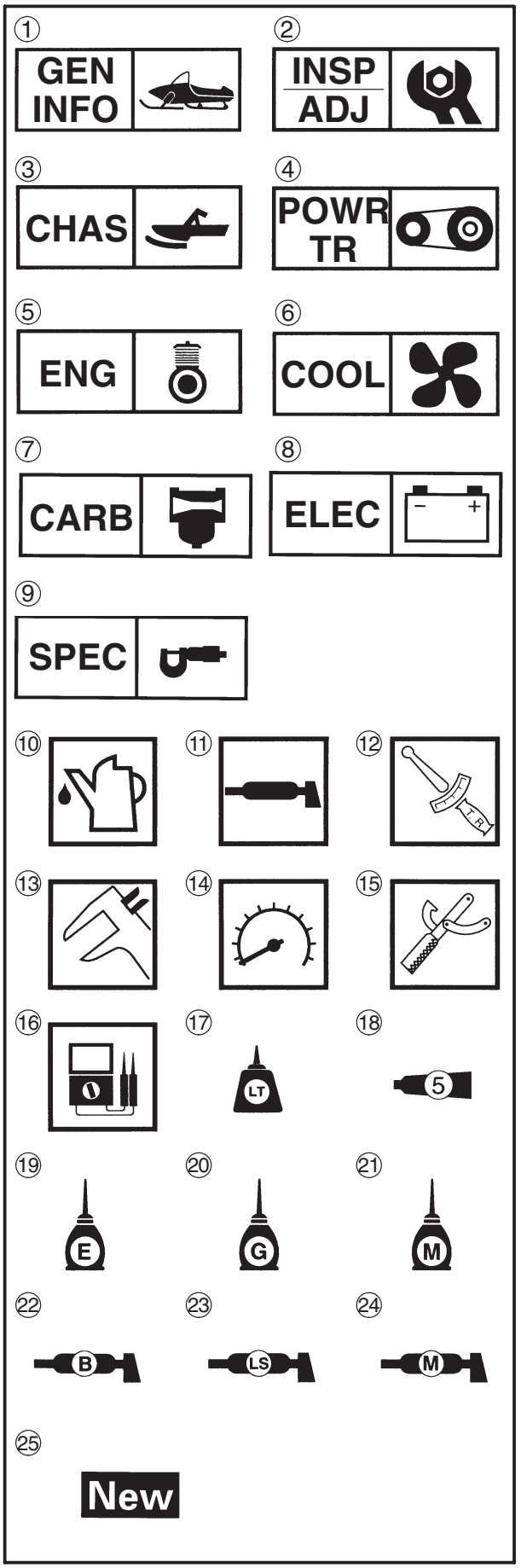

ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑨ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Periodic inspections and adjustments
③ Chassis
④ Power train
⑤ Engine
⑥ Cooling system
⑦ Carburetion
⑧ Electrical
⑨ Specifications

Illustrated symbols ⑩ to ⑯ are used to identify the specifications which appear.

⑩ Filling fluid
⑪ Lubricant
⑫ Tightening
⑬ Wear limit, clearance
⑭ Engine speed
⑮ Special tool
⑯ Ω, V, A

Illustrated symbols ⑰ to ㉕ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑰ Apply locking agent (LOCTITE®)
⑱ Apply Yamabond No.5®
⑲ Apply engine oil
⑳ Apply gear oil
㉑ Apply molybdenum disulfide oil
㉒ Apply wheel bearing grease
㉓ Apply low-temperature lithium-soap base grease
㉔ Apply molybdenum disulfide grease
㉕ Use new one

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CHAPTER 1.
GENERAL INFORMATION

CHAPTER 2.
PERIODIC INSPECTION AND ADJUSTMENT

CHAPTER 3.
CHASSIS

CHAPTER 4.
POWER TRAIN

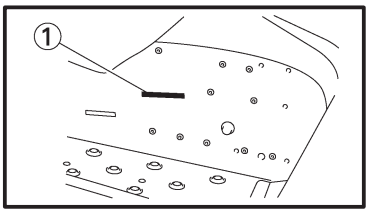
CHAPTER 5.
ENGINE

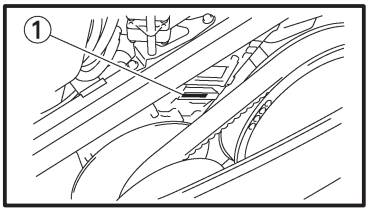
CHAPTER 6. COOLING SYSTEM

CHAPTER 7. CARBURETION

CHAPTER 8. ELECTRICAL

CHAPTER 9. SPECIFICATIONS





GENERAL INFORMATION

MACHINE IDENTIFICATION

FRAME SERIAL NUMBER

The frame serial number ① is located on the right-hand side of the frame (just below the front of the seat).

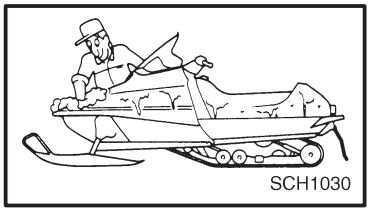
ENGINE SERIAL NUMBER

The engine serial number ① is located on the left-hand side of the crankcase.

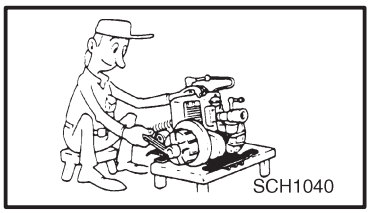
NOTE:

Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION
PREPARATION FOR REMOVAL AND DISASSEMBLY


SCH1030

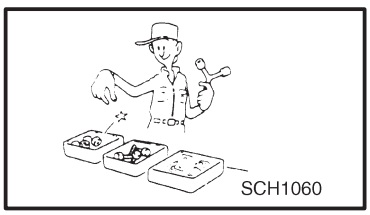
1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.
   While cleaning, take care to protect the electrical parts, such as relays, switches, motor, resistors, controllers, etc., from high pressure water splashes.


SCH1040

2. Use proper tools and cleaning equipment.
   Refer to “SPECIAL TOOLS”.

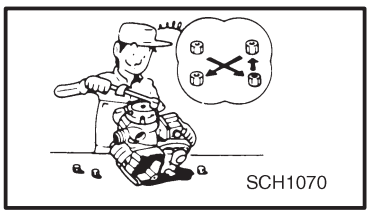

SCH1050

3. When disassembling the machine, keep mated parts together. This includes gears, cylinders, pistons, and other parts that have been “mated” through normal wear. Mated parts must be reused or replaced as an assembly.

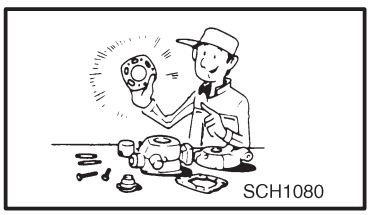

SCH1060

4. During disassembly of the machine, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help ensure that all parts are reinstalled correctly.

5. Keep all parts away from any source of fire.


SCH1070

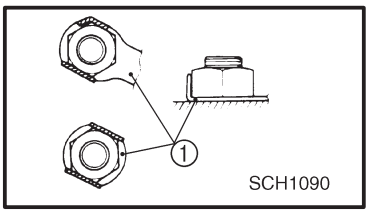
6. Be sure to keep to the tightening torque specifications. When tightening bolts, nuts, and screws, start with those that have larger diameters, and proceed from the inside to the outside in a criss-cross pattern.


SCH1080

ALL REPLACEMENT PARTS
We recommend using genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for assembly and adjustments.

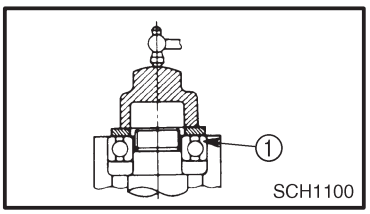
GASKETS, OIL SEALS, AND O-RINGS

1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. 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.



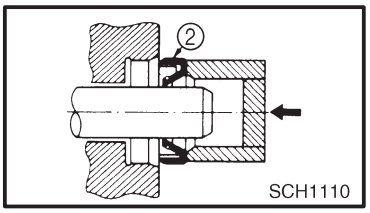
LOCK WASHERS/PLATES AND COTTER PINS

All lock washers/plates ① and cotter pins must be replaced if they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



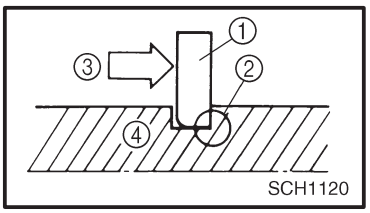
BEARINGS AND OIL SEALS

Install the bearings ① and oil seals ② with their manufacturer's marks or numbers facing outwards. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. Oil the bearings liberally when installing.



CAUTION:

Do not use compressed air to spin the bearings dry. This causes damage to the surface of the bearings.



CIRCLIPS

All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace misshapen circlips. When installing a circlip ①, make sure that the sharp edged corner ② is positioned opposite to the thrust ③ it receives. See the sectional view.

④ Shaft

LOCTITE ®

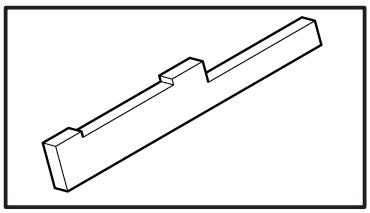
After installing fasteners that have LOCTITE ® applied, wait 24 hours before using the machine. This will give the LOCTITE ® time to dry properly.

SPECIAL TOOLS

Some special tools are necessary for a completely accurate tune-up and assembly. Using the correct special tool will help prevent damage that can be caused by the use of improper tools or improvised techniques.

NOTE:

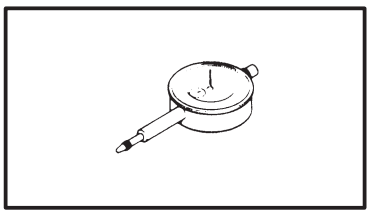
Be sure to use the correct part number when ordering the tool, since the part number may differ according to country.



FOR TUNE UP

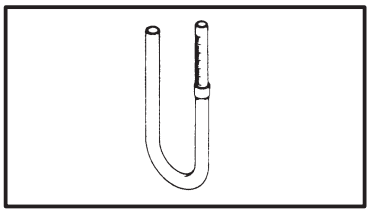
- Sheave gauge
  P/N: YS-42421-1 (15 mm offset) (for U.S.A./Canada)

This gauge is used to measure the sheave distance and for offset adjustment.



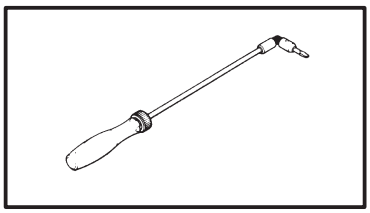
- Dial gauge
  P/N: YU-03097 (for U.S.A./Canada)
  90890-03097 (for Europe)

This gauge is used for run out measurement.



