Replace the balancer drive gear and balancer driven gear as a set.

Excessive noise during operation → Replace the balancer drive gear and balancer driven gear as a set.
INSTALLING THE BALANCER DRIVE GEAR AND BALANCER DRIVEN GEAR

1. Install:
   - pins
   - springs
   - balancer drive gear (onto the buffer boss)
   - plate
   - circlip

   **NOTE:**
   Align the punch mark a on the balancer drive gear with the hole b to the buffer boss.

2. Install:
   - balancer driven gear

   **NOTE:**
   Align the punch mark a on the balancer drive gear with the punch mark b on the balancer driven gear.

3. Install:
   - lock washer New
   - balancer driven gear nut 1

   **NOTE:**
   - Place an aluminum plate 2 between the teeth of the balancer drive gear 3 and balancer driven gear 4.
   - Apply the molybdenum disulfide grease to the thread of axle and nut.

   110 Nm (11.0 m·kg, 80 ft·lb)

4. Bend the lock washer tabs along the balancer driven gear nut.
### Removing the primary and secondary sheaves

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive belt cover</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Rubber gasket</td>
<td>1</td>
<td>Refer to “ENGINE REMOVAL”.</td>
</tr>
<tr>
<td>3</td>
<td>Bearing housing</td>
<td>1</td>
<td>Refer to “REMOVING THE PRIMARY AND SECONDARY SHEAVES” and “INSTALLING THE PRIMARY AND SECONDARY SHEAVES”.</td>
</tr>
<tr>
<td>4</td>
<td>Dowel pin</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Primary sheave assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>V-belt</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** The V-belt can be replaced even if the engine assembly is not removed.
### Order

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Primary fixed sheave</td>
<td>1</td>
<td>Refer to “REMOVING THE PRIMARY AND SECONDARY SHEAVES” and “INSTALLING THE PRIMARY AND SECONDARY SHEAVES”.</td>
</tr>
<tr>
<td>8</td>
<td>Secondary sheave assembly</td>
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<tr>
<td>9</td>
<td>Drive belt case</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>10</td>
<td>Rubber gasket</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
PRIMARY SHEAVE

Disassembling the primary sheave

Remove the parts in the order listed.

1. Primary pulley sheave cap 1
2. Primary pulley slider 4
3. Spacer 4
4. Primary pulley cam 1
5. Primary pulley weight 8
6. Collar 1
7. Oil seal 2
8. Primary sliding sheave 1
9. O-ring 1

For assembly, reverse the disassembly procedure.

Refer to “ASSEMBLING THE PRIMARY SHEAVE”.

3 Nm (0.3 m·kg, 2.2 ft·lb)
SECONDARY SHEAVE

Disassembling the secondary sheave

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nut</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
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<td>2</td>
<td>Spring seat</td>
<td>1</td>
<td>Refer to “DISASSEMBLING THE SECONDARY SHEAVE” and “ASSEMBLING THE SECONDARY SHEAVE”.</td>
</tr>
<tr>
<td>3</td>
<td>Compression spring</td>
<td>1</td>
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<tr>
<td>4</td>
<td>Spring seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Guide pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Secondary sliding sheave</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Secondary fixed sheave</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Oil seal</td>
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</tr>
<tr>
<td>10</td>
<td>Oil seal</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

For assembly, reverse the disassembly procedure.

90 Nm (9.0 m·kg, 65 ft·lb)
REMOVING THE PRIMARY AND SECONDARY SHEAVES
1. Loosen:
   • secondary sheave nut ①
   • primary sheave nut ②

NOTE:
• Use the sheave holder ③ to hold the primary sheave.
• First, loosen the secondary sheave nut ①, then loosen the primary sheave nut ②.

DISASSEMBLING THE SECONDARY SHEAVE
1. Remove:
   • nut ①

a. Attach the sheave fixed block ②, locknut wrench ③ and sheave spring compressor ④ to the secondary sheave assembly.

b. Place the sheave fixed block in a vise and secure it.

c. Tighten the sheave spring compressor nut ⑤ and compress the spring.

d. Loosen the nut ① with the locknut wrench ③.

e. Remove the nut ①.

f. Remove the sheave spring compressor and locknut wrench.
CHECKING THE PRIMARY SHEAVE
1. Check:
   - weight outside diameter
     Out of specification → Replace the weight.

   Weight outside diameter
   30 mm (1.18 in)
   <Limit>: 29.5 mm (1.16 in)

2. Check:
   - primary pulley slider
   - primary sliding sheave splines
     Wear/cracks/damage → Replace.
   - spacer
   - primary pulley cam
     Cracks/damage → Replace.

3. Check:
   - primary sliding sheave
   - primary fixed sheave
     Cracks/damage → Replace.

CHECKING THE SECONDARY SHEAVE
1. Check:
   - secondary fixed sheave smooth operation
   - secondary sliding sheave smooth operation
     Scratches/damage → Replace as a set.

2. Check:
   - torque cam grooves
     Wear/damage → Replace.

3. Check:
   - guide pins
     Wear/damage → Replace.

4. Check:
   - secondary sheave spring
     Damage → Replace.

5. Measure:
   - secondary sheave spring free length
     Out of specification → Replace the secondary sheave spring.

   Free length
   124.2 mm (4.89 in)
   <Limit>: 112.0 mm (4.40 in)
ASSEMBLING THE PRIMARY SHEAVE

1. Clean:
   - primary sliding sheave face
   - primary fixed sheave face
   - collar
   - weights
   - primary sliding sheave cam face

   **NOTE:**
   Remove any excess grease.

2. Install:
   - weights

   **NOTE:**
   - Apply Yamaha Grizzly grease (90 g) to the whole outer surface of the weights and install.
   - Apply Yamaha Grizzly grease to the inner surface of the collar.
   - Apply Yamaha Grizzly grease to the inner surface of the primary sliding sheave.

3. Install:
   - spacer
   - sliders
   - primary pulley cam
   - primary sliding sheave cap

       \[3 \text{ Nm (0.3 m} \cdot \text{kg, 2.2 ft} \cdot \text{lb)}\]

ASSEMBLING THE SECONDARY SHEAVE

1. Apply:
   - BEL-RAY assembly lube
     (to the secondary sliding sheave inner surface and oil seals)
   - BEL-RAY assembly lube
     (to the bearings, oil seals and inner surface of the secondary fixed sheave)

2. Install:
   - guide pins
3. Apply:
   - BEL-RAY assembly lube®
     (to the guide pin sliding grooves ①, and O-rings ②)

4. Install:
   - spring seat
   - compression spring
   - spring seat
   - nut

\[
\begin{align*}
\text{a.} & \quad \text{Attach the sheave fixed block, locknut wrench and sheave spring compressor to the secondary sheave assembly.} \\
\text{Sheave fixed block} & \quad \text{P/N. YM-04135, 90890-04135} \\
\text{Locknut wrench} & \quad \text{P/N. YM-01348, 90890-01348} \\
\text{Sheave spring compressor} & \quad \text{P/N. YM-04134, 90890-04134} \\
\end{align*}
\]

\[
\begin{align*}
\text{b.} & \quad \text{Place the sheave fixed block in a vise and secure it.} \\
\text{c.} & \quad \text{Tighten the sheave spring compressor nut ① and compress the spring.} \\
\text{d.} & \quad \text{Install the nut ② and tighten it to the specified torque using the locknut wrench.} \\
\end{align*}
\]

\[
\begin{align*}
\text{Nut} & \quad 90 \text{ Nm (9.0 m} \cdot \text{kg, 65 ft} \cdot \text{lb)} \\
\end{align*}
\]

\[
\begin{align*}
\text{e.} & \quad \text{Remove the sheave spring compressor, locknut wrench, and sheave fixed block.} \\
\end{align*}
\]
INSTALLING THE PRIMARY AND SECONDARY SHEAVES

1. Install:
   - secondary sheave assembly
   - V-belt
   - primary sheave assembly

   **NOTE:**
   - Tightening the bolts 1 will push the secondary sliding sheave away, causing the gap between the secondary fixed and sliding sheaves to widen.
   - Install the V-belt so that its arrow faces the direction show in the illustration.

2. Tighten:
   - primary sheave nut 1
     - **120 Nm (12.0 m·kg, 85 ft·lb)**
   - secondary sheave nut 2
     - **100 Nm (10.0 m·kg, 72 ft·lb)**

   **NOTE:**
   - Use the sheave holder 3 to hold the primary sheave.
   - First, tighten the primary sheave nut 1, then tighten the secondary sheave nut 2.

---

Primary sheave holder
P/N. YS-01880-A
Sheave holder
P/N. 90890-01701
Removing the clutch

Remove the parts in the order listed. Refer to “PRIMARY AND SECONDARY SHEAVES”.

1 Clutch housing assembly 1
2 Gasket/dowel pin 1/2
3 One-way clutch bearing 1
4 Nut 1
5 Clutch carrier assembly 1

For installation, reverse the removal procedure.

**Remarks**

- **Removing the clutch**
  - Primary and secondary sheaves

- **Q'ty**
  - 1
  - 1/2
  - 1
  - 1

- **10 Nm (1.0 m·kg, 7.2 ft·lb)**

- **160 Nm (16.0 m·kg, 115 ft·lb)**
Disassembling the clutch housing

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oil seal</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bearing housing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bearing</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td>8</td>
<td>Clutch housing</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
REMOVING THE CLUTCH

1. Remove:
   - clutch housing assembly
   - gasket
   - dowel pins

**NOTE:**
Working in crisscross pattern, loosen each bolt 1/4 of a turn. Remove them after all of them are loosened.

2. Straighten:
   - punched portion of the nut ①

3. Remove:
   - nut ①

**NOTE:**
Use a universal clutch holder ② to hold the clutch carrier assembly.

**Universal clutch holder**
P/N. YM-91042, 90890-04086

CHECKING THE CLUTCH

1. Check:
   - clutch housing ①
     *Heat damage/wear/damage → Replace.*
   - one-way clutch bearing ②
     *Chafing/wear/damage → Replace.*

**NOTE:**
- Replace the one-way clutch assembly and clutch housing as a set.
- The one-way clutch bearing must be installed with the flange side facing in.

- a. Install the one-way clutch bearing and clutch carrier assembly to the clutch housing and hold the clutch carrier assembly.
b. When turning the clutch housing clockwise \( A \), the clutch housing should turn freely. If not, the one-way clutch assembly is faulty. Replace it.

c. When turning the clutch housing counterclockwise \( B \), the clutch housing and crankshaft should be engaged. If not, the one-way clutch assembly is faulty. Replace it.

2. Check:
   - clutch shoe
   Heat damage → Replace.

3. Measure:
   - clutch shoe thickness
   Out of specification → Replace.

   **Clutch shoe thickness**
   1.5 mm (0.06 in)
   Clutch shoe wear limit ③
   1.0 mm (0.04 in)

**INSTALLING THE CLUTCH**

1. Install:
   - clutch carrier assembly
   - nut ① New

   \[ 160 \text{ Nm (16.0 m \cdot kg, 115 ft \cdot lb)} \]

**NOTE:**

Use a universal clutch holder ② to hold the clutch carrier assembly.

   **Universal clutch holder**
   P/N. YM-91042, 90890-04086

2. Lock the threads with a drift punch.
3. Install:
   - one-way clutch bearing

**NOTE:**
The one-way clutch bearing should be installed in the clutch carrier assembly with the arrow mark \( a \) facing toward the clutch housing.

4. Install:
   - dowel pins
   - gasket New
   - clutch housing assembly

**NOTE:**
- Tighten the bolts in stages, using a criss-cross pattern.
- After tightening the bolts, check that the clutch housing assembly rotates smoothly.

\[ 10 \text{ Nm (1.0 m \cdot kg, 7.2 ft \cdot lb)} \]
CRANKCASE
STARTER MOTOR, TIMING CHAIN AND OIL FILTER

Remove the starter motor, timing chain and oil filter

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Timing chain guide (intake side)</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Timing chain</td>
<td>1</td>
<td>Refer to “ENGINE REMOVAL”.</td>
</tr>
<tr>
<td>3</td>
<td>Starter motor/O-ring</td>
<td>1/1</td>
<td>Refer to “CAMSHAFT AND CYLINDER HEAD”.</td>
</tr>
<tr>
<td>4</td>
<td>Oil filter cartridge/O-ring</td>
<td>1</td>
<td>Refer to “CYLINDER AND PISTON”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to “ENGINE COOLING FAN AND A.C. MAGNETO”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to “PRIMARY AND SECONDARY SHEAVES”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to “CLUTCH”.</td>
</tr>
</tbody>
</table>
For installation, reverse the removal procedure.
Separating the crankcase

1 Shift lever cover/gasket
2 Dowel pin
3 Shift lever 1
4 Shift lever 2 assembly
5 Right crankcase
6 Dowel pin
7 Left crankcase
8 Spacer
9 Crankshaft seal

Q'ty
1/1 1 1 1 1 2 1

Remarks
Remove the parts in the order listed.
Refer to “INSTALLING THE SHIFT LEVERS”.
Refer to “SEPARATING THE CRANKCASE” and “ASSEMBLING THE CRANKCASE”.
For installation, reverse the removal procedure.
CRANKCASE BEARINGS

Removing the crankcase bearings
Crankshaft and oil pump

Transmission
Middle drive/driven shaft

1 O-ring/collar 1/1
2 Oil seal 1
3 Bearing retainer 1
4 Bearing 9

For installation, reverse the removal procedure.

Remove the parts in the order listed.
Refer to “CRANKSHAFT AND OIL PUMP”.
Refer to “TRANSMISSION”.
Refer to “MIDDLE GEAR”.

10 Nm (1.0 m kg, 7.2 ft lb)
SEPARATING THE CRANKCASE
1. Separate:
   • right crankcase
   • left crankcase

   a. Remove the crankcase bolts.

   **NOTE:**
   • Loosen each bolt 1/4 of a turn at a time and after all the bolts are loosened, remove them.
   • Loosen the bolts in stages, using a criss-cross pattern.

   ![Right crankcase](image1)
   ![Left crankcase](image2)

   b. Remove the left crankcase.

   **CAUTION:**
   Use a soft hammer to tap on one side of the crankcase. Tap only on reinforced portions of the crankcase. Do not tap on the crankcase mating surfaces. Work slowly and carefully. Make sure that the crankcase halves separate evenly.

   c. Remove the dowel pins.

CHECKING THE TIMING CHAIN AND GUIDES
1. Check:
   • timing chain
     Cracks/stiff → Replace the timing chain and camshaft sprocket as a set.

2. Check:
   • timing chain guides
     Wear/damage → Replace.

CHECKING THE OIL DELIVERY PIPE
1. Check:
   • oil delivery pipe
     Cracks/damage → Replace.
     Clogged → Blow out with compressed air.
CHECKING THE RELIEF VALVE
1. Check:
   - relief valve ①
   - spring ②
   Damage/wear → Replace the defective part(s).

CHECKING THE CRANKCASE
1. Thoroughly wash the case halves in a mild solvent.
2. Clean all the gasket mating surfaces and crankcase mating surfaces thoroughly.
3. Check:
   - crankcase
     Cracks/damage → Replace.
   - oil delivery passages
     Clogged → Blow out with compressed air.

CHECKING THE BEARINGS
1. Check:
   - bearings
     Clean and lubricate, then rotate the inner race with a finger.
     Roughness → Replace.

ASSEMBLING THE CRANKCASE
1. Apply:
   - sealant (Quick Gasket®) ①
     (to the mating surfaces of both case halves)

Sealant (Quick Gasket®)
P/N. ACC-11001-05-01
Yamaha bond No. 1215
P/N. 90890-85505

2. Install:
   - dowel pins ②
3. Fit the left crankcase onto the right case. Tap lightly on the case with a soft hammer.

**CAUTION:**
Before installing and torquing the crankcase holding bolts, be sure to check whether the transmission is functioning properly by manually rotating the shift drum in both directions.

4. Tighten:
   - crankcase bolts 1, 2 (follow the proper tightening sequence)
     - 10 Nm (1.0 m · kg, 7.2 ft · lb)
   - crankcase bolts 3 (follow the proper tightening sequence)
     - 26 Nm (2.6 m · kg, 19 ft · lb)

**NOTE:**
- Tighten the bolts in stages, using a crisscross pattern.
- Apply sealant (Quick Gasket®) 4 to the thread of the bolt 2 shown in the illustration.

5. Apply:
   - 4-stroke engine oil (to the crank pin, bearing and oil delivery hole)

6. Check:
   - crankshaft and transmission operation
   Unsmooth operation → Repair.

### INSTALLING THE SHIFT LEVERS
1. Install:
   - shift lever 2 assembly 1
     - 14 Nm (1.4 m · kg, 10 ft · lb)
   - shift lever 1 2

**NOTE:**
When installing the shift lever 1, align the punch mark 3 on the shift lever 1 with the punch marks 5 on the shift lever 2.
Removing the crankshaft and oil pump

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oil strainer/O-ring</td>
<td>1/1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Oil pump assembly/gasket</td>
<td>1/1</td>
<td>Refer to “CRANKCASE”.</td>
</tr>
<tr>
<td>3</td>
<td>Balancer</td>
<td>1</td>
<td>Refer to “REMOVING THE CRANKSHAFT” and “INSTALLING THE CRANKSHAFT AND BALANCER”.</td>
</tr>
<tr>
<td>4</td>
<td>Plate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Relief valve assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Crankshaft</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
Disassembling the oil pump

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Rotor cover</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>②</td>
<td>Pin</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>③</td>
<td>Shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>④</td>
<td>Pin</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑤</td>
<td>Inner rotor</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑥</td>
<td>Outer rotor</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td>⑦</td>
<td>Oil pump housing</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
CRANKSHAFT AND OIL PUMP

REMOVING THE CRANKSHAFT
1. Remove:
   - crankshaft
     Use a crankcase separating tool 1.

   Crankcase separating tool
   P/N. YU-01135-A, 90890-01135

CHECKING THE OIL PUMP
1. Check:
   - rotor housing
   - rotor cover
     Cracks/wear/damage → Replace.

2. Measure:
   - tip clearance \( a \) (between the inner rotor ① and the outer rotor ②)
   - side clearance \( b \) (between the outer rotor ② and the pump housing ③)
   - body clearance \( c \) (between the outer rotor ② and the pump housing ③)
     Out of specification → Replace the oil pump.

   Tip clearance
   less than 0.15 mm (0.0059 in)
   <Limit>: 0.23 mm (0.0091 in)

   Side clearance
   0.03 ~ 0.10 mm
   (0.0012 ~ 0.0039 in)
   <Limit>: 0.17 mm (0.0067 in)

   Body clearance
   0.09 ~ 0.17 mm
   (0.0035 ~ 0.0067 in)
   <Limit>: 0.24 mm (0.0094 in)

3. Check:
   - oil pump operation
     Unsmooth → Repeat steps #1 and #2 or replace the defective parts.
CHECKING THE RELIEF VALVE
1. Check:
   • relief valve body ①
   • relief valve ②
   • spring ③
   • O-ring ④
   Damage/wear → Replace the defective part(s).

CHECKING THE OIL STRAINER
1. Check:
   • oil strainer ①
   • O-ring ②
   Damage → Replace.
   Contaminants → Clean with engine oil.

ASSEMBLING THE OIL PUMP
1. Install:
   • inner rotor
   • outer rotor
   • oil pump shaft
   (with the recommended lubricant)

<table>
<thead>
<tr>
<th>Recommended lubricant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine oil</td>
</tr>
</tbody>
</table>
CHECKING THE CRANKSHAFT

1. Measure:
   - crank width \( A \)
     Out of specification → Replace the crankshaft.
   - side clearance \( D \)
     Out of specification → Replace the crankshaft.
   - runout \( C \)
     Out of specification → Replace the crankshaft.

### Crank width
74.95 ~ 75.00 mm
(2.9508 ~ 2.9528 in)

### Big end side clearance
0.35 ~ 0.65 mm
(0.0138 ~ 0.0256 in)
<Limit>: 1.0 mm (0.0394 in)

### Runout limit
- \( C1: 0.03 \text{ mm (0.0012 in)} \)
- \( C2: 0.03 \text{ mm (0.0012 in)} \)

The crankshaft ① and the crank pin ② oil passages must be properly interconnected with a tolerance of less than 1 mm (0.04 in).

**CAUTION:**
The buffer boss and woodruff key should be replaced when removed from the crankshaft.
CRANKSHAFT AND OIL PUMP

INSTALLING THE CRANKSHAFT AND BALANCER

1. Install:
   • crankshaft

   **NOTE:**
   Hold the connecting rod at the Top Dead Center (TDC) with one hand while turning the nut of the installing tool with the other. Operate the installing tool until the crankshaft bottoms against the bearing.

   **CAUTION:**
   Apply engine oil to each bearing to protect the crankshaft against scratches and to make installation easier.

   ![Crankshaft installer components](image)

   Crankshaft installer pot ①
   P/N. 90890-01274

   Crankshaft installer bolt ②
   P/N. 90890-01275

   Crankshaft installer set ③
   P/N. YU-90050

   Adapter ④
   P/N. YM-01383, 90890-01383

   Spacer (crankshaft installer) ⑤
   P/N. YM-91044, 90890-04081

   Spacer ⑥
   P/N. 90890-01309
### Removing the transmission

Crankcase separation
Middle driven gear

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low wheel gear</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to “CRANKCASE”.</td>
</tr>
<tr>
<td>2</td>
<td>Shift drum</td>
<td>1</td>
<td>Refer to “MIDDLE GEAR”.</td>
</tr>
<tr>
<td>3</td>
<td>Shift fork assembly</td>
<td>1</td>
<td>White painting</td>
</tr>
<tr>
<td>4</td>
<td>Short spring</td>
<td>1</td>
<td>Refer to “REMOVING THE TRANSMISSION” and “INSTALLING THE TRANSMISSION”.</td>
</tr>
<tr>
<td>5</td>
<td>Shift fork 1</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>6</td>
<td>Long spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Shift fork 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Guide bar</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Secondary shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Drive axle assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Chain</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
**DRIVE AXLE ASSEMBLY**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clutch dog</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>High wheel gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Middle drive gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Driven sprocket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Drive axle</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

For assembly, reverse the disassembly procedure.
REMOVING THE TRANSMISSION

1. Remove:
   - shift drum ①
   - shift fork assembly ②

   a. Pull out the guide bar from the right crankcase.
   b. Slide the shift fork assembly and remove the shift fork followers from the shift drum grooves.
   c. Remove the shift drum.
   d. Remove the shift fork assembly.

2. Remove:
   - secondary shaft ①
   - drive axle assembly ②
   - chain ③

   NOTE: Remove the secondary shaft, drive axle assembly, and chain as a set.

CHECKING THE SHIFT FORKS

1. Check:
   - shift fork follower ①
   - shift fork pawl ②
     Scoring/bends/wear/damage → Replace.

2. Check:
   - guide bar
     Roll the guide bar on a flat surface.
     Bends → Replace.

   **WARNING**
   Do not attempt to straighten a bent guide bar.
TRANSMISSION

3. Check:
   • shift fork movement
     (on the guide bar)
   Unsmooth operation → Replace the shift fork and the guide bar.

4. Check:
   • springs
     Cracks/damage → Replace.

CHECKING THE SHIFT DRUM
1. Check:
   • shift drum grooves
     Scratches/wear/damage → Replace.

CHECKING THE DRIVE AXLE
1. Measure:
   • axle runout
     Use a centering device and a dial gauge.
     Out of specification → Replace the bent axle.

   Drive axle runout limit
   0.06 mm (0.0024 in)

CHECKING THE HIGH WHEEL GEAR AND MIDDLE DRIVE GEAR
1. Check:
   • gear teeth
     Blue discoloration/pitting/wear → Replace.
   • mated dogs
     Rounded edges/cracks/missing portions → Replace.
2. Check:
   • gear movement
     Unsmooth → Repeat steps #1 or replace the defective parts.
3. Check:
   • circlip
     Bends/looseness/damage → Replace.

CHECKING THE SECONDARY SHAFT AND DRIVEN SPROCKET
1. Check:
   • gear teeth
     Blue discoloration/pitting/wear → Replace.
2. Check:
   • gear movement
     Unsmooth → Repeat steps #1 or replace the defective parts.
3. Check:
   • circlip
     Bends/looseness/damage → Replace.

CHECKING THE CHAIN
1. Check:
   • chain
     Cracks/shift → Replace the chain, secondary shaft and driven sprocket as a set.
**ASSEMBLING THE SHIFT FORK ASSEMBLY**

1. Install:
   - guide bar ①
   - shift fork 2 ②
   - long spring ③
   - shift fork 1 ④
   - short spring ⑤

**INSTALLING THE TRANSMISSION**

1. Install:
   - chain ①
   - drive axle assembly ②
   - secondary shaft ③
   - shift fork assembly ④
   - shift drum ⑤
   - low wheel gear

2. Check:
   - shift operation
     Unsmooth operation → Repair.

**NOTE:**

- Oil each gear and bearing thoroughly.
- Before assembling the crankcase, be sure that the transmission is in neutral and that the gears turn freely.
MIDDLE GEAR
MIDDLE DRIVE SHAFT

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bearing housing</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to “CRANKCASE”.</td>
</tr>
<tr>
<td>2</td>
<td>Middle driven gear</td>
<td>1</td>
<td>Refer to “REMOVING THE MIDDLE DRIVE SHAFT” and “INSTALLING THE MIDDLE DRIVE SHAFT”.</td>
</tr>
<tr>
<td>3</td>
<td>Nut</td>
<td>1</td>
<td>Refer to “SELECTING THE MIDDLE DRIVE AND DRIVEN GEAR SHIMS”.</td>
</tr>
<tr>
<td>4</td>
<td>Middle drive pinion gear</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>5</td>
<td>Shim</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Middle drive shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bearing retainer</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Removing the middle drive shaft
Crankcase separation

145 Nm (14.5 m·kg, 105 ft·lb)
32 Nm (3.2 m·kg, 23 ft·lb)
29 Nm (2.9 m·kg, 21 ft·lb)
# MIDDLE DRIVEN SHAFT

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Removing the middle driven shaft</td>
<td></td>
<td>Remove the parts in the order listed. Refer to “CRANKCASE”.</td>
</tr>
<tr>
<td>1</td>
<td>Drive shaft coupling</td>
<td>1</td>
<td>Refer to “REMOVING THE MIDDLE DRIVEN SHAFT” and “INSTALLING THE MIDDLE DRIVEN SHAFT”.</td>
</tr>
<tr>
<td>2</td>
<td>Circlip</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bearing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Universal joint</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Universal joint yoke</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Bearing housing/O-ring</td>
<td>1/1</td>
<td>Refer to “SELECTING THE MIDDLE DRIVE AND DRIVEN GEAR SHIMS”.</td>
</tr>
<tr>
<td>7</td>
<td>Shim</td>
<td></td>
<td>Refer to “REMOVING THE MIDDLE DRIVEN SHAFT” and “INSTALLING THE MIDDLE DRIVEN SHAFT”.</td>
</tr>
<tr>
<td>8</td>
<td>Middle driven pinion gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Bearing retainer</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
For installation, reverse the removal procedure.
MIDDLE GEAR

REMOVING THE MIDDLE DRIVE SHAFT
1. Straighten:
   • punched portion of the nut (middle drive pinion gear)
2. Loosen:
   • middle drive pinion gear nut

NOTE: Secure the middle drive shaft in the vise with a clean rag.

3. Remove:
   • middle drive pinion gear nut
   • middle drive pinion gear
   • shim(s)

REMOVING THE MIDDLE DRIVEN SHAFT
1. Remove:
   • nut
   • washer
   • drive shaft coupling

NOTE: Use the coupling gear/middle shaft tool to hold the drive shaft coupling.

Coupling gear/middle shaft tool
P/N. YM-01229, 90890-01229
2. Remove:
• universal joint

\[\text{Remove the circlips} \ ①.\]
\[\text{Place the universal joint in a press.}\]
\[\text{With a suitable diameter pipe} \ ② \text{beneath the yoke} \ ③, \text{press the bearing} \ ④ \text{into the pipe as shown.}\]

\textbf{NOTE:} It may be necessary to lightly tap the yoke with a punch.

d. Repeat the steps for the opposite bearing.
e. Remove the yoke.

\textbf{NOTE:} It may be necessary to lightly tap the yoke with a punch.

3. Remove:
• nut ①
• washer
• universal joint yoke

\textbf{NOTE:} Use the universal joint holder ② to hold the universal joint yoke.

<table>
<thead>
<tr>
<th>Universal joint holder</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N. YM-04062, 90890-04062</td>
</tr>
</tbody>
</table>
4. Remove:
   • bearing housing assembly ①

   a. Clean the outside of the bearing housing assembly.
   b. Place the bearing housing assembly onto a hydraulic press.
   **CAUTION:**
   • Never directly press the middle driven pinion gear end with a hydraulic press, this will result in damage to the middle driven pinion gear thread.
   • Install the suitable socket ② on the middle driven pinion gear end to protect the thread from damage.

   c. Press the middle driven pinion gear end and remove the bearing housing.

5. Remove:
   • bearing retainer
   • bearing

   a. Place a rag ① in the vise.
   b. Secure the bearing housing edge in the vise.
   c. Attach the bearing retainer wrench ②.
   **CAUTION:**
   The middle driven shaft bearing retainer has left-handed threads. To loosen the retainer, turn it clockwise.
   d. Remove the bearing retainer and bearing.
6. Remove:
   - drive shaft coupling
   - oil seal ①
   - bearing retainer ②
   - bearing

**NOTE:**
Attach the ring nut wrench ③.

**CAUTION:**
The middle driven shaft bearing retainer has left-handed threads. To loosen the retainer, turn it clockwise.

7. Remove:
   - middle driven shaft ① (with bearing)

**CHECKING THE PINION GEARS**
1. Check:
   - gear teeth (drive pinion gear) ①
   - gear teeth (driven pinion gear) ②
     Pitting/galling/wear → Replace.
2. Check:
   - O-ring
     Damage → Replace.
   - bearings
     Pitting/damage → Replace.
3. Check:
   - universal joint movement
     Roughness → Replace universal joint.
SELECTING THE MIDDLE DRIVE AND DRIVEN GEAR SHIMS
When the drive and driven gear, bearing housing assembly and/or crankcase replaced, be sure to adjust the gear shims ① and ②.

1. Select:
   - middle drive gear shim ①
   - middle driven gear shim ②

\[ \text{Middle drive pinion gear shim thickness} \quad \text{“}A\text{”} = ⑥ + ④ - ⑥ - ⑤ \]

Where:
⑥ = a numeral (usually a decimal number) on the bearing housing is either added to or subtracted from “7.5”.
⑤ = 17.0
④ = drive pinion gear to driven pinion gear center distance (considered constance “55”).
⑥ = a numeral (usually a decimal number) on the left crankcase specifies a thickness of “65”.
Example:
1) If the bearing housing is marked “+02”,
   ...... ③ is 7.52,
2) ④ is 17
3) ⑤ is 55
4) If the crankcase (left) is marked “64.98”,
   ...... ⑥ is 64.98.
5) Therefore, the shim thickness is 0.50 mm.
   \[ A = 7.52 + 64.98 - 17 - 55 \]
   \[ = 0.50 \]
6) Round off hundredths digit and select appropriate shim(s).
   In the example above, the calculated shim thickness is 0.50 mm. The chart instructs you, however, to round off 0 to 0.

<table>
<thead>
<tr>
<th>Hundredths</th>
<th>Round value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 1, 2</td>
<td>0</td>
</tr>
<tr>
<td>3, 4, 5, 6, 7</td>
<td>5</td>
</tr>
<tr>
<td>8, 9</td>
<td>10</td>
</tr>
</tbody>
</table>

Shims are supplied in the following thickness.

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>0.10</th>
<th>0.15</th>
<th>0.20</th>
<th>0.30</th>
<th>0.40</th>
<th>0.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle drive pinion gear shim thickness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Middle driven pinion gear shim thickness**

\[ "B" = ⑥ - ① + ③ - ① + ① - 0.05 \]

Where:
⑥ = a numeral (usually a decimal number) on the bearing housing is either added to or subtracted from “76”.
① = a numeral (usually a decimal number) on the middle driven pinion gear is either added to or subtracted from “60”.

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\( g \) = a numeral (usually a decimal number) on the middle driven pinion gear is either added to or subtracted from “80.5”.

\( h \) = a numeral (usually a decimal number) on the right crankcase specifies a thickness of “97.26”.

\( i \) = a numeral (usually a decimal number) on the left crankcase specifies a thickness of “1.66”.

Example:
1) If the bearing housing is marked “–06”, ...... \( g \) is 75.94.
2) If the driven pinion gear is marked “+0”, ...... \( f \) is 60.00.
3) If the driven pinion gear is marked “–13”, ...... \( g \) is 80.37.
4) If the crankcase (right) is marked “97.29”, ...... \( h \) is 97.29.
5) If the crankcase (left) is marked “1.67”, ...... \( i \) is 1.67.
6) Therefore, the shim thickness is 0.64 mm.
   \[ B = 75.94 - 60.00 + 80.37 - 97.29 + 1.67 - 0.05 = 0.64 \]
7) Round off hundredths digit and select appropriate shim(s).
   In the example above, the calculated shim thickness is 0.64 mm. The chart instructs you, however, to round off 4 to 5.

<table>
<thead>
<tr>
<th>Hundredths</th>
<th>Round value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 1, 2</td>
<td>0</td>
</tr>
<tr>
<td>3, 4, 5, 6, 7</td>
<td>5</td>
</tr>
<tr>
<td>8, 9</td>
<td>10</td>
</tr>
</tbody>
</table>

Shims are supplied in the following thickness.
INSTALLING THE MIDDLE DRIVEN SHAFT

1. Install:
   • bearing retainer ①

   **Bearing retainer**
   80 Nm (8.0 m·kg, 58 ft·lb)
   LOCTITE®

   **NOTE:**
   Attach the ring nut wrench ②.

   **CAUTION:**
   The middle driven shaft bearing retainer has left-handed threads. To tighten the retainer, turn it counterclockwise.

2. Install:
   • bearing retainer ①

   a. Place a rag ② in the vise.
   b. Secure the bearing housing edge in the vise.
   c. Attach the bearing retainer wrench ③.

   **Bearing retainer wrench**
   P/N. YM-04128, 90890-04128

d. Tighten the bearing retainer.

   **CAUTION:**
   The middle driven shaft bearing retainer has left-handed threads. To tighten the retainer, turn it counterclockwise.

   **Bearing retainer**
   110 Nm (11.0 m·kg, 80 ft·lb)
   LOCTITE®
3. Install:
   • shims ①
   • bearing housing

   **NOTE:**
   Install the shims so that the tabs are positioned as shown in the illustration.

4. Install:
   • universal joint yoke
   • washer
   • nut ①

   **NOTE:**
   Use the universal joint holder ② to hold the yoke.

   **Universal joint yoke nut**
   150 Nm (15.0 m·kg, 110 ft·lb)
   LOCTITE®

   **Universal joint holder**
   P/N. YM-04062, 90890-04062

5. Install:
   • universal joint

   a. Install the opposite yoke into the universal joint.
   b. Apply wheel bearing grease to the bearings.
   c. Install the bearing ① onto the yoke.

   **CAUTION:**
   Check each bearing. The needles can easily fall out of their races. Slide the yoke back and forth on the bearings; the yoke will not go all the way onto a bearing if a needle is out of place.
d. Press each bearing into the universal joint using a suitable socket.

**NOTE:**
The bearing must be inserted far enough into the universal joint so that the circlip can be installed.

e. Install the circlips ② into the groove of each bearing.

6. Install:
- drive shaft coupling
- washer
- nut ①

**NOTE:**
Use the coupling gear/middle shaft tool ② to hold the drive shaft coupling.

![Coupling gear/middle shaft tool](P/N. YM-01229, 90890-01229)

INSTALLING THE MIDDLE DRIVE SHAFT

1. Tighten:
- middle drive pinion gear nut ①

**NOTE:**
Secure the middle drive shaft in the vise with a clean rag.

2. Lock the threads with a drift punch.
MEASURING THE MIDDLE GEAR BACKLASH

1. Measure:
   • gear lash

| Middle gear lash | 0.1 ~ 0.3 mm (0.004 ~ 0.012 in) |

a. Temporary install the left crankcase.

b. Wrap a rag 1 around a screwdriver 2, and then insert it into the installation hole 3 of the right crankcase speed sensor to hold the middle driven gear.

c. Attach the gear lash measurement tool 4 and dial gauge 5.

d. Measure the gear lash while rotating the middle driven shaft back and forth.

NOTE:
Measure the gear lash at 4 positions. Rotate the middle driven gear 90° each time.

e. If the gear lash is incorrect, adjust the gear lash by middle driven pinion gear shims and/or middle drive pinion gear shim(s).
## Removing the radiator

Remove the parts in the order listed. Refer to “OIL COOLER”. Drain. Refer to “CHANGING THE COOLANT” in chapter 3.

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thermo switch 3 coupler</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>2</td>
<td>Coolant reservoir hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>3</td>
<td>Radiator fan breather hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>4</td>
<td>Radiator inlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Radiator outlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Water pump inlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Coolant outlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Radiator</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Radiator fan</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Thermo switch 3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
### RADIATOR AND COOLANT RESERVOIR

**Coolant reservoir**

**Coolant reservoir breather hose**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Coolant reservoir</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>12</td>
<td>Coolant reservoir breather hose</td>
<td>1</td>
<td>Disconnect. For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

**Torque Specifications**

- **7 Nm (0.7 m·kg, 5.1 ft·lb)**
- **28 Nm (2.8 m·kg, 20 ft·lb)**
CHECKING THE RADIATOR

1. Check:
   - radiator fins
     Obstruction → Clean.
     Apply compressed air to the rear of the radiator.
     Damage → Repair or replace.

   NOTE: Straighten any flattened fins with a thin, flat-head screwdriver.

2. Check:
   - radiator hoses
     Cracks/damage → Replace.

3. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.

     Radiator cap opening pressure
     107.9 ~ 137.3 kPa
     (1.079 ~ 1.373 kg/cm², 15.35 ~ 19.53 psi)

     a. Install the radiator cap tester ① and adapter ② onto the radiator cap ③.

     Radiator cap tester
     P/N. YU-24460-01, 90890-01325
     Radiator cap tester adapter
     P/N. YU-33984, 90890-01352

     b. Apply the specified pressure for ten seconds and make sure that there is no drop in pressure.

4. Check:
   - radiator fan
     Damage → Replace.
     Malfunction → Check and repair.
     Refer to “COOLING SYSTEM” in chapter 9.
INSTALLING THE RADIATOR

1. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” in chapter 3.

2. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.
## Order

<table>
<thead>
<tr>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Removing the water pump</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver seat/passenger seat/console</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Coolant outlet joint breather hose</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.</td>
</tr>
<tr>
<td>2 Water pump inlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3 Water pump outlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4 Water pump outlet pipe</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5 O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6 Water pump assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7 O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8 Water pump breather hose</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

10 Nm (1.0 m·kg, 7.2 ft·lb)
### Disassembling the Water Pump

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water pump housing cover</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Gasket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Impeller</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rubber damper holder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Rubber damper</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Water pump seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Oil seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Water pump housing</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

**Specifications:**
- **10 Nm (1.0 m·kg, 7.2 ft·lb)**
- **12 Nm (1.2 m·kg, 8.7 ft·lb)**
WATER PUMP

DISASSEMBLING THE WATER PUMP
1. Remove:
   - rubber damper holder ①
   - rubber damper ②
     (from the impeller, with a thin, flathead screwdriver)

   **NOTE:**
   Do not scratch the impeller shaft.

2. Remove:
   - water pump seal ①

   **NOTE:**
   Tap out the water pump seal from the inside of the water pump housing.

3. Remove:
   - bearing ①
   - oil seal ②

   **NOTE:**
   Tap out the bearing and oil seal from the outside of the water pump housing.

CHECKING THE WATER PUMP
1. Check:
   - water pump housing cover ①
   - water pump housing ②
   - impeller ③
   - rubber damper ④
   - rubber damper holder ⑤
     Cracks/damage/wear → Replace.

2. Check:
   - water pump seal
   - oil seal
   - water pump outlet pipe
     Cracks/damage/wear → Replace.
   - bearing
     Rough movement → Replace.
COOL WATER PUMP

3. Measure:
   - impeller shaft tilt
     Out of specification → Replace.

   ![Impeller Shaft Tilt Measurement Diagram](image)

   **Max. impeller shaft tilt**
   - 0.15 mm (0.006 in)

   ![Diagram of Impeller Shaft](image)

   1. Straightedge
   2. Impeller

ASSEMBLING THE WATER PUMP

1. Install:
   - oil seal (into the water pump housing)

   **NOTE:**
   - Before installing the oil seal, apply tap water or coolant onto its outer surface.
   - Install the oil seal with a socket that matches its outside diameter.

   ![Oil Seal Installation Diagram](image)

   ![Diagram of Oil Seal](image)

   **CAUTION:**
   Never lubricate the water pump seal surface with oil or grease.

   ![Water Pump Seal Diagram](image)

   ![Diagram of Water Pump Seal](image)

   **NOTE:**
   Install the water pump seal with the special tools.

   ![Water Pump Seal Installer](image)

   ![Diagram of Water Pump Seal Installer](image)

   ![Mechanical Seal Installer](image)

   ![Diagram of Mechanical Seal Installer](image)

   ![Middle Driven Shaft Bearing Driver](image)

   ![Diagram of Middle Driven Shaft Bearing Driver](image)

   **NOTE:**
   - Push down.

   ![Diagram of Push Down Action](image)
3. Install:
   - rubber damper ① New
   - rubber damper holder ② New

**NOTE:**
Before installing the rubber damper, apply tap water or coolant onto its outer surface.

**CAUTION:**
Make sure that the rubber damper and rubber damper holder are flush with the impeller.
Removing the oil cooler
Driver seat/passenger seat/console/left support side panel/right support side panel/footrest cover
Engine oil

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oil cooler inlet pipe 1/oil cooler outlet pipe 1</td>
<td>1/1</td>
<td>Remove the parts in the order listed. Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8. Drain. Refer to “CHANGING THE ENGINE OIL” in chapter 3.</td>
</tr>
<tr>
<td>2</td>
<td>O-ring</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Oil cooler</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Oil cooler inlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Oil cooler outlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Oil outlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Oil inlet hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Order</td>
<td>Job/Part</td>
<td>Q'ty</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------------------------------</td>
<td>------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Oil cooler inlet pipe 2/oil cooler outlet pipe 2</td>
<td>1/1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
CHECKING THE OIL COOLER

1. Check:
   - oil cooler
     Obstruction → Clean.
     Apply compressed air to the rear of the oil cooler.
     Damage → Repair or replace the oil cooler.

   NOTE: 
   Straighten any flattened fins with a thin, flat-head screwdriver.

2. Check:
   - oil hoses
     Cracks/damage → Replace.
Removing the fuel pump and fuel tank
Driver seat/passenger seat/console/right side panel/right support side panel/right protector/passenger seat support

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vacuum hose</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Fuel hose</td>
<td>2</td>
<td>Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.</td>
</tr>
<tr>
<td>3</td>
<td>Fuel filter</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fuel suction hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Fuel return hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Fuel pump</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Fuel tank breather hose</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Rollover valve</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Fuel tank stay</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
For installation, reverse the removal procedure.
CHECKING THE FUEL PUMP OPERATION

1. Remove:
   - driver seat
   - passenger seat
   - console
   - right protector
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.

2. Place a container under the end of the fuel hose 1.

3. Check:
   • fuel pump operation

   Suck on the end of the vacuum hose 1.

   Fuel flows. Fuel pump is OK.
   Fuel does not flow. Replace the fuel pump.

4. Install:
   - right protector
   - console
   - passenger seat
   - driver seat
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.
Removing the carburetor
Driver seat/passenger seat/console 1

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Crankcase breather hose</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Air filter case</td>
<td>1</td>
<td>Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.</td>
</tr>
<tr>
<td>3</td>
<td>Carburetor joint (air filter case)</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>4</td>
<td>Vacuum chamber breather hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Air vent hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Starter cable/starter plunger</td>
<td>1/1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>7</td>
<td>Fuel hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Carburetor heater lead</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>9</td>
<td>Carburetor assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Drain hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Throttle valve cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Order</td>
<td>Job/Part</td>
<td>Q'ty</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------------</td>
<td>------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>12</td>
<td>Throttle cable end</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Throttle cable</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Carburetor joint (intake manifold)</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

For installation, reverse the removal procedure.
Disassembling the carburetor

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Throttle stop screw</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vacuum chamber cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Jet needle holder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Jet needle set</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Piston valve</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Coasting enricher diaphragm</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
For assembly, reverse the disassembly procedure.
DISASSEMBLING THE CARBURETOR

NOTE:
Before disassembling the carburetor, make sure to note the number of times the pilot screw is turned out from the seated position to its set position.

CHECKING THE CARBURETOR

1. Check:
   - carburetor body
   - float chamber
     Cracks/damage → Replace.
   - fuel passage
     Contamination → Clean as indicated.
   - fuel chamber body
     Contamination → Clean.

   a. Wash the carburetor in a petroleum based solvent.
      (Do not use any caustic carburetor cleaning solution.)
   b. Blow out all of the passages and jets with compressed air.

2. Check:
   - float ①
   - float tang ②
     Damage → Replace.

3. Check:
   - needle valve seat ①
   - needle valve ②
   - O-ring ③
     Contamination/wear/damage → Replace as a set.

NOTE:
Always replace the needle valve and valve seat as a set.
4. Check:
   - piston valve ①
     Scratches/wear/damage → Replace.
   - rubber diaphragm ②
     Tears → Replace.

5. Check:
   - vacuum chamber cover ①
   - spring ②
     Cracks/damage → Replace.

6. Check:
   - diaphragm (coasting enricher) ①
   - spring ②
   - cover ③
     Tears (diaphragm) /damage → Replace.

7. Check:
   - jet needle ①
   - main jet ②
   - needle jet ③
   - pilot air jet ④
   - pilot jet ⑤
   - starter jet ⑥
   - starter plunger ⑦
     Bends/wear/damage → Replace.
     Blockage → Blow out the jets with compressed air.
8. Check:
• free movement (piston valve)
   Sticks → Replace the piston valve guide and the piston valve.
   Insert the piston valve into the carburetor body, and check for free movement.
9. Check:
• free movement (throttle valve)
   Sticks → Replace.

ASSEMBLING THE CARBURETOR

NOTE: ______________________________________
Before assembling the carburetor, make sure to turn out the pilot screw the same number of times, as noted before disassembly, from the seated position to the set position.

CAUTION: ______________________________________
Before assembling, wash all of the parts in a clean petroleum based solvent.

1. Measure:
• float height a
  Out of specification → Adjust.

<table>
<thead>
<tr>
<th>Float height (F.H.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 mm (0.51 in)</td>
</tr>
</tbody>
</table>

a. Hold the carburetor in an upside down position.
b. Measure the distance from the front mating surface of the float chamber (gasket removed) to the top of the float.

NOTE: ______________________________________
The float arm should be resting on the needle valve, but not compressing it.

c. If the float height is not within the specification, check the valve seat and needle valve.
d. If either is worn, replace them both.
e. If both are fine, adjust the float height by bending the float tang ① on the float.
f. Recheck the float height.
ADJUSTING THE FUEL LEVEL

1. Measure:
   - fuel level
     Out of specification → Adjust.

- Fuel level
  4.0 ~ 5.0 mm (0.16 ~ 0.20 in)
  Above the float chamber mating surface

a. Place the vehicle on a level surface.
b. Connect the fuel level gauge to the drain pipe.
c. Loosen the drain screw.
d. Hold the gauge vertically next to the float chamber line.
e. Measure the fuel level with the gauge.
f. If the fuel level is incorrect, adjust the fuel level.
g. Remove the carburetor.
h. Check the valve seat and needle valve.
i. If either is worn, replace them both.
j. If both are fine, adjust the float level by bending the float tang slightly.
k. Install the carburetor.
l. Recheck the fuel level.

Fuel level gauge
P/N. YM-01312-A, 90890-01312
The following conditions may indicate damaged shaft drive components:

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A pronounced hesitation or “jerky” movement during acceleration, deceleration, or sustained speed. (This must not be confused with engine surging or transmission characteristics.)</td>
<td>A. Bearing damage.</td>
</tr>
<tr>
<td>2. A “rolling rumble” noticeable at low speed; a high-pitched whine; a “clunk” from a shaft drive component or area.</td>
<td>B. Improper gear lash.</td>
</tr>
<tr>
<td>3. A locked-up condition of the shaft drive train mechanism, no power transmitted from the engine to the front and/or rear wheel.</td>
<td>C. Gear tooth damage.</td>
</tr>
<tr>
<td></td>
<td>D. Broken drive shaft.</td>
</tr>
<tr>
<td></td>
<td>E. Broken gear teeth.</td>
</tr>
<tr>
<td></td>
<td>F. Seizure due to lack of lubrication.</td>
</tr>
<tr>
<td></td>
<td>G. Small foreign objects lodged between the moving parts.</td>
</tr>
</tbody>
</table>

**NOTE:**

Areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from normal vehicle operating noise. If there is reason to believe these components are damaged, remove the components and check them.

---

**Check notes**

1. Investigate any unusual noises.

The following “noises” may indicate a mechanical defect:

- A “rolling rumble” noise during coasting, acceleration, or deceleration. The noise increases with front and/or rear wheel speed, but it does not increase with higher engine or transmission speeds. Diagnosis: Possible wheel bearing damage.
- A “whining” noise that varies with acceleration and deceleration. Diagnosis: Possible incorrect reassembly, too-little gear lash.
CAUTION: Too little gear lash is extremely destructive to the gear teeth. If a test ride following reassembly indicates this condition, stop riding immediately to minimize gear damage.

c. A slight “thunk” evident at low speed operation. This noise must be distinguished from normal vehicle operation. Diagnosis: Possible broken gear teeth.

WARNING Stop riding immediately if broken gear teeth are suspected. This condition could result in the shaft drive assembly locking up, causing loss of control of the vehicle and possible injury to the rider.

2. Check:
   • drained oil
     Drained oil shows large amounts of metal particles → Check the bearing for seizure.

   NOTE: A small amount of metal particles in the oil is normal.

3. Check:
   • oil leakage

   a. Clean the entire vehicle thoroughly, then dry it.
   b. Apply a leak-localizing compound or dry powder spray to the shaft drive.
   c. Road test the vehicle for the distance necessary to locate the leak.
     Leakage → Check the component housing, gasket, and/or seal for damage.
     Damage → Replace the component.

   NOTE: • An apparent oil leak on a new or nearly new vehicle may be the result of a rust-preventative coating or excessive seal lubrication.
   • Always clean the vehicle and recheck the suspected location of an apparent leakage.
Troubleshooting chart
When basic condition “a” and “b” exist, check the following points:

<table>
<thead>
<tr>
<th>YES Replace the wheel bearing.</th>
<th>YES Replace the wheel bearing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevate and spin both wheels. Feel for wheel bearing damage.</td>
<td>(Refer to “STEERING SYSTEM” and “REAR KNUCKLE AND STABILIZER” in chapter 8.)</td>
</tr>
<tr>
<td>NO</td>
<td>Torque to specification.</td>
</tr>
<tr>
<td>NO Check the wheel nuts and hub nuts for tightness.</td>
<td>(Refer to “FRONT WHEELS AND BRAKE DISCS” and “REAR WHEELS AND BRAKE DISC” in chapter 8.)</td>
</tr>
<tr>
<td>NO</td>
<td>Constant velocity joint bearings and differential gear bearings are probably not damaged. Repeat the test or remove the individual components.</td>
</tr>
<tr>
<td>NO Check the front constant velocity joints. Feel for bearing damage.</td>
<td>YES</td>
</tr>
<tr>
<td>NO</td>
<td>Constant velocity joint bearings and final drive gear bearings are probably not damaged. Repeat the test or remove the individual components.</td>
</tr>
<tr>
<td>NO Check the parking brake adjustment.</td>
<td>YES</td>
</tr>
<tr>
<td>YES</td>
<td>Adjust per instructions.</td>
</tr>
<tr>
<td>YES</td>
<td>(Refer to “ADJUSTING THE PARKING BRAKE” in chapter 3.)</td>
</tr>
<tr>
<td>NO Check the rear constant velocity joints. Feel for bearing damage.</td>
<td>NO</td>
</tr>
<tr>
<td>NO</td>
<td>Constant velocity joint bearings and final drive gear bearings are probably not damaged. Repeat the test or remove the individual components.</td>
</tr>
<tr>
<td>YES</td>
<td>Remove the drive shaft components.</td>
</tr>
</tbody>
</table>
### Removing the front constant velocity joints, differential gear and drive shaft

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constant velocity joint</td>
<td>2</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Gear motor coupler/On-Command four-wheel drive switch and differential</td>
<td>1/1</td>
<td>Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.</td>
</tr>
<tr>
<td></td>
<td>gear lock switch coupler</td>
<td></td>
<td>Drain.</td>
</tr>
<tr>
<td>3</td>
<td>Differential gear case breather hose</td>
<td>1</td>
<td>Refer to “STEERING SYSTEM” in chapter 8.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to “FRONT ARMS AND FRONT SHOCK ABSORBER” in chapter 8.</td>
</tr>
</tbody>
</table>

55 Nm (5.5 m • kg, 40 ft • lb)
### Order | Job/Part               | Q'ty | Remarks
---|------------------------|-----|------------------
4  | Differential gear assembly | 1   |                  
5  | Drive shaft            | 1   |                  
6  | Compression spring     | 1   | For installation, reverse the removal procedure. 

55 Nm (5.5 m · kg, 40 ft · lb)
Disassembling the constant velocity joint

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Circlip</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>②</td>
<td>Boot band</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>③</td>
<td>Boot band</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>④</td>
<td>Dust boot</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>⑤</td>
<td>Circlip</td>
<td>1</td>
<td>Refer to “ASSEMBLING THE FRONT CONSTANT VELOCITY JOINTS”.</td>
</tr>
<tr>
<td>⑥</td>
<td>Double off-set joint</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑦</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑧</td>
<td>Ball bearing</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td>⑨</td>
<td>Joint shaft assembly</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Disassembling the differential gear

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gear motor/O-ring</td>
<td>1/1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Circlip</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bearing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Universal joint</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Universal joint yoke/O-ring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Stopper bolt/shaft</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Shift fork (with shift fork sliding gear)</td>
<td>1</td>
<td>Refer to “DISASSEMBLING THE UNIVERSAL JOINT” and “ASSEMBLING THE UNIVERSAL JOINT.”</td>
</tr>
<tr>
<td>8</td>
<td>Differential gear case cover/O-ring</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Drive clutch</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Circlip/bearing</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Adapter</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**
Do not disassemble the gear motor or remove the pinion gear.
FRONT CONSTANT VELOCITY JOINTS, DIFFERENTIAL GEAR AND DRIVE SHAFT

Order | Job/Part                      | Q'ty | Remarks
--- | ----------------------------- | ---- | -------------------------------
12   | Shim (right)                  | 1    |                               
13   | Differential gear assembly    | 1    |                               
14   | Shim (left)                   | 1    |                               
15   | Bearing                       | 1    |                               
16   | Bearing                       | 1    |                               
17   | Circlip/bearing               | 1/1  |                               
18   | Drive pinion gear             | 1    |                               
19   | Differential gear case        | 1    |                               
20   | Bearing                       | 1    |                               

For assembly, reverse the disassembly procedure.
DISASSEMBLING THE UNIVERSAL JOINT
1. Remove:
   • universal joint

   a. Remove the circlips ①.
   b. Place the universal joint in a press.
   c. With a suitable diameter pipe ② beneath the yoke ③, press the bearing ④ into the pipe as shown.

   NOTE: It may be necessary to lightly tap the yoke with a punch.

   d. Repeat the steps for the opposite bearing.
   e. Remove the yoke.

2. Remove:
   • universal joint yoke

   Use a universal joint holder ①.

   Universal joint holder
   P/N. YM-04062, 90890-04062

REMOVING THE DIFFERENTIAL GEAR ASSEMBLY
1. Remove:
   • differential gear assembly ①

   NOTE: The ring gear and the differential gear should be fastened together. Do not disassemble the differential gear assembly.

   CAUTION: The differential gears are assembled into a proper unit at the factory by means of specialized equipment. Do not attempt to disassemble this unit. Disassembly will result in the malfunction of the unit.
CHECKING THE CONSTANT VELOCITY JOINTS
1. Check:
   • double off-set joint spline
   • ball joint spline
   • shaft spline
     Wear/damage → Replace.
2. Check:
   • dust boots
     Cracks/damage → Replace.

CAUTION:
Always use a new boot band.

3. Check:
   • balls and ball races
   • inner surface of double off-set joint
     Pitting/wear/damage → Replace.

CHECKING THE DIFFERENTIAL GEAR
1. Check:
   • gear teeth
     Pitting/galling/wear → Replace drive pinion gear and ring gear as a set.
   • bearings
     Pitting/damage → Replace.
   • oil seals
   • O-rings
     Damage → Replace.
2. Check:
   • drive shaft splines
   • universal joints
   • drive pinion gear splines
     Wear/damage → Replace.
   • spring
     Fatigue → Replace.
     Move the spring up and down.
3. Check:
   - front drive shaft
     Bends → Replace.
   - torque limiter
     Loose → Replace the front drive shaft.

**WARNING**
Do not attempt to straighten a bent shaft; this may dangerously weaken the shaft.

CHECKING THE GEAR MOTOR
1. Check:
   - gear motor

   a. Connect two C size batteries to the gear motor terminals (as shown in the illustrations).

   **CAUTION:**
   - Do not use a 12 V battery to operate the pinion gear.
   - Do not connect the batteries to the gear motor when it is installed in the gear case. The gear motor should be checked when it is removed from the gear case.

   ![Diagram A](image)
   ![Diagram B](image)

   Check that the pinion gear turns counterclockwise.
   Check that the pinion gear turns clockwise.

   **NOTE:**
   Do not disassemble the gear motor or remove the pinion gear.

ASSEMBLING THE FRONT CONSTANT VELOCITY JOINTS
1. Apply:
   - molybdenum disulfide grease
     (into the ball joint assembly)

   **NOTE:**
   Molybdenum disulfide grease is included in the repair kit.
2. Install:
   - dust boots  
   - boot bands  

   a. Apply molybdenum disulfide grease into the dust boots.

   Molybdenum disulfide grease
   40 g (1.4 oz) per dust boot (front wheel side)
   45 g (1.6 oz) per dust boot (differential gear case side)

   b. Install the dust boots.
   c. Install the dust boot bands.

   NOTE: 
   - The new boot bands may differ from the original ones.
   - The dust boots should be fastened with the boot bands  at the grooves in the joint shaft.

3. Check:
   - free play (thrust movement)
     Excessive play → Replace the joint assembly.

ASSEMBLING THE DIFFERENTIAL GEAR
1. Measure:
   - gear lash
     Refer to “MEASURING AND ADJUSTING THE DIFFERENTIAL GEAR LASH”.

2. Install:
   - gear motor

   a. Slide the shift fork sliding gear , which is installed to the differential gear, to the right to put it into the 2WD mode.
b. Connect two C size batteries to the gear motor terminal 2 to operate the pinion gear 3. Operate the pinion gear until the paint mark 4 on the gear is aligned with the paint mark 5 on the gear motor case.

**CAUTION:**

Do not use a 12 V battery to operate the pinion gear.

c. Insert 8 mm bolts 6 into the gear motor 7 and use them as a guide to set the motor on the differential gear assembly 8 so that the shift fork sliding gear 9 does not move.

**CAUTION:**

If the position of the shift fork sliding gear is moved, the position of the differential gear and the indicator light display may differ, and the 2WD or differential lock mode may not be activated.

d. Remove the 8 mm bolts, and then install the motor with the gear motor bolts.

<table>
<thead>
<tr>
<th>Gear motor bolts</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Nm (1.3 m·kg, 9.4 ft·lb)</td>
</tr>
</tbody>
</table>

3. Install:
- universal joint yoke
- O-ring
- washer
- nut 62 Nm (6.2 m·kg, 45 ft·lb)

Use a universal joint holder 1.

<table>
<thead>
<tr>
<th>Universal joint holder</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N. YM-04062, 90890-04062</td>
</tr>
</tbody>
</table>

**NOTE:**

Apply locking agent (LOCTITE®) to the nut threads.
4. Check:
   - differential gear operation
     Unsmooth operation → Replace the differential gear assembly.
Insert the double off-set joint into the differential gear, and turn the gear back and forth.

ASSEMBLING THE UNIVERSAL JOINT
1. Install:
   - universal joint

   a. Install the opposite yoke into the universal joint.
b. Apply wheel bearing grease to the bearings.
c. Install the bearing ① onto the yoke.
   **CAUTION:**
Check each bearing. The needles can easily fall out of their races. Slide the yoke back and forth on the bearings; the yoke will not go all the way onto a bearing if a needle is out of plate.

d. Press each bearing into the universal joint using a suitable socket.
   **NOTE:**
The bearing must be inserted far enough into the universal joint so that the circlip can be installed.

e. Install the circlips ② into the groove of each bearing.