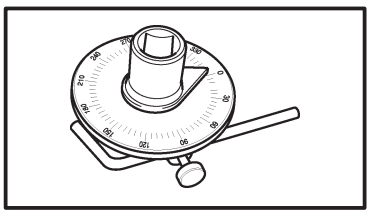
- Fuel level gauge
  P/N: YM-01312-A (for U.S.A./Canada)
  90890-01312 (for Europe)

This gauge is used to measure the fuel level in the float chamber.



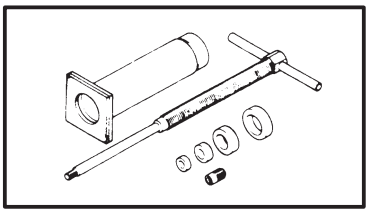
- Carburetor angle driver:
  P/N: 90890-03173 (for Europe)

This tool is used to adjust the pilot screw when synchronizing the caburetor.



- Angle gauge:
  Use goods on the market.

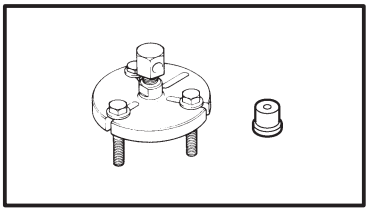
This tool is used to tightening the torque.



FOR ENGINE SERVICE

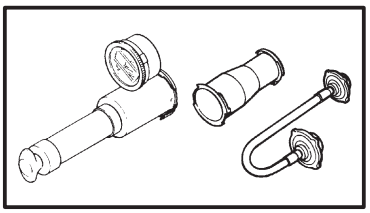
- Piston pin puller

P/N: YU-01304 (for U.S.A./Canada)
90890-01304 (for Europe)
This tool is used to remove the piston pin.



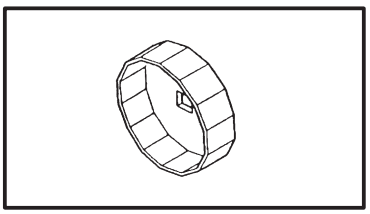
- Rotor holding puller, attachment

P/N: YU-33270 (for U.S.A./Canada)
90890-01362 (for Europe)
P/N: YM-33282
90890-04089
This tool is used to remove the magneto rotor.



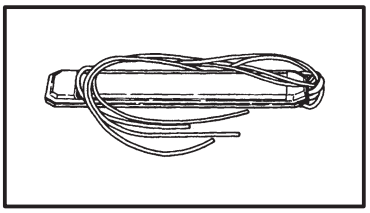
- Cooling system tester, adapter

P/N: YU-24460-01 (for U.S.A./Canada)
90890-01325 (for Europe)
P/N: YU-33984 (for U.S.A./Canada)
90890-01352 (for Europe)
This tester is used for checking the cooling system.



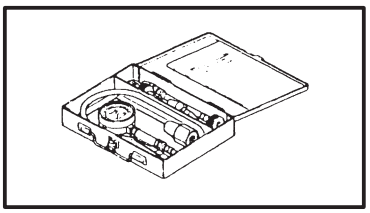
- Oil filter wrench

P/N: YU-38411 (for U.S.A./Canada)
90890-01426 (for Europe)
This tool is needed to loosen or tighten the oil filter cartridge.



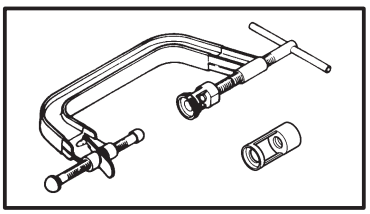
- Carburetor synchronizer

P/N: YU-8030 (for U.S.A./Canada)
90890-03094 (for Europe)
This guide is used to synchronize the carburetors.



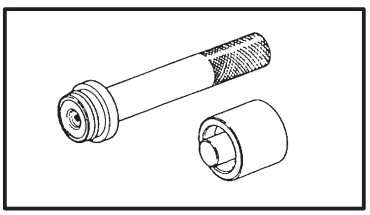
- Compression gauge set

P/N: YU-33223 (compression gage) (for U.S.A./Canada)
90890-03081 (for Europe)
P/N: YU-33223-3 (adapter) (for U.S.A./Canada) (for Europe)
90890-04136 (for Europe)
These tools are used to measure engine compression.



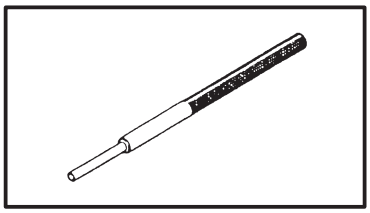
- Valve spring compressor set, quick release, attachment

P/N: YM-04019 (valve spring compresser) (for U.S.A./Canada)
90890-04019 (for Europe)
P/N: YM-4108, YM-4114 (attachment) (for U.S.A./Canada)
90890-04108, 90890-04114 (for Europe)
These tools are used-to remove or install the valve assemblies.

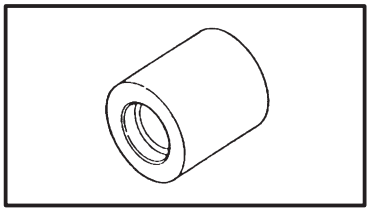


- 40 and 50 mm bearing driver.
  Water pump seal installer.

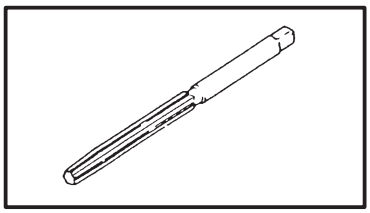
P/N: YM-4058 (40 and 50 mm bearing driver) (for U.S.A./Canada)
90890-04058 (for Europe)
P/N: YM-33221 (water pump seal installer) (for U.S.A./Canada)
90890-04078 (for Europe)
These tools are used to install the water pump seal.



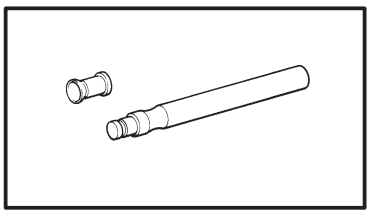
• Valve guide remover (ø4, ø4.5)
P/N: YM-04111 (ø4) (for U.S.A./Canada)
90890-04111 (for Europe)
P/N: YM-4116 (ø4.5) (for U.S.A./Canada)
90890-04116 (for Europe)
These tools are used to remove or install the valve guides.



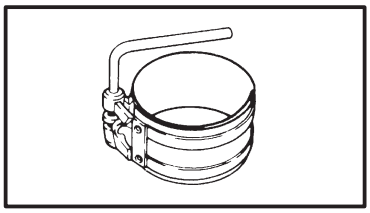
• Valve guide installer (ø4, ø4.5)
P/N: YM-04112 (ø4) (for U.S.A./Canada)
90890-04112 (for Europe)
P/N: YM-4117 (ø4.5) (for U.S.A./Canada)
90890-04117 (for Europe)
These tools are used to install the valve guides.



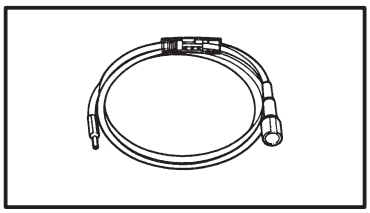
• Valve guide reamer (ø4, ø4.5)
P/N: YM-04113 (ø4) (for U.S.A./Canada)
90890-04113 (for Europe)
P/N: YM-4118 (ø4.5) (for U.S.A./Canada)
90890-04118 (for Europe)
These tools are used to rebore the new valve guides.



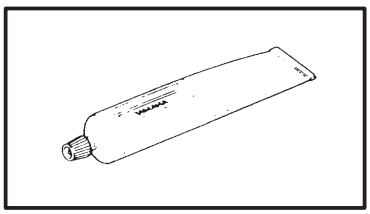
• Valve lapper
P/N: 90890-04101 (for Europe)
This tools is needed to remove and install the valve lifter.



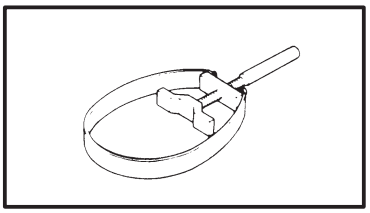
• Piston ring compresser
P/N: YM-8037 (for U.S.A./Canada)
90890-05158 (for Europe)
This tool is used to compress the piston rings when installing the piston into the cylinder.



• Dynamic spark tester
P/N: YM-34487 (for U.S.A./Canada)
90890-06754 (for Europe)
This tool is used to check the ignition system component.



• Quick gasket ®
P/N: ACC-1100-15-01 (for U.S.A./Canada)
90890-85505 (for Europe)
This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces.)

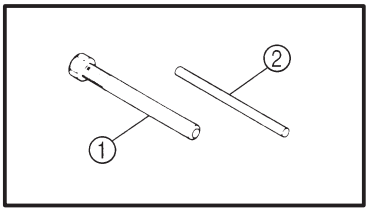


FOR POWER TRAIN SERVICE

- Primary sheave holder

P/N: YS-01880 (for U.S.A./Canada)
90890-01701 (for Europe)

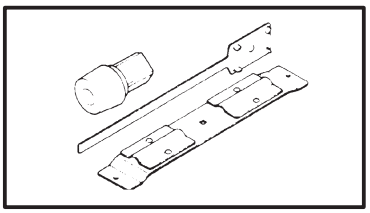
This tool is used to hold the primary sheave.



- Primary sheave puller (18 mm)

P/N: YS-01881-1 ①, YS-01882-1 ② (for U.S.A./Canada)
90890-01898 (for Europe)

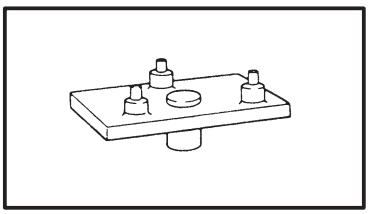
This tool is used for removing the primary sheave.



- Clutch spider separator

P/N: YS-28890-B (for U.S.A./Canada)
90890-01711 (for Europe)

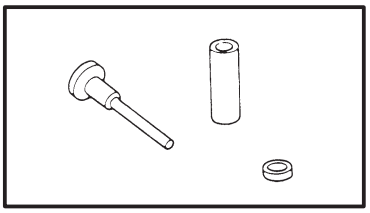
This tool is used when disassembling and assembling the primary sheave.



- Clutch separator adapter

P/N: YS-34480 (for U.S.A./Canada)
90890-01740 (for Europe)

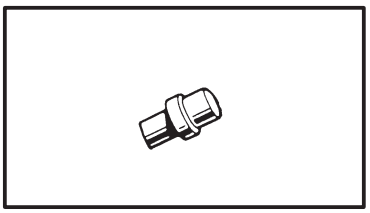
This tool is used when disassembling and assembling the primary sheave.