MEASURING AND ADJUSTING THE DIFFERENTIAL GEAR LASH
Measuring the differential gear lash
1. Secure the gear case in a vise or another supporting device.
2. Remove:
   - drain plug
   - gasket
3. Install:
   - a bolt of the specified size ① (into the drain plug hole)

   **CAUTION:**
   Finger tighten the bolt until it holds the ring gear. Otherwise, the ring gear will be damaged.

4. Attach:
   - gear lash measurement tool ①
   - dial gauge ②

   **Gear lash measurement tool**
   P/N. YM-01467, 90890-01467

   Measuring point is 21 mm (0.83 in)

5. Measure:
   - gear lash
     Gently rotate the gear coupling from engagement to engagement.

   **Differential gear lash**
   0.05 ~ 0.25 mm
   (0.002 ~ 0.010 in)

   **NOTE:**
   Measure the gear lash at four positions. Rotate the shaft 90° each time.

   **Adjusting the differential gear lash**
   1. Remove:
      - shim(s) (left) ①
      - differential gear assembly ②
      - shim(s) (right) ③
2. Adjust:

* gear lash

a. Select the suitable shims using the following chart.

<table>
<thead>
<tr>
<th>Too little gear lash</th>
<th>Reduce right shim thickness.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too large gear lash</td>
<td>Increase right shim thickness.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ring gear shim (left and right)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness (mm)</td>
</tr>
<tr>
<td>0.1</td>
</tr>
<tr>
<td>0.2</td>
</tr>
<tr>
<td>0.3</td>
</tr>
<tr>
<td>0.4</td>
</tr>
</tbody>
</table>

* right shim only

**NOTE:**

- Use a combination of shims (left and right) so that the differential gear lash is within specification.
- Always keep the total combined thickness of the shims (left and right) the same.

Example:
If the differential gear lash exceeds the specification, increase the thickness of the right shim(s) by 0.1 mm (0.004 in) and decrease the thickness of the left shim(s) by 0.1 mm (0.004 in).

b. Measure the differential gear lash again.

**CHECKING THE DIFFERENTIAL GEAR OPERATION**

1. Block the rear wheels, and elevate the front wheels by placing a suitable stand under the frame.
2. Remove the center cap from the axle nut (right or left).
3. Measure the starting torque of the front wheel (i.e., differential gear preload) with a torque wrench.

**NOTE:**
- Repeat this step several times to obtain an average figure.
- During this test, the other front wheel will turn in the opposite direction.

4. Out of specification → Replace the differential gear assembly.
5. Within specification → Install the new cotter pin and wheel cap.

**Front wheel starting torque (differential gear preload)**

**New unit**
- 17 ~ 25 Nm
  - (1.7 ~ 2.5 m · kg, 12 ~ 18 ft · lb)
- Minimum
  - 10 Nm (1.0 m · kg, 7.2 ft · lb)
**Removing the rear constant velocity joints, final drive gear and drive shaft**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Removing the rear constant velocity joints, final drive gear and drive shaft</strong></td>
<td></td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>1</td>
<td>Rear skid plate</td>
<td></td>
<td>Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED” in chapter 8.</td>
</tr>
<tr>
<td>2</td>
<td>Muffler/exhaust pipe</td>
<td></td>
<td>Refer to “ENGINE REMOVAL” in chapter 4.</td>
</tr>
<tr>
<td>3</td>
<td>Final gear oil</td>
<td></td>
<td>Drain.</td>
</tr>
<tr>
<td>4</td>
<td>Rear knuckle</td>
<td></td>
<td>Refer to “REAR KNUCKLE AND STABILIZER” in chapter 8.</td>
</tr>
<tr>
<td>5</td>
<td>Rear lower arm</td>
<td></td>
<td>Refer to “REAR ARMS AND REAR SHOCK ABSORBER” in chapter 8.</td>
</tr>
<tr>
<td>6</td>
<td>Brake caliper assembly</td>
<td></td>
<td>Refer to “FRONT AND REAR BRAKES” in chapter 8.</td>
</tr>
</tbody>
</table>
### ORDER OF SERVICE

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rear constant velocity joint</td>
<td>2</td>
<td><strong>NOTE:</strong> Remove the constant velocity joint on the right side of the vehicle, rotate the final gear assembly slightly so that the constant velocity joint on the left side clears the frame, and then remove it.</td>
</tr>
<tr>
<td>2</td>
<td>Final drive gear case breather hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>3</td>
<td>Final drive gear assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Compression spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Coupling gear</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Drive shaft</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
Disassembling the rear constant velocity joint

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Circlip</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Boot band</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Boot band</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Dust boot</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Circlip</td>
<td>1</td>
<td>Refer to “ASSEMBLING THE REAR CONSTANT VELOCITY JOINTS”.</td>
</tr>
<tr>
<td>6</td>
<td>Double off-set joint</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Ball bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Joint shaft assembly</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

For assembly, reverse the disassembly procedure.
### Disassembling the final gear case

Rear brake disc

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bolt</td>
<td>4</td>
<td>Remove the parts in the order listed. Refer to “REAR WHEELS AND BRAKE DISC” in chapter 8.</td>
</tr>
<tr>
<td>2</td>
<td>Final drive pinion gear shim</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Drive shaft coupling</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Final drive pinion gear</td>
<td>1</td>
<td>Refer to “DISASSEMBLING THE FINAL GEAR CASE” and “ASSEMBLING THE FINAL GEAR CASE”.</td>
</tr>
<tr>
<td>5</td>
<td>Inner race</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Oil seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bearing retainer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Bearing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Final drive pinion gear bearing housing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Ring gear stopper</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
NOTE: Working in a crisscross pattern, loosen each bolt 1/4 of a turn. After all the bolts are loosened, remove them.
<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Bearing</td>
<td>1</td>
<td>Refer to “REMOVING THE FINAL DRIVE ROLLER BEARINGS” and “INSTALLING THE FINAL DRIVE ROLLER BEARINGS”. For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td>3</td>
<td>Bearing</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Specifications:**
- 20 Nm (2.0 m·kg, 14 ft·lb)
- 23 Nm (2.3 m·kg, 17 ft·lb)
- 170 Nm (17.0 m·kg, 125 ft·lb)
- 80 Nm (8.0 m·kg, 58 ft·lb)
- 32 Nm (3.2 m·kg, 23 ft·lb)
- 40 Nm (4.0 m·kg, 29 ft·lb)
- 16 Nm (1.6 m·kg, 11 ft·lb)
ASSEMBLING THE REAR CONSTANT VELOCITY JOINTS

1. Apply:
   - molybdenum disulfide grease (into the ball joint assembly)

2. Install:
   - dust boots ①
   - boot bands ②, ③ New

3. Check:
   - free play (thrust movement)
     Excessive play → Replace the joint assembly

DISASSEMBLING THE FINAL GEAR CASE

1. Remove:
   - drive shaft coupling nut

2. Place a folded rag ①.

3. Secure the drive shaft coupling edge in the vise.

4. Remove the drive shaft coupling nut.
2. Remove:
   • final drive pinion gear bearing housing assembly ①

   a. Clean the outside surface of the final drive pinion gear.
   b. Place the final drive pinion gear in a hydraulic press.

   CAUTION:
   • Never directly press the gear end with a hydraulic press, this will result in damage to the gear thread.
   • Install the suitable socket ② on the gear end to protect the thread from damage.

   c. Press the gear end and remove the bearing housing assembly.

3. Remove:
   • bearing retainer

   a. Place a folded rag ①.
   b. Secure the final drive pinion gear bearing housing edge in the vise.
   c. Attach the bearing retainer wrench ②.

   d. Remove the bearing retainer.

   CAUTION:
   The bearing retainer has left-handed threads. To loosen the retainer, turn it clockwise.

REMOVING THE FINAL DRIVE ROLLER BEARINGS
1. Remove:
   • roller bearing (ring gear) ①
     Use a suitable press tool ② and an appropriate support for the main housing.
2. Remove:
   • roller bearing (final drive pinion gear) ①

   The removal of the final drive pinion gear roller bearing is difficult and seldom necessary.

INSTALLING THE FINAL DRIVE ROLLER BEARINGS
1. Install:
   • roller bearing (final drive pinion gear) New

   a. Heat the main housing only to 150 °C (302 °F).
   b. Install the roller bearing outer race using the proper adapter.
   c. Install the inner race onto the drive pinion gear.

2. Install:
   • roller bearing (ring gear) ①

   Use a suitable press tool ② and a press to install the above components into the main housing.

POSITIONING THE FINAL DRIVE PINION GEAR AND RING GEAR
When the final drive pinion gear, ring gear, final gear case and/or ring gear bearing housing are replaced, be sure to adjust the positions of the final drive pinion gear and ring gear using the shim(s).
Selecting the final drive pinion gear shim

1. Select:
   • final drive pinion gear shim(s)

   To find the final drive pinion gear shim thickness “A”, use the following formula.

   \[ A = a + (c - b) - d \]

   - \( a \) = 92.5 mm
   - \( b \) = a numeral (usually a decimal number) on the final drive pinion gear bearing housing either added to or subtracted from “34”
   - \( c \) = a numeral (usually a decimal number) on the final drive pinion gear bearing housing either added to or subtracted from “55”
   - \( d \) = a numeral (usually a decimal number) on the final gear case either added to or subtracted from “112”

   Example:
   1) \( a = 92.5 \)
   2) If “98” is stamped on the final drive pinion gear bearing housing,
      \[ b = 34 + 0.98 \]
      \[ b = 34.98 \]
   3) If “48” is stamped on the final drive pinion gear bearing housing,
      \[ c = 55 + 0.48 \]
      \[ c = 55.48 \]
   4) If “03” is stamped on the final gear case,
      \[ d = 112 + 0.03 \]
      \[ d = 112.03 \]
   5) Therefore, “A” is 0.97.
      \[ A = 92.5 + (55.48 - 34.98) - 112.03 \]
      \[ A = 0.97 \]
   6) Round off the hundredth digit and select the appropriate shim(s).

   In the example above, the calculated number is 0.97. The chart instructs you to round off 7 to 5 at the hundredth place. Thus, the shim thickness is 0.95 mm.

   \[
   \begin{array}{|c|c|}
   \hline
   \text{Hundredths} & \text{Rounded value} \\
   \hline
   0, 1, 2 & 0 \\
   3, 4, 5, 6, 7 & 5 \\
   8, 9 & 10 \\
   \hline
   \end{array}
   \]
Shims are supplied in the following thicknesses.

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>0.25</th>
<th>0.30</th>
<th>0.35</th>
<th>0.40</th>
<th>0.45</th>
<th>0.50</th>
</tr>
</thead>
</table>

Selecting the ring gear shim

1. Select:
   - ring gear shim(s) ①

   a. To find the ring gear shim thickness “B”, use the following formula.

   \[
   B = \Theta - \Phi - (\Psi + \Phi) 
   \]

   \( \Theta \) = a numeral (usually a decimal number) on the final gear case either added to or subtracted from “50”

   \( \Phi \) = a numeral (usually a decimal number) on the outside of the ring gear bearing housing and added to 1

   \( \Psi \) = a numeral (usually a decimal number) on the inside of the ring gear either added to or subtracted from 35.00

   \( \Phi \) = bearing thickness (considered constant)

Example:

1) If “98” is stamped on the final gear case,
   \[ \Theta = 50 + 0.98 \]
   \[ = 50.98 \]

2) If “55” is stamped on the ring gear bearing housing,
   \[ \Phi = 1 + 0.55 \]
   \[ = 1.55 \]

3) If “–05” is stamped on the ring gear,
   \[ \Psi = 35 - 0.05 \]
   \[ = 34.95 \]

4) \( \Phi = 14.00 \)

5) Therefore, shim thickness “B” is 0.48.
   \[ B = 50.98 - 1.55 - (34.95 + 14.00) \]
   \[ = 49.43 - 48.95 \]
   \[ = 0.48 \]
6) Round off the hundredth digit and select the appropriate shim(s).

In the example above, the calculated number is 0.48. The chart instructs you to round off 8 to 10 at the hundredth place. Thus, the shim thickness is 0.50 mm.

<table>
<thead>
<tr>
<th>Hundredths</th>
<th>Rounded value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 1, 2</td>
<td>0</td>
</tr>
<tr>
<td>3, 4, 5, 6, 7</td>
<td>5</td>
</tr>
<tr>
<td>8, 9</td>
<td>10</td>
</tr>
</tbody>
</table>

Shims are supplied in the following thicknesses.

Selecting the thrust washer
1. Measure:
   - ring gear thrust clearance “C”

   a. Place four pieces of Plastigauge® between the originally fitted thrust washer and the ring gear.
   b. Install the final gear assembly and tighten the bolts to specification.

   **M8 bolts (ring gear bearing housing)**
   
   23 Nm (2.3 m · kg, 17 ft · lb)
   
   **M10 bolts (ring gear bearing housing)**
   
   40 Nm (4.0 m · kg, 29 ft · lb)

**NOTE:**

Do not turn the drive pinion gear and ring gear when measuring the clearance with Plastigauge®.
c. Remove the final gear assembly.
d. Measure the thrust clearance. Calculate the width of the flattened Plastigauge® ①.

<table>
<thead>
<tr>
<th>Ring gear thrust clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 ~ 0.2 mm (0.004 ~ 0.008 in)</td>
</tr>
</tbody>
</table>

e. If out of specification, select the correct washer.

2. Select:
   • ring gear thrust clearance “C”

<table>
<thead>
<tr>
<th>Thrust washer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness (mm)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

b. Repeat the measurement steps until the ring gear thrust clearance is within the specified limits.

Adjusting the ring gear stopper

1. Install:
   • ring gear stopper
   • nut
2. Adjust:
   • ring gear stopper clearance

a. Finger tighten the ring gear stopper ① until it contacts the ring gear ②.
b. Turn the ring gear stopper 120° counterclockwise.
c. Tighten the ring gear stopper nut ③.

<table>
<thead>
<tr>
<th>Ring gear stopper nut</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Nm (1.6 m·kg, 11 ft·lb)</td>
</tr>
</tbody>
</table>
CHECKING THE DRIVE SHAFT
1. Check:
   • drive shaft (splines) ①
   • coupling gear (splines) ②
     Wear/damage → Replace.

CHECKING THE FINAL GEAR CASE
1. Check:
   • final gear case ①
   • ring gear bearing housing ②
     Cracks/damage → Replace.

NOTE: ____________________________
When the final gear case and/or the ring gear bearing housing are replaced, be sure to adjust the shim of the final drive pinion gear and/or ring gear.

2. Check:
   • gear teeth
     Pitting/galling/wear → Replace the drive pinion gear and ring gear as a set.
   • oil seals
   • O-rings
     Damage → Replace.

3. Check:
   • bearings
     Damage → Replace.

NOTE: ____________________________
• Reusing roller bearings is acceptable, but Yamaha recommends installing new ones.
  Do not reuse the oil seal.
• When the final drive pinion gear and/or ring gear are replaced, be sure to adjust the shim of the final drive pinion gear and/or ring gear.
MEASURING AND ADJUSTING THE FINAL GEAR LASH

Measuring the final gear lash
1. Secure the gear case in a vise or another supporting device.
2. Remove:
   - drain plug
   - gasket
3. Install:
   - a bolt of the specified size ① (into the drain plug hole)
   - gear lash measurement tool ①
   - dial gauge ②
4. Attach:
   - gear lash measurement tool ①
   - dial gauge ②
5. Measure:
   - gear lash
     Gently rotate the gear coupling from engagement to engagement.

NOTE:
Measure the gear lash at four positions. Rotate the shaft 90° each time.

CAUTION:
Finger tighten the bolt until it holds the ring gear. Otherwise, the ring gear will be damaged.
Adjusting the final gear lash

1. Remove:
   - ring gear bearing housing ①
   - ring gear shim(s) ②
   - ring gear ③
   - thrust washer ④

2. Adjust:
   - gear lash

Select a suitable shim(s) and thrust washer(s) using the following chart.

<table>
<thead>
<tr>
<th>Too little gear lash</th>
<th>Reduce shim thickness.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too large gear lash</td>
<td>Increase shim thickness.</td>
</tr>
</tbody>
</table>

b. If increased by more than 0.2 mm (0.008 in):
   Reduce the thrust washer thickness by 0.2 mm (0.008 in) for every 0.2 mm of ring gear shim increase.

c. If reduced by more than 0.2 mm (0.008 in):
   Increase the thrust washer thickness by 0.2 mm (0.008 in) for every 0.2 mm that the ring gear shim is decreased.

### Ring gear shim

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>0.25</th>
<th>0.30</th>
<th>0.35</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.40</td>
<td></td>
<td>0.45</td>
<td>0.50</td>
</tr>
</tbody>
</table>

### Thrust washer

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>1.0</th>
<th>1.1</th>
<th>1.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>1.4</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>1.7</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>2.0</td>
<td>2.1</td>
<td></td>
</tr>
</tbody>
</table>

ASSEMBLING THE FINAL GEAR CASE

1. Adjust:
   - final gear lash

Refer to “MEASURING AND ADJUSTING THE FINAL GEAR LASH”.

---

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2. Install:
   - ring gear bearing housing
   - M8 bolts (ring gear bearing housing) ①
     - Apply Quick Gasket® to the bolts ① and ② threads.
   - M10 bolts (ring gear bearing housing) ②
     - 23 Nm (2.3 m·kg, 17 ft·lb)
     - 40 Nm (4.0 m·kg, 29 ft·lb)

   **NOTE:**
   - Apply Quick Gasket® to the bolts ① and ② threads.

3. Install:
   - bearing retainer

   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼
   a. Place a folded rag ①.
   b. Secure the final drive pinion gear bearing housing edge in the vise.
   **NOTE:**
   - Apply locking agent (LOCTITE®) to the threads of bearing retainer.
   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼
   c. Attach the bearing retainer wrench ②.
   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼
   d. Tighten the bearing retainer.
   ▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼▲▼
   **CAUTION:**
   - The bearing retainer has left-hand threads.
   - Turn the retainer counterclockwise to tighten it.
4. Install:
- drive shaft coupling nut

- Place a folded rag ①.
- Secure the drive shaft coupling edge in the vise.
- Tighten the drive shaft coupling nut.

<table>
<thead>
<tr>
<th>Drive shaft coupling nut</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 Nm (8.0 m · kg, 58 ft · lb)</td>
</tr>
</tbody>
</table>

5. Check:
- final drive gear operation
  Unsmooth operation → Replace the final drive gear assembly.
  Insert the double off-set joint into the final drive gear, and turn the gear back and forth.
### CHASSIS

#### SEATS, ENCLOSURE, HOOD AND CARGO BED

#### FRONT BUMPER AND HOOD

![Diagram of front bumper and hood with torques](image)

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front bumper protector</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Front bumper</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Headlight coupler</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>4</td>
<td>Hood</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

For installation, reverse the removal procedure.

The torques are:
- 16 Nm (1.6 m·kg, 11 ft·lb)
- 32 Nm (3.2 m·kg, 23 ft·lb)
- 59 Nm (5.9 m·kg, 43 ft·lb)
- 7 Nm (0.7 m·kg, 5.1 ft·lb)

Remove the parts in the order listed.
## SEATS, CONSOLE AND INSTRUMENT PANELS

### Removing the seats, console and instrument panels

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Driver seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Passenger seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Console</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Steering wheel cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Steering wheel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Pedal cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Light switch coupler</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>8</td>
<td>Main switch coupler</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>9</td>
<td>On-Command four-wheel drive switch</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td></td>
<td>and differential gear lock switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Indicator/warning light coupler</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
</tbody>
</table>

Remove the parts in the order listed.

**T/R.**

7 Nm (0.7 m \cdot kg, 5.1 ft \cdot lb)

35 Nm (3.5 m \cdot kg, 25 ft \cdot lb)
<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Auxiliary DC jack connector</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>12</td>
<td>Nut/starter cable</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Upper instrument panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Lower instrument panel</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cedure.</td>
</tr>
</tbody>
</table>

7 Nm (0.7 m · kg, 5.1 ft · lb)

35 Nm (3.5 m · kg, 25 ft · lb)
Removing the panels and footrest cover

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Left side panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Right side panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Left corner panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Right corner panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Air duct end cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Protector cap</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Left protector 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Right protector 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Left protector 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Right protector 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Footrest cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Driver seat support</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Remove the parts in the order listed.
### Order Job/Part Q'ty Remarks

|   | Passenger seat support | 1 | For installation, reverse the removal procedure. |

**SEATS, ENCLOSURE, HOOD AND CARGO BED**

- **16 Nm (1.6 m·kg, 11 ft·lb)**
- **7 Nm (0.7 m·kg, 5.1 ft·lb)**
- **32 Nm (3.2 m·kg, 23 ft·lb)**
CARGO BED

Removing the cargo bed

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tail/brake light connector</td>
<td>6</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Damper</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>3</td>
<td>Pin</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cargo bed assembly</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

**Note:**
- **16 Nm (1.6 m·kg, 11 ft·lb)**
- New components are indicated with a new symbol.

---

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### Order

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hinge cover</td>
<td>2</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Tailgate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cargo bed panel</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tail/brake light bulb holder</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Mud guard</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Cargo bed release lever</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cargo bed</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

For assembly, reverse the disassembly procedure.

<table>
<thead>
<tr>
<th>Notes</th>
<th>7 Nm (0.7 m · kg, 5.1 ft · lb)</th>
<th>11 Nm (1.1 m · kg, 8.0 ft · lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 Nm (2.6 m · kg, 19 ft · lb)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T R. 7 Nm (0.7 m · kg, 5.1 ft · lb)

T R. 7 Nm (0.7 m · kg, 5.1 ft · lb)

T R. 11 Nm (1.1 m · kg, 8.0 ft · lb)

T R. 26 Nm (2.6 m · kg, 19 ft · lb)
SKID PLATES

Removing the engine skid plates

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front skid plate</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Center skid plate</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td>3</td>
<td>Rear skid plate</td>
<td>1</td>
<td>cedure.</td>
</tr>
</tbody>
</table>

7 Nm (0.7 m · kg, 5.1 ft · lb)
## ENCLOSURE AND SEAT BELTS

- **64 Nm (6.4 m·kg, 46 ft·lb)**
- **64 Nm (6.4 m·kg, 46 ft·lb)**
- **64 Nm (6.4 m·kg, 46 ft·lb)**
- **59 Nm (5.9 m·kg, 43 ft·lb)**
- **59 Nm (5.9 m·kg, 43 ft·lb)**
- **59 Nm (5.9 m·kg, 43 ft·lb)**

### Order | Job/Part | Q'ty | Remarks
--- | --- | --- | ---
| **Removing the enclosure and seat belts** | Front top frame | 1 | Remove the parts in the order listed. |
| 1 | Rear top frame | 1 | |
| 2 | Left support frame | 1 | |
| 3 | Right support frame | 1 | |
| 4 | Left side frame | 1 | |
| 5 | Right side frame | 1 | |
| 6 | Seat belt | 2 | |
| 7 | Buckle | 2 | For installation, reverse the removal procedure. |
FRONT WHEELS AND BRAKE DISCS

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Removing the front wheel</td>
<td></td>
<td>Remove the parts in the order listed. Place the vehicle on a level surface.</td>
</tr>
<tr>
<td>1</td>
<td>Front wheel</td>
<td>1</td>
<td>Refer to “INSTALLING THE FRONT WHEEL”.</td>
</tr>
<tr>
<td>2</td>
<td>Center cap</td>
<td>1</td>
<td>Refer to “INSTALLING THE FRONT WHEEL”.</td>
</tr>
<tr>
<td>3</td>
<td>Axle nut</td>
<td>1</td>
<td>Refer to “INSTALLING THE FRONT WHEEL HUB”.</td>
</tr>
</tbody>
</table>

WARNING

Securely support the vehicle so there is no danger of it falling over.

---

**FRONT WHEELS AND BRAKE DISCS**

Removing the front wheel

Place the vehicle on a level surface.

**WARNING**

Securely support the vehicle so there is no danger of it falling over.

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### FRONT WHEELS AND BRAKE DISCS

**Order** | **Job/Part** | **Q'ty** | **Remarks**
---|---|---|---
4 | Brake caliper assembly | 1 | **NOTE:**
5 | Front wheel hub | 1 | Do not depress the brake pedal when the brake caliper is off of the brake disc as the brake pads will be forced shut.
6 | Brake disc | 1 | For installation, reverse the removal procedure.

*NOTE:* 260 Nm (26.0 m·kg, 190 ft·lb)  
*New*  

- 48 Nm (4.8 m·kg, 35 ft·lb)  
- 30 Nm (3.0 m·kg, 22 ft·lb)  
- 55 Nm (5.5 m·kg, 40 ft·lb)
CHECKING THE FRONT WHEEL
1. Check:
   • wheel
2. Measure:
   • wheel runout
   Over the specified limit → Replace the wheel or check the wheel bearing play ₁.

   Wheel runout limit
   Radial ₀: 2.0 mm (0.08 in)
   Lateral ₃: 2.0 mm (0.08 in)

3. Check:
   • wheel balance
   Out of balance → Adjust.

   WARNING
   After replacing the tire, ride conservatively to allow the tire to be properly seated in the rim. Failure to do so may cause an accident resulting in vehicle damage and possible injury.

CHECKING THE FRONT WHEEL HUB
1. Check:
   • wheel hub ₁
     Cracks/damage → Replace.
   • splines (wheel hub) ₂
     Wear/damage → Replace.
CHECKING THE FRONT BRAKE DISC
1. Check:
   • brake disc
     Gallng/damage → Replace.
2. Measure:
   • brake disc deflection
     Out of specification → Check the wheel runout.
     If wheel runout is within the limits, replace the brake disc.

   **Brake disc maximum deflection**
   0.10 mm (0.004 in)

   • brake disc thickness
     Out of specification → Replace.

   **Brake disc minimum thickness**
   3.0 mm (0.12 in)

INSTALLING THE FRONT WHEEL HUB
1. Install:
   • axle nut
     New
     260 Nm (26.0 m·kg, 190 ft·lb)

   **NOTE:**
   • Do not apply oil to the seat of the nut.
   • After tightening the nut, stake the collar of the nut into the notch of the shaft.

INSTALLING THE FRONT WHEEL
1. Install:
   • wheel

   **NOTE:**
   The arrow mark on the tire must point in the direction of rotation of the wheel.

2. Tighten:
   • wheel nuts

   **WARNING**
   Tapered wheel nuts are used for both the front and rear wheels. Install each nut with its tapered side towards the wheel.
## Removing the Rear Wheel

1. Rear wheel  
2. Center cap  
3. Axle nut  
4. Rear wheel hub

**Order**: 1

**Remarks**: Remove the parts in the order listed. Place the vehicle on a level surface.

**WARNING**: Securely support the vehicle so there is no danger of it falling over.

**Q'ty**: 1

- Refer to “INSTALLING THE REAR WHEEL”.
- Refer to “INSTALLING THE REAR WHEEL HUB”.
- For installation, reverse the removal procedure.
REAR BRAKE DISC

Removing the rear brake disc
Brake caliper assembly
Final drive gear

1
Rear brake disc

1

× 10 Nm (1.0 m·kg, 7.2 ft·lb)

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Removing the rear brake disc</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to “FRONT AND REAR BRAKES”. Refer to “REAR CONSTANT VELOCITY JOINTS, FINAL DRIVE GEAR AND DRIVE SHAFT” in chapter 7. For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>
CHECKING THE REAR WHEEL
1. Check:
   • wheel
     Refer to “CHECKING THE FRONT WHEEL”.
2. Measure:
   • wheel runout
     Refer to “CHECKING THE FRONT WHEEL”.
     Over the specified limit → Replace.

Wheel runout limit
Radial: 2.0 mm (0.08 in)
Lateral: 2.0 mm (0.08 in)

3. Check:
   • wheel balance
     Refer to “CHECKING THE FRONT WHEEL”.
     Out of balance → Adjust.

CHECKING THE REAR WHEEL HUB
1. Check:
   • wheel hub ①
     Cracks/damage → Replace.
   • splines (wheel hub) ②
     Wear/damage → Replace.

CHECKING THE REAR BRAKE DISC
1. Check:
   • brake disc
     Gallling/damage → Replace.
2. Measure:
   • brake disc deflection
     Out of specification → Replace.

Brake disc maximum deflection
0.10 mm (0.004 in)

• brake disc thickness ③
  Out of specification → Replace.

Brake disc minimum thickness
4.5 mm (0.18 in)
INSTALLING THE REAR WHEEL HUB
1. Install:
   • axle nut New
   Refer to “INSTALLING THE FRONT WHEEL HUB”.

INSTALLING THE REAR WHEEL
1. Install:
   • wheel
   Refer to “INSTALLING THE FRONT WHEEL”.
2. Tighten:
   • wheel nuts
   Refer to “INSTALLING THE FRONT WHEEL”.
# FRONT AND REAR BRAKES

## FRONT BRAKE PADS

**Removing the front brake pads**

Front wheel

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake caliper mounting bolt</td>
<td>2</td>
<td>Remove the parts in the order listed. Refer to “FRONT WHEELS AND BRAKE DISCS”.</td>
</tr>
<tr>
<td>2</td>
<td>Brake pad holding bolt</td>
<td>2</td>
<td>Refer to “REPLACING THE FRONT BRAKE PADS”.</td>
</tr>
<tr>
<td>3</td>
<td>Brake pad</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pad spring</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

**Torque Specifications**

- **48 Nm (4.8 m·kg, 35 ft·lb)**
- **18 Nm (1.8 m·kg, 13 ft·lb)**

---

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# REAR BRAKE PADS

**Removing the rear brake pads**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spring</td>
<td>1</td>
<td>Remove the parts in the order listed. Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”.</td>
</tr>
<tr>
<td>2</td>
<td>Parking brake cable</td>
<td>1</td>
<td>Refer to “REPLACING THE REAR BRAKE PADS”.</td>
</tr>
<tr>
<td>3</td>
<td>Brake caliper mounting bolt</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brake pad holding bolt</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brake pad (piston side)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Brake pad</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Insulator/pad shim</td>
<td>2/2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Pad spring</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

**Torque Specifications**

- **40Nm (4.0 m·kg, 29 ft·lb)** for 3 and 7.
- **17 Nm (1.7 m·kg, 12 ft·lb)** for 5 and 8.
CAUTION:
Disc brake components rarely require disassembly. DO NOT:
• disassemble components unless absolutely necessary;
• use solvents on internal brake components;
• use spent brake fluid for cleaning; (use only clean brake fluid)
• allow brake fluid to come in contact with the eyes, as this may cause eye injury;
• splash brake fluid onto painted surfaces or plastic parts, as this may cause damage;
• disconnect any hydraulic connection, as this would require the entire brake system to be disassembled, drained, cleaned, properly filled and bled after reassembly.

REPLACING THE FRONT BRAKE PADS
NOTE: ________________________________
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

1. Measure:
• brake pad wear limit \( \text{a} \)
  Out of specification → Replace the brake pads as a set.

Brake pad wear limit
1.5 mm (0.06 in)
2. Install:
   - brake pads
   - brake pad spring

**NOTE:**
Always install new brake pads and brake pad spring as a set.

a. Connect a suitable hose 1 tightly to the brake caliper bleed screw 2. Put the other end of this hose into an open container.
b. Loosen the brake caliper bleed screw and, using a finger, push the caliper piston into the brake caliper.
c. Tighten the brake caliper bleed screw.

d. Install the retaining bolts and brake caliper.

<table>
<thead>
<tr>
<th>Brake caliper bleed screw</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Nm (0.6 m·kg, 4.3 ft·lb)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brake pad holding bolt</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Nm (1.8 m·kg, 13 ft·lb)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brake caliper mounting bolt</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 Nm (4.8 m·kg, 35 ft·lb)</td>
</tr>
</tbody>
</table>

3. Check:
   - brake fluid level
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

4. Check:
   - brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

**REPLACING THE REAR BRAKE PADS**

**NOTE:**
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.
1. Measure:
   • brake pad wear limit (a)
     Out of specification → Replace the brake pads as a set.

   ![Brake pad wear limit 1.5 mm (0.06 in)]

2. Install:
   • brake pads
   • brake pad spring

**NOTE:**
Always install new brake pads, new brake pad shims, new insulators, and a new brake pad spring as a set.

```
\begin{itemize}
  \item a. Connect a suitable hose 1 tightly to the brake caliper bleed screw 2. Put the other end of this hose into an open container.
  \item b. Loosen the brake caliper bleed screw, and then turn the brake caliper piston 3 clockwise until section ③ of the brake caliper piston is level with the surface of the brake caliper body.
  \item c. Tighten the brake caliper bleed screw.
  \item d. Install new brake pads, new insulators, new brake pad shims and a new brake pad spring.
\end{itemize}
```

**NOTE:**
Align an end ⑤ of the groove in the brake caliper piston with the punch mark ⑥ on the brake caliper body.

```
\begin{itemize}
  \item Align the projection d on the piston side of the brake pad with the groove in the brake caliper piston.
\end{itemize}
```
e. Install the brake pad holding bolts, the brake caliper, and the brake caliper mounting bolts.

<table>
<thead>
<tr>
<th>Brake pad holding bolt</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 Nm (1.7 m · kg, 12 ft · lb)</td>
</tr>
<tr>
<td>Brake caliper mounting bolt</td>
</tr>
<tr>
<td>40 Nm (4.0 m · kg, 29 ft · lb)</td>
</tr>
</tbody>
</table>

3. Check:
   - brake fluid level
     Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

4. Check:
   - brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
BRAKE MASTER CYLINDER

Removing the brake master cylinder

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake fluid</td>
<td>1</td>
<td>Remove the parts in the order listed. Drain.</td>
</tr>
<tr>
<td>2</td>
<td>Brake fluid reservoir cap</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Brake fluid reservoir diaphragm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brake fluid reservoir float</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Union bolt</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Copper washer</td>
<td>2</td>
<td>Disconnect. Refer to “INSTALLING THE BRAKE MASTER CYLINDER”.</td>
</tr>
<tr>
<td>7</td>
<td>Brake hose</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>8</td>
<td>Brake pipe</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>9</td>
<td>Brake master cylinder</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

19 Nm (1.9 m·kg, 13 ft·lb)
16 Nm (1.6 m·kg, 11 ft·lb)
27 Nm (2.7 m·kg, 19 ft·lb)
Disassembling the brake master cylinder

1. Dust boot 1
2. Circlip 1
3. Primary brake master cylinder kit 1
4. Secondary brake master cylinder kit stopper 1
5. Gasket 1

For assembly, reverse the disassembly procedure.

Remove the parts in the order listed.

Refer to “ASSEMBLING THE BRAKE MASTER CYLINDER”.

9 Nm (0.9 m·kg, 6.5 ft·lb)
CHECKING THE MASTER CYLINDER
1. Check:
   • brake master cylinder ①
     Wear/scratches → Replace the brake master cylinder assembly.
   • brake master cylinder body
     Cracks/damage → Replace.
   • brake fluid delivery passage
     (brake master cylinder body)
     Blockage → Blow out with compressed air.
2. Check:
   • brake master cylinder kit
     Scratches/wear/damage → Replace as a set.
     A Primary brake master cylinder kit
     B Secondary brake master cylinder kit
3. Check:
   • brake fluid reservoir ①
   • brake fluid reservoir diaphragm ②
     Cracks/damage → Replace.

ASSEMBLING THE BRAKE MASTER CYLINDER

WARNING
• All internal brake components should be cleaned and lubricated with new brake fluid only before installation.

Recommended brake fluid
DOT 4

• Whenever a master cylinder is disassembled, replace the piston seals and dust seals.
INSTALLING THE BRAKE MASTER CYLINDER

1. Install:
   - brake master cylinder
   - brake pipe
   - copper washers
   - brake hose
   - union bolt

   **NOTE:**
   Tighten the union bolt while holding the brake hose as shown.

   **WARNING**
   Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” in chapter 2.

3. Fill:
   - brake fluid reservoir

   **CAUTION:**
   Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

   **WARNING**
   - Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
   - Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
   - Be careful that water does not enter the brake master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

   **Recommended brake fluid**
   DOT 4

   **New**
   - 16 Nm (1.6 m·kg, 11 ft·lb)
   - 19 Nm (1.9 m·kg, 13 ft·lb)
   - 27 Nm (2.7 m·kg, 19 ft·lb)
4. Air bleed:
   • brake system
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

5. Check:
   • brake fluid level
     Brake fluid level is under the “MIN” level line
     → Fill up.
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

6. Adjust:
   • brake pedal free play
     Refer to “ADJUSTING THE BRAKE PEDAL” in chapter 3.
## FRONT BRAKE CALIPER

### Removing the front brake caliper
- Brake fluid
- Front wheel

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Union bolt</td>
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<td>Remove the parts in the order listed.</td>
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<tr>
<td>2</td>
<td>Copper washer</td>
<td>2</td>
<td>Drain.</td>
</tr>
<tr>
<td>3</td>
<td>Brake hose</td>
<td>1</td>
<td>Refer to “FRONT WHEELS AND BRAKE DISCS”.</td>
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<tr>
<td>4</td>
<td>Brake pad holding bolt</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
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<td>5</td>
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<td>2</td>
<td>Loosen.</td>
</tr>
<tr>
<td>6</td>
<td>Brake caliper assembly</td>
<td>1</td>
<td>Refer to “INSTALLING THE FRONT BRAKE CALIPERS”.</td>
</tr>
</tbody>
</table>

For installation, reverse the removal procedure.
### Disassembling the front brake caliper

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake pad holding bolt</td>
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<td>Remove the parts in the order listed.</td>
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<tr>
<td>2</td>
<td>Brake pad</td>
<td>2</td>
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</tr>
<tr>
<td>3</td>
<td>Pad spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Caliper bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brake caliper piston</td>
<td>2</td>
<td>Refer to “DISASSEMBLING THE FRONT BRAKE CALIPERS” and “ASSEMBLING THE FRONT BRAKE CALIPERS”.</td>
</tr>
<tr>
<td>6</td>
<td>Dust seal</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Caliper piston seal</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Bleed screw</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>

- 6 Nm (0.6 m·kg, 4.3 ft·lb)
- 18 Nm (1.8 m·kg, 13 ft·lb)
REAR BRAKE CALIPER

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Removing the rear brake caliper</strong></td>
<td></td>
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<tr>
<td></td>
<td>Rear skid plate</td>
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<tr>
<td></td>
<td>Brake fluid</td>
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<tr>
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<td>Parking brake switch coupler</td>
<td>1</td>
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<tr>
<td>2</td>
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<td>1</td>
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</tr>
<tr>
<td>3</td>
<td>Parking brake cable</td>
<td>1</td>
<td>Drain.</td>
</tr>
<tr>
<td>4</td>
<td>Parking brake lever assembly mounting bolt</td>
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<td>Disconnect.</td>
</tr>
<tr>
<td>5</td>
<td>Parking brake lever assembly</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

New 27 Nm (2.7 m·kg, 19 ft·lb)
# FRONT AND REAR BRAKES

![Diagram of brake system](image)

**Order** | **Job/Part** | **Q'ty** | **Remarks** |
---|---|---|---|
6 | Union bolt | 1 |  |
7 | Copper washer | 2 |  |
8 | Brake hose | 1 | Disconnect. Refer to "INSTALLING THE REAR BRAKE CALIPER". |
9 | Brake caliper mounting bolt | 2 |  |
10 | Brake caliper assembly | 1 | For installation, reverse the removal procedure. |

**Torque Specifications**
- 40 Nm (4.0 m·kg, 29 ft·lb)
- 7 Nm (0.7 m·kg, 5.1 ft·lb)
- 27 Nm (2.7 m·kg, 19 ft·lb)
## Disassembling the Rear Brake Caliper

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake pad holding bolt</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Brake pad (piston side)</td>
<td>1</td>
<td>Refer to “ASSEMBLING THE REAR BRAKE CALIPER”.</td>
</tr>
<tr>
<td>3</td>
<td>Brake pad</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Insulator/pad shim</td>
<td>2/2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pad spring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Brake caliper bracket</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Parking brake arm nut</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Parking brake arm</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Set bolt</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Parking brake arm shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Parking brake case bolt</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Tightening Torques:**
- 5 Nm (0.5 m?kg, 3.6 ft?lb)
- 17 Nm (1.7 m?kg, 12 ft?lb)
- 22 Nm (2.2 m?kg, 16 ft?lb)
FRONT AND REAR BRAKES

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Parking brake case</td>
<td>1</td>
<td>Refer to “ASSEMBLING THE REAR BRAKE CALIPER”.</td>
</tr>
<tr>
<td>13</td>
<td>Gasket</td>
<td>1</td>
<td>Refer to ”DISASSEMBLING THE FRONT BRAKE CALIPERS” and “ASSEMBLING THE REAR BRAKE CALIPER”.</td>
</tr>
<tr>
<td>14</td>
<td>Brake caliper piston</td>
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</tr>
<tr>
<td>15</td>
<td>Dust seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Caliper piston seal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Bleed screw</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>
DISASSEMBLING THE FRONT BRAKE CALIPERS

1. Remove:
   - brake caliper pistons
   - dust seals ①
   - caliper piston seals ②

   a. Blow compressed air into the hose joint opening to force out the caliper piston from the brake caliper body.

   **WARNING**
   - Never try to pry out a caliper piston.
   - Cover the caliper piston with a rag. Be careful not to get injured when the piston is expelled from the caliper cylinder.

   b. Remove the dust seals and caliper piston seals.

DISASSEMBLING THE REAR BRAKE CALIPER

1. Remove:
   - brake caliper piston ①
   - dust seal ②
   - caliper piston seal ③

   a. Turn the brake caliper piston counterclockwise to remove it.

   **WARNING**
   - Never try to pry out the caliper piston.

   b. Remove the dust seal and caliper piston seal.
CHECKING THE FRONT AND REAR BRAKE CALIPERS

<table>
<thead>
<tr>
<th>Recommended brake component replacement schedule:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake pads</td>
</tr>
<tr>
<td>Piston seals, dust seals</td>
</tr>
<tr>
<td>Brake hoses</td>
</tr>
<tr>
<td>Brake fluid</td>
</tr>
</tbody>
</table>

⚠️ WARNING

All internal brake components should be cleaned in new brake fluid only. Do not use solvents as they will cause seals to swell and distort.

1. Check:
   - brake caliper pistons ①
     Scratches/rust/wear → Replace the brake caliper assembly.
   - brake caliper cylinders ②
     Wear/scratches → Replace the brake caliper assembly.
   - brake caliper body ③
     Cracks/damage → Replace.
   - brake fluid delivery passage (brake caliper body)
     Blockage → Blow out with compressed air.

⚠️ WARNING

Replace the caliper piston seals and dust seals whenever the brake caliper is disassembled.

A Front
B Rear
ASSEMBLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the front brake calipers.

**WARNING**

- All internal brake components should be cleaned and lubricated with new brake fluid only before installation.

Recommended brake fluid

DOT 4

- Replace the caliper piston seals and dust seal whenever a brake caliper is disassembled.

1. Install:
   - caliper piston seals ① New
   - dust seals ② New

2. Install:
   - brake caliper pistons ①
ASSEMBLING THE REAR BRAKE CALIPER

**WARNING**

- All internal brake components should be cleaned and lubricated with new brake fluid only before installation.

<table>
<thead>
<tr>
<th>Recommended brake fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT 4</td>
</tr>
</tbody>
</table>

- Replace the caliper piston seal and dust seal whenever a brake caliper is disassembled.

1. Install:
   - caliper piston seal ① New
   - dust seal ② New

2. Install:
   - brake caliper piston ①
     Turn the brake caliper piston clockwise until section ③ of the brake caliper piston is level with the surface of the brake caliper body.

   **NOTE:**
   Align an end ⑤ of the groove in the brake caliper piston with the punch mark ⑥ on the brake caliper body.

3. Install:
   - gasket ①
   - parking brake case ②
   - parking brake case bolts ③
   - O-ring ④

   ![Diagram](image-url)
4. Install:
   • parking brake arm shaft ①
   • parking brake arm ②
   • set bolt ③
   • parking brake arm nut ④

**NOTE:**
Apply lithium-soap-based grease to the parking brake arm shaft and set bolt.

a. Screw in the parking brake arm shaft counterclockwise completely so that the punch mark ③ on the parking brake arm shaft is between the alignment marks ④.

**NOTE:**
The hole for the parking brake arm shaft has multiple threads. If the punch mark ③ on the parking brake arm shaft is not between the alignment marks ④ when the parking brake arm shaft is screwed in completely, remove the parking brake arm shaft and screw it in from a different starting position.

b. Turn the parking brake arm shaft approximately 60° clockwise.

c. Install the parking brake arm to the parking brake arm shaft so that the punch mark ⑤ on the parking brake arm is aligned with the punch mark ⑥ on the parking brake arm shaft.

d. Turn the parking brake arm until it contacts the pin ⑦.

e. Finger tighten the set bolt.

f. Tighten the parking brake arm nut.

5. Install:
   • brake pad (piston side) ① (with insulator and pad shim)

**NOTE:**
Align the projection ① on the piston side of the brake pad with the groove in the brake caliper piston.
6. Install:
   - brake pad holding bolts
     \[17 \text{ Nm (1.7 m} \cdot \text{kg, 12 ft} \cdot \text{lb)}\]

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INSTALLING THE FRONT BRAKE CALIPERS
The following procedure applies to both of the front brake calipers.

1. Install:
   - brake caliper assembly
   - brake caliper mounting bolts
     \[48 \text{ Nm (4.8 m} \cdot \text{kg, 35 ft} \cdot \text{lb)}\]
   - brake hose \(\text{①}\)
   - copper washers \(\text{②}\)  New
   - union bolt \(\text{③}\)
     \[27 \text{ Nm (2.7 m} \cdot \text{kg, 19 ft} \cdot \text{lb)}\]

   **CAUTION:**
   When installing the brake hose on the brake caliper, make sure that the brake pipe touches the projection \(\text{③}\) on the brake caliper.

   **WARNING**
   Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” in chapter 2.

2. Fill:
   - brake reservoir

   **Recommended brake fluid**
   DOT 4

   **CAUTION:**
   Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.
FRONT AND REAR BRAKES

WARNING

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

3. Air bleed:
   - brake system
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

4. Check:
   - brake fluid level
   Brake fluid level is below the “MIN” level line → Add the recommended brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

INSTALLING THE REAR BRAKE CALIPER

1. Install:
   - brake caliper assembly
   - brake caliper mounting bolts
     40 Nm (4.0 m·kg, 29 ft·lb)
   - brake hose
   - copper washers
   - union bolt
     27 Nm (2.7 m·kg, 19 ft·lb)

   NOTE: 
   Tighten the union bolt while holding the brake hose as shown.

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” in chapter 2.
2. Fill:
   - brake reservoir

   **Recommended brake fluid**
   DOT 4

   **CAUTION:**
   Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

   **WARNING**
   - Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
   - Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
   - Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

3. Air bleed:
   - brake system
   Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

4. Check:
   - brake fluid level
   Brake fluid level is below the “MIN” level line
   → Add the recommended brake fluid to the proper level.
   Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

5. Adjust:
   - parking brake cable free play
   Refer to “ADJUSTING THE PARKING BRAKE” in chapter 3.
Removing the pedal assembly
Steering wheel cover/steering wheel/pedal cover/upper instrument panel/lower instrument panel
Steering joint
Brake master cylinder
Splash plate
Brake light switch coupler
Brake switch
Throttle cable
Pin
Brake pedal rod
Pedal assembly

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”.</td>
</tr>
<tr>
<td>3</td>
<td>Brake switch</td>
<td>1</td>
<td>Refer to “STEERING SYSTEM”.</td>
</tr>
<tr>
<td>4</td>
<td>Throttle cable</td>
<td>1</td>
<td>Refer to “FRONT AND REAR BRAKES”.</td>
</tr>
<tr>
<td>5</td>
<td>Pin</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>6</td>
<td>Brake pedal rod</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>7</td>
<td>Pedal assembly</td>
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</tr>
</tbody>
</table>

For installation, reverse the removal procedure.
Disassembling the pedal assembly

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
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</thead>
<tbody>
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<td>Circlip</td>
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</tr>
<tr>
<td>3</td>
<td>Washer</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brake pedal</td>
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<td></td>
</tr>
<tr>
<td>5</td>
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</tr>
<tr>
<td>6</td>
<td>Circlip</td>
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</tr>
<tr>
<td>7</td>
<td>Washer</td>
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<td>8</td>
<td>Accelerator pedal</td>
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</tr>
<tr>
<td>9</td>
<td>Pedal assembly bracket</td>
<td>1</td>
<td>procedure.</td>
</tr>
</tbody>
</table>
STEERING SYSTEM
STEERING COLUMN AND STEERING ASSEMBLY

Removing the steering column and steering assembly
Steering wheel cover/steering wheel/upper instrument panel/lower instrument panel

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
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<td>Refer to &quot;SEATS, ENCLOSURE, HOOD AND CARGO BED&quot;.</td>
</tr>
<tr>
<td>3</td>
<td>Steering assembly</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

21 Nm (2.1 m·kg, 15 ft·lb)
22 Nm (2.2 m·kg, 16 ft·lb)
39 Nm (3.9 m·kg, 28 ft·lb)
48 Nm (4.8 m·kg, 35 ft·lb)
Disassembling the steering assembly

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tie-rod end locknut</td>
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<td>Remove the parts in the order listed.</td>
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<td>2</td>
<td>Tie-rod end</td>
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<td>Refer to “ASSEMBLING THE STEERING ASSEMBLY”.</td>
</tr>
<tr>
<td>3</td>
<td>Plastic locking tie</td>
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<tr>
<td>4</td>
<td>Dust boot</td>
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<td>Refer to “DISASSEMBLING THE STEERING ASSEMBLY” and “ASSEMBLING THE STEERING ASSEMBLY”.</td>
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<tr>
<td>5</td>
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<td>8</td>
<td>Oil seal</td>
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<td>9</td>
<td>Circlip</td>
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<td>10</td>
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<td>----------------------------------------------------------------------------------------------</td>
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<tr>
<td>13</td>
<td>Steering assembly</td>
<td>1</td>
<td>Refer to “ASSEMBLING THE STEERING ASSEMBLY”. For assembly, reverse the disassembly procedure.</td>
</tr>
</tbody>
</table>
DISASSEMBLING THE STEERING ASSEMBLY
1. Remove:
   - oil seal
   - circlip
   - pinion gear with bearing

**NOTE:**
Lightly tap on the steering housing with a soft hammer to remove the pinion gear easily.

CHECKING THE STEERING JOINT
1. Check:
   - steering joint
     Rough movement → Replace.

CHECKING THE STEERING ASSEMBLY
1. Check:
   - pinion gear bearing
     Check the bearing movement on the pinion gear by rotating with the fingers.
     Roughness → Replace.

2. Check:
   - pinion needle bearing
     Damage → Replace.

**NOTE:**
When replacing the pinion needle bearing, it is recommended to replace the steering assembly. The steering housing may be subject to damage during removal of the pinion needle bearing.
3. Check:
- rack gear teeth ①
- pinion gear teeth ②
  Wear/damage → Replace the steering assembly.

**NOTE:**
The wear pattern on the rack and pinion gear teeth should be uniform. An uneven wear pattern may indicate improper adjustment or lack of lubrication.

4. Check:
- pressure pad ①
  Wear/damage → Replace.
- dust boots ②
  Damage → Replace.

5. Check:
- tie-rod free play and movement
  Free play → Replace the tie-rod end.
  Turns roughly → Replace the tie-rod end.

6. Check:
- tie-rod
d  Bends/damage → Replace.

**ASSEMBLING THE STEERING ASSEMBLY**
1. Lubricate:
- bearings
- rack gear
- pinion gear
- oil seal

**Recommended lubricant**
Molybdenum disulfide grease
2. Install:
   • steering assembly
   • bearing
   • circlips
   • pinion gear
   • oil seal

NOTE:
After centering the rack gear, make two alignment marks on the pinion gear and the steering housing to mark the position of the pinion gear. This is necessary to install the steering joint to the pinion gear properly.

3. Apply lithium-soap-based grease to the gear surface of the rack gear.

   Lithium-soap-based grease
   5 ~ 10 g (0.2 ~ 0.4 oz)

4. Adjust:
   • rack gear-pinion gear backlash

a. Install the force pressure pad, spring, and adjuster.

b. Tighten the adjuster .

c. Loosen the adjuster 15 ~ 25°.

5. Install:
   • dust boots
   • plastic locking tie
   • tie-rod end
   • tie-rod end locknut

<table>
<thead>
<tr>
<th>Adjuster</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.9 Nm (0.39 m · kg, 2.8 ft · lb)</td>
</tr>
<tr>
<td>LOCTITE®</td>
</tr>
</tbody>
</table>

   | 40 Nm (4.0 m · kg, 29 ft · lb) |

INSTALLING THE STEERING SYSTEM
1. Adjust:
   • toe-in

   Refer to “ADJUSTING THE TOE-IN” in chapter 3.
### TIE-ROD AND STEERING KNUCKLE

Removing the tie-rod and steering knuckle
Front wheel/brake disc

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tie-rod</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Brake disc guard</td>
<td>1</td>
<td>Refer to “FRONT WHEELS AND BRAKE DISCS”.</td>
</tr>
<tr>
<td>3</td>
<td>Nut</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brake hose holder bolt</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Steering knuckle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Ball joint</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Rubber boot</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
</tbody>
</table>

![Diagram of tie-rod and steering knuckle with torque specifications](image)

- **Tie-rod**: 7 Nm (0.7 m·kg, 5.1 ft·lb)
- **Brake hose holder bolt**: 39 Nm (3.9 m·kg, 28 ft·lb)
- **Steering knuckle**: 30 Nm (3.0 m·kg, 22 ft·lb)
- **Brake disc guard**: 7 Nm (0.7 m·kg, 5.1 ft·lb)
REMOVING THE STEERING KNUCKLES
1. Remove:
   - steering knuckle ①

   **NOTE:**
   Use a general puller to separate the ball joints ② from the steering knuckle ① or the front lower arm ③.

CHECKING THE TIE-RODS
1. Check:
   - tie-rod free play and movement
     Free play → Replace the tie-rod end.
     Turns roughly → Replace the tie-rod end.

2. Check:
   - tie-rods
     Bends/damage → Replace.

CHECKING THE STEERING KNUCKLES
1. Check:
   - steering knuckles
     Damage/pitting → Replace.

2. Check:
   - ball joints
     Damage/pitting → Replace the ball joint.
     Free play → Replace the ball joint.
     Turns roughly → Replace the ball joint.

a. Clean the outside of the steering knuckle.
b. Remove the steering knuckle oil seal.
c. Remove the circlip ① and rubber boot ②.
   Use the ball joint remover and installer set.
d. Install the body 3, short bolt 5, remover washer 6 and remover spacer 7 onto the ball joint.

**NOTE:**
- Remover washer 6 must be aligned with the projection on the head of the ball joint.
- Surface 3 of the remover spacer 7 must be aligned with the surface 6 of the steering knuckle.

e. Hold the body 3 in place while turning in the short bolt 5 to remove the ball joint 11 from the steering knuckle.

f. Remove the ball joint remover/installer.

g. Install the long bolt 4, installer spacer 9 and installer guide 10 onto the body 3.
h. Attach the assembled ball joint remover/installer, new ball joint ⑫ and installer attachment ⑬ to the steering knuckle ⑭.

**NOTE:**
Do not tap or damage the top of the ball joint.

i. Hold the body ⑬ in place while turning in the long bolt ⑭ to install the new ball joint ⑫ into the steering knuckle ⑬.

j. Remove the ball joint remover/installer.

k. Apply lithium-soap base grease to the new ball joint ⑫.

l. Install a new rubber boot and new circlip.

**NOTE:**
Always use a new ball joint set.

m. Install a steering knuckle oil seal.

3. Check:
   - front wheel bearings
     Bearings allow play in the wheel hubs or the wheel turns roughly → Replace.
   - oil seals
     Damage → Replace.

a. Clean the outside of the steering knuckle.

b. Remove the oil seals ①.

c. Drive out the bearings ②.

**WARNING**
Eye protection is recommended when using striking tools.

d. Remove the spacer ③.

e. Apply lithium base grease to the bearings and oil seals.

f. Install the spacer to the steering knuckle.

g. Install the new bearings.

**NOTE:**
Install the outside bearing first.

**CAUTION:**
Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.
h. Install the new oil seals.

**NOTE:**
When installing the oil seals, the “seal side” of the oil seal faces out.
## Removing the front arms and front shock absorber

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake disc guard</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Front arm protector</td>
<td>1</td>
<td>Refer to “FRONT WHEELS AND BRAKE DISCS”.</td>
</tr>
<tr>
<td>3</td>
<td>Nut</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bolt/nut</td>
<td>2/2</td>
<td>Refer to “REMOVING THE FRONT ARMS” and “INSTALLING THE FRONT ARMS AND FRONT SHOCK ABSORBER”.</td>
</tr>
<tr>
<td>5</td>
<td>Front lower arm/bushing</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Nut/bolt</td>
<td>2/2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Front shock absorber</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Bolt/nut</td>
<td>2/2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Front upper arm/bushing</td>
<td>1/2</td>
<td></td>
</tr>
</tbody>
</table>
### FRONT ARMS AND FRONT SHOCK ABSORBER

**Diagram**

- **45 Nm (4.5 m•kg, 32 ft•lb)**
- **7 Nm (0.7 m•kg, 5.1 ft•lb)**
- **30 Nm (3.0 m•kg, 22 ft•lb)**

### Table

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Circlip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Ball joint</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

---

For installation, reverse the removal procedure.
REMOVING THE FRONT ARMS
1. Check:
   • front arm free play

   a. Check the front arm side play A by moving it from side to side.
      If side play is noticeable, check the bushings.

   b. Check the front arm vertical movement B by moving it up and down.
      If the vertical movement is tight or rough, or if there is binding, check the bushings.

2. Remove:
   • front arms

CHECKING THE FRONT ARMS
1. Check:
   • front arms
      Bends/damage → Replace.

2. Check:
   • bushings
      Wear/damage → Replace.

3. Check:
   • ball joint
      Damage/pitting → Replace the ball joint.
      Free play → Replace the ball joint.
      Turns roughly → Replace the ball joint.

a. Clean the outside of the front lower arm.
b. Remove the circlip ① and rubber boot ②.
   Use the ball joint remover and installer set.
c. Install the body ③, long bolt ④, remover washer ⑤ and remover spacer ⑥ onto ball joint.

**NOTE:**
Remover washer ⑤ must be aligned with the projection on the head of the ball joint.

d. Hold the body ③ in place while turning in the long bolt ④ to remove the ball joint ⑩ from the front lower arm.

e. Remove the ball joint remover/installer.

f. Install the long bolt ④, installer spacer ⑧ and installer guide ⑨ onto the body ③.

g. Attach the assembled ball joint remover/installer, new ball joint ⑪ and installer attachment ⑦ to the front lower arm ⑫.

**NOTE:**
Do not tap or damage the top of the ball joint.

h. Hold the body ③ in place while turning in the long bolt ④ to install the new ball joint ⑪ into the front lower arm ⑫.

i. Remove the ball joint remover/installer.
j. Apply lithium-soap base grease to the new ball joint (⑨).
k. Install a new rubber boot and new circlip.

**NOTE:**
Always use a new ball joint set.

---

**CHECKING THE FRONT SHOCK ABSORBER**

1. Check:
   - shock absorber rod
     Bends/damage → Replace the shock absorber assembly.
   - shock absorber assembly
     Oil leaks → Replace the shock absorber assembly.
   - spring
     Fatigue → Replace the shock absorber assembly.
     Move the spring up and down.
INSTALLING THE FRONT ARMS AND FRONT SHOCK ABSORBER

1. Install:
   - front arms
   - front shock absorber

a. Install the front upper arm ① and front lower arm ②.

   **NOTE:**
   - Lubricate the bolts ③ with lithium-soap-based grease.
   - Be sure to position the bolts ③ so that the bolt head faces outward.
   - Temporarily tighten the nuts ④.

b. Install the front shock absorber ⑤.

c. Install the ball joints.

d. Install the new cotter pins.

e. Tighten the nuts ④.

   **Nut ⑤ 45 Nm (4.5 m·kg, 32 ft·lb)**

   **Nut ⑥ 45 Nm (4.5 m·kg, 32 ft·lb)**

   **Nut ⑦ 30 Nm (3.0 m·kg, 22 ft·lb)**

   **Nut ④ 45 Nm (4.5 m·kg, 32 ft·lb)**
Removing the rear knuckle and stabilizer
Remove the parts in the order listed.

Refer to "REAR WHEELS AND BRAKE DISC".

Order | Job/Part | Q'ty | Remarks
--- | --- | --- | ---
1 | O-ring | 1 | For installation, reverse the removal procedure.
2 | Rear knuckle | 1 |
3 | Spacer cover | 4 |
4 | Spacer | 2 |
5 | Stabilizer joint | 2 |
6 | Stabilizer holder | 2 |
7 | Bushing | 2 |
8 | Stabilizer | 1 |
CHECKING THE REAR KNUCKLE
1. Check:
   • rear knuckle
     Damage/pitting → Replace.
2. Check:
   • rear wheel bearings
     Bearings allow play in the wheel hubs or the wheel turns roughly → Replace.
   • oil seals
     Damage → Replace.