- YXR clutch bushing jig kit

P/N: YS-39752 (for U.S.A./Canada)

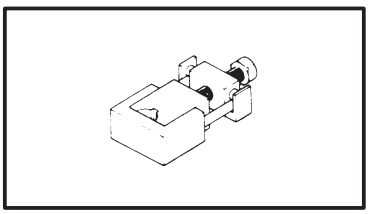
This tool is used for removal and installation of primary clutch weight and roller bushings.



- Clutch bushing press

P/N: YS-42424 (for U.S.A./Canada)

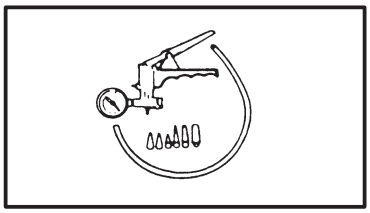
This tool is used for removing and installing the post bushings (primary sheave cap bush, sliding sheave bush and torque cam bush).



- Track clip installer

P/N: YS-91045-A (for U.S.A./Canada)
90890-01721 (for Europe)

This tool is used for installing the track clip.

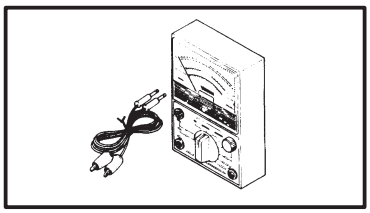


FOR CARBURETION SERVICE

- Mity vac

P/N: YB-35956 (for U.S.A./Canada)
90890-06756 (for Europe)

This tool is used to check the fuel pump.

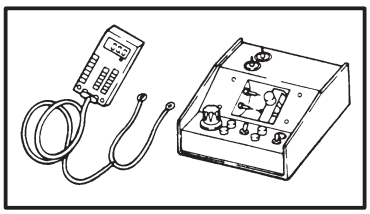


FOR ELECTRICAL SERVICE

- Pocket tester

P/N: YU-03112 (for U.S.A./Canada)
90890-03112 (for Europe)

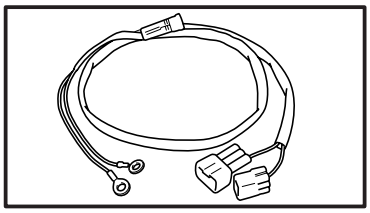
This instrument is necessary for checking the electrical components.



- Electro tester

P/N: YU-33260-A (for U.S.A./Canada)
90890-03021 (for Europe)

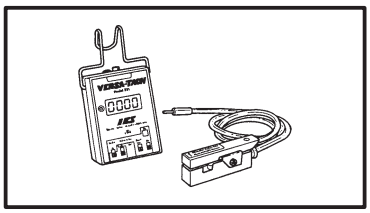
This instrument is invaluable for checking the electrical system.



- Speedometer unit test coupler.

P/N: YS-45686 (for U.S.A./Canada)
8EK-82507-09 (For Europe)

This tool is used for checking the speedometer unit.



- Inductive self-powered tachometer

P/N: YU-8036-B (for U.S.A./Canada)
90793-80009 (for Europe)

This tool is used to check engine speed.

INSP ADJ

PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION

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

PERIODIC MAINTENANCE TABLE

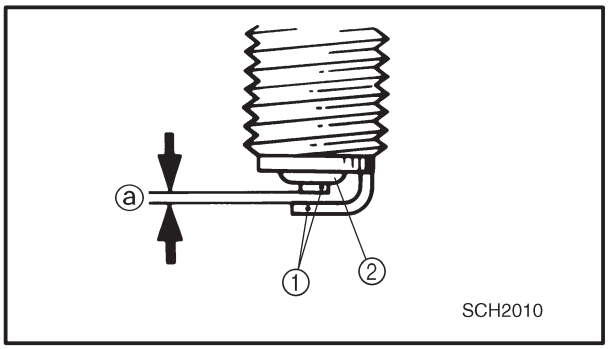
Item	Remarks	Preoperation check (Daily)	Initial 1 month or 800 km (500 mi) (40 hr)	Every Seasonally or 3,200 km (2,000 mi) (160 hr)
Spark plugs	Check condition. Adjust gap and clean. Replace if necessary.			●
Valves	Check valve clearance. Adjust clearance when engine is cold.	Every 40,000 km (25,000 mi)		
Engine oil	Check oil level.	●		
	Replace.		●	●
Engine oil filter cartridge	Replace.		●	Every 20,000 km (12,000 mi)
Fuel	Check fuel level.	●		
Fuel filter	Check condition. Replace if necessary.			●
Fuel line	Check fuel hose for cracks or damage. Replace if necessary.			●
Engine coolant	Check coolant level.	●		
	Air bleed the cooling system if necessary.			●
Carburetor	Check the throttle lever operation.	●		
	Adjust the jets.	Whenever operating condition (elevation/temperature) is changed.		
Engine stop switch	Check operation. Repair if necessary.	●		
Throttle override system (T.O.R.S.)	Check operation. Repair if necessary.	●		
Throttle lever	Check operation. Repair if necessary.	●		
Exhaust system	Check for leakage. Tighten or replace gasket if necessary.			●
Drive guard	Check for cracks, bends or damage. Replace if necessary.	●		
V-belt	Check for wear and damage. Replace if necessary.	●		
Drive track and idler wheels	Check deflection, and for wear and damage. Adjust/replace if necessary.	●		
Slide runners	Check for wear and damage.	●		
	Replace if necessary.			●

Item	Remarks	Preoperation check (Daily)	Initial 1 month or 800 km (500 mi) (40 hr)	Every Seasonally or 3,200 km (2,000 mi) (160 hr)
Brake and parking brake	Check operation and fluid leakage.	●		
	Adjust free play and/or replace pads if necessary.			●
	Repair brake fluid.	See note.		
Disc brake installation	Check for slight free play. Lubricate shaft with specified grease as required.			Every 1,600 km (1,000 mi)
Drive chain oil	Check oil level.		●	
	Replace.			●
Drive chain	Check deflection. Adjust if necessary.	Initial at 500 km (300 mi) and every 800 km (500 mi) thereafter.		
Skis and ski runners	Check for wear and damage.	●		
	Repair if necessary.			●
Steering system	Check operation.	●		
	Adjust toe-out if necessary.			●
Lights	Check operation. Replace bulbs if necessary.	●		
Primary and secondary clutches	Check engagement and shift speed.			●
	Adjust if necessary.	Whenever operating elevation is changed.		
	Inspect sheaves for wear/damage. Inspect weights/rollers and bushings for wear-for primary. Inspect ramp shoes/bushings for wear-for secondary. Replace if necessary.			●
	Lubricate with specified grease.			●
Steering column bearing	Lubricate with specified grease.			●
Ski and front suspension	Lubricate with specified grease.			●
Suspension component	Lubricate with specified grease.			●
Parking brake cable end and lever end/throttle cable end	Lubricate with specified grease.			●
	Check cable damage. Replace if necessary.			●
Shroud latches	Make sure that the shroud latches and hooked.	●		
Fittings and fasteners	Check tightness. Replace if necessary.	●		
Tool kit and recommended equipment	Check for proper placement.	●		

NOTE:

Brake fluid replacement:

1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. Replace the brake hoses every four years, or if cracked or damaged.

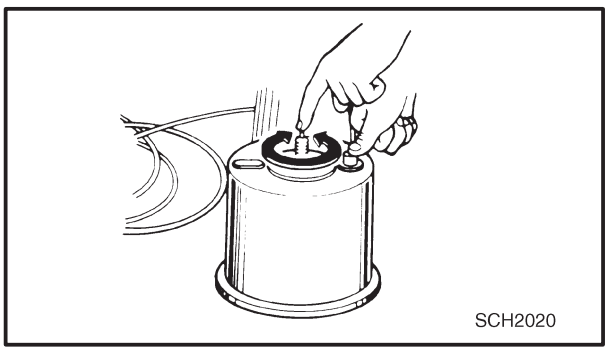


ENGINE

SPARK PLUGS

1. Remove:
   - Spark plug caps
   - Spark plugs
2. Inspect:
   - Electrodes ①
     Damage/wear → Replace the spark plug.
   - Insulator color ②
3. Measure:
   - Spark plug gap ⓐ
     Out of specification → Regap.
     Use a wire thickness gauge.

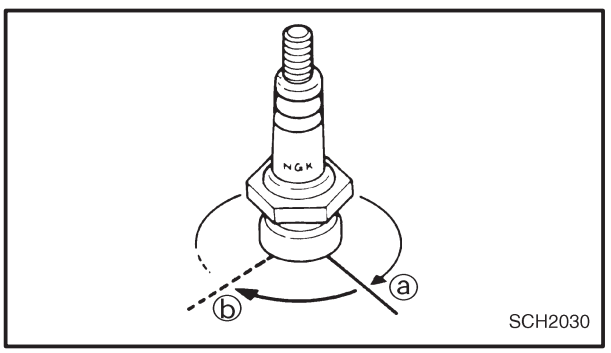
Spark plug gap:
0.7 ~ 0.8 mm
(0.028 ~ 0.031 in)



If necessary, clean the spark plugs with a spark plug cleaner.

Standard spark plug:
CR9E (NGK)

Before installing a spark plug, clean the gasket surface and spark plug surface.

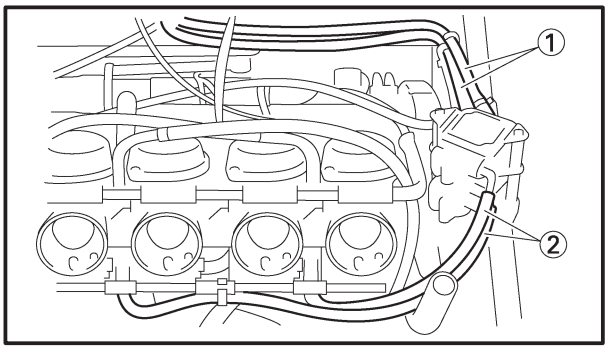


4. Install:
   - Spark plugs

Spark plug:
13 Nm (1.3 m•kg, 9.4 ft•lb)

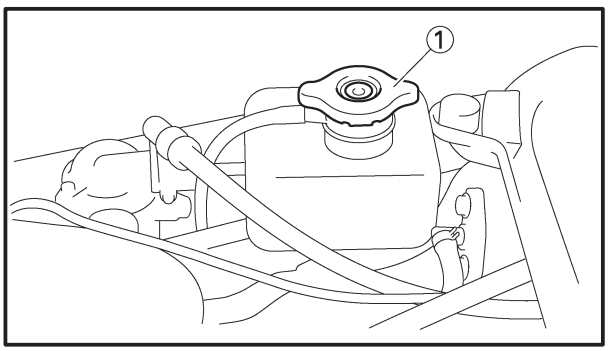
NOTE:

Finger-tighten ⓐ the spark plug before torquing ⓑ it to specification.



FUEL LINE INSPECTION

1. Remove:
   - Intake silencer
     Refer to "CARBURETORS" in CHAPTER 7.
2. Inspect:
   - Fuel hoses ①
   - Fuel delivery hoses ②
     Cracks/damage → Replace.
3. Install:
   - Intake silencer
     Refer to "CARBURETORS" in CHAPTER 7.



COOLING SYSTEM

Coolant replacement

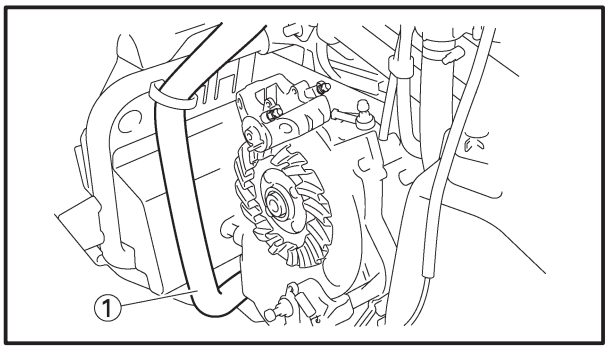
NOTE:

The coolant should be changed at least every season.

1. Place the machine on a level surface.
2. Remove:
   - Intake silencer
     Refer to "CARBURETORS" in CHAPTER 7.
3. Remove:
   - Coolant filler cap ①

⚠ WARNING

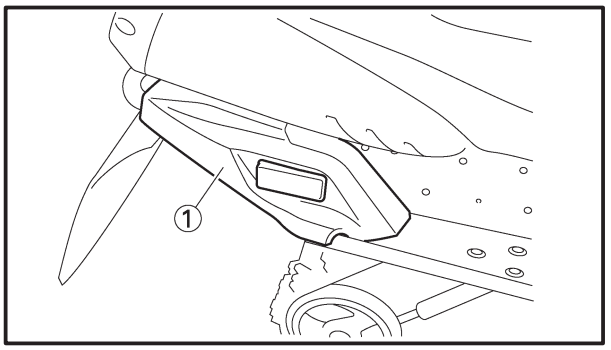
Do not remove the coolant filler cap ① when the engine is hot. Pressurized scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, place a thick rag or a towel over the coolant filler cap.
Slowly turn the cap counterclockwise until it stop. This allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning it counterclockwise to remove it.



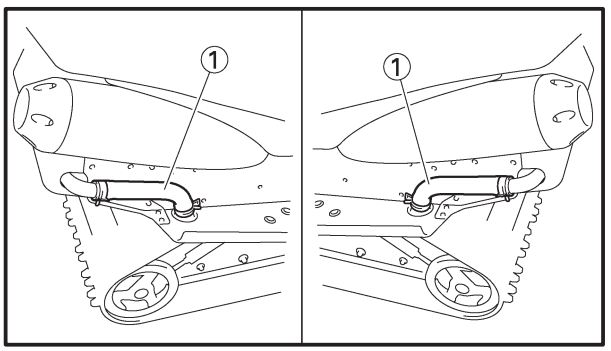
4. Place an open container under the coolant hose.
5. Disconnect:
   • Coolant hose ①
6. Drain the coolant.

NOTE:

Lift up the tail of the machine to drain the coolant.



7. Remove:
   • Rear cover ①



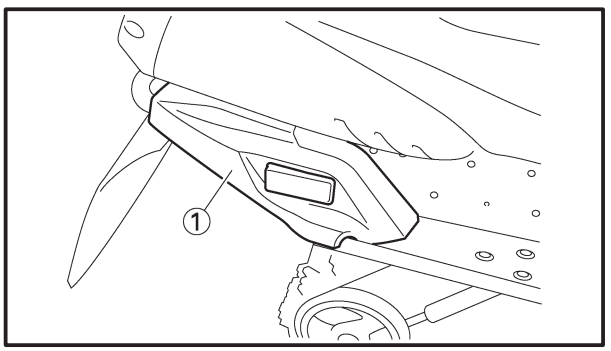
8. Disconnect:
   • Coolant hoses ①
9. Drain the coolant.

NOTE:

Lift up the front of the machine to drain the coolant completely.

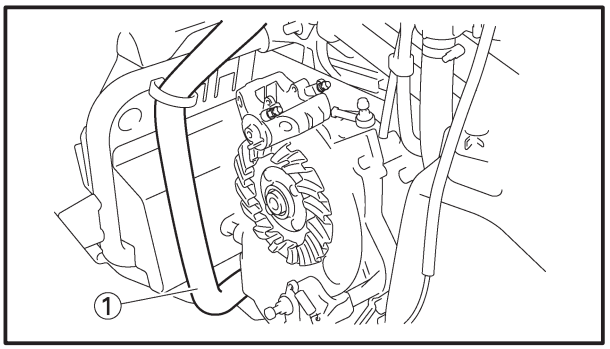
⚠ WARNING

Coolant is poisonous. It is harmful or fatal if swallowed.
- **If coolant is swallowed, induce vomiting immediately and get immediate medical attention.**
- **If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.**
- **If coolant splashes on your skin or clothes, quickly wash it away with soap and water.**



10. Connect:
    • Coolant hoses
11. Install:
    • Rear cover ①

	Bolt (rear cover): **3 Nm (0.3 m•kg, 2.2 ft•lb)**



12. Install:
    • Coolant hose ①

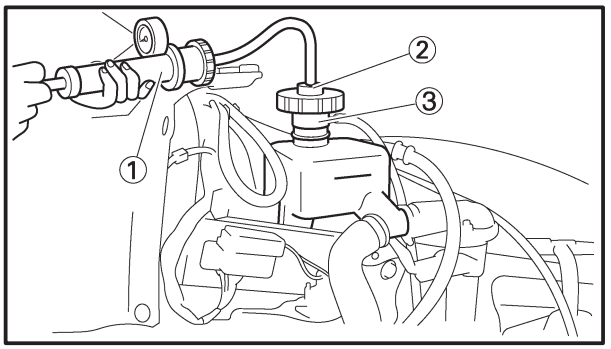
13. Install:
    • Intake silencer
      Refer to “CARBURETORS” in CHAPTER 7.
14. Fill:
    • Cooling system

Recommended coolant:
High quality silicate-free ethylene glycol antifreeze containing corrosion inhibitors
Coolant mixing ratio (coolant:water)
3:2 (60%:40%)
Total amount:
4.7 L (4.14 lmp qt, 4.97 US qt)

CAUTION:

- **Hard water or salt water is harmful to engine parts. If soft water is not available, use boiled or distilled water.**
- **Do not use water containing impurities or oil.**

15. Bleed the air from the cooling system.
16. Inspect:
    • Cooling system
      Decrease of pressure (leaks) → Repair as required.

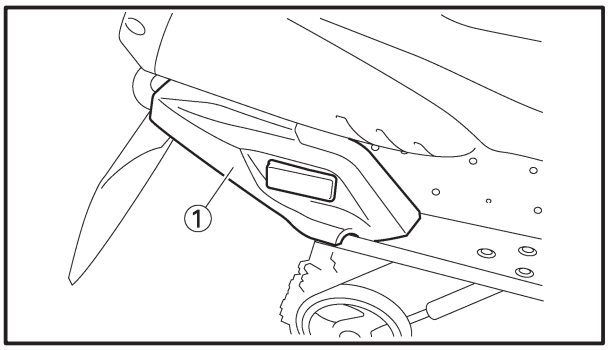


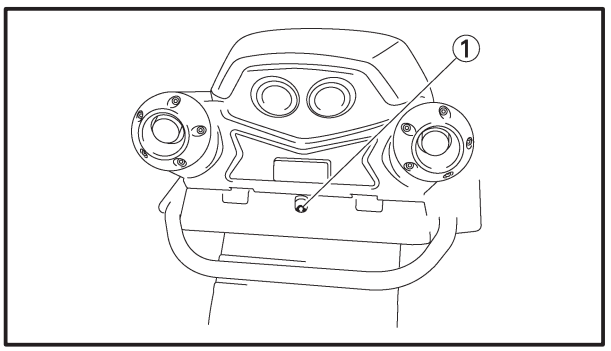
Inspection steps:
- Attach the cooling system tester ① and adapter ② to the coolant filler ③.

Cooling system tester:
90890-01325, YU-24460-01
Adapter:
90890-01352, YU-24460-01

- Apply 100 kPa (1.0 kg/cm^2, 14 psi).
- Measure the pressure with the gauge.

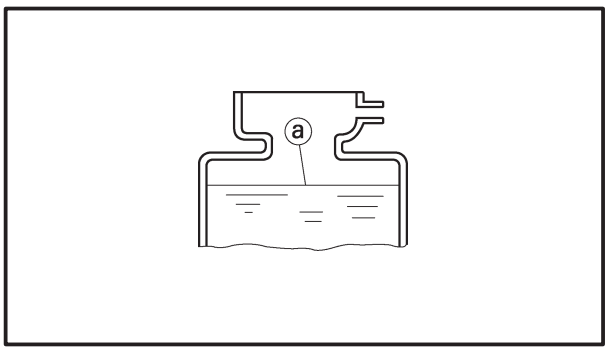
Air bleeding
1. Remove:
   - Rear cover ①
2. Bleed air from the cooling system.





Air bleeding steps:
- Lift up the tail of the machine.
- Remove the bleed bolt ① on the heat exchanger.
- While slowly adding coolant to the coolant filler, drain the coolant until no more air bubbles appear.
- Tighten the bleed bolt ①.

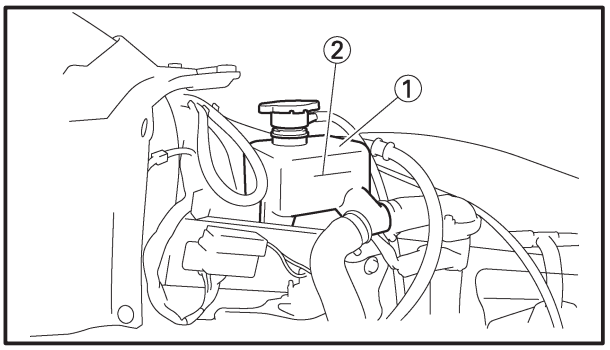
Bleed bolt:
13 Nm (1.3 m•kg, 9.4 ft•lb)



- Add coolant to the coolant cold level ⓐ.
- Install the coolant filler cap.
  Apply and lock the parking brake. Start the engine and run it at approximately 2,500 ~ 3,000 r/min until the coolant circulates (approximately 3 ~ 5 minutes). The rear heat exchanger will be warm to the touch.

⚠ WARNING

To avoid severe injury or death:
- **Make sure the machine is securely supported with a suitable stand.**
- **Do not exceed 3,000 r/min. Drive line damage and excessive V-belt wear could occur, or the machine could unexpectedly move forward if the clutch engages.**
- **Operate the engine only in a well-ventilated area.**



- Remove the coolant filler cap and bleed the cooling system again, as described above. No air bubbles → OK.
- Add coolant to the specified level.
- Pour coolant into the coolant reservoir ① until the coolant level reaches the "COLD LEVEL" level mark ②.