_warning_
a. Clean the outside of the rear knuckle.
b. Remove the oil seals 1.
c. Drive out the bearings 2.

**WARNING**
Eye protection is recommended when using striking tools.

d. Remove the spacer 3.
e. Apply lithium base grease to the bearings and oil seals.
f. Install the spacer to the rear knuckle.
g. Install the new bearings.

**NOTE:**
Install the outside bearing first.

**CAUTION:**
Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.

h. Install a new oil seal.

**NOTE:**
When installing the oil seals, the “seal side” of the oil seal faces out.

CHECKING THE STABILIZER
1. Check:
   • stabilizer
     Bends/cracks/damage → Replace.
### Removing the Rear Arms and Rear Shock Absorber

**Rear Knuckle/Stabilizer**

Refer to "REAR KNUCKLE AND STABILIZER".

1. **Nut/bolt**: 2/2
2. **Rear Upper Arm/Bushing**: 1/2
3. **Nut/bolt**: 2/2
4. **Rear Shock Absorber**: 1
5. **Nut/bolt**: 2/2
6. **Rear Lower Arm/Bushing**: 1/2

For installation, reverse the removal procedure.

---

**Order** | **Job/Part** | **Q'ty** | **Remarks**
---|---|---|---
1 | Nut/bolt | 2/2 | Remove the parts in the order listed. Refer to "REAR KNUCKLE AND STABILIZER".
2 | Rear upper arm/bushing | 1/2 |
3 | Nut/bolt | 2/2 |
4 | Rear shock absorber | 1 |
5 | Nut/bolt | 2/2 |
6 | Rear lower arm/bushing | 1/2 |

---

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CHECKING THE REAR ARMS
1. Check:
   • rear arms ①
     Bends/damage → Replace.
2. Check:
   • bushings ②
     Wear/damage → Replace.

CHECKING THE REAR SHOCK ABSORBER
1. Check:
   • shock absorber rod
     Bends/damage → Replace the shock absorber assembly.
   • shock absorber assembly
     Oil leaks → Replace the shock absorber assembly.
   • spring
     Move the spring up and down.
     Fatigue → Replace the shock absorber assembly.
INSTALLING THE REAR ARMS AND REAR SHOCK ABSORBER

1. Install:
   - rear arms
   - rear shock absorber

   a. Install the rear upper arm ① and rear lower arm ②.

   NOTE:
   - Lubricate the bolts ③ with lithium-soap-based grease.
   - Be sure to position the bolts ③ so that the bolt head faces inward.
   - Temporarily tighten the nuts ④.

   b. Install the rear shock absorber ⑤.

   c. Install the rear knuckle.

   d. Tighten the nuts ④.

<table>
<thead>
<tr>
<th>Nut ⑥</th>
<th>45 Nm (4.5 m·kg, 32 ft·lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nut ⑦</td>
<td>45 Nm (4.5 m·kg, 32 ft·lb)</td>
</tr>
<tr>
<td>Nut ④</td>
<td>45 Nm (4.5 m·kg, 32 ft·lb)</td>
</tr>
</tbody>
</table>
ELECTRICAL COMPONENTS

1. Diode 1
2. Thermo switch 2
3. Diode 2
4. Circuit breaker (radiator fan motor)
5. Carburetor heater
6. Thermo switch 1
7. Ignition coil
8. Gear position switch
9. Reverse switch
10. Brake light switch
11. Parking brake switch
12. Pickup coil/stator assembly
13. Speed sensor
14. Gear motor
15. Radiator fan
16. Thermo switch 3
1. Rectifier/regulator
2. Auxiliary DC jack
3. Indicator light assembly 1
4. Indicator light assembly 2
5. On-Command four-wheel drive switch and differential gear lock switch
6. Main switch
7. Light switch
8. Four-wheel drive relay 1
9. Four-wheel drive relay 2
10. Starter relay

11. Main fuse
12. Four-wheel drive relay 3
13. Differential gear lock indicator light relay
14. Four-wheel drive indicator light relay
15. Fuse box
16. C.D.I. unit
17. Battery
CHECKING THE SWITCH

CHECKING THE SWITCH
Use a pocket tester to check the terminals for continuity. If the continuity is faulty at any point, replace the switch.

NOTE:
- Set the pocket tester to “0” before starting the test.
- The pocket tester should be set to the “Ω × 1” range when testing the switch for continuity.
- Turn the switch on and off a few times when checking it.

Pocket tester
P/N. YU-03112-C, 90890-03112

CHECKING A SWITCH SHOWN IN THE MANUAL
The terminal connections for switches (main switch, light switch, etc.) are shown in a chart similar to the one on the left. This chart shows the switch positions in the column and the switch lead colors in the top row.

For each switch position, “ΟΟΟΟΟΟΟ” indicates the terminals with continuity.

The example chart shows that:
① There is continuity between the “Brown/Blue and Red” leads when the switch is set to “ON”.

---

- Grid chart showing switch positions and lead colors.
CHECKING THE SWITCH CONTINUITY
Refer to “CHECKING THE SWITCH” and check for continuity between lead terminals.
Poor connection, no continuity → Correct or replace.
* The coupler locations are circled.
CHECKING THE SWITCH

① Fuse
② Brake light switch
③ On-Command four-wheel drive switch and differential gear lock switch
④ Main switch
⑤ Light switch
⑥ Parking brake switch
⑦ Gear position switch
⑧ Reverse switch
⑨ Four-wheel drive switch
CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.
- Damage/wear → Repair or replace the bulb, bulb socket or both.
- Improperly connected → Properly connect.
- Incorrect continuity reading → Repair or replace the bulb, bulb socket or both.

TYPES OF BULBS
The bulbs used on this vehicle are shown in the illustration on the left.
- Bulbs A and B are used for headlights and usually use a bulb holder which must be detached before removing the bulb. The majority of these bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulb C is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs D and E are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.

CHECKING THE CONDITION OF THE BULBS
The following procedure applies to all of the bulbs.
1. Remove:
   - bulb
CHECKING THE BULBS AND BULB SOCKETS

**WARNING**
Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

**CAUTION:**
- Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.
- Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

2. Check:
- bulb (for continuity)
  (with the pocket tester)
  No continuity → Replace.

**NOTE:**
Before checking for continuity, set the pocket tester to “0” and to the “Ω x 1” range.

```markdown
a. Connect the tester (+) lead to terminal ① and the tester (−) lead to terminal ②, and check the continuity.
b. Connect the tester (+) lead to terminal ① and the tester (−) lead to terminal ③, and check the continuity.
c. If either of the readings indicate no continuity, replace the bulb.
```

Pocket tester
P/N. YU-03112-C, 90890-03112
CHECKING THE BULBS AND BULB SOCKETS

CHECKING THE CONDITION OF THE BULB SOCKETS
The following procedure applies to all of the bulb sockets.

1. Check:
   • Bulb socket (for continuity)
     (with the pocket tester)
     No continuity → Replace.

<table>
<thead>
<tr>
<th>Pocket tester</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N. YU-03112-C, 90890-03112</td>
</tr>
</tbody>
</table>

**NOTE:**
Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

- Install a good bulb into the bulb socket.
- Connect the pocket tester probes to the respective leads of the bulb socket.
- Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.
ELEC
IGNITION SYSTEM

TROUBLESHOOTING

IF THE IGNITION SYSTEM FAILS TO OPERATE (NO SPARK OR INTERMITTENT SPARK):

Procedure
Check:
1. Fuses (main, ignition)
2. Battery
3. Spark plug
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil resistance
7. Main switch
8. Pickup coil resistance
9. Rotor rotation direction detection coil resistance
10. Wiring connection (the entire ignition system)

NOTE:
• Remove the following part(s) before troubleshooting:
  1) Console
  2) Footrest cover
• Use the following special tool(s) for troubleshooting.

Pulse ignition spark checker
P/N. YM-34487
Ignition checker
P/N. 90890-06754
Pocket tester
P/N. YU-03112-C, 90890-03112

EB802011

1. Fuses (main, ignition)
Refer to “CHECKING THE SWITCH”.

2. Battery
• Check the battery condition.
  Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
  Open-circuit voltage
  12.8 V or more at 20 °C (68 °F)

CORRECT
CONTINUITY

NO CONTINUITY
Replace the fuse(s).

INCORRECT

• Clean the battery terminals.
• Recharge or replace the battery.
3. Spark plug

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.
  Refer to “CHECKING THE SPARK PLUG” in chapter 3.

| Spark plug gap | 0.8 ~ 0.9 mm (0.031 ~ 0.035 in) |

INCORRECT

Correct

Repair or replace the spark plug.

4. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the pulse ignition spark checker or ignition checker ① as shown.
  ② Spark plug cap
  - Turn the main switch to “ON”.
  - Check the ignition spark gap ③.
  - Crank the engine by pushing the starter switch, and increase the spark gap until a misfiring occurs.

| Minimum spark gap | 6.0 mm (0.24 in) |

OUT OF SPECIFICATION OR NO SPARK

MEETS SPECIFICATION

The ignition system is not faulty.
5. Spark plug cap resistance
- Remove the spark plug cap.
- Connect the pocket tester (Ω × 1k) to the spark plug cap.

- Check that the spark plug cap has the specified resistance.

<table>
<thead>
<tr>
<th>Spark plug cap resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 kΩ at 20 °C (68 °F)</td>
</tr>
</tbody>
</table>

MEETS SPECIFICATION

6. Ignition coil resistance
- Disconnect the ignition coil connector from the wire harness.
- Connect the pocket tester (Ω × 1) to the ignition coil.

| Tester (+) lead → Orange lead terminal |
| Tester (−) lead → Ignition coil base   |

- Check that the primary coil has the specified resistance.

<table>
<thead>
<tr>
<th>Primary coil resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.18 ~ 0.28 Ω at 20 °C (68 °F)</td>
</tr>
</tbody>
</table>

OUT OF SPECIFICATION

- Connect the pocket tester (Ω × 1k) to the ignition coil.

| Tester (+) lead → Orange lead terminal |
| Tester (−) lead → Spark plug lead     |

- Check that the secondary coil has the specified resistance.

<table>
<thead>
<tr>
<th>Secondary coil resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.32 ~ 9.48 kΩ at 20 °C (68 °F)</td>
</tr>
</tbody>
</table>

BOTH MEET SPECIFICATION

OUT OF SPECIFICATION

Replace the ignition coil.

OUT OF SPECIFICATION

Replace the spark plug cap.
7. Main switch

Refer to "CHECKING THE SWITCH".

INCORRECT

Replace the main switch.

CORRECT

8. Pickup coil resistance

- Disconnect the A.C. magneto coupler from the wire harness.
- Connect the pocket tester (Ω × 100) to the pickup coil terminal.

**Tester (+) lead → White/Red terminal**
**Tester (−) lead → White/Green terminal**

- Check the pickup coil for the specified resistance.

Pickup coil resistance
459 ~ 561 Ω at 20 °C (68 °F)
(White/Red – White/Green)

MEETS SPECIFICATION

9. Rotor rotation direction detection coil resistance

- Disconnect the A.C. magneto coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the rotor rotation direction detection coil terminal.

**Tester (+) lead → Red terminal**
**Tester (−) lead → White/Blue terminal**

- Check the rotor rotation direction detection coil for the specified resistance.

Rotor rotation direction detection coil resistance
0.063 ~ 0.077 Ω at 20 °C (68 °F)
(Red – White/Blue)

MEETS SPECIFICATION

OUT OF SPECIFICATION

Replace the pickup coil/stator assembly.

OUT OF SPECIFICATION

Replace the pickup coil/stator assembly.

*
10. Wiring connection

- Check the connections of the entire ignition system.
  Refer to “CIRCUIT DIAGRAM”.

Correct

- Replace the C.D.I. unit.

Poor connection

- Properly connect the ignition system.
The starting circuit on this model consists of the starter motor, starter relay, brake light switch, C.D.I. unit and gear position switch. If the main switch is “START” position, the starter motor can be operated only if:

- The transmission is in neutral (the gear position switch is in the neutral gear position).
- or
- The brake pedal is pressed (the brake light switch is closed).

1. Main fuse
2. Battery
3. Starter relay
4. Starter motor
5. Diode 1
6. Signaling system fuse
7. Brake light switch
8. Ignition fuse
9. C.D.I. unit
10. Gear position switch

A] TO MAIN SWITCH
B] FROM MAIN SWITCH
ELEC

ELECTRIC STARTING SYSTEM

EB803020
TROUBLESHOOTING

IF THE STARTER MOTOR FAILS TO OPERATE:

Procedure
Check:
1. Fuses (main, ignition, signaling system)
2. Battery
3. Starter motor
4. Starter relay
5. Main switch
6. Gear position switch
7. Brake light switch
8. Diode 1
9. Wiring connection (the entire starting system)

NOTE:
• Remove the following part(s) before troubleshooting:
  1) Console
• Use the following special tool(s) for troubleshooting.

EB802011

1. Fuses (main, ignition, signaling system)
Refer to “CHECKING THE SWITCH”.

CONTINUITY

NO CONTINUITY

Replace the fuse(s).

INCORRECT

EB802012

2. Battery

• Check the battery condition.
  Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C (68 °F)

CORRECT

• Clean the battery terminals.
• Recharge or replace the battery.
3. Starter motor
- Connect the battery (+) terminal ① and starter motor cable ② using a jumper lead ③.
- Check the operation of the starter motor.

**WARNING**
• A wire that is used as a jumper lead must have the equivalent capacity or more as that of the battery lead, otherwise the jumper lead may burn.
• This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.

**DOES NOT TURN**
Repair or replace the starter motor.

4. Starter relay
- Remove the starter relay from the wire harness.
- Connect the pocket tester (Ω x 1) and the battery (12 V) to the starter relay terminals.

<table>
<thead>
<tr>
<th>Battery (+) terminal</th>
<th>Yellow/Blue terminal ①</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery (-) terminal</td>
<td>Blue/Black terminal ②</td>
</tr>
<tr>
<td>Tester (+) lead</td>
<td>Red terminal ③</td>
</tr>
<tr>
<td>Tester (-) lead</td>
<td>Black terminal ④</td>
</tr>
</tbody>
</table>

- Check the starter relay for continuity.

**NO CONTINUITY**
Replace the starter relay.

5. Main switch
Refer to “CHECKING THE SWITCH”.

**CORRECT**
Replace the main switch.
6. Gear position switch
Refer to “CHECKING THE SWITCH”.

INCORRECT
Replace the gear position switch.

CORRECT
Replace the brake light switch.

7. Brake light switch
Refer to “CHECKING THE SWITCH”.

INCORRECT
Replace the diode 1.

CORRECT
Properly connect the starting system.

8. Diode 1
- Remove the diode from the coupler.
- Connect the pocket tester (Ω x 1) to the diode terminals as shown.
- Check the diode for continuity as follows.

<table>
<thead>
<tr>
<th>Tester (+) lead →</th>
<th>Tester (−) lead →</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow/Blue terminal 1</td>
<td>Black/Yellow terminal 2</td>
</tr>
</tbody>
</table>

**Continuity**

<table>
<thead>
<tr>
<th>Tester (+) lead →</th>
<th>Tester (−) lead →</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow/Blue terminal 1</td>
<td>Blue/White terminal 3</td>
</tr>
</tbody>
</table>

**No continuity**

<table>
<thead>
<tr>
<th>Tester (+) lead →</th>
<th>Tester (−) lead →</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black/Yellow terminal 2</td>
<td>Yellow/Blue terminal 1</td>
</tr>
</tbody>
</table>

**NOTE:**
When you switch the tester’s positive and negative probes, the readings in the left chart will be reversed.

9. Wiring connection
- Check the connections of the entire starting system.
- Refer to “CIRCUIT DIAGRAM”.

POOR CONNECTION
Properly connect the starting system.
**STARTER MOTOR**

---

### Removing the starter motor

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Starter motor lead</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Starter motor/O-ring</td>
<td>1/1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

### Disassembling the starter motor

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Bracket 1</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>②</td>
<td>Washer kit</td>
<td>1</td>
<td>Refer to “ASSEMBLING THE STARTER MOTOR”.</td>
</tr>
<tr>
<td>③</td>
<td>Bracket 2</td>
<td>1</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td>④</td>
<td>Shims</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑤</td>
<td>Brush seat 1/brush seat 2</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>⑥</td>
<td>Armature coil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>⑦</td>
<td>Yoke</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
ELECTRIC STARTING SYSTEM

CHECKING THE STARTER MOTOR

1. Check:
   • commutator
     Dirty → Clean it with #600 grit sandpaper.

2. Measure:
   • commutator diameter \( a \)
     Out of specification → Replace the starter motor.

   Outside diameter
   28 mm (1.10 in)
   <Wear limit>:
   27 mm (1.06 in)

3. Measure:
   • mica undercut \( b \)
     Out of specification → Scrape the mica using a hacksaw blade.

   Mica undercut
   0.7 mm (0.03 in)

NOTE:
Scrape the mica to the proper measurement using a hacksaw blade which has been grounded to fit the commutator.

4. Check:
   • armature coil (insulation/continuity)
     Defects → Replace the starter motor.

   Armature coil resistance
   Continuity check
   0.025 ~ 0.035 \( \Omega \) at 20 \( ^\circ \)C (68 \( ^\circ \)F)
   Insulation check
   More than 1 M\( \Omega \) at 20 \( ^\circ \)C (68 \( ^\circ \)F)

   a. Connect the pocket tester for the continuity check ① and insulation check ②.
   b. Measure the armature resistances.
   c. If the resistance is incorrect, replace the starter motor.
5. Measure:
   - brush length \( \text{a} \) (each)
     Out of specification → Replace the brush.

![Brush length diagram]

**Brush length**
12.5 mm (0.49 in)

**Wear limit:**
5 mm (0.20 in)

6. Measure:
   - brush spring force
     Fatigue/out of specification → Replace as a set.

![Brush spring force diagram]

**Brush spring force**
7.65 ~ 10.01 Nm
(780 ~ 1,021 g, 27.5 ~ 36.0 oz)

7. Check:
   - oil seal
   - bushing
   - O-rings
     Wear/damage → Replace.

ASSEMBLING THE STARTER MOTOR

1. Install:
   - brush seat 1 \( \text{b} \)

**NOTE:**
Align the projection \( \text{a} \) on the brush seat 1 with the slot \( \text{a} \) on the yoke.

2. Install:
   - yoke
   - brackets

**NOTE:**
Align the match marks \( \text{a} \) on the yoke with the match marks \( \text{b} \) on the brackets.
TROUBLESHOOTING

IF THE BATTERY IS NOT CHARGED:

Procedure
Check:
1. Fuse (main)
2. Battery
3. Charging voltage
4. Charging coil resistance
5. Wiring connections (the entire charging system)

NOTE:
- Remove the following part(s) before troubleshooting:
  1) Console
  2) Footrest cover
- Use the following special tool(s) for troubleshooting:
  - Digital engine test tachometer
    P/N. YU-8036-C
  - Engine tachometer
    P/N. 90890-03113
  - Pocket tester
    P/N. YU-03112-C, 90890-03112

1. Fuse (main)
   Refer to “CHECKING THE SWITCH”.
   \[\downarrow\] \text{CONTINUITY}

2. Battery
   \[\downarrow\] \text{INCORRECT}
   - Check the battery condition.
   - Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   - Open-circuit voltage
     \[12.8 \text{ V or more at } 20 ^\circ \text{C (68 } ^\circ \text{F)}\]
   \[\downarrow\] \text{CORRECT}

3. Charging voltage
   \[\downarrow\] \text{NO CONTINUITY}
   - Connect the engine tachometer to the spark plug lead.
   - Connect the pocket tester (DC 20 V) to the battery.
   - Tester (+) lead \rightarrow Battery (+) terminal
   - Tester (–) lead \rightarrow Battery (–) terminal
   - Replace the fuse.

   \[\downarrow\] \text{NO CONTINUITY}
   - Clean the battery terminals.
   - Recharge or replace the battery.
4. Charging coil resistance
   - Disconnect the A.C. magneto coupler from the wire harness.
   - Connect the pocket tester (Ω × 1) to the charging coils.

   **Tester (+) lead → White terminal ①**
   **Tester (−) lead → White terminal ②**

   **Tester (+) lead → White terminal ①**
   **Tester (−) lead → White terminal ③**

   - Measure the charging coil resistance.

   **Charging coil resistance**
   0.32 ~ 0.43 Ω at 20 °C (68 °F)

5. Wiring connections
   - Check the connections of the entire charging system.
   - Refer to “CIRCUIT DIAGRAM”.

   **Replace the rectifier/regulator.**
TROUBLESHOOTING

IF THE HEADLIGHT AND/OR TAILLIGHT FAIL TO COME ON:

Procedure
Check:
1. Fuses (main, lighting system)  
2. Battery  
3. Main switch  
4. Light switch  
5. Wiring connections (the entire lighting system)

NOTE:
• Remove the following part(s) before troubleshooting:
  1) Console
• Use the following special tool(s) for troubleshooting:
  Pocket tester
  P/N. YU-03112-C, 90890-03112

1. Fuses (main, lighting system)
   Refer to “CHECKING THE SWITCH”.

   NO CONTINUITY
   Replace the fuse(s).

   CONTINUITY

2. Battery
   • Check the battery condition.
     Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

   Open-circuit voltage
   12.8 V or more at 20 °C (68 °F)

   INCORRECT
   • Clean the battery terminals.
   • Recharge or replace the battery.

   CORRECT

3. Main switch
   Refer to “CHECKING THE SWITCH”.

   INCORRECT
   Replace the main switch.

   CORRECT

*
### 4. Light switch

Refer to “CHECKING THE SWITCH”.

<table>
<thead>
<tr>
<th>INCORRECT</th>
<th>CORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace the light switch.</td>
<td>Replace the light switch.</td>
</tr>
</tbody>
</table>

**EB805013**

### 5. Wiring connection

- Check the connections of the entire lighting system.
  - Refer to “CIRCUIT DIAGRAM”.

<table>
<thead>
<tr>
<th>INCORRECT</th>
<th>CORRECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor connection</td>
<td>Properly connect the lighting system.</td>
</tr>
</tbody>
</table>

Check the condition of each of the lighting system’s circuits.
Refer to “CHECKING THE LIGHTING SYSTEM”.
CHECKING THE LIGHTING SYSTEM

1. If the headlights fail to come on:

<table>
<thead>
<tr>
<th>1. Bulb and bulb socket</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Check the bulb and bulb socket for continuity.</td>
</tr>
</tbody>
</table>

[Diagram of bulb and socket with continuity checks]

- NO CONTINUITY
- Replace the bulb and/or bulb socket.

2. Voltage

- Connect the pocket tester (DC 20 V) to the headlight couplers.

[Diagram of tester connection to headlight couplers]

Tester (+) lead → Green terminal 1 or Yellow terminal 2
Tester (−) lead → Black terminal 3

- When the light switch is on “
- When the light switch is on “
- Turn the main switch to “ON”
- Turn the light switch to “” or “”
- Check the voltage (12 V) of the “Green” and “Yellow” leads on the bulb socket connector.

[Diagram of voltage checking]

- OUT OF SPECIFICATION
- The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

This circuit is not faulty.
2. If the taillights fail to come on:

1. Bulb and bulb socket
   - Check the bulb and bulb socket for continuity.

   **CONTINUITY**

   **NO CONTINUITY**
   - Replace the bulb and/or bulb socket.

2. Voltage
   - Connect the pocket tester (DC 20 V) to the tail/brake light connectors.

   **Tester (+) lead → Blue lead terminal①**
   **Tester (−) lead → Black lead terminal②**

   **OUT OF SPECIFICATION**
   - The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

   **MEETS SPECIFICATION**
   - This circuit is not faulty.

   - Turn the main switch to “ON”.
   - Turn the light switch to “ΟΟ” or “ΟΟ”.
   - Check the voltage (12 V) of the “Blue” lead on the bulb socket connector.
③ Main switch
⑥ Battery
⑦ Main fuse
⑩ Brake light switch
⑫ Reverse switch
⑬ C.D.I. unit
⑭ Gear position switch
⑬ Parking brake switch
⑮ Thermo switch 1
⑮ Gear motor
⑰ Diode 2
⑲ Four-wheel drive indicator light
⑳ Differential gear lock indicator light
⑳ Coolant temperature warning light
⑱ Four-wheel drive indicator light relay
⑳ Differential gear lock indicator light relay
⑳ Neutral indicator light
⑳ Reverse indicator light
⑳ Parking brake indicator light
⑳ Signalng system fuse
⑳ Tail/brake light
**SIGNALING SYSTEM**

**EB806010**

**TROUBLESHOOTING**

**IF A BRAKE LIGHT, AN INDICATOR LIGHT, OR THE WARNING LIGHT FAILS TO COME ON:**

**Procedure**

Check:
1. Fuses (main, signaling system)
2. Battery
3. Main switch
4. Wiring connections (the entire signal system)

**NOTE:**
- Remove the following part(s) before troubleshooting:
  1) Console
- Use the following special tool(s) for troubleshooting:
  - Pocket tester
    P/N. YU-03112-C, 90890-03112

**EB802011**

1. Fuses (main, signaling system)

Refer to “CHECKING THE SWITCH”.

**CONTINUITY**

**NO CONTINUITY**

Replace the fuse(s).

**EB802012**

2. Battery

- Check the battery condition.
  - Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

**Open-circuit voltage**

- 12.8 V or more at 20 °C (68 °F)

**INCORRECT**

- Clean the battery terminals.
- Recharge or replace the battery.

**CORRECT**

3. Main switch

Refer to “CHECKING THE SWITCH”.

**INCORRECT**

Replace the main switch.

**CORRECT**

*
4. Wiring connections

- Check the connections of the entire signal system.
  Refer to “CIRCUIT DIAGRAM”.

Check the condition of each of the signal system’s circuits.
Refer to “CHECKING THE SIGNAL SYSTEM”.

POOR CONNECTION

CORRECT

Properly connect the signal system.
CHECKING THE SIGNAL SYSTEM
1. If the brake lights fail to come on:

1. Bulb and bulb socket
   • Check the bulb and bulb socket for continuity.

   NO CONTINUITY
   Replace the bulb and/or bulb socket.

   CONTINUITY

2. Brake light switch
   Refer to “CHECKING THE SWITCH”.

   NO CONTINUITY
   Replace the brake light switch.

3. Voltage
   • Connect the pocket tester (DC 20 V) to the bulb socket connector.

   Tester (+) lead → Yellow terminal ①
   Tester (−) lead → Black terminal ②

   MEETS SPECIFICATION
   This circuit is not faulty.

   OUT OF SPECIFICATION
   The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.
2. If the neutral indicator light fails to come on:

1. Bulb and bulb socket
   - Check the bulb and bulb socket for continuity.

   NO CONTINUITY
   Replace the bulb and/or bulb socket.

   CONTINUITY

2. Gear position switch
   Refer to “CHECKING THE SWITCH”.

   NO CONTINUITY
   Replace the gear position switch.

   CONTINUITY

3. Voltage
   - Connect the pocket tester (DC 20 V) to the indicator light assembly 2 coupler.

   tester (+) lead → brown terminal 1
   tester (−) lead → sky blue terminal 2

   • Turn the main switch to “ON”.
   • Check the voltage (12 V).

   OUT OF SPECIFICATION
   The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

   MEETS SPECIFICATION
   This circuit is not faulty.
3. If the parking brake indicator light fails to come on:

1. Bulb and bulb socket
   - Check the bulb and bulb socket for continuity.

   **NO CONTINUITY**
   Replace the bulb and/or bulb socket.

2. Parking brake switch
   Refer to “CHECKING THE SWITCH”.

   **NO CONTINUITY**
   Replace the parking brake switch.

3. Voltage
   - Connect the pocket tester (DC 20 V) to the indicator light assembly 2 coupler.

   **TESTER (+) lead → Brown terminal ①**
   **TESTER (−) lead → Blue/Red terminal ②**

   **OUT OF SPECIFICATION**
   The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

   - Turn the main switch to “ON”.
   - Check the voltage (12 V).

   **MEETS SPECIFICATION**
   This circuit is not faulty.
4. If the reverse indicator light fails to come on:

1. Bulb and bulb socket
   - Check the bulb and bulb socket for continuity.

2. Reverse switch
   - Refer to “CHECKING THE SWITCH”.

3. Voltage
   - Connect the pocket tester (DC 20 V) to the indicator light assembly 2 coupler.
     - **Tester (+) lead → Brown terminal ①**
     - **Tester (−) lead → Green/Blue terminal ②**

   - Turn the main switch to “ON”.
   - Check the voltage (12 V).

   - **MEETS SPECIFICATION**
     - Replace the C.D.I. unit.

   - **OUT OF SPECIFICATION**
     - The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

   - **NO CONTINUITY**
     - Replace the bulb and/or bulb socket.

   - **CONTINUITY**
     - Replace the reverse switch.
5. If the coolant temperature warning light does not come on when the main switch to “ON”, or if the coolant temperature warning light does not come on when the temperature is high (more than 117 ~ 123 °C (242.6 ~ 253.4 °F)):

### 1. Bulb and bulb socket
- Check the bulb and bulb socket for continuity.

**NO CONTINUITY**

Replace the bulb and/or bulb socket.

**CONTINUITY**

### 2. Thermo switch 1
- Remove the thermo switch 1 from the cylinder head.
- Connect the pocket tester (Ω × 1) to the thermo switch 1.
- Immerse the thermo switch 1 in coolant.
- Check the thermo switch 1 for continuity.

While heating the coolant use a thermometer to record the temperatures.

<table>
<thead>
<tr>
<th>Test step</th>
<th>Coolant temperature</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than 120 ± 3 °C (248 ± 5.4 °F)</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>More than 120 ± 3 °C (248 ± 5.4 °F)</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>More than 113 °C (235.4 °F)</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Less than 113 °C (235.4 °F)</td>
<td>No</td>
</tr>
</tbody>
</table>

Test steps 1 & 2: Heating phase
Test steps 3 & 4: Cooling phase

**WARNING**

Handle the thermo switch 1 with special care.
Never subject it to a strong shock or allow it to be dropped. Should it be dropped, it must be replaced.

Thermo switch 1
8 Nm (0.8 m·kg, 5.8 ft·lb)
Three bond sealock® #10

BAD CONDITION

Replace the thermo switch 1.
3. Voltage

- Connect the pocket tester (DC 20 V) to the indicator light assembly 1 coupler.