3. Install:
   - Rear cover

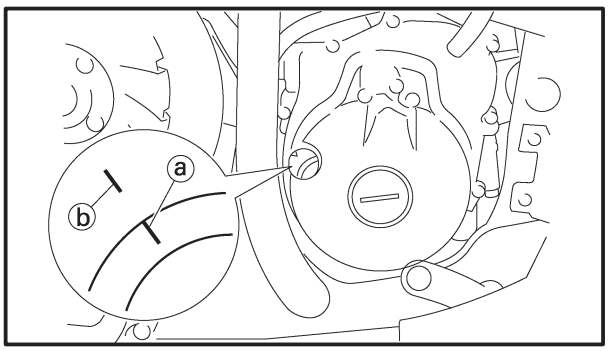
VALVE CLEARANCE ADJUSTMENT

NOTE:

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.

1. Drain:
   - Coolant
2. Remove:
   - Cylinder head cover
     Refer to "CYLINDER HEAD" in CHAPTER 5.
   - Timing plug
3. Measure:
   - Valve clearance
     Out of specification → Adjust.

Valve clearance (cold)
Intake valve
0.11 ~ 0.20 mm
(0.0043 ~ 0.0079 in)
Exhaust valve
0.21 ~ 0.25 mm
(0.0083 ~ 0.0098 in)

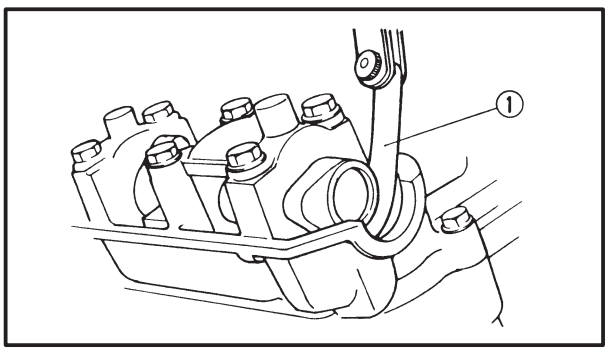


Checking steps:

- Turn the crankshaft clockwise.
- When piston #4 is at TDC on the compression stroke, align the TDC mark ⓐ on the A.C. magneto rotor with the mark ⓑ on the A.C. magneto cover.
- Turn the crankshaft clockwise.

NOTE:

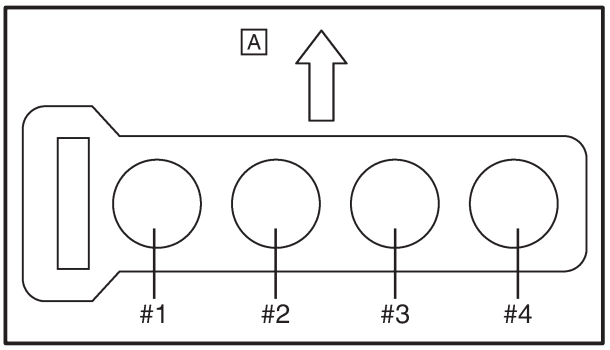
TDC on the compression stroke can be found when the camshaft lobes are turned away from each other.

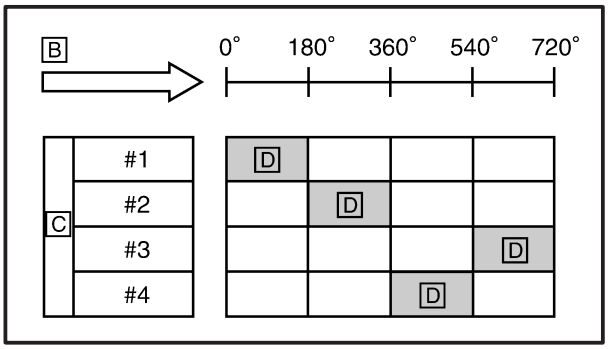


- Measure the valve clearance with a thickness gauge ①.

NOTE:
- If the valve clearance is incorrect, record the measured reading.
- Measure the valve clearance in the following sequence.

Valve clearance measuring sequence
Cylinder #1 → #2 → #4 → #3





A Front
For each cylinder, starting with cylinder #1 at TDC, turn the crankshaft clockwise as specified in the following table.

B Degrees that the crankshaft is turned clockwise

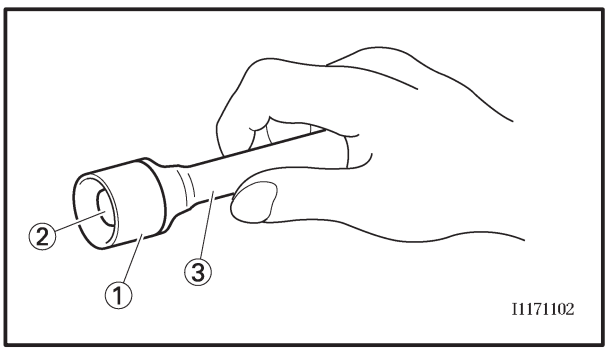
C Cylinder

D Combustion cycle

#2 Cylinder	180°
#4 Cylinder	360°
#3 Cylinder	540°

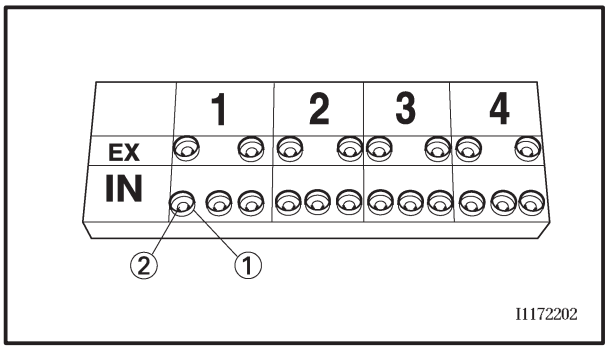
4. Remove:
   - Intake camshaft
   - Exhaust camshaft

NOTE:
- Refer to "CAMSHAFTS" in CHAPTER 5.
- When removing the timing chain and camshafts, fasten a wire to the timing chain to retrieve it if it falls into the crankcase.



5. Adjust:
   - Valve clearance

Adjustment steps:
- Remove the valve lifter ① and the valve pad ② with a valve lapper ③.



NOTE:

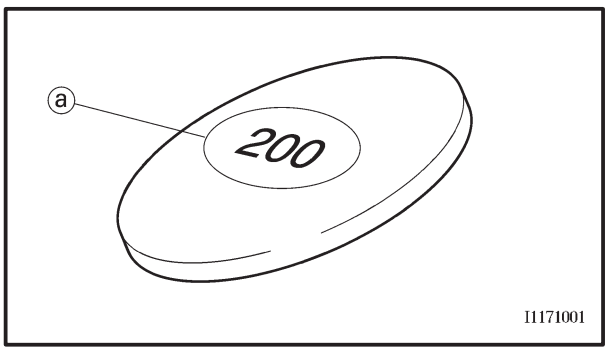
- Cover the timing chain opening with a rag to prevent the valve pad from falling into the crankcase.
- Make a note of the position of each valve lifter ① and valve pad ② so that they can be installed in the correct place.

- Select the proper valve pad from the following table.

Valve pad thickness range		Available valve pads
Nos. 120 ~ 240	1.20 ~ 2.40 mm (0.047 ~ 0.095 in)	25 thicknesses in 0.05 mm (0.0020 in) increments

NOTE:

- The thickness ⓐ of each valve pad is marked in hundredths of millimeters on the side that touches the valve lifter.
- Since valve pads of various sizes are originally installed, the valve pad number must be rounded in order to reach the closest equivalent to the original.



- Round off the original valve pad number according to the following table.

Last digit	Rounded value
0 or 2	0
5	5
8	10

EXAMPLE:
Original valve pad number = 148 (thickness =1.48 mm (0.058 in))
Rounded value = 150

- Locate the rounded number of the original valve pad and the measured valve clearance in the valve pad selection table. The point where the column and row intersect is the new valve pad number.

NOTE:

The new valve pad number is only an approximation. The valve clearance must be measured again and the above steps should be repeated if the measurement is still incorrect.

VALVE PAD SELECTION TABLE
INTAKE

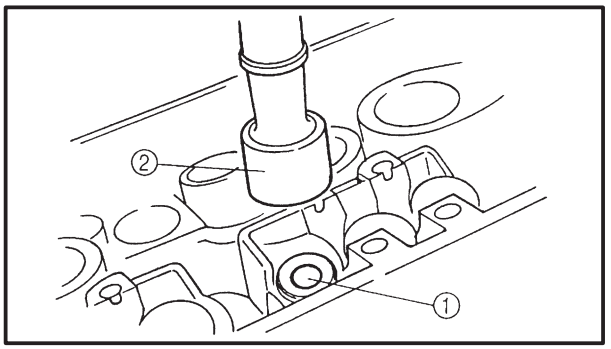
Measured clearance ↓	INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.03 ~ 0.07			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.08 ~ 0.10		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.11 ~ 0.20	Specification																								
exa → 0.21 ~ 0.22	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.23 ~ 0.27	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.28 ~ 0.32	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.33 ~ 0.37	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.38 ~ 0.42	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.43 ~ 0.47	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.48 ~ 0.52	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.53 ~ 0.57	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.58 ~ 0.62	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.63 ~ 0.67	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.68 ~ 0.72	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.73 ~ 0.77	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.78 ~ 0.82	185	190	195	200	205	210	215	220	225	230	235	240													
0.83 ~ 0.87	190	195	200	205	210	215	220	225	230	235	240														
0.88 ~ 0.92	195	200	205	210	215	220	225	230	235	240															
0.93 ~ 0.97	200	205	210	215	220	225	230	235	240																
0.98 ~ 1.02	205	210	215	220	225	230	235	240																	
1.03 ~ 1.07	210	215	220	225	230	235	240																		
1.08 ~ 1.12	215	220	225	230	235	240																			
1.13 ~ 1.17	220	225	230	235	240																				
1.18 ~ 1.22	225	230	235	240																					
1.23 ~ 1.27	230	235	240																						
1.28 ~ 1.32	235	240																							
1.33 ~ 1.37	240																								

EXAMPLE:
VALVE CLEARANCE: 0.11 ~ 0.20 mm
(0.0043 ~ 0.0079 in)
Installed is 150
Measured clearance is 0.25 mm (0.0098 in)
Replace 150 pad with 160 pad

EXHAUST

Measured clearance ↓	INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02						120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.03 ~ 0.07					120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
0.08 ~ 0.12				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.13 ~ 0.17			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.18 ~ 0.20		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.21 ~ 0.25	Specification																								
exa → 0.26 ~ 0.30	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.31 ~ 0.35	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.36 ~ 0.40	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.41 ~ 0.45	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.46 ~ 0.50	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.51 ~ 0.55	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.56 ~ 0.60	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.61 ~ 0.65	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.66 ~ 0.70	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.71 ~ 0.75	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.76 ~ 0.80	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.81 ~ 0.85	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.86 ~ 0.90	185	190	195	200	205	210	215	220	225	230	235	240													
0.91 ~ 0.95	190	195	200	205	210	215	220	225	230	235	240														
0.96 ~ 1.00	195	200	205	210	215	220	225	230	235	240															
1.01 ~ 1.05	200	205	210	215	220	225	230	235	240																
1.06 ~ 1.10	205	210	215	220	225	230	235	240																	
1.11 ~ 1.15	210	215	220	225	230	235	240																		
1.16 ~ 1.20	215	220	225	230	235	240																			
1.21 ~ 1.25	220	225	230	235	240																				
1.26 ~ 1.30	225	230	235	240																					
1.31 ~ 1.35	230	235	240																						
1.36 ~ 1.40	235	240																							
1.41 ~ 1.45	240																								

EXAMPLE:
VALVE CLEARANCE: 0.21 ~ 0.25 mm
(0.0083 ~ 0.0098 in)
Installed is 175
Measured clearance is 0.35 mm (0.0138 in)
Replace 175 pad with 185 pad



• Install the new valve pad ① and the valve lifter ②.