**Tester (+) lead → Brown terminal** ①
**Tester (−) lead → White/Blue terminal** ②

- Turn the main switch to “ON”.
- Check the voltage (12 V).

**MEETS SPECIFICATION**

OUT OF SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

4. Diode 2

- Remove the diode from the coupler.
- Connect the pocket tester (Ω × 1) to the diode terminals as shown.
- Check the diode for continuity as follows.

**NOTE:**

When you switch the tester’s positive and negative probes, the readings in the left chart will be reversed.

**INCORRECT**

Replace the diode 2.

**CORRECT**

This circuit is not faulty.

**Tester (+) lead → Blue/Black terminal** ① **Continuity**
**Tester (−) lead → White/Blue terminal** ②

**Tester (+) lead → White/Blue terminal** ② **No continuity**
**Tester (−) lead → Blue/Black terminal** ①
6. If the differential gear lock indicator light fails to come on:

1. Bulb and bulb socket
   - Check the bulb and bulb socket for continuity.

   ![Continuity Diagram](image)

   NO CONTINUITY

   Replace the bulb and/or bulb socket.

   CONTINUITY

2. Differential gear lock indicator light relay
   - Remove the differential gear lock indicator light relay from the wire harness.
   - Connect the pocket tester (Ω x 1) and the battery (12 V) to the differential gear lock indicator light relay terminals.
   - Check the differential gear lock indicator light relay for continuity as follows.

<table>
<thead>
<tr>
<th>Tester (+) lead →</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black/Green terminal 1</td>
<td></td>
</tr>
<tr>
<td>Tester (−) lead →</td>
<td></td>
</tr>
<tr>
<td>Black terminal 2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Battery (+) terminal →</th>
<th>No continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown terminal 3</td>
<td></td>
</tr>
<tr>
<td>Battery (−) terminal →</td>
<td></td>
</tr>
<tr>
<td>Black/Red terminal 4</td>
<td></td>
</tr>
</tbody>
</table>

   NO CONTINUITY

   Replace the differential gear lock indicator light relay.

   CONTINUITY

3. Four-wheel drive switch
   Refer to “CHECKING THE SWITCH”.

   ![Continuity Diagram](image)

   NO CONTINUITY

   Replace the gear motor.
4. Voltage

- Connect the pocket tester (DC 20 V) to the indicator light assembly 1 coupler.

<table>
<thead>
<tr>
<th>Tester (+) lead → Brown terminal</th>
<th>Tester (−) lead → Black/Green terminal</th>
</tr>
</thead>
</table>

* MEETS SPECIFICATION

- Turn the main switch to “ON”.
- Check the voltage (12 V).

OUT OF SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

This circuit is not faulty.
7. If the four-wheel drive indicator light fails to come on:

1. Bulb and bulb socket
   • Check the bulb and bulb socket for continuity.
   
   ![Diagram](image.png)

   **CONTINUITY**

   Replace the bulb and bulb socket.

2. Four-wheel drive indicator light relay
   • Remove the four-wheel drive indicator light relay from the wire harness.
   • Connect the pocket tester (Ω × 1) and the battery (12 V) to the four-wheel drive indicator light relay terminals.
   • Check the four-wheel drive indicator light relay for continuity as follows.

   **Tester (+) lead** → **White/Yellow terminal** ①
   **Tester (−) lead** → **Black terminal** ②

   **Continuity**

   **Battery (+) terminal** → **Brown terminal** ③
   **Battery (−) terminal** → **White/Black terminal** ④

   **No continuity**

   **Tester (+) lead** → **White/Yellow terminal** ①
   **Tester (−) lead** → **Black terminal** ②

   **NO CONTINUITY**

   Replace the four-wheel drive indicator light relay.

3. Four-wheel drive switch
   Refer to “CHECKING THE SWITCH”.

   ![Diagram](image.png)

   **CONTINUITY**

   Replace the gear motor.
4. Voltage

- Connect the pocket tester (DC 20 V) to the indicator light assembly 1 coupler.

| Tester (+) lead → Brown terminal ① | Tester (−) lead → White/Yellow terminal ② |

- Turn the main switch to “ON”.
- Check the voltage (12 V).

This circuit is not faulty.

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.
TROUBLESHOOTING

IF THE FAN MOTOR DOES NOT MOVE:

Procedure

Check:
1. Fuse (main)
2. Battery
3. Main switch
4. Radiator fan motor
5. Circuit breaker (radiator fan motor)
6. Thermo switch 3
7. Wiring connection (the entire cooling system)

NOTE:
• Remove the following part(s) before troubleshooting.
  1) Console
• Use the following special tool(s) for troubleshooting.

EB802011

1. Fuse (main)
Refer to “CHECKING THE SWITCH”.

NO CONTINUITY

Replace the fuse.

CORRECT

EB802012

2. Battery
• Check the battery condition.
  Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Open-circuit voltage:
12.8 V or more at 20 °C (68 °F)

INCORRECT

• Clean the battery terminals.
• Recharge or replace the battery.

CORRECT

3. Main switch
Refer to “CHECKING THE SWITCH”.

INCORRECT

Replace the main switch.

CORRECT

*
4. Radiator fan motor

- Disconnect the radiator fan motor coupler.
- Connect the battery (12 V) as shown.

Battery (+) lead → Blue terminal ①
Battery (−) lead → Black terminal ②

- Check the operation of the radiator fan motor.

DOES NOT TURN

Replace the radiator fan motor.

5. Circuit breaker (radiator fan motor)

- Remove the circuit breaker from the wire harness.
- Connect the pocket tester (Ω × 1) to the circuit breaker.

Circuit breaker resistance
Zero Ω at 20 °C (68 °F)

OUT OF SPECIFICATION

Replace the circuit breaker.
6. Thermo switch 3

- Remove the thermo switch 3 from the radiator.
- Connect the pocket tester (Ω × 1) to the thermo switch 3.
- Immerse the thermo switch 3 in coolant.
- Check the thermo switch 3 for continuity.
  While heating the coolant use a thermometer to record the temperatures.

A The thermo switch 3 circuit is closed.
B The thermo switch 3 circuit is open.

<table>
<thead>
<tr>
<th>Test step</th>
<th>Coolant temperature</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than 75 ± 3 °C (167 ± 5.4 °F)</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>More than 75 ± 3 °C (167 ± 5.4 °F)</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>More than 68 °C (154.4 °F)</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Less than 68 °C (154.4 °F)</td>
<td>No</td>
</tr>
</tbody>
</table>

Test steps 1 & 2: Heating phase
Test steps 3 & 4: Cooling phase

**WARNING**

Handle the thermo switch 3 with special care.
Never subject it to a strong shock or allow it to be dropped. Should it be dropped, it must be replaced.

Thermo switch 3
28 Nm (2.8 m · kg, 20 ft · lb)

GOOD CONDITION

BAD CONDITION

Replace the thermo switch 3.
7. Wiring connection

- Check the connections of the entire cooling system.
  Refer to “CIRCUIT DIAGRAM”.

This circuit is not faulty.

* POOR CONNECTION

CORRECT

Properly connect the cooling system.
TROUBLESHOOTING

IF THE FOUR-WHEEL DRIVE INDICATOR FAILS TO COME ON:

Procedure
Check:
1. Fuses (main, four-wheel drive)
2. Battery
3. Main switch
4. Four-wheel drive relay 1
5. Four-wheel drive relay 2
6. Four-wheel drive relay 3
7. On-Command four-wheel drive switch and differential gear lock switch
8. Gear motor
9. Wiring connections (the entire 2WD/4WD selecting system)

NOTE:
- Remove the following part(s) before troubleshooting:
  1) Console
- Use the following special tool(s) for troubleshooting:
  - Pocket tester
    P/N. YU-03112-C, 90890-03112

1. Fuses (main, four-wheel drive)
   NO CONTINUITY
   Replace the fuse(s).
   CONTINUITY

2. Battery
   INCORRECT
   - Check the battery condition.
   - Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   - Open-circuit voltage
     12.8 V or more at 20 °C (68 °F)
   CORRECT
   INCORRECT
   - Clean the battery terminals.
   - Recharge or replace the battery.
   CORRECT

3. Main switch
   CORRECT
   Replace the main switch.
4. Four-wheel drive relay 1

- Remove the four-wheel drive relay 1 from the wire harness.
- Connect the pocket tester (Ω × 1) and the battery (12 V) to the four-wheel drive relay 1 terminals.

<table>
<thead>
<tr>
<th>Tester (+) lead →</th>
<th>Black/Yellow terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester (−) lead →</td>
<td>Black terminal</td>
</tr>
</tbody>
</table>

| Battery (+) terminal → | Brown/Red terminal |
| Battery (−) terminal → | Blue/Red terminal  |

- Check the four-wheel drive relay 1 for continuity.

5. Four-wheel drive relay 2

- Remove the four-wheel drive relay 2 from the wire harness.
- Connect the pocket tester (Ω × 1) and the battery (12 V) to the four-wheel drive relay 2 terminals.

<table>
<thead>
<tr>
<th>Tester (+) lead →</th>
<th>Brown/Black terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester (−) lead →</td>
<td>Black terminal</td>
</tr>
</tbody>
</table>

| Battery (+) terminal → | Brown/Red terminal |
| Battery (−) terminal → | Blue/Green terminal |

- Check the four-wheel drive relay 2 for continuity.

* NO CONTINUITY
Replace the four-wheel drive relay 1.

* NO CONTINUITY
Replace the four-wheel drive relay 2.
6. Four-wheel drive relay 3

- Remove the four-wheel drive relay 3 from the wire harness.
- Connect the pocket tester (Ω × 1) and the battery (12 V) to the four-wheel drive relay 3 terminals.

<table>
<thead>
<tr>
<th>Battery (+) terminal → Brown/Red terminal</th>
<th>Battery (–) terminal → Yellow/Black terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester (+) lead → Blue/Red terminal</td>
<td>Tester (–) lead → Gray terminal</td>
</tr>
</tbody>
</table>

- Check the four-wheel drive relay 3 for continuity.

7. On-Command four-wheel drive switch and differential gear lock switch

Refer to “CHECKING THE SWITCH”.

---

*NO CONTINUITY*

Replace the four-wheel drive relay 3.

*CORRECT*

*INCORRECT*

Replace the On-Command four-wheel drive switch and differential gear lock switch.
8. Gear motor
   • Disconnect the gear motor coupler.
   • Remove the gear motor from the differential gear case.
     Refer to “FRONT CONSTANT VELOCITY JOINTS, DIFFERENTIAL GEAR AND DRIVE SHAFT” in chapter 7.
   • Connect two C size batteries to the gear motor terminals (as shown illustrations).

   ![Illustration A]
   - Check that the pinion gear \(\mathbb{2}\) turns counterclockwise.
   - Check that the pinion gear \(\mathbb{2}\) turns clockwise.

   • Make sure that the drive gear (shift fork sliding gear) operates correctly.

   **NOTE:**
   When installing the differential gear case in the gear motor, refer to “FRONT CONSTANT VELOCITY JOINTS, DIFFERENTIAL GEAR AND DRIVE SHAFT” in chapter 7.

9. Wiring connection
   • Check the connections of the entire 2WD/4WD selecting system.
     Refer to “CIRCUIT DIAGRAM”.

   ![Illustration B]
   - Replace the gear motor.
   - Properly connect the 2WD/4WD selecting system.
TROUBLESHOOTING

IF THE CARBURETOR HEATING SYSTEM FAILS TO OPERATE:

Procedure
Check:
1. Fuses (main, carburetor heater)
2. Battery
3. Main switch
4. Thermo switch 2
5. Carburetor heater
6. Wiring connection (the entire carburetor warming system)

NOTE:
• Remove the following part(s) before troubleshooting.
  1) Console
• Use the following special tool(s) for troubleshooting.

1. Fuses (main, carburetor heater)
   Refer to “CHECKING THE SWITCH”.
   NO CONTINUITY
   CORRECT
   Replace the fuse(s).

2. Battery
   • Check the battery condition.
   • Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   Open-circuit voltage
   12.8 V or more at 20 °C (68 °F)
   INCORRECT
   CORRECT
   • Clean the battery terminals.
   • Recharge or replace the battery.

3. Main switch
   Refer to “CHECKING THE SWITCH”.
   INCORRECT
   CORRECT
   Replace the main switch.
4. Thermo switch 2

- Remove the thermo switch 2 from the wire harness.
- Connect the pocket tester (Ω × 1) to the thermo switch 2 ①.
- Immerse the thermo switch 2 in a container filled with water ②.
- Place a thermometer ③ in the water.
- Slowly heat the water, then let it cool to the specified temperature as indicated in the table.
- Check the thermo switch 2 for continuity at the temperatures indicated in the table.

The thermo switch 2 circuit is closed.
The thermo switch 2 circuit is open.

<table>
<thead>
<tr>
<th>Test step</th>
<th>Water temperature</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than 16 ± 3 °C (60.8 ± 37.4 °F)</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>More than 16 ± 3 °C (60.8 ± 37.4 °F)</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>More than 11 ± 3 °C (51.8 ± 37.4 °F)</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Less than 11 ± 3 °C (51.8 ± 37.4 °F)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Test steps 1 & 2: Heating phase
Test steps 3 & 4: Cooling phase

GOOD CONDITION

BAD CONDITION

Replace the thermo switch 2.
5. Carburetor heater

- Remove the carburetor heater from the carburetor.
- Connect the pocket tester (Ω x 1) to the carburetor heater.

<table>
<thead>
<tr>
<th>Tester (+) lead →</th>
<th>Carburetor heater terminal ①</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester (–) lead →</td>
<td>Carburetor heater body ②</td>
</tr>
</tbody>
</table>

- Measure the carburetor heater resistance.

Carburetor heater resistance
6 ~ 12 Ω at 20 °C (68 °F)

INCORRECT

Replace the carburetor heater.

CORRECT

6. Wiring connection

- Check the connections on the entire carburetor heating system.
  Refer to “CIRCUIT DIAGRAM”.

INCORRECT

POOR CONNECTION

This circuit is not faulty.

CORRECT

Properly connect the carburetor heating system.
# TROUBLESHOOTING

**NOTE:**
The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for check, adjustment and replacement of parts.

## STARTING FAILURE/HARD STARTING

### FUEL SYSTEM

**Fuel tank**
- Empty
- Clogged fuel filter
- Clogged fuel breather hose
- Deteriorated or contaminated fuel

**Fuel pump**
- Clogged fuel hose
- Damaged vacuum hose

**Carburetor**
- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Deformed float
- Worn needle valve
- Improperly sealed valve seat
- Improperly adjusted fuel level
- Improperly set pilot jet
- Clogged starter jet
- Starter plunger malfunction

**Air filter**
- Clogged air filter element

### ELECTRICAL SYSTEM

**Spark plug**
- Improper plug gap
- Worn electrodes
- Wire between terminals broken
- Improper heat range
- Faulty spark plug cap

**Ignition coil**
- Broken or shorted primary/secondary
- Faulty spark plug lead
- Broken body

**C.D.I. system**
- Faulty C.D.I. unit
- Faulty pickup coil
- Broken woodruff key

**Switches and wiring**
- Faulty main switch
- Broken or shorted wiring
- Faulty gear position switch
- Faulty brake light switch

**Starter motor**
- Faulty starter motor
- Faulty starter relay
- Faulty starter clutch

**Battery**
- Faulty battery
COMPRESSION SYSTEM
Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder

Valve, camshaft and crankshaft
- Improperly sealed valve
- Improperly contacted valve and valve seat
- Improper valve timing
- Broken valve spring
- Seized camshaft
- Seized crankshaft

Piston and piston rings
- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

Crankcase and crankshaft
- Improperly seated crankcase
- Seized crankcase

Valve train
- Improperly adjusted valve clearance
- Improperly adjusted valve timing

EBS00538
POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor
- Improperly returned starter plunger
- Loose pilot jet
- Clogged pilot jet
- Clogged pilot air jet
- Improperly adjusted idle speed (throttle stop screw)
- Improper throttle cable play
- Flooded carburetor

Electrical system
- Faulty spark plug
- Faulty C.D.I. unit
- Faulty pickup coil
- Faulty charging/rotor rotation direction detection coil
- Faulty ignition coil

Valve train
- Improperly adjusted valve clearance

Air filter
- Clogged air filter element

EBS00539
POOR MEDIUM AND HIGH-SPEED PERFORMANCE

POOR MEDIUM AND HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURE/HARD STARTING” and “POOR IDLE SPEED PERFORMANCE—Valve train”.

Carburetor
- Improper jet needle clip position
- Improperly adjusted fuel level
- Clogged or loose main jet
- Deteriorated or contaminated fuel

Air filter
- Clogged air filter element
### Faulty Drive Train

The following conditions may indicate damaged shaft drive components:

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A pronounced hesitation or “jerky” movement during acceleration, deceleration, or sustained speed. (This must not be confused with engine surging or transmission characteristics.)</td>
<td>A. Bearing damage.</td>
</tr>
<tr>
<td>2. A “rolling rumble” noticeable at low speed; a high-pitched whine; a “clunk” from a shaft drive component or area.</td>
<td>B. Improper gear lash.</td>
</tr>
<tr>
<td>3. A locked-up condition of the shaft drive mechanism, no power transmitted from the engine to the front and/or rear wheels.</td>
<td>C. Gear tooth damage.</td>
</tr>
<tr>
<td></td>
<td>D. Broken drive shaft.</td>
</tr>
<tr>
<td></td>
<td>E. Broken gear teeth.</td>
</tr>
<tr>
<td></td>
<td>F. Seizure due to lack of lubrication.</td>
</tr>
<tr>
<td></td>
<td>G. Small foreign objects lodged between the moving parts.</td>
</tr>
</tbody>
</table>

**NOTE:**

Areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from normal vehicle operating noise. If there is reason to believe these components are damaged, remove the components and check them.
FAULTY GEAR SHIFTING

HARD SHIFTING
Refer to “CLUTCH SLIPPING”.

SHIFT LEVER DOES NOT MOVE
Shift drum, shift forks
- Groove jammed with impurities
- Seized shift fork
- Bent shift fork guide bar

Transmission
- Seized transmission gear
- Jammed impurities
- Incorrectly assembled transmission

Shift guide
- Broken shift guide

JUMPS OUT OF GEAR
Shift forks
- Worn shift fork

Transmission
- Damaged transmission gears

Shift drum
- Improper thrust play
- Worn shift drum groove

Transmission
- Worn gear dog

FAULTY CLUTCH PERFORMANCE

ENGINE OPERATES BUT VEHICLE WILL NOT MOVE

V-belt
- Bent, damaged or worn V-belt
- V-belt slips

Primary pulley cam and primary pulley slider
- Damaged or worn primary pulley cam
- Damaged or worn primary pulley slider

Transmission
- Damaged transmission gears

Primary sliding sheave
- Seized primary sliding sheave

CLUTCH SLIPPING

Clutch spring
- Damaged, loose or worn clutch shoe spring

Clutch shoe
- Damaged or worn clutch shoe

Primary sliding sheave
- Seized primary sliding sheave

POOR STARTING PERFORMANCE

V-belt
- V-belt slips
- Oil or grease on the V-belt

Primary sliding sheave
- Faulty operation
- Worn pin groove
- Worn pin

Transmission
- Bent, damaged or worn clutch shoe
POOR SPEED PERFORMANCE

V-belt
- Oil or grease on the V-belt

Primary pulley weight
- Faulty operation
- Worn primary pulley weight

Primary fixed sheave
- Worn primary fixed sheave

Primary sliding sheave
- Worn primary sliding sheave

Secondary fixed sheave
- Worn secondary fixed sheave

Secondary sliding sheave
- Worn secondary sliding sheave

OVERHEATING

Ignition system
- Improper spark plug gap
- Improper spark plug heat range
- Faulty C.D.I. unit

Fuel system
- Improper carburetor main jet (improper setting)
- Improper fuel level
- Clogged air filter element

Compression system
- Heavy carbon deposit

Engine oil
- Improper oil level
- Improper oil viscosity
- Inferior oil quality

Brake
- Brake drag

Cooling system
- Low coolant level
- Clogged or damaged radiator
- Damaged or faulty water pump
- Faulty fan motor
- Faulty thermo switch

Oil cooling system
- Clogged or damaged oil cooler

FAULTY BRAKE

POOR BRAKING EFFECT

Disc brake
- Worn brake pads
- Worn disc
- Air in brake fluid
- Leaking brake fluid
- Faulty master cylinder kit cup
- Faulty caliper kit seal
- Loose union bolt
- Broken brake hose and pipe
- Oily or greasy disc/brake pads
- Improper brake fluid level

SHOCK ABSORBER MALFUNCTION

MALFUNCTION
- Bent or damaged damper rod
- Damaged oil seal lip
- Fatigued shock absorber spring
UNSTABLE HANDLING

Steering wheel
- Improperly installed or bent

Steering
- Incorrect toe-in
- Bent steering shaft
- Improperly installed steering shaft
- Damaged bearing
- Bent tie-rods
- Deformed steering knuckles

Tires
- Uneven tire pressures on both sides
- Incorrect tire pressure
- Uneven tire wear

Wheels
- Deformed wheel
- Loose bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame
- Bent
- Damaged frame

LIGHTING SYSTEM

HEADLIGHT DOES NOT COME ON
- Improper bulb
- Too many electric accessories
- Hard charging (broken stator coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or lights switch)
- Bulb life expired

BULB BURNT OUT
- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or lights switch
- Bulb life expired
HOW TO USE THIS MANUAL

MANUAL ORGANIZATION
This manual consists of chapters for the main categories of subjects. (See “symbols”)

1st title ①: This is the title of the chapter with its symbol in the upper right corner of each page.

2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.

3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

EXPLODED DIAGRAMS
To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

1. An easy-to-see exploded diagram ④ is provided for removal and disassembly jobs.

2. Numbers ⑤ are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.

3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ⑥. The meanings of the symbol marks are given on the next page.

4. A job instruction chart ⑦ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

5. For jobs requiring more information, the step-by-step format supplements ⑧ are given in addition to the exploded diagram and the job instruction chart.
The following symbols are not relevant to every vehicle.

Symbols ① to ⑩ indicate the subject of each chapter.

① General information
② Specifications
③ Periodic checks and adjustments
④ Engine
⑤ Cooling system
⑥ Fuel system
⑦ Drive train
⑧ Chassis
⑨ Electrical
⑩ Troubleshooting

Symbols ⑪ to ⑮ indicate the following.

⑪ Can be serviced with engine mounted
⑫ Filling fluid
⑬ Lubricant
⑭ Special tool
⑮ Torque
⑯ Wear limit, clearance
⑰ Engine speed
⑱ Electrical data (Ω, V, A)

Symbols ① to ⑩ in the exploded diagrams indicate the types of lubricants and lubrication points.

① Apply engine oil
② Apply gear oil
③ Apply molybdenum disulfide oil
④ Apply wheel bearing grease
⑤ Apply lithium-soap-based grease
⑥ Apply molybdenum disulfide grease

Symbols ⑪ to ⑯ in the exploded diagrams indicate where to apply a locking agent ⑰ and when to install a new part ⑱.

⑰ Apply the locking agent (LOCTITE®)
⑱ Replace
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## YXR660FAT WIRING DIAGRAM
## SPECIFICATIONS

### GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model code</td>
<td>5UG4</td>
</tr>
<tr>
<td></td>
<td>5UG8</td>
</tr>
<tr>
<td><strong>Basic weight</strong></td>
<td></td>
</tr>
<tr>
<td>With oil and full fuel tank</td>
<td>509 kg (1,122 lb)</td>
</tr>
<tr>
<td><strong>Transmission</strong></td>
<td></td>
</tr>
<tr>
<td>Primary reduction system</td>
<td>V-belt</td>
</tr>
<tr>
<td>Secondary reduction system</td>
<td>Shaft drive</td>
</tr>
<tr>
<td>Secondary reduction ratio</td>
<td>$41/21 \times 24/18 \times 33/9$ (9.544)</td>
</tr>
<tr>
<td>Transmission type</td>
<td>V-belt automatic</td>
</tr>
<tr>
<td>Operation</td>
<td>Right hand operation</td>
</tr>
<tr>
<td>Single speed automatic</td>
<td>$2.450 \sim 0.834 : 1$</td>
</tr>
<tr>
<td>Sub transmission ratio</td>
<td>low 35/17 (2.058)</td>
</tr>
<tr>
<td></td>
<td>high 28/19 (1.473)</td>
</tr>
<tr>
<td>Reverse gear</td>
<td>25/17 (1.471)</td>
</tr>
<tr>
<td><strong>Tire pressure (cold tire)</strong></td>
<td></td>
</tr>
<tr>
<td>Maximum load*</td>
<td>398 kg (878 lb)</td>
</tr>
<tr>
<td>Off-road riding</td>
<td>front 63 ~ 77 kPa (0.63 ~ 0.77 kg/cm², 9 ~ 11 psi)</td>
</tr>
<tr>
<td></td>
<td>rear 91 ~ 105 kPa (0.91 ~ 1.05 kg/cm², 13 ~ 15 psi)</td>
</tr>
</tbody>
</table>

* Load in total weight of cargo, operator, passenger, accessories and tongue weight
## ENGINE SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carburetor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. D. mark</td>
<td>5UG4 10</td>
<td></td>
</tr>
<tr>
<td>Main jet (M.J)</td>
<td>#145</td>
<td></td>
</tr>
<tr>
<td>Main air jet (M.A.J)</td>
<td>#70</td>
<td></td>
</tr>
<tr>
<td>Jet needle (J.N)</td>
<td>6JPH10</td>
<td></td>
</tr>
<tr>
<td>Needle jet (N.J)</td>
<td>O-0M (922)</td>
<td></td>
</tr>
<tr>
<td>Pilot air jet (P.A.J.1)</td>
<td>#60</td>
<td></td>
</tr>
<tr>
<td>Pilot air jet (P.A.J.2)</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Pilot outlet (P.O)</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Pilot jet (P.J)</td>
<td>#40</td>
<td></td>
</tr>
<tr>
<td>Bypass 1 (B.P.1)</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Bypass 2 (B.P.2)</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Bypass 3 (B.P.3)</td>
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</tr>
<tr>
<td>Valve seat size (V.S)</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Starter jet (G.S.1)</td>
<td>#55</td>
<td></td>
</tr>
<tr>
<td>Starter jet (G.S.2)</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Throttle valve size (Th.V)</td>
<td>#105</td>
<td></td>
</tr>
<tr>
<td>Float height (F.H)</td>
<td>13 mm (0.51 in)</td>
<td></td>
</tr>
<tr>
<td>Fuel level (F.L)</td>
<td>4.0 ~ 5.0 mm (0.16 ~ 0.20 in)</td>
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</tr>
<tr>
<td>Engine idle speed</td>
<td>1,450 ~ 1,550 r/min</td>
<td></td>
</tr>
<tr>
<td>Intake vacuum</td>
<td>28.0 ~ 30.7 kPa</td>
<td>(210 ~ 230 mmHg, 8.27 ~ 9.06 inHg)</td>
</tr>
</tbody>
</table>

## CHASSIS SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Brake lever and brake pedal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accelerator pedal free play</td>
<td>0 mm (0.0 in)</td>
<td></td>
</tr>
<tr>
<td>Brake pedal free play</td>
<td>0 mm (0.0 in)</td>
<td></td>
</tr>
<tr>
<td>Parking brake lever free play</td>
<td>0 ~ 1 click of parking brake lever</td>
<td></td>
</tr>
</tbody>
</table>

## ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
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</thead>
<tbody>
<tr>
<td>C.D.I.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magneto model/manufacturer</td>
<td>F4T46972/MITSUBISHI</td>
<td></td>
</tr>
<tr>
<td>Pickup coil resistance/color</td>
<td>459 ~ 561 Ω at 20 °C (68 °F)/White/Red – White/Green</td>
<td></td>
</tr>
<tr>
<td>Rotor rotation direction sensing coil resistance/color</td>
<td>0.063 ~ 0.077 Ω at 20 °C (68 °F)/Red – White/Blue</td>
<td></td>
</tr>
<tr>
<td>C.D.I. unit model/manufacturer</td>
<td>F8T38682/MITSUBISHI</td>
<td></td>
</tr>
</tbody>
</table>
## TIGHTENING TORQUES

### ENGINE TIGHTENING TORQUES

<table>
<thead>
<tr>
<th>Part to be tightened</th>
<th>Part name</th>
<th>Thread size</th>
<th>Q'ty</th>
<th>Tightening torque</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nm    m · kg  ft · lb</td>
<td></td>
</tr>
<tr>
<td>Engine cooling fan</td>
<td>Bolt</td>
<td>M6</td>
<td>2</td>
<td>9 0.9 6.5</td>
<td></td>
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</table>

### CHASSIS TIGHTENING TORQUES

<table>
<thead>
<tr>
<th>Part to be tightened</th>
<th>Thread size</th>
<th>Tightening torque</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nm    m · kg  ft · lb</td>
<td></td>
</tr>
<tr>
<td>Rear wheel hub and constant velocity joint</td>
<td>M20</td>
<td>260 26.0 190</td>
<td>Stake</td>
</tr>
<tr>
<td>Cargo hook and cargo bed</td>
<td>M6</td>
<td>7 0.7 5.1</td>
<td></td>
</tr>
<tr>
<td>Tailgate cable and cargo bed</td>
<td>M6</td>
<td>7 0.7 5.1</td>
<td></td>
</tr>
<tr>
<td>Tailgate cable and tailgate</td>
<td>M6</td>
<td>7 0.7 5.1</td>
<td></td>
</tr>
</tbody>
</table>
CABLE ROUTING

1. Left headlight lead
2. Wire harness
3. Throttle cable
4. Brake light switch lead
5. Radiator fan motor breather hose
6. Starter cable
7. Starter (choke) knob
8. Light switch
9. Coolant reservoir breather hose
10. Parking brake switch lead
11. Parking brake cable
12. Crankcase breather hose
13. Gear position switch
14. Reverse switch lead
15. Front brake hoses
16. Differential gear case breather hose
17. Reverse switch terminal
18. Gear position switch lead
A 30 ~ 60 mm (1.18 ~ 2.36 in)  
B 160 ~ 190 mm (6.30 ~ 7.48 in)  
C Fasten the wire harness to the frame with the plastic bands.  
D Pull the excess of the hoses through the guide in the upper instrument panel so that there is no slack in the hoses.  
E Fasten the throttle cable, parking brake switch lead, and parking brake cable to the air duct assembly 1 with the plastic band.  
F Fasten the throttle cable to the air duct assembly 1 with the plastic band.  
G Fasten the radiator inlet hose and throttle cable with the plastic bands.  
H 20 mm (0.79 in) or less  
I 5 mm (0.20 in) or less  
J 15°
1. Float chamber breather hose
2. Throttle cable
3. Parking brake cable
4. Thermo switch 1
5. Vacuum hose
6. Spark plug cap
7. Wire harness
8. Tail/brake light lead
9. Starter motor lead
10. Carburetor heater leads
11. Carburetor heater

A. Fasten the parking brake switch lead and parking brake cable to the air duct assembly 1 with the plastic band.
B. Fasten the wire harness to the frame with the plastic bands.
C. Pass the tail/brake light lead through the grommet.
D. Fasten the parking brake cable to the air duct assembly 2 with the plastic band.
Fasten the parking brake cable and float chamber breather hose with the plastic clip.