NOTE:

- Apply molybdenum disulfide oil to the valve pad and the valve lifter.
- The valve lifter must turn smoothly when rotated by hand.
- Install the valve lifter and the valve pad in the correct place.

- Install the exhaust and intake camshafts, timing chain and camshaft caps.

Camshaft cap bolt
10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

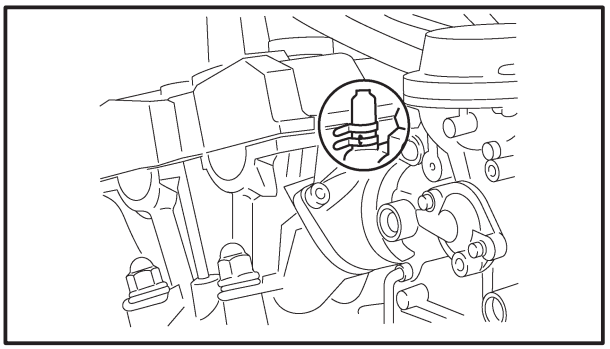
- Refer to “CAMSHAFTS” in CHAPTER 4.
- Lubricate the camshaft caps, camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshaft marks with the camshaft cap marks.
- Rotate the crankshaft clockwise several turns to seat the parts.

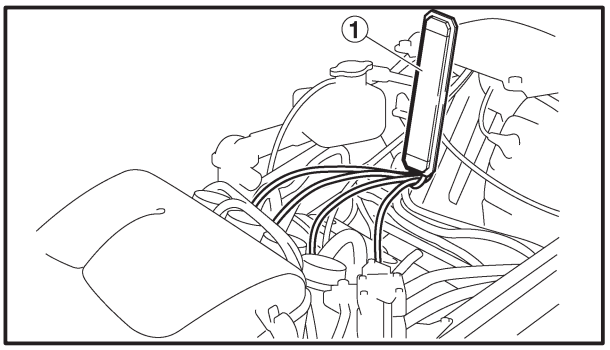
- Measure the valve clearance again.
- If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

6. Install:
   - Cylinder head cover
     Refer to “CAMSHAFTS” in CHAPTER 5.
7. Install:
   - All removed parts

NOTE:

For installation, reverse the removal procedure. Note the following points.





CARBURETOR SYNCHRONIZATION

NOTE:

Prior to synchronizing the carburetors, the valve clearance and the engine idling speed should be properly adjusted and the ignition timing should be checked.

1. Remove:
   • Vacuum cap

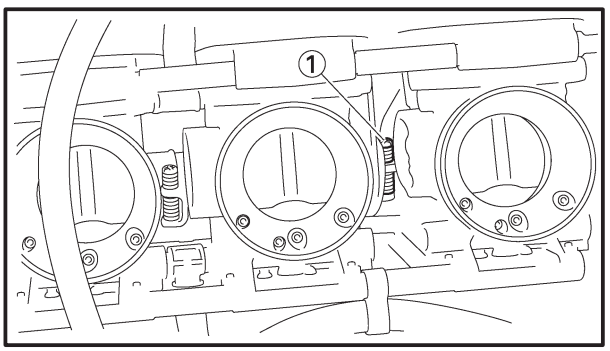
2. Install:
   • Carburetor synchronizer ①
   • Engine tachometer (near the spark plug)

Carburetor synchronizer
90890-03094, YU-8030
Engine tachometer
90793-80009, YU-8036-B

3. Start the engine and let it warm up for several minutes.
4. Inspect:
   • Engine idle speed
   Out of specification → Adjust.
   Refer to "ENGINE IDLE SPEED ADJUSTMENT".

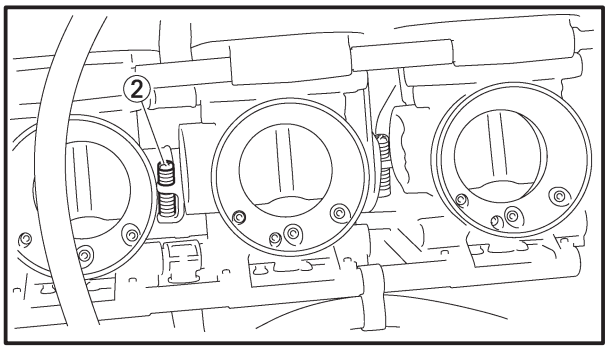
Engine idle speed:
1,350 ± 100 r/min
(1,250 ~ 1,450 r/min)

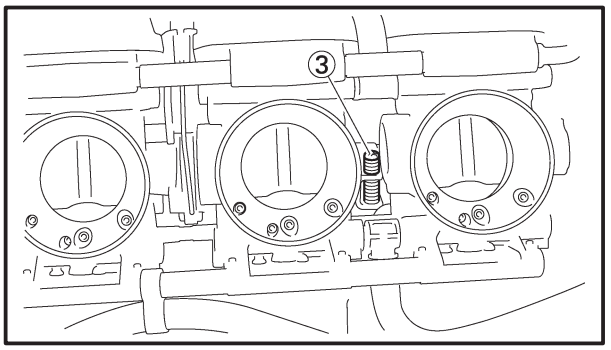
5. Adjust:
   • Carburetor synchronization



Adjustment steps:

• Synchronize carburetor #2 to carburetor #3 by turning the synchronizing screw ① in either direction until both gauges read the same.





NOTE:

After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.

- Synchronize carburetor #4 to carburetor #3 by turning the synchronizing screw ② in either direction until both gauges read the same.
- Synchronize carburetor #2 to carburetor #1 by turning the synchronizing screw ③ in either direction until both gauges read the same.

Vacuum pressure at engine idling speed
35 kPa (0.35 kg/cm^2, 4.98 psi)

NOTE:

The difference in vacuum pressure between two carburetors should not exceed 1.33 kPa (0.01 kg/cm^2, 0.19 psi).

6. Measure:
   - Engine idle speed
     Out of specification → Adjust.
7. Adjust:
   - Throttle cable free play
     Refer to “THROTTLE CABLE FREE PLAY ADJUSTMENT”.

ENGINE IDLE SPEED ADJUSTMENT

NOTE:

Prior to adjusting the engine idling speed, the carburetor synchronization should be adjusted properly, the air filter should be clean, and the engine should have adequate compression.

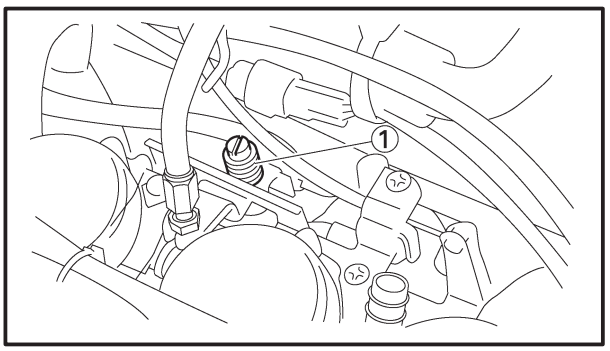
1. Start the engine and let it warm up for several minutes.
2. Install:
   - Engine tachometer
     (near the spark plug)

Engine tachometer
90793-80009, YU-8036-B

3. Measure:
   - Engine idle speed
     Out of specification → Adjust.

Engine idle speed:
1,350 ± 100 r/min
(1,250 ~ 1,450 r/min)

4. Adjust:
   - Engine idle speed



- Turn the throttle stop screw ① in or out until the specified engine idle speed is obtained.

Turning in → Idle speed is increased.
Turning out → Idle speed is decreased.

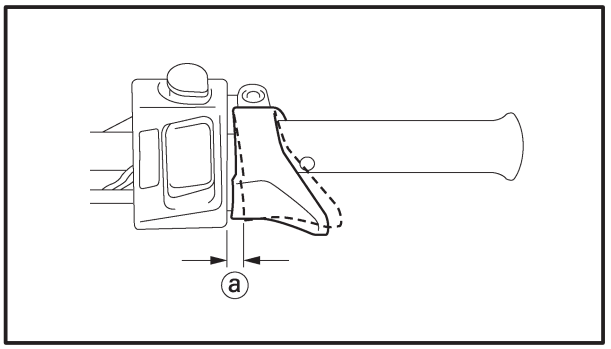
NOTE:

After adjusting the engine idle speed, the throttle cable free play should be adjusted.

THROTTLE CABLE FREE PLAY ADJUSTMENT

NOTE:

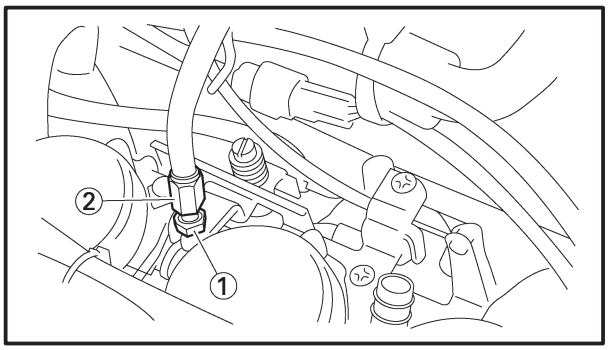
- Before adjusting the throttle cable free play, the engine idle speed should be adjusted.
- Adjust the throttle cable free play while the cable is in the cable guide.