Fasten the wire harness with the plastic band. Face the end of the plastic band down.

Push the excess tail/brake light lead into the rear fender so that there is no slack in the lead.

Fasten the tail/brake light lead with the plastic clamp.

20 ~ 40°

Fasten the starter motor lead, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, and parking brake switch lead with the plastic band.

Fasten the wire harness with the plastic clamps.
1. Main switch  
2. Starter (choke) knob  
3. Starter (choke) cable  
4. Rectifier/regulator  
5. Wire harness  
6. Coolant reservoir breather hose  
7. Right headlight lead  
8. Radiator fan motor breather hose  
9. Radiator fan motor coupler  

10. Differential gear case breather hose  
11. Thermo switch 3  
12. Gear motor couplers  
13. Coolant reservoir hose  
14. Speed sensor coupler  
15. A.C. magneto couplers  
16. Parking brake switch lead  
17. Parking brake cable  
18. Throttle cable  
19. Radiator inlet pipe  
20. Rear brake pipe  
21. Radiator outlet pipe  
22. Gear motor lead  
23. Brake light switch lead  
24. Indicator light assembly leads  
25. Auxiliary DC jack lead
A Fasten the wire harness with the plastic band.
B Fasten the wire harness, radiator fan motor lead, and thermo switch 3 lead to the frame with the plastic locking tie.
C Fasten the wire harness to the frame with the plastic locking ties.
D 30 ~ 60 mm (1.18 ~ 2.36 in)
E 160 ~ 190 mm (6.30 ~ 7.48 in)
F Fasten the radiator outlet hose and coolant reservoir hose with the plastic clip.
G 12 ~ 22 mm (0.47 ~ 0.87 in)
H Fasten the wire harness, starter motor lead, ground lead, and starter (choke) cable to the frame with the plastic band.
I Fasten the wire harness, starter motor lead, and ground lead to the frame with the plastic band.
J Fasten the wire harness, speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with the plastic band.
Fasten the throttle cable with the plastic band.

Fasten the radiator inlet pipe with the plastic band.

Fasten the rear brake pipe with the plastic band.

Fasten the radiator outlet pipe with the plastic band.

Fasten the wire harness, starter (choke) cable, starter motor lead, and ground lead with the plastic band.

Fasten the gear motor lead with the plastic band.

Fasten the wire harness, brake light switch lead, and starter (choke) cable with the plastic band.
1. Ignition coil lead
2. Spark plug lead
3. Final gear case breather hose
4. Vacuum hose
5. Fuel hoses
6. Air vent hoses
7. Starter (choke) cable
8. Crankcase breather hose
9. Ground lead
10. Rear brake hose
11. Parking brake cable

2. Ignition coil
3. Rear brake pipe
4. Wire harness
5. Fuel tank breather hose
6. Rollover valve
7. Fuel return hose
8. Fuel suction hose
A Fasten the spark plug lead with the plastic holder.
B 20 ~ 30 mm (0.79 ~ 1.18 in)
C Pass the final gear case breather hose through the grommet.
D 10°
E Fasten the starter (choke) cable, starter motor lead, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, parking brake switch lead, and air vent hose with the metal holder.

F Fasten the A.C. magneto leads, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, and parking brake switch lead with the plastic bands.
G Pass the wire harness through the grommet.
H Fasten the wire harness with the plastic band.
I Fasten the parking brake cable and wire harness with the plastic clip.
J Fasten the parking brake cable with the metal holder.
K Fasten the wire harness, ignition coil lead, and rear brake hose with the plastic band.
L Fasten the final gear case breather hose and fuel hose with the plastic clip.
M Fasten the fuel filter with the plastic band.
N Fasten the fuel hose with the plastic holders.
O Fasten the final gear case breather hose with the plastic holders.
P Fasten the parking brake cable and final gear case breather hose with the plastic holders.
Q Fasten the rear brake hose with the plastic bands.
R Less than 1 mm (0.04 in)
S Fasten the rear brake pipe and wire harness with the plastic holder.
1. Throttle cable
2. Rear brake pipe
3. A.C. magneto couplers
4. Starter (choke) cable
5. Air vent hose
6. Rear brake hose
7. Fuel hose
8. Vacuum hose
9. Spark plug lead
10. Parking brake cable

A. Pass the throttle cable through the cable guide.
B. Fasten the speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with the plastic band.
C. Fasten the wire harness and A.C. magneto lead with the plastic band.
D. Fasten the wire harness with the plastic band.
E. Fasten the fuel hose and vacuum hose with the metal holder.
Fasten the fuel hose and vacuum hose with the plastic clip.

Make sure that the spark plug lead does not contact the frame.

The end of the spark plug cap boot must face towards the passenger side of the vehicle.

Fasten the final gear case breather hose with the plastic holder.

Fasten the wire harness with the plastic band.

Make sure that the plastic band is not fastened too tightly around the wire harness.

Pass the spark plug lead through the cutout in the protective cover as shown.

Fasten the rear brake pipe with the plastic band.

Fasten the wire harness, speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with the plastic band.
SPEC  CABLE ROUTING

1. Battery
2. Negative battery lead
3. Rectifier/regulator
4. Starter (choke) cable
5. Indicator light assembly couplers
6. On-Command four-wheel drive switch and differential gear lock switch leads
7. On-Command four-wheel drive switch and differential gear lock switch
8. Main switch
9. Starter (choke) knob

10. Light switch
11. Differential gear case breather hose
12. Radiator fan motor breather hose
13. Left headlight lead
14. Throttle cable
15. Right headlight lead
16. Starter motor lead
17. Starter relay lead
18. Four-wheel drive relay 1
19. Four-wheel drive relay 2
20. Starter relay
Fasten the wire harness with the plastic bands.

Pass the radiator fan motor breather hose, differential gear case breather hose, coolant reservoir breather hose, and brake light switch lead through the guide.

Pass the radiator fan motor breather hose, differential gear case breather hose, throttle cable, and brake light switch lead through the guide.
Pass the radiator fan motor breather hose and differential gear case breather hose through the guide.

Fasten the throttle cable with the plastic holder.

Fasten the left headlight lead, differential gear case breather hose, and radiator fan motor breather hose with the plastic holder.

Fasten the left headlight lead and differential gear case breather hose with the plastic holder.

Fasten the starter motor lead and starter relay lead with the plastic holder.

Fasten the positive battery lead with the plastic holder.

59 ~ 61 mm (2.32 ~ 2.40 in)

4 mm (0.16 in) of clearance or more is required around the boot.

Make sure that the washer is installed on the side of the pedal assembly bracket towards the boot.
1. Auxiliary DC jack
2. Auxiliary DC jack lead
3. Coolant reservoir breather hose
4. Throttle cable
5. Radiator fan motor breather hose
6. Differential gear case breather hose
7. Starter (choke) cable
8. Wire harness
9. Front brake hoses
10. Coolant reservoir hose
11. Ground lead

2. Starter relay lead

A. Fasten the coolant reservoir breather hose with the plastic band.
B. Fasten the front brake hose with the plastic band.
C. Fasten the wire harness and ground lead with the plastic band.
D. Fasten the differential gear case breather hose, coolant reservoir hose, radiator fan motor lead, and thermo switch 3 lead with the plastic holder.
PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

EB301000

PERIODIC MAINTENANCE/LUBRICATION

NOTE:
- For vehicles not equipped with an odometer or hour meter, follow the month maintenance intervals.
- For vehicles equipped with an odometer or an hour meter, follow the km (mi) or hours maintenance intervals. However, keep in mind that if the vehicle isn’t used for a long period of time, the month maintenance intervals should be followed.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ROUTINE</th>
<th>INITIAL</th>
<th>EVERY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whichever comes first</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>km (mi)</td>
<td></td>
<td>320 (200)</td>
<td>1,200 (750)</td>
</tr>
<tr>
<td>hours</td>
<td></td>
<td>20</td>
<td>75</td>
</tr>
<tr>
<td>Valves*</td>
<td>• Check valve clearance. • Adjust if necessary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling system</td>
<td>• Check coolant leakage. • Repair if necessary. • Replace coolant every 24 months.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spark plug</td>
<td>• Check condition. • Adjust gap and clean. • Replace if necessary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air filter elements (Engine and air intake duct)</td>
<td>• Clean. • Replace if necessary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carburetor*</td>
<td>• Check idle speed/starter operation. • Adjust if necessary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crankcase breather system*</td>
<td>• Check breather hose for cracks or damage. • Replace if necessary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust system*</td>
<td>• Check for leakage. • Tighten if necessary. • Replace gasket(s) if necessary.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sparks arrester</td>
<td>• Clean.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel line*</td>
<td>• Check fuel hose for cracks or damage. • Replace if necessary.</td>
<td></td>
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</tr>
<tr>
<td>Engine oil</td>
<td>• Replace (warm engine before draining).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engine oil filter cartridge</td>
<td>• Replace.</td>
<td></td>
<td></td>
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<tr>
<td>Final gear oil</td>
<td>• Check oil level/oil leakage.</td>
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<td></td>
</tr>
<tr>
<td>Differential gear oil</td>
<td>• Replace.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front brake*</td>
<td>• Check operation/brake wear/liquid leakage/see NOTE page 21. • Correct if necessary. Replace pads if worn to the limit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear brake*</td>
<td>• Check operation/brake wear/liquid leakage/see NOTE page 21. • Correct if necessary. Replace pads if worn to the limit.</td>
<td></td>
<td></td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>ITEM</th>
<th>ROUTINE</th>
<th>Whichever comes first</th>
<th>INITIAL</th>
<th>EVERY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>month</td>
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<td></td>
<td></td>
<td></td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>km (mi)</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>hours</td>
<td>20</td>
</tr>
<tr>
<td>Accelerator pedal*</td>
<td>• Check operation and free play.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>V-belt*</td>
<td>• Check operation.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Check for wear, cracks, or damage.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Wheels*</td>
<td>• Check balance/damage/runout.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Repair if necessary.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Wheel bearings*</td>
<td>• Check bearing assemblies for looseness/damage.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Replace if damaged.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Front and rear</td>
<td>• Check operation and for leakage.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>suspension*</td>
<td>• Correct if necessary.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Steering system*</td>
<td>• Check operation and for looseness/Replace if damaged.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Check toe-in/Adjust if necessary.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Rear upper and lower</td>
<td>• Lubricate with lithium-soap-based grease.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>knuckle pivots*</td>
<td></td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Drive shaft universal</td>
<td>• Lubricate with lithium-soap-based grease.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>joint*</td>
<td></td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Engine mount*</td>
<td>• Check for cracks or damage.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Check bolt tightness.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Front and rear axle</td>
<td>• Check operation.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>boots*</td>
<td>• Replace if damaged.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Stabilizer bushings*</td>
<td>• Check for cracks or damage.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Fittings and fasten-</td>
<td>• Check all chassis fittings and fasteners.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>ers*</td>
<td>• Correct if necessary.</td>
<td></td>
<td>○</td>
<td></td>
</tr>
</tbody>
</table>

* Since these items require special tools, data and technical skills have a Yamaha dealer perform the service.

**NOTE:**
- Recommended brake fluid: DOT 4
- Brake fluid replacement:
  - When disassembling the master cylinder or caliper, replace the brake fluid. Normally check the brake fluid level and add fluid as required.
  - On the inner parts of the master cylinder and caliper, replace the oil seals every two years.
  - Replace the brake hoses every four years, or if cracked or damaged.
ENGINE
CLEANING THE AIR FILTER ELEMENTS
Cleaning the intake duct air filter element
1. Remove:
   • air intake duct grill

2. Remove:
   • air filter element
     (from the air intake duct grill)

3. Clean:
   • air filter element

   NOTE: Remove any large particles from the air filter element by hand, tap the air filter element to remove most of the dust and dirt, and then blow the remaining dirt out with compressed air.

4. Check:
   • air filter element
     Damage → Replace.

5. Install:
   • air filter element
     (into the air intake duct grill)

6. Install:
   • air intake duct grill

Cleaning the engine air filter element
NOTE: There is a check hose at the bottom of the air filter case. If dust and/or water collects in this hose, clean the air filter element and air filter case.
CLEANING THE AIR FILTER ELEMENTS

1. Remove:
   • driver seat
   • passenger seat
   • console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”.

2. Remove:
   • air filter case cover ①

3. Remove:
   • air filter element assembly ①
   • air filter element cap ②
   • air filter element ③
   **CAUTION:** Never operate the engine with the air filter element removed. This will allow unfiltered air to enter, causing rapid wear and possible engine damage. Additionally, operation without the filter element will affect carburetor tuning with subsequent poor performance and possible engine overheating.

4. Check:
   • air filter element
     Damaged → Replace.
5. Clean:
   • air filter element

   a. Wash the element gently, but thoroughly in solvent.

   [WARNING]
   Use a cleaning solvent which is designed to clean parts only. Never use gasoline or low flash point solvents as they may cause a fire or explosion.

   b. Squeeze the excess solvent out of the element and let it dry.

   [CAUTION:]
   Do not twist or wring out the element. This could damage the foam material.

   c. Apply Yamaha foam air filter oil or other quality foam air filter oil (not spray type).

   d. Squeeze out the excess oil.

   [NOTE:]
   The element should be wet but not dripping.

6. Install:
   • air filter element
   • air filter case cover

   [NOTE:]
   To prevent air leaks make sure that the sealing surface of the element matches the sealing surface of the case.

7. Install:
   • console
   • passenger seat
   • driver seat

   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”.

---

---
CHASSIS

ADJUSTING THE PARKING BRAKE

1. Shift the drive select lever into low gear “L”.
2. Remove:
   • driver seat
   • passenger seat
   • console
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”.
3. Check:
   • parking brake lever free play
   The maximum free play is equal to one click of the parking brake lever. If necessary, adjust the free play as follows.

**NOTE:**
The parking brake lever must be released when checking and adjusting the parking brake lever free play.

4. Adjust:
   • parking brake lever free play

Turning in  | Free play is increased.
---|---
Turning out | Free play is decreased.

d. Tighten the locknut ①.
e. Slide the adjuster cover to its original position.

5. Install:
   • console
   • passenger seat
   • driver seat
   Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”.

---

<table>
<thead>
<tr>
<th>Turning in</th>
<th>Free play is increased.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning out</td>
<td>Free play is decreased.</td>
</tr>
</tbody>
</table>

---
ENGINE REMOVAL

AIR DUCTS, MUFFLER AND EXHAUST PIPE

**Order** | **Job/Part** | **Q'ty** | **Remarks**
---|---|---|---
Removing the air ducts, muffler and exhaust pipe | | | Remove the parts in the order listed.
Engine oil | | | Drain.
Coolant | | | Refer to “CHANGING THE ENGINE OIL” in chapter 3. (Manual No.: 5UG-F8197-10)
Driver seat/passenger seat/console/air duct end cover/left protector | | | Drain.
Engine cooling fan air duct assembly | | | Refer to “CHANGING THE COOLANT” in chapter 3. (Manual No.: 5UG-F8197-10)
Carburetor assembly/air filter case | | | Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”.
Carburetor assembly/air filter case | | | Refer to “ENGINE COOLING FAN AND A.C. MAGNETO” in chapter 4. (Manual No.: 5UG-F8197-10)
Carburetor assembly/air filter case | | | Refer to “CARBURETOR” in chapter 6. (Manual No.: 5UG-F8197-10)
**Engine Removal**

1. **Fuel tank**
   - Order: 7
   - Q'ty: 1
   - Remarks: Refer to "FUEL PUMP AND FUEL TANK" in chapter 6. (Manual No.: 5UG-F8197-10)

2. **Heat protector**
   - Order: 1
   - Q'ty: 1

3. **Muffler stay**
   - Order: 2
   - Q'ty: 1

4. **Muffler damper**
   - Order: 3
   - Q'ty: 1

5. **Muffler bracket**
   - Order: 4
   - Q'ty: 1

6. **Muffler/gasket**
   - Order: 5
   - Q'ty: 1/1

7. **Exhaust pipe/gasket**
   - Order: 6
   - Q'ty: 1/2

8. **Air duct assembly 1**
   - Order: 7
   - Q'ty: 1

9. **Air duct assembly 2**
   - Order: 8
   - Q'ty: 1

**Torque Specifications**

- **N m (kg, ft lb)**
  - 7 Nm (0.7 m kg, 5.1 ft lb)
  - 10 Nm (1.0 m kg, 7.2 ft lb)
  - 11 Nm (1.1 m kg, 8.0 ft lb)
  - 14 Nm (1.4 m kg, 10 ft lb)
  - 14 Nm (1.4 m kg, 10 ft lb)
  - 20 Nm (2.0 m kg, 14 ft lb)

For installation, reverse the removal procedure.
**Removing the carburetor**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Crankcase breather hose</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Air filter case joint</td>
<td>1</td>
<td>Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”.</td>
</tr>
<tr>
<td>3</td>
<td>Air filter case</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>4</td>
<td>Carburetor joint (air filter case)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Vacuum chamber breather hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Air vent hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Starter cable/starter plunger</td>
<td>1/1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>8</td>
<td>Fuel hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Carburetor heater lead</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>10</td>
<td>Carburetor assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Drain hose</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Throttle valve cover</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
For installation, reverse the removal procedure.
INSTALLING THE AIR FILTER CASE JOINT

1. Install:
   - air filter case joint

NOTE: Align the tab a on the air filter case joint with the slot b in the air filter case.
### Removing the seats, console and instrument panels

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Driver seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Passenger seat</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Air intake duct</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Console</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Steering wheel cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Steering wheel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Pedal cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Light switch coupler</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>9</td>
<td>Main switch coupler</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>10</td>
<td>On-Command four-wheel drive switch and differential gear lock switch</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>11</td>
<td>Indicator/warning light coupler</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>Order</td>
<td>Job/Part</td>
<td>Q'ty</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------</td>
<td>------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>12</td>
<td>Auxiliary DC jack connector</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>13</td>
<td>Nut/starter cable</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Upper instrument panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Hinge</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Glove box lid</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Lower instrument panel</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
</tbody>
</table>

For installation, reverse the removal procedure.
### PANELS AND FOOTREST COVER

![Diagram of panels and footrest cover]

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Left side panel</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Right side panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Left corner panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Right corner panel</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Air duct end cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Left protector 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Right protector 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Footrest cover</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Driver seat support</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td>10</td>
<td>Passenger seat support</td>
<td>1</td>
<td>cedure.</td>
</tr>
</tbody>
</table>

**Torque Specifications:**
- 16 Nm (1.6 m·kg, 11 ft·lb)
- 32 Nm (3.2 m·kg, 23 ft·lb)
### CARGO BED

#### Disassembling the Cargo Bed

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tailgate cable</td>
<td>2</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Hinge cover</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Tailgate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cargo bed panel</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tail/brake light bulb holder</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Mud guard</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cargo bed release lever</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cargo hook</td>
<td>4</td>
<td>For assembly, reverse the disassembly procedure.</td>
</tr>
<tr>
<td>9</td>
<td>Cargo bed</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

- **7 Nm (0.7 m·kg, 5.1 ft·lb)**
- **11 Nm (1.1 m·kg, 8.0 ft·lb)**
- **26 Nm (2.6 m·kg, 19 ft·lb)**
ENCLOSURE AND SEAT BELTS

Removing the enclosure and seat belts

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front top frame</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Rear top frame</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Left support frame</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Right support frame</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Left side frame</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Right side frame</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Seat belt</td>
<td>2</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td>8</td>
<td>Buckle</td>
<td>2</td>
<td>cedure.</td>
</tr>
</tbody>
</table>

64 Nm (6.4 m · kg, 46 ft · lb)

59 Nm (5.9 m · kg, 43 ft · lb)
HOW TO USE THIS MANUAL

MANUAL ORGANIZATION

This manual consists of chapters for the main categories of subjects. (See “symbols”)

1st title ①: This is the title of the chapter with its symbol in the upper right corner of each page.

2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.

3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

EXPLODED DIAGRAMS

To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

1. An easy-to-see exploded diagram ④ is provided for removal and disassembly jobs.
2. Numbers ⑤ are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ⑥. The meanings of the symbol marks are given on the next page.
4. A job instruction chart ⑦ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
5. For jobs requiring more information, the step-by-step format supplements ⑧ are given in addition to the exploded diagram and the job instruction chart.
The following symbols are not relevant to every vehicle.

Symbols 1 to 10 indicate the subject of each chapter.

1. General information
2. Specifications
3. Periodic checks and adjustments
4. Engine
5. Cooling system
6. Fuel system
7. Drive train
8. Chassis
9. Electrical
10. Troubleshooting

Symbols 11 to 18 indicate the following.

11. Can be serviced with engine mounted
12. Filling fluid
13. Lubricant
14. Special tool
15. Torque
16. Wear limit, clearance
17. Engine speed
18. Electrical data (Ω, V, A)

Symbols 19 to 24 in the exploded diagrams indicate the types of lubricants and lubrication points.

19. Apply engine oil
20. Apply gear oil
21. Apply molybdenum disulfide oil
22. Apply wheel bearing grease
23. Apply lithium-soap-based grease
24. Apply molybdenum disulfide grease

Symbols 25 to 26 in the exploded diagrams indicate where to apply a locking agent 25 and when to install a new part 26.

25. Apply the locking agent (LOCTITE®)
26. Replace
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YXR66FAV 2006 WIRING DIAGRAM
### GENERAL SPECIFICATIONS

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<tr>
<th>Item</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model code</strong></td>
<td>5UG9, 5UGB, 5UGF (for USA)</td>
</tr>
<tr>
<td></td>
<td>5UGA, 5UGC, 5UGG (for CDN)</td>
</tr>
<tr>
<td></td>
<td>5UGD, 5UGH (for Europe)</td>
</tr>
<tr>
<td></td>
<td>5UGE (for Oceania)</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
</tr>
<tr>
<td>Overall length</td>
<td>2,885 mm (113.6 in)</td>
</tr>
<tr>
<td>Overall width</td>
<td>1,385 mm (54.5 in)</td>
</tr>
<tr>
<td>Overall height</td>
<td>1,853 mm (73.0 in)</td>
</tr>
<tr>
<td>Seat height</td>
<td>818 mm (32.2 in)</td>
</tr>
<tr>
<td>Wheelbase</td>
<td>1,910 mm (75.2 in)</td>
</tr>
<tr>
<td>Minimum ground clearance</td>
<td>280 mm (11.0 in)</td>
</tr>
<tr>
<td>Minimum turning radius</td>
<td>3,900 mm (153.5 in)</td>
</tr>
<tr>
<td><strong>Basic weight</strong></td>
<td></td>
</tr>
<tr>
<td>With oil and full fuel tank</td>
<td>506 kg (1,116 lb) (except for Europe)</td>
</tr>
<tr>
<td></td>
<td>519 kg (1,144 lb) (for Europe)</td>
</tr>
<tr>
<td><strong>Chassis</strong></td>
<td></td>
</tr>
<tr>
<td>Frame type</td>
<td>Steel tube frame</td>
</tr>
<tr>
<td>Caster angle</td>
<td>5.0°</td>
</tr>
<tr>
<td>Camber angle</td>
<td>0°</td>
</tr>
<tr>
<td>Kingpin angle</td>
<td>12°</td>
</tr>
<tr>
<td>Kingpin offset</td>
<td>0 mm (0 in)</td>
</tr>
<tr>
<td>Trail</td>
<td>26 mm (1.02 in)</td>
</tr>
<tr>
<td>Tread (STD)</td>
<td></td>
</tr>
<tr>
<td>front</td>
<td>1,115 mm (43.90 in)</td>
</tr>
<tr>
<td>rear</td>
<td>1,105 mm (43.50 in)</td>
</tr>
<tr>
<td>Toe-in</td>
<td>15 – 25 mm (0.59 – 0.98 in)</td>
</tr>
<tr>
<td><strong>Tire</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Tubeless</td>
</tr>
<tr>
<td>Size</td>
<td></td>
</tr>
<tr>
<td>front</td>
<td>25 × 8–12NHS</td>
</tr>
<tr>
<td>rear</td>
<td>25 × 10–12NHS</td>
</tr>
<tr>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>front</td>
<td>MAXXIS</td>
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<tr>
<td>rear</td>
<td>MAXXIS</td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>front</td>
<td>M951Y</td>
</tr>
<tr>
<td>rear</td>
<td>M952Y</td>
</tr>
<tr>
<td><strong>Tire pressure (cold tire)</strong></td>
<td></td>
</tr>
<tr>
<td>Maximum load*</td>
<td>401 kg (884 lb) (except for Europe)</td>
</tr>
<tr>
<td></td>
<td>388 kg (855 lb) (for Europe)</td>
</tr>
<tr>
<td>Off-road riding</td>
<td></td>
</tr>
<tr>
<td>front</td>
<td>63 – 77 kPa (0.63 – 0.77 kgf/cm², 9 – 11 psi)</td>
</tr>
<tr>
<td>rear</td>
<td>91 – 105 kPa (0.91 – 1.05 kgf/cm², 13 – 15 psi)</td>
</tr>
<tr>
<td>* Load is total weight of cargo, operator, passenger, accessories and tongue weight</td>
<td></td>
</tr>
<tr>
<td><strong>Headlight type</strong></td>
<td>Halogen bulb</td>
</tr>
</tbody>
</table>
### SPEC

#### GENERAL SPECIFICATIONS

#### CHASSIS SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bulb wattage × quantity</strong></td>
<td></td>
</tr>
<tr>
<td>Headlight</td>
<td>12 V 30 W/30 W × 2</td>
</tr>
<tr>
<td>Tail/brake light</td>
<td>12 V 5 W/21 W × 2</td>
</tr>
<tr>
<td><strong>Indicator lights</strong></td>
<td></td>
</tr>
<tr>
<td>Except for special edition models</td>
<td></td>
</tr>
<tr>
<td>Neutral indicator light</td>
<td>12 V 1.7 W × 1</td>
</tr>
<tr>
<td>Reverse indicator light</td>
<td>12 V 1.7 W × 1</td>
</tr>
<tr>
<td>Coolant temperature warning light</td>
<td>12 V 1.7 W × 1</td>
</tr>
<tr>
<td>Parking brake indicator light</td>
<td>12 V 1.7 W × 1</td>
</tr>
<tr>
<td>Four-wheel drive indicator light</td>
<td>12 V 1.7 W × 1</td>
</tr>
<tr>
<td>Differential gear lock indicator light</td>
<td>12 V 1.7 W × 1</td>
</tr>
<tr>
<td>For special edition models</td>
<td></td>
</tr>
<tr>
<td>Neutral indicator light</td>
<td>LED</td>
</tr>
<tr>
<td>Reverse indicator light</td>
<td>LED</td>
</tr>
<tr>
<td>Coolant temperature warning light</td>
<td>LED</td>
</tr>
<tr>
<td>Parking brake indicator light</td>
<td>LED</td>
</tr>
<tr>
<td>High-range indicator light</td>
<td>LED</td>
</tr>
<tr>
<td>Low-range indicator light</td>
<td>LED</td>
</tr>
<tr>
<td>Differential gear lock indicator light</td>
<td>LED</td>
</tr>
<tr>
<td>Four-wheel drive indicator light</td>
<td>LCD</td>
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### CHASSIS SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Front wheel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Panel wheel (except for special edition models)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cast wheel (for special edition models)</td>
<td></td>
</tr>
<tr>
<td>Rim size</td>
<td>12 × 6.0 AT</td>
<td></td>
</tr>
<tr>
<td>Rim material</td>
<td>Steel (except for special edition models)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aluminum (for special edition models)</td>
<td></td>
</tr>
<tr>
<td>Rim runout limit</td>
<td>radial 2.0 mm (0.08 in)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lateral 2.0 mm (0.08 in)</td>
<td></td>
</tr>
<tr>
<td><strong>Rear wheel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Panel wheel (except for special edition models)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cast wheel (for special edition models)</td>
<td></td>
</tr>
<tr>
<td>Rim size</td>
<td>12 × 7.5 AT</td>
<td></td>
</tr>
<tr>
<td>Rim material</td>
<td>Steel (except for special edition models)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aluminum (for special edition models)</td>
<td></td>
</tr>
<tr>
<td>Rim runout limit</td>
<td>radial 2.0 mm (0.08 in)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lateral 2.0 mm (0.08 in)</td>
<td></td>
</tr>
</tbody>
</table>
# ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headlight relay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model/manufacturer</td>
<td>G8HN-1C4T-DJ-Y52/OMRON</td>
<td>----</td>
</tr>
<tr>
<td>Coil resistance</td>
<td>94.5 ~ 115.5 Ω at 20°C (68 °F)</td>
<td>----</td>
</tr>
</tbody>
</table>

# TIGHTENING TORQUES

## CHASSIS TIGHTENING TORQUES

<table>
<thead>
<tr>
<th>Part to be tightened</th>
<th>Thread size</th>
<th>Tightening torque</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat belt buckle and support frame</td>
<td>M10</td>
<td>59 Nm, 5.9 m·kg, 43 ft·lb</td>
<td></td>
</tr>
<tr>
<td>Front wheel hub and constant velocity joint</td>
<td>M24</td>
<td>350 Nm, 35.0 m·kg, 255 ft·lb</td>
<td>Stake</td>
</tr>
<tr>
<td>Rear wheel hub and constant velocity joint</td>
<td>M24</td>
<td>350 Nm, 35.0 m·kg, 255 ft·lb</td>
<td>Stake</td>
</tr>
<tr>
<td>Cargo bed release lever</td>
<td>M6</td>
<td>7 Nm, 0.7 m·kg, 5.1 ft·lb</td>
<td></td>
</tr>
<tr>
<td>Gas spring assembly and gas spring assembly bracket</td>
<td>M8</td>
<td>16 Nm, 1.6 m·kg, 11 ft·lb</td>
<td></td>
</tr>
<tr>
<td>Cargo bed assembly and gas spring assembly bracket</td>
<td>M6</td>
<td>7 Nm, 0.7 m·kg, 5.1 ft·lb</td>
<td></td>
</tr>
<tr>
<td>Mud guard (for special edition models)</td>
<td>M6</td>
<td>7 Nm, 0.7 m·kg, 5.1 ft·lb</td>
<td></td>
</tr>
</tbody>
</table>
CABLE ROUTING

1. Left headlight lead
2. Wire harness
3. Throttle cable
4. Brake light switch lead
5. Radiator fan motor breather hose
6. Rectifier/regulator
7. Starter cable
8. Starter (choke) knob
9. Light switch
10. Coolant reservoir breather hose

11. Parking brake switch lead
12. Parking brake cable
13. Crankcase breather hose
14. Gear position switch
15. Reverse switch lead
16. Reverse switch terminal
17. Differential gear case breather hose
18. Front brake hoses
19. Gear position switch lead

Diagram with numbered parts corresponding to the text.
A 30 ~ 60 mm (1.18 ~ 2.36 in)  
B 160 ~ 190 mm (6.30 ~ 7.48 in)  
C Fasten the wire harness to the frame with the plastic bands.  
D Pull the excess of the hoses through the guide in the upper instrument panel so that there is no slack in the hoses.  
E Fasten the throttle cable, parking brake switch lead, and parking brake cable to the air duct assembly 1 with a plastic band.  
F Fasten the throttle cable to the air duct assembly 1 with a plastic band.  
G Fasten the radiator inlet hose and throttle cable with the plastic bands.  
H 20 mm (0.79 in) or less  
I 5 mm (0.20 in) or less  
J Route the throttle cable to the inside of the radiator inlet hose.  
K 15°
Float chamber breather hose
2 Throttle cable
3 Parking brake cable
4 Thermo switch 1
5 Vacuum hose
6 Spark plug cap
7 Wire harness
8 Tail/brake light lead
9 Starter motor lead
10 Carburetor heater leads
11 Carburetor heater

A Fasten the parking brake switch lead and parking brake cable to the air duct assembly 1 with a plastic band.
B Fasten the wire harness to the frame with the plastic bands.
C Fasten the parking brake cable to the air duct assembly 2 with a plastic band.
D Fasten the parking brake cable and float chamber breather hose with the plastic clip.
E Fasten the wire harness with the plastic holders.
F 20 ~ 40°
G Fasten the starter motor lead, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, and parking brake switch lead with a plastic band.
H Push the excess tail/brake light lead into the rear fender so that there is no slack in the lead.
I Fasten the unused coupler to the wire harness with tape.
J Fasten the tail/brake light lead with the plastic holders.
K Fasten the tail/brake light lead with the plastic bands.
L Fasten the wire harness with the plastic bands.
1. Main switch
2. Starter (choke) knob
3. Starter (choke) cable
4. Wire harness
5. Coolant reservoir breather hose
6. Right headlight lead
7. Radiator fan motor breather hose
8. Radiator fan motor coupler
9. Differential gear case breather hose
10. Thermo switch 3
11. Gear motor couplers
12. Coolant reservoir hose
13. Speed sensor coupler
14. A.C. magneto couplers
15. Parking brake switch lead
16. Parking brake cable
17. Throttle cable
18. Radiator inlet pipe
19. Rear brake pipe
20. Radiator outlet pipe
21. Gear motor lead
22. Brake light switch lead
23. Indicator light assembly leads (except for special edition models)
24. On-Command four-wheel drive switch and differential gear lock switch lead
25. Auxiliary DC jack lead
Fasten the wire harness with the plastic bands.