1. Measure:
   - Throttle cable free play ⓐ
     Out of specification → Adjust.

Throttle cable free play:
2.0 ~ 3.0 mm (0.08 ~ 0.12 in)

2. Adjust:
   - Throttle cable free play



Adjustment steps:

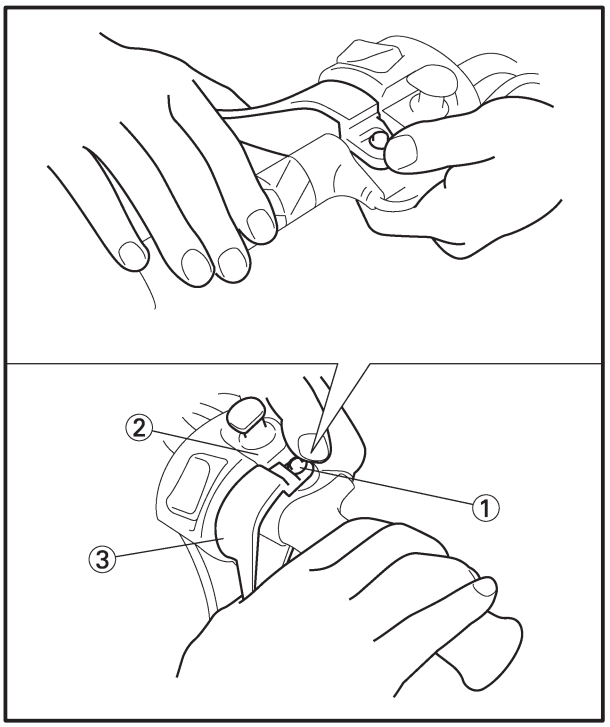
- Loosen the locknut ①.
- Turn the adjusting nut ② in or out until the specified free play is obtained.

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

- Tighten the locknut.

NOTE:

After adjusting the free play, turn the handlebar to right and left, and make sure that the engine idling does not run faster.



THROTTLE OVERRIDE SYSTEM (T.O.R.S.) CHECK

⚠ WARNING

When checking T.O.R.S.:
- **Be sure the parking brake is applied.**
- **Be sure the throttle lever moves smoothly.**
- **Do not run the engine up to the clutch engagement speed. Otherwise, the machine could start moving forward unexpectedly, which could cause an accident.**

1. Start the engine.
2. Hold the pivot point of the throttle lever away from the throttle switch by putting your thumb (above) and forefinger (below) between the throttle lever pivot ① and stop switch housing ②.
   While holding as described above, press the throttle lever ③ gradually.
   The T.O.R.S. will operate and the engine should run between 2,800 and 3,000 r/min.

⚠ WARNING

If the engine does not run between 2,800 and 3,000 r/min, stop the engine by turning the main switch to the "OFF" position and check the electrical system.

COMPRESSION PRESSURE MEASUREMENT

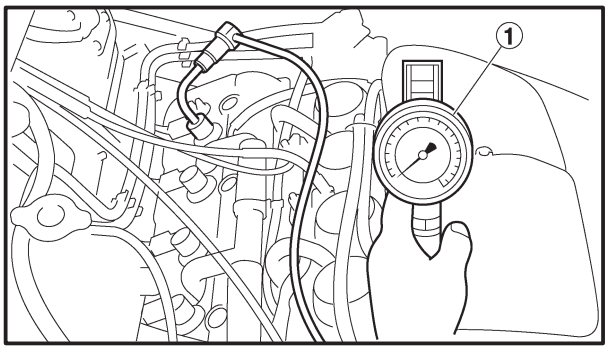
NOTE:

Insufficient compression pressure will result in a loss of performance.

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
     Refer to "VALVE CLEARANCE ADJUSTMENT".
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
   - Spark plug

CAUTION:

Before removing the spark plugs, use compressed air to blow away any dirt accumulated in the spark plug wells to prevent it from falling into the cylinders.



4. Install:
   • Compression gauge ①

Compression gauge set
90890-03081, YU-33223
Compression gauge adapter
90890-04136, YU-33223-3

5. Measure:
   • Compression pressure
   Above the maximum pressure → Inspect 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 following table.

Compression pressure (with oil applied into cylinder)	
Reading	**Diagnosis**
Higher than without oil	**Piston ring(-s) wear or damage → Repair.**
Same as without oil	**Piston, valves, cylinder head gasket or piston possibly defective → Repair.**

Compression pressure (at sea level)

Compression pressure (at sea level):
Standard:
1,450 kPa (14.5 kg/cm^2, 206 psi) at 400 r/min
Minimum:
1,260 kPa (12.6 kg/cm^2, 179 psi) at 400 r/min
Maximum:
1,620 kPa (16.2 kg/cm^2, 230 psi) at 400 r/min

Measurement steps:
- Turn the main switch to "ON".
- With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

⚠ WARNING

To prevent sparking, ground all spark plug leads before cranking the engine.

NOTE:

The difference in compression pressure between cylinders should not exceed 100 kPa (1 kg/cm^2, 14.2 psi)

6. Install:
   - Spark plug

Spark plug:
13 Nm (1.3 m•kg, 9.4 ft•lb)

ENGINE OIL LEVEL INSPECTION

1. Inspect:
   - Engine oil level

CAUTION:

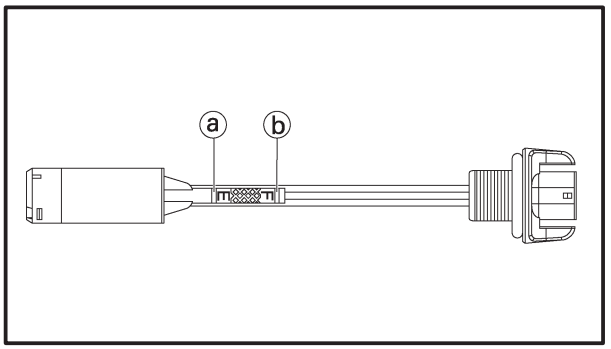
Do not run the engine with too much or not enough oil in the oil tank. Oil could flow into the intake silencer and the engine could be damaged.

Inspection steps:
- Place the snowmobile on a level surface and apply the parking brake.
- Start the engine, warm it up for 10 ~ 15 minutes, and then turn off.
- Disconnect the oil level gauge coupler.

CAUTION:

Disconnect the oil level gauge coupler before removing the oil level gauge. Otherwise the lead can twist and become severed.

- Remove the oil level gauge, wipe it clean, insert it back into the filler hole (without screwing it in), and then remove it again to check the oil level.



• The engine oil level should be between the minimum level mark ⓐ and maximum level mark ⓑ.

Below the minimum level mark → Add the recommended engine oil to the proper level.

CAUTION:

When adding the engine oil, be careful not to fill above the maximum level mark and minimum level mark on the oil level gauge.

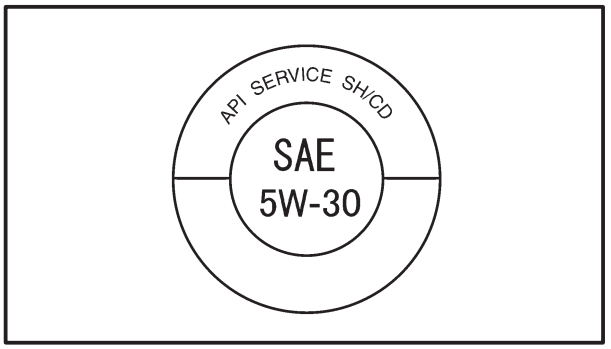
Recommended oil

Refer to the chart for the engine oil grade which is best suited for certain atmospheric temperatures.

API standard

API SE, SF, SG or higher

SAE 5W-30

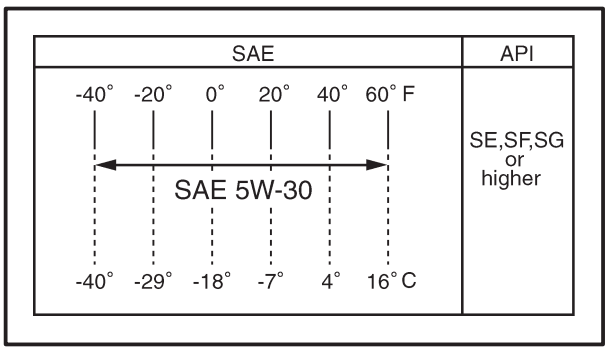


CAUTION:

Do not allow foreign materials to enter the crankcase.

NOTE:

Before checking the engine oil level, wait a few minutes until the oil has settled.



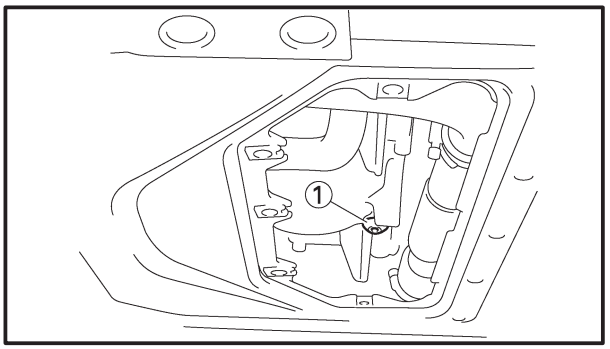
• Start the engine, warm it up for several minutes, and then turn it off.
• Check the engine oil level again.

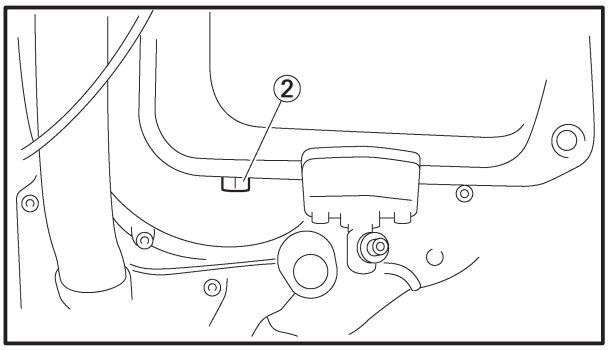
NOTE:

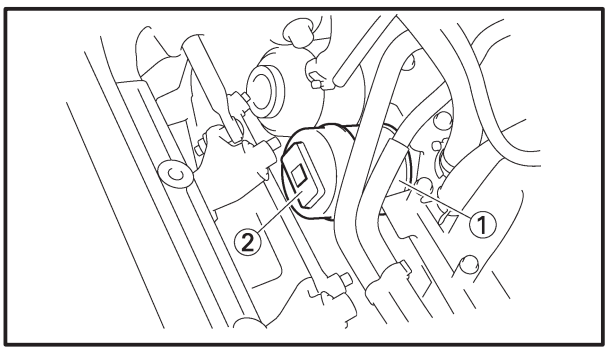
Before checking the engine oil level, wait a few minutes until the oil has settled.

CAUTION:

- **Use only 4-stroke engine oil.**
- **In order to prevent starter clutch slippage, do not mix any chemical additives. Do not use oils with a diesel specification of "CD" or oils of a higher quality than specified. In addition, do not use oils labeled "ENERGY CONSERVING II" or higher.**







ENGINE OIL REPLACEMENT

1. Start the engine, warm up for several minutes, and then turn it off.
2. Place a containers under the engine oil drain bolt and oil tank.
3. Remove:
   - Bottom panel
   - Right side cover
   - Oil level gauge coupler
   - Oil level gauge/dipstick
   - Cylinder head cap
   - Oil pan drain bolt ①
   - Oil tank drain bolt ②
4. Drain:
   - Engine oil
   (completely from the oil pan and oil tank)
5. If the oil filter cartridge is also to be replaced, perform the following procedure.