Fasten the wire harness, radiator fan motor lead, and thermo switch 3 lead to the frame with a plastic band.

Fasten the wire harness to the frame with the plastic bands.

30 ~ 60 mm (1.18 ~ 2.36 in)

160 ~ 190 mm (6.30 ~ 7.48 in)

Fasten the radiator outlet hose and coolant reservoir hose with the plastic clip.

12 ~ 22 mm (0.47 ~ 0.87 in)

Fasten the wire harness, starter motor lead, ground lead, and starter (choke) cable to the frame with a plastic band.

Fasten the radiator outlet hose and coolant reservoir hose with the plastic clip.

12 ~ 22 mm (0.47 ~ 0.87 in)

Fasten the wire harness, starter motor lead, and ground lead to the frame with a plastic band.

Fasten the wire harness, speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with a plastic band.
K 70 ~ 90 mm (2.76 ~ 3.54 in) 
L Fasten the throttle cable with a plastic band.
M Fasten the radiator inlet pipe with a plastic band.
N Fasten the rear brake pipe with a plastic band.
O Fasten the radiator outlet pipe with a plastic band.

P Fasten the wire harness, starter (choke) cable, starter motor lead, and ground lead with the plastic bands.
Q Fasten the gear motor lead with a plastic band.
R Fasten the wire harness, brake light switch lead, and starter (choke) cable with a plastic band.
CABLE ROUTING

1. Ignition coil lead
2. Spark plug lead
3. Final gear case breather hose
4. Vacuum hose
5. Fuel hoses
6. Air vent hoses
7. Starter (choke) cable
8. Crankcase breather hose
9. Ground lead
10. Rear brake hose
11. Parking brake cable

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Fasten the spark plug lead with the plastic holder.
20 ~ 30 mm (0.79 ~ 1.18 in)
Pass the final gear case breather hose through the grommet.
10°
Fasten the starter (choke) cable, starter motor lead, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, parking brake switch lead, and air vent hose with the metal holder.

Fasten the A.C. magneto leads, reverse switch lead, gear position switch lead, thermo switch 1 lead, carburetor heater lead, and parking brake switch lead with the plastic bands.
130 mm (5.12 in)
Fasten the final gear case breather hose with the plastic holders.
Pass the wire harness through the grommet.
Fasten the wire harness with a plastic band.
Fasten the parking brake cable and wire harness with the plastic clip.
L Fasten the parking brake cable with the metal holder.
M Fasten the wire harness and rear brake hose with a plastic band.
N Fasten the final gear case breather hose and fuel hose with the plastic clip.
O Fasten the fuel filter with a plastic band.
P Fasten the fuel hose with the plastic holders.
Q Fasten the parking brake cable and final gear case breather hose with the plastic holders.
R Fasten the rear brake hose with the plastic bands.
S Less than 1 mm (0.04 in)
T Fasten the rear brake pipe and wire harness with the plastic holder.
U Fasten the ignition coil lead with a plastic band.
1. Throttle cable
2. Rear brake pipe
3. A.C. magneto couplers
4. Starter (choke) cable
5. Air vent hose
6. Rear brake hose
7. Fuel hose
8. Vacuum hose
9. Spark plug lead
10. Parking brake cable
11. Wire harness

A. Pass the throttle cable through the cable guide.
B. Fasten the speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with a plastic band.
C. Fasten the wire harness and A.C. magneto leads with a plastic band.
D. Fasten the wire harness with a plastic band.
E. Fasten the fuel hose and vacuum hose with the metal holder.
Fasten the fuel hose and vacuum hose with the plastic clip.

Make sure that the spark plug lead does not contact the frame.

Fasten the vacuum hose with the plastic holder.

The end of the spark plug cap boot must face towards the passenger side of the vehicle.

Fasten the wire harness with a plastic band.

Make sure that a plastic band is not fastened too tightly around the wire harness.

Pass the spark plug lead through the cutout in the protective cover as shown.

Fasten the rear brake pipe with a plastic band.

Fasten the wire harness, speed sensor lead, starter (choke) cable, starter motor lead, and ground lead with a plastic band.
1 Battery
2 Negative battery lead
3 Starter (choke) cable
4 Meter assembly couplers (for special edition models)
5 Indicator light assembly couplers (except for special edition models)
6 On-Command four-wheel drive switch and differential gear lock switch leads
7 On-Command four-wheel drive switch and differential gear lock switch
8 Main switch
9 Starter (choke) knob
10 Light switch
11 Rectifier/regulator
12 Differential gear case breather hose
13 Radiator fan motor breather hose
14 Left headlight lead
15 Throttle cable
16 Right headlight lead
17 Starter motor lead
18 Starter relay lead
1. Four-wheel drive relay 1
2. Four-wheel drive relay 2
3. Starter relay
4. Four-wheel drive relay 3
5. Four-wheel drive indicator light relay (except for special edition models)
6. Headlight relay
7. Differential gear lock indicator light relay (except for special edition models)
8. Fuse box
9. Positive battery lead

10. Neutral indicator light (except for special edition models)
11. Reverse indicator light (except for special edition models)
12. Parking brake indicator light (except for special edition models)
13. Four-wheel drive indicator light (except for special edition models)
14. Differential gear lock indicator light (except for special edition models)
Coolant temperature indicator light (except for special edition models)

C.D.I. unit

A Fasten the wire harness and the leads of the unused couplers with a plastic band. (for special edition models)

B Fasten the wire harness with the plastic bands.

C Pass the radiator fan motor breather hose, differential gear case breather hose, coolant reservoir breather hose, and brake light switch lead through the guide.

D Pass the radiator fan motor breather hose, differential gear case breather hose, throttle cable, and brake light switch lead through the guide.

E Pass the radiator fan motor breather hose and differential gear case breather hose through the guide.
Fasten the throttle cable with the plastic holder.

Fasten the left headlight lead, differential gear case breather hose, and radiator fan motor breather hose with the plastic holder.

Fasten the left headlight lead and differential gear case breather hose with the plastic holder.

Fasten the starter motor lead and starter relay lead with the plastic holder.

Fasten the positive battery lead with the plastic holder.

59 ~ 61 mm (2.32 ~ 2.40 in)

4 mm (0.16 in) of clearance or more is required around the boot.

Make sure that the washer is installed on the side of the pedal assembly bracket on the boot side.
CABLE ROUTING

1. Auxiliary DC jack
2. Auxiliary DC jack lead
3. Coolant reservoir breather hose
4. Throttle cable
5. Radiator fan motor breather hose
6. Differential gear case breather hose
7. Starter (choke) cable
8. Rectifier/regulator
9. Wire harness
10. Front brake hoses
11. Coolant reservoir hose
12. Ground lead
13. Starter relay lead

A. Fasten the coolant reservoir breather hose with the plastic holders.
B. Fasten the front brake hose with the plastic bands.
C. Fasten the wire harness and ground lead with a plastic band.
D. Fasten the differential gear case breather hose, coolant reservoir hose, radiator fan motor lead, and thermo switch 3 lead with the plastic holder.

Fasten the coolant reservoir breather hose with the plastic holders.
Fasten the front brake hose with the plastic bands.
Fasten the wire harness and ground lead with a plastic band.
Fasten the differential gear case breather hose, coolant reservoir hose, radiator fan motor lead, and thermo switch 3 lead with the plastic holder.
CHANGING A HEADLIGHT BULB

PERIODIC CHECKS AND ADJUSTMENTS

ELECTRICAL

CHANGING A HEADLIGHT BULB

1. Lift the hood up.
2. Remove:
   • headlight bulb holder cover ①
3. Disconnect:
   • headlight coupler ①
4. Remove:
   • headlight bulb holder assembly ①

NOTE: The headlight bulb cannot be removed from the headlight bulb holder. To replace the headlight bulb, replace the headlight bulb holder assembly.

WARNING

Keep flammable products and your hands away from the bulb while it is on, since it will be hot. Do not touch the bulb until it cools down.

5. Install:
   • headlight bulb holder assembly

CAUTION:

Avoid touching the glass part of the bulb. Keep it free from oil; otherwise, the transparency of the glass, life of the bulb, and luminous flux will be adversely affected. If oil gets on the bulb, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.
6. Connect:
   • headlight coupler
7. Install:
   • headlight bulb holder cover
8. Close the hood.
Removing the engine cooling fan and A.C. magneto

Driver seat/passenger seat/console

Drive belt cover

Engine oil

Coolant

Order | Job/Part | Q'ty | Remarks
--- | --- | --- | ---
Removing the engine cooling fan and A.C. magneto | | | Remove the parts in the order listed.
 | Driver seat/passenger seat/console | | Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”. (Manual No.: 5UG-F8197-11)
 | Drive belt cover | | Refer to “PRIMARY AND SECONDARY SHEAVES” in chapter 4. (Manual No.: 5UG-F8197-10)
 | Engine oil | | Drain. Refer to “CHANGING THE ENGINE OIL” in chapter 3. (Manual No.: 5UG-F8197-10)
 | Coolant | | Drain. Refer to “CHANGING THE COOLANT” in chapter 3. (Manual No.: 5UG-F8197-10)
## ENGINE COOLING FAN AND A.C. MAGNETO

### Order

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water pump assembly</td>
<td>1</td>
<td>Refer to “WATER PUMP” in chapter 5. (Manual No.: 5UG-F8197-10)</td>
</tr>
<tr>
<td>1</td>
<td>Engine cooling fan air duct assembly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Air shroud 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Engine cooling fan</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Air shroud 2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>A.C. magneto coupler</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>6</td>
<td>Engine cooling fan pulley base</td>
<td>1</td>
<td>Refer to “REMOVING THE A.C. MAGNETO” and “INSTALLING THE A.C. MAGNETO” in chapter 4. (Manual No.: 5UG-F8197-10)</td>
</tr>
<tr>
<td>7</td>
<td>A.C. magneto cover/gasket</td>
<td>1/1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Dowel pin</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Stator lead holder</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Pickup coil</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Stator assembly</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
12 A.C. magneto rotor 1
13 Woodruff key 1
14 Starter wheel gear 1
15 Washer 1
16 Starter idle gear shaft 1
17 Bearing 1
18 Starter idle gear 1

Order | Job/Part | Q'ty | Remarks
--- | --- | --- | ---
12 | A.C. magneto rotor | 1 | Refer to “REMOVING THE A.C. MAGNETO” and “INSTALLING THE A.C. MAGNETO” in chapter 4. (Manual No.: 5UG-F8197-10)
13 | Woodruff key | 1 |
14 | Starter wheel gear | 1 |
15 | Washer | 1 |
16 | Starter idle gear shaft | 1 |
17 | Bearing | 1 |
18 | Starter idle gear | 1 |

For installation, reverse the removal procedure.
Removing the oil cooler
Driver seat/passenger seat/console

Left corner panel/right corner panel/footrest cover
Engine oil

1 Oil cooler inlet pipe 1/oil cooler outlet pipe 1 1/1
2 O-ring 2
3 Oil cooler 1
4 Oil cooler inlet hose 1
5 Oil cooler outlet hose 1

Remove the parts in the order listed. Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”. (Manual No.: 5UG-F8197-11)

Refer to “SEATS, ENCLOSURE, HOOD AND CARGO BED”. Drain. Refer to “CHANGING THE ENGINE OIL” in chapter 3. (Manual No.: 5UG-F8197-10)
Order | Job/Part | Q'ty | Remarks
---|---|---|---
6 | Oil outlet hose | 1 | For installation, reverse the removal procedure.
7 | Oil inlet hose | 1 |
8 | Oil cooler inlet pipe 2/oil cooler outlet pipe 2 | 1/1 |
CHASSIS

SEATS, ENCLOSURE, HOOD AND CARGO BED
FRONT GUARD AND HOOD

Removing the front guard and the hood

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front guard protector</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Front guard</td>
<td>1</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>3</td>
<td>Headlight coupler</td>
<td>2</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>4</td>
<td>Hood</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

32 Nm (3.2 m · kg, 23 ft · lb)

59 Nm (5.9 m · kg, 43 ft · lb)

7 Nm (0.7 m · kg, 5.1 ft · lb)
## PANELS AND FOOTREST COVER

### Order | Job/Part | Q'ty | Remarks
--- | --- | --- | ---
| **Removing the panels and footrest cover** | | | 
1 | Left side panel | 1 | Remove the parts in the order listed. |
2 | Right side panel | 1 | |
3 | Left corner panel | 1 | |
4 | Right corner panel | 1 | |
5 | Left protector 1 | 1 | |
6 | Right protector 1 | 1 | |
7 | Footrest cover | 1 | For installation, reverse the removal procedure. |
8 | Driver seat support | 1 | |
9 | Passenger seat support | 1 | |

**16 Nm (1.6 m·kg, 11 ft·lb)**

**32 Nm (3.2 m·kg, 23 ft·lb)**
## Cargo Bed

### Diagram

- **16 Nm (1.6 m·kg, 11 ft·lb)**
- **7 Nm (0.7 m·kg, 5.1 ft·lb)**

### Order of Removal

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tail/brake light connector</td>
<td>6</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Gas spring assembly</td>
<td>2</td>
<td>Disconnect.</td>
</tr>
<tr>
<td>3</td>
<td>Pin</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cargo bed assembly</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

---

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**Disassembling the cargo bed**

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cargo bed mat</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Tailgate cable</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hinge cover</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tailgate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Cargo bed panel</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Tail/brake light bulb holder</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cargo bed release lever</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cargo hook</td>
<td>4</td>
<td>For assembly, reverse the disassembly</td>
</tr>
<tr>
<td>9</td>
<td>Cargo bed</td>
<td>1</td>
<td>procedure.</td>
</tr>
</tbody>
</table>

*26 Nm (2.6 m · kg, 19 ft · lb)*

*5 Nm (0.5 m · kg, 5.5 ft · lb)*

*7 Nm (0.7 m · kg, 5.1 ft · lb)*

*7 Nm (0.7 m · kg, 5.1 ft · lb)*
## SKID PLATES

Removing the engine skid plates

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front skid plate</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Rear skid plate</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td></td>
<td><strong>Removing the engine skid plates</strong></td>
<td></td>
<td>cedure.</td>
</tr>
</tbody>
</table>

Nm (0.7 m·kg, 5.1 ft·lb)
INSTALLING THE REAR SKID PLATE

1. Install:
   • rear skid plate ①

**NOTE:**

Make sure that the hole ③ in the rear skid plate ① is towards the left side of the vehicle.

- A Forward
- B Left side
- C Right side
ENCLOSURE AND SEAT BELTS

Removing the enclosure and seat belts

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front top frame</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Rear top frame</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Left support frame</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Right support frame</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Left side frame</td>
<td>1</td>
<td>For installation, reverse the removal pro-</td>
</tr>
<tr>
<td>6</td>
<td>Right side frame</td>
<td>1</td>
<td>cedure.</td>
</tr>
<tr>
<td>7</td>
<td>Seat belt</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Buckle</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Removing the front wheel

Remove the parts in the order listed. Place the vehicle on a level surface.

**WARNING**
Securely support the vehicle so there is no danger of it falling over.

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front wheel</td>
<td>1</td>
<td>Refer to “INSTALLING THE FRONT WHEEL” in chapter 8. (Manual No.: 5UG-F8197-10)</td>
</tr>
<tr>
<td>2</td>
<td>Center cap</td>
<td>1</td>
<td>Refer to “INSTALLING THE FRONT WHEEL HUB” in chapter 8. (Manual No.: 5UG-F8197-10)</td>
</tr>
<tr>
<td>3</td>
<td>Axle nut</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
### FRONT WHEELS AND BRAKE DISCS

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q’ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Brake caliper assembly</td>
<td>1</td>
<td><strong>NOTE:</strong> Do not depress the brake pedal when the brake caliper is off of the brake disc as the brake pads will be forced shut.</td>
</tr>
<tr>
<td>5</td>
<td>Front wheel hub</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Brake disc</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
</tbody>
</table>

**New**

- 48 Nm (4.8 m \cdot kg, 35 ft \cdot lb)
- 30 Nm (3.0 m \cdot kg, 22 ft \cdot lb)
- 350 Nm (35.0 m \cdot kg, 255 ft \cdot lb)
- 55 Nm (5.5 m \cdot kg, 40 ft \cdot lb)
## Removing the Rear Wheel

1. **Rear wheel**
   - **Order:** 1
   - **Part:** Rear wheel
   - **Q'ty:** 1
   - **Remarks:** Remove the parts in the order listed.
     Place the vehicle on a level surface.

   **WARNING**
   - Securely support the vehicle so there is no danger of it falling over.

2. **Center cap**
   - **Order:** 2
   - **Part:** Center cap
   - **Q'ty:** 1

3. **Axle nut**
   - **Order:** 3
   - **Part:** Axle nut
   - **Q'ty:** 1

4. **Rear wheel hub**
   - **Order:** 4
   - **Part:** Rear wheel hub
   - **Q'ty:** 1

   For installation, reverse the removal procedure.

---

**Note:**
- Refer to "INSTALLING THE REAR WHEEL" in chapter 8.
- (Manual No.: 5UG-F8197-10)
FRONT ARMS AND FRONT SHOCK ABSORBERS

Removing the front arms and front shock absorbers

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brake disc guard</td>
<td>1</td>
<td>Remove the parts in the order listed.</td>
</tr>
<tr>
<td>2</td>
<td>Front arm protector</td>
<td>1</td>
<td>Refer to “FRONT WHEELS AND BRAKE DISCS”.</td>
</tr>
<tr>
<td>3</td>
<td>Nut</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bolt/nut</td>
<td>2/2</td>
<td>Refer to “REMOVING THE FRONT ARMS” and “INSTALLING THE FRONT ARMS AND FRONT SHOCK ABSORBER” in chapter 8. (Manual No.: 5UG-F8197-10)</td>
</tr>
<tr>
<td>5</td>
<td>Front lower arm/bushing</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Nut/bolt</td>
<td>2/2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Front shock absorber</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Bolt/nut</td>
<td>2/2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Front upper arm/bushing</td>
<td>1/2</td>
<td></td>
</tr>
</tbody>
</table>
For installation, reverse the removal procedure.
### Removing the rear knuckle and stabilizer

Remove the parts in the order listed. Refer to "REAR WHEELS AND BRAKE DISC".

<table>
<thead>
<tr>
<th>Order</th>
<th>Job/Part</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mud guard (for special edition models)</td>
<td>1</td>
<td>For installation, reverse the removal procedure.</td>
</tr>
<tr>
<td>2</td>
<td>O-ring</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Rear knuckle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Spacer cover</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Spacer</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Stabilizer joint</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Stabilizer holder</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Bushing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Stabilizer</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
ELECTRICAL COMPONENTS

1. Diode 1
2. Thermo switch 2
3. Diode 2
4. Circuit breaker (radiator fan motor)
5. Carburetor heater
6. Thermo switch 1
7. Ignition coil
8. Gear position switch
9. Reverse switch
10. Brake light switch
11. Parking brake switch
12. Pickup coil/stator assembly
13. Speed sensor
14. Gear motor
15. Radiator fan
16. Thermo switch 3
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rectifier/regulator</td>
</tr>
<tr>
<td>2</td>
<td>Auxiliary DC jack</td>
</tr>
<tr>
<td>3</td>
<td>Indicator light assembly 1 (except for special edition models)</td>
</tr>
<tr>
<td>4</td>
<td>Indicator light assembly 2 (except for special edition models)</td>
</tr>
<tr>
<td>5</td>
<td>On-Command four-wheel drive switch and differential gear lock switch</td>
</tr>
<tr>
<td>6</td>
<td>Main switch</td>
</tr>
<tr>
<td>7</td>
<td>Light switch</td>
</tr>
<tr>
<td>8</td>
<td>Four-wheel drive relay 1</td>
</tr>
<tr>
<td>9</td>
<td>Four-wheel drive relay 2</td>
</tr>
<tr>
<td>10</td>
<td>Starter relay</td>
</tr>
<tr>
<td>11</td>
<td>Main fuse</td>
</tr>
<tr>
<td>12</td>
<td>Four-wheel drive relay 3</td>
</tr>
<tr>
<td>13</td>
<td>Four-wheel drive indicator light relay (except for special edition models)</td>
</tr>
<tr>
<td>14</td>
<td>Headlight relay</td>
</tr>
<tr>
<td>15</td>
<td>Differential gear lock indicator light relay (except for special edition models)</td>
</tr>
<tr>
<td>16</td>
<td>Fuse box</td>
</tr>
<tr>
<td>17</td>
<td>C.D.I. unit</td>
</tr>
<tr>
<td>18</td>
<td>Battery</td>
</tr>
</tbody>
</table>
TROUBLESHOOTING

IF THE HEADLIGHTS AND/OR TAILLIGHT FAIL TO COME ON:

Procedure
Check:
1. Fuses (main, lighting system)  
2. Battery  
3. Main switch  
4. Light switch  
5. Headlight relay  
6. Wiring connections  
   (the entire lighting system)

NOTE:  
• Remove the following part(s) before troubleshooting:
  1) Console
• Use the following special tool(s) for troubleshooting.

Pocket tester
P/N. YU-03112-C, 90890-03112

1. Fuses (main, lighting system)
Refer to “CHECKING THE SWITCH” in chapter 9. (Manual No.: 5UG-F8197-10)

2. Battery
• Check the battery condition.
  Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
  (Manual No.: 5UG-F8197-10)

<table>
<thead>
<tr>
<th>Open-circuit voltage</th>
<th>12.8 V or more at 20 °C (68 °F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CORRECT</td>
</tr>
</tbody>
</table>

3. Main switch
Refer to “CHECKING THE SWITCH” in chapter 9. (Manual No.: 5UG-F8197-10)

* CORRECT

NO CONTINUITY
Replace the fuse(s).

INCORRECT
• Clean the battery terminals.
• Recharge or replace the battery.

CORRECT
Replace the main switch.
4. Light switch

Refer to “CHECKING THE SWITCH” in chapter 9. (Manual No.: 5UG-F8197-10)

INCORRECT

CORRECT

5. Headlight relay

• Remove the headlight relay from the wire harness.
• Connect the pocket tester (Ω x 1) and the battery (12 V) to the headlight relay terminals.

Tester (+) lead → Blue terminal ①
Tester (-) lead → Green terminal ②

Battery (+) terminal → Yellow terminal ③
Battery (-) terminal → Black terminal ④

Tester (+) lead → Blue terminal ①
Tester (-) lead → Yellow terminal ⑤

• Check the headlight relay for continuity.

CONTINUITY

NO CONTINUITY

Replace the headlight relay.

POOR CONNECTION

6. Wiring connection

• Check the connections of the entire lighting system.
Refer to “CIRCUIT DIAGRAM”.

CORRECT

POOR CONNECTION

Properly connect the lighting system.

Check the condition of each of the lighting system’s circuits.
Refer to “CHECKING THE LIGHTING SYSTEM” in chapter 9.
(Manual No.: 5UG-F8197-10)
SIGNALING SYSTEM (for special edition models)

3 Main switch
4 Backup fuse
6 Battery
7 Main fuse
10 Brake light switch
12 Reverse switch
13 C.D.I. unit
18 Multi-function meter
19 Differential gear lock indicator light
20 Coolant temperature warning light
21 Reverse indicator light
22 Neutral indicator light
23 Parking brake indicator light
24 High-range indicator light
25 Low-range indicator light
26 Gear position switch
27 Parking brake switch
28 Thermo switch 1
29 On-Command four-wheel drive switch and differential gear lock switch
30 Gear motor
31 Diode 2
34 Signaling system fuse
35 Ignition fuse
36 Tail/brake light
CHECKING THE SIGNALING SYSTEM

With multi-function meter

1. If the coolant temperature warning light does not come on when the main switch to "ON", or if the coolant temperature warning light does not come on when the temperature is high (more than 117 ~ 123 °C (242.6 ~ 253.4 °F)):

<table>
<thead>
<tr>
<th>Test step</th>
<th>Coolant temperature</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than 120 ± 3 °C (248 ± 5.4 °F)</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>More than 120 ± 3 °C (248 ± 5.4 °F)</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>More than 113 °C (235.4 °F)</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Less than 113 °C (235.4 °F)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Test steps 1 & 2: Heating phase
Test steps 3 & 4: Cooling phase

⚠️ WARNING
Handle the thermo switch 1 with special care.
Never subject it to a strong shock or allow it to be dropped. Should it be dropped, it must be replaced.

Thermo switch 1
8 Nm (0.8 m·kg, 5.8 ft·lb)
Three bond sealock® #10

GOOD CONDITION
* BAD CONDITION

Replace the thermo switch 1.
2. Diode 2

- Remove the diode from the coupler.
- Connect the pocket tester (Ω × 1) to the diode terminals as shown.
- Check the diode for continuity as follows.

<table>
<thead>
<tr>
<th>Tester (+) lead → Blue/Black terminal ①</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester (–) lead → White/Blue terminal ②</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tester (+) lead → White/Blue terminal ②</th>
<th>No continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tester (–) lead → Blue/Black terminal ①</td>
<td></td>
</tr>
</tbody>
</table>

* CORRECT

This circuit is not faulty.

**NOTE:**
When you switch the tester’s positive and negative probes, the readings in the left chart will be reversed.

INCORRECT

Replace the diode 2.
YXR66FAV 2006 WIRING DIAGRAM

1. A.C. magneto
2. Rectifier/regulator
3. Main switch
4. Backup fuse
5. Carburetor heater fuse
6. Battery
7. Main fuse
8. Starter relay
9. Starter motor
10. Brake light switch
11. Diode 1
12. Reverse switch
13. C.D.I. unit
14. Ignition coil
15. Spark plug
16. Speed sensor
17. Meter assembly
18. Multi-function meter
19. Differential gear lock indicator light
20. Coolant temperature warning light
21. Reverse indicator light
22. Neutral indicator light
23. Parking brake indicator light
24. High-range indicator light
25. Low-range indicator light
26. Gear position switch
27. Parking brake switch
28. Thermo switch 1
29. Thermo switch 2
30. Carburetor heater
31. Four-wheel drive relay 2
32. Four-wheel drive relay 1
33. Four-wheel drive fuse
34. Four-wheel drive relay 3
35. On-Command four-wheel drive switch and differential gear lock switch
36. Gear motor
37. Diode 2
38. Indicator light assembly 1
39. Four-wheel drive indicator light
40. Differential gear lock indicator light
41. Coolant temperature warning light
42. Four-wheel drive indicator light relay
43. Differential gear lock indicator light relay
44. Indicator light assembly 2
45. Neutral indicator light
46. Reverse indicator light
47. Parking brake indicator light
48. Signaling system fuse

COLOR CODE
B............ Black
Br .......... Brown
G ........... Green
Gy ......... Gray
L ............ Blue
O ............ Orange
P ........... Pink
R ........... Red
Sb.......... Sky blue
W........... White
Y............ Yellow
B/G....... Black/Green
B/L....... Black/Blue
B/R....... Black/Red
B/Y....... Black/Yellow
Br/B..... Brown/Black
Br/L..... Brown/Blue
Br/R..... Brown/Red
G/L....... Green/Blue
G/R....... Green/Red
G/W....... Green/White
L/B....... Blue/Black
L/G....... Blue/Green
L/R....... Blue/Red
L/W....... Blue/White
L/Y....... Blue/Yellow
R/B....... Red/Black
R/G....... Red/Green
R/W....... Red/White
R/Y....... Red/Yellow
W/B....... White/Black
W/G....... White/Green
W/L....... White/Blue
W/R....... White/Red
W/Y....... White/Yellow
Y/B....... Yellow/Black
Y/L....... Yellow/Blue