Replacement steps:

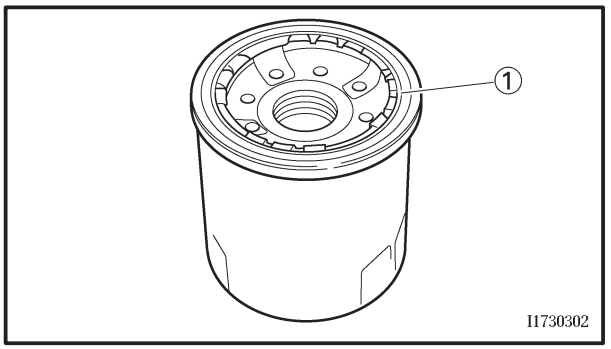
a) Remove air box
b) Remove battery
c) Remove battery bracket
d) Then remove oil filter

- Remove the oil filter cartridge ① with an oil filter wrench ②.

NOTE:

When remove the oil filter cartridge, turn the handlebar to the left.

Oil filter wrench:
90890-01426, YU-38411



• Apply a thin coat of engine oil onto the O-ring ① of the new oil filter cartridge.

CAUTION:

Make sure that the O-ring ① is positioned correctly in the groove of the oil filter cartridge.

• 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:
   • Drain bolts
   (along with the new gaskets)

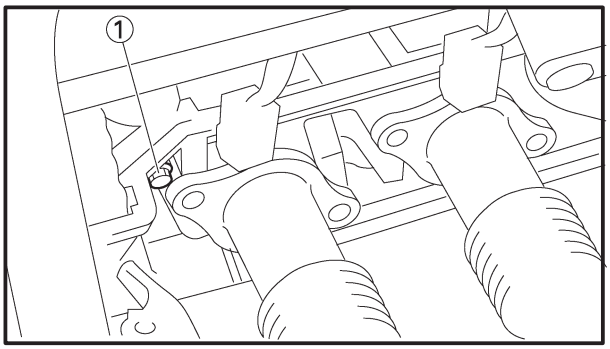
Drain bolt (oil tank):
16 Nm (1.6 m•kg, 12 ft•lb)
Drain bolt (oil pan):
30 Nm (3.0 m•kg, 22 ft•lb)

7. Fill:
   • Engine oil
   (with the specified amount of the recomended engine oil)

Add 2.0 L (1.8 Imp qt, 2.1 US qt) of the recommended engine oil to the oil tank, and then install and tighten the oil level gauge/dipstick and the cylinder head cap.

Quantity
Total amount
3.8 L (3.3 Imp qt, 4.0 US qt)
Periodic oil change
2.8 L (2.5 Imp qt, 3.0 US qt)
With oil filter replacement
3.0 L (2.6 Imp qt, 3.2 US qt)

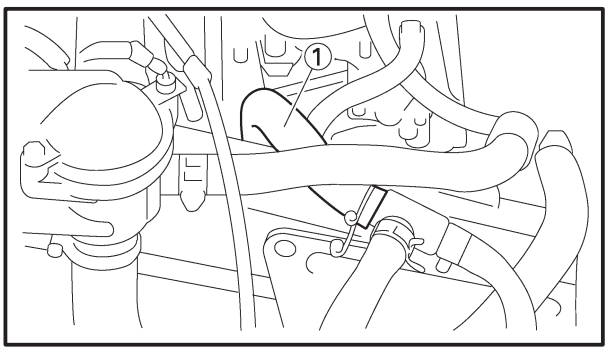
8. Inspect:
   • Engine and oil tank
   (for engine oil leaks)
9. Inspect:
   • Engine oil level
   Refer to “ENGINE OIL INSPECTION”.



10. Inspect:
    • Engine oil pressure

Inspection steps:
- Slightly loosen the oil gallery bolt ①.
- 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.
- Check the engine oil passages, the oil filter and the oil pump for damage or leakage.
- Start the engine after solving the problem(-s) and check the engine oil pressure again. Tighten the oil gallery bolt to specification.

	Oil gallery bolt **10 Nm (1.0 m•kg, 7.2 ft•lb)**

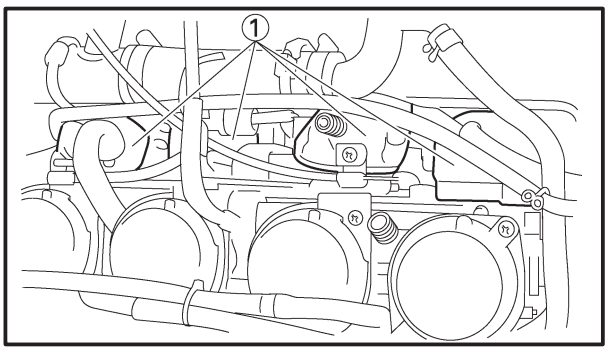


CRANKCASE BREATHER HOSE INSPECTION

1. Inspect:
    • Crankcase breather hose ①
    Cranks/damage → Replace.
    Loosen connection → Connect properly.

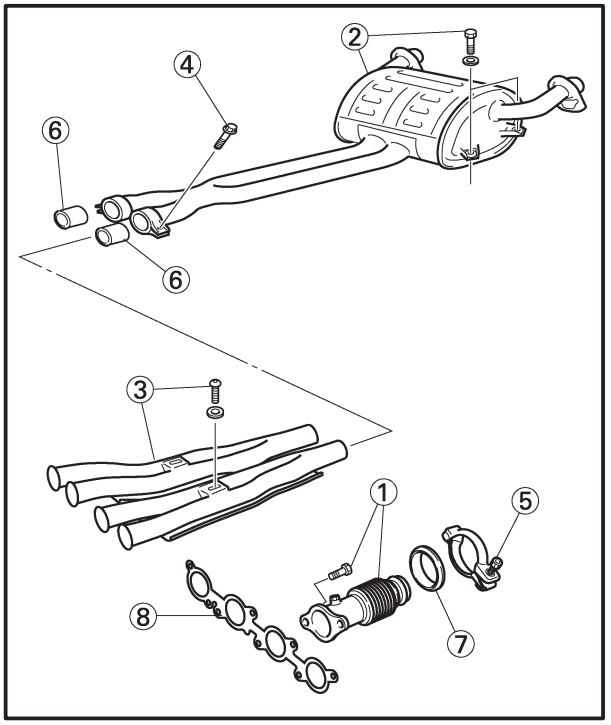
CAUTION:

Make sure that the crankcase breather hose is routed correctly.



CARBURETOR JOINTS INSPECTION

1. Remove:
    • Silencer assembly
2. Inspect:
    • Carburetor joints ①
    Refer to “CARBURETORS” in CHAPTER 6.



EXHAUST SYSTEM INSPECTION

1. Remove:
   - Seat
   - Exhaust system
   - Refer to “EXHAUST PIPE AND MUFFLER” in CHAPTER 5.
2. Inspect:
   - Exhaust joint ①
   - Tightening torque

Bolt (exhaust joint):
25 Nm (2.5 m•kg, 18 ft•lb)

- Muffler ②
- Tightening torque

Bolt (muffler):
16 Nm (1.6 m•kg, 12 ft•lb)

- Exhaust pipe ③
- Tightening torque

Bolt (exhaust pipe):
25 Nm (2.5 m•kg, 18 ft•lb)

- Muffler band ④
- Tightening torque

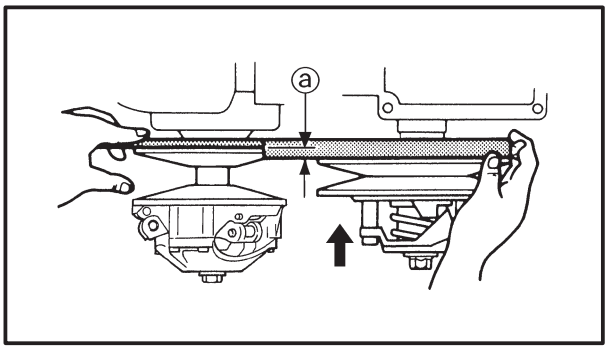
Bolt (muffler band):
20 Nm (2.0 m•kg, 14 ft•lb)

- Exhaust pipe band ⑤
- Tightening torque

Bolt (exhaust pipe band):
9 Nm (0.9 m•kg, 6.5 ft•lb)

Cracks/damage → Replace.
- Gaskets ⑥
- Gaskets ⑦
- Gasket ⑧

Exhaust gas leaks→Replace.



POWER TRAIN

SHEAVE OFFSET ADJUSTMENT

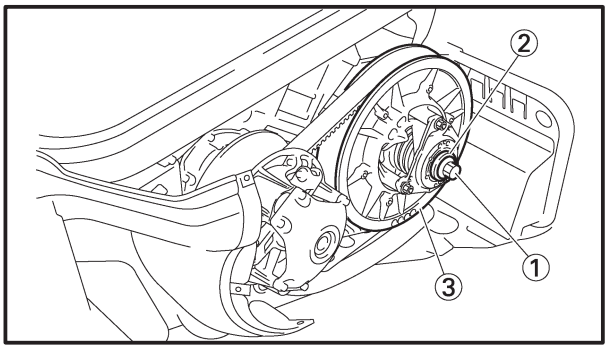
1. Measure:
   • Sheave offset ⓐ
   Use the sheave gauge.
   Out of specification → Adjust.

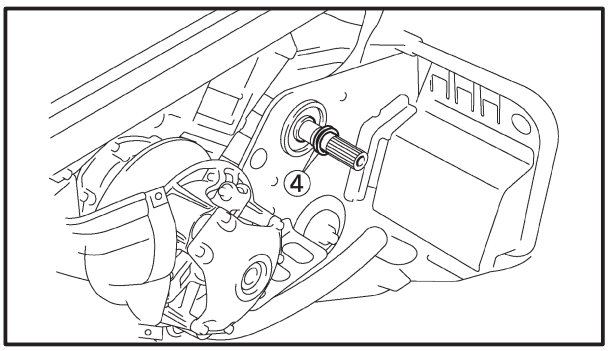
Sheave offset:
15 ± 1.5 mm (0.59 ± 0.06 in)
(13.5 ~ 16.5 mm
(0.53 ~ 0.65 in))

Sheave gauge:
YS-42421-1

NOTE:

Push the secondary sheave toward the inside of vehicle frame first and measure the sheave offset.





2. Adjust:
   • Sheave offset

Adjustment steps:

- Apply the brake to lock the secondary sheave.
- Remove the bolt (Secondary sheave) ①, washer ② and secondary sheave ③.
- Adjust the sheave offset by adding or removing shim(s) ④.

Adding shim → Offset is increased.
Removing shim → Offset is decreased.

Shim size	
Part Number	**Thickness**
90201-25526	**2.0 mm (0.08 in)**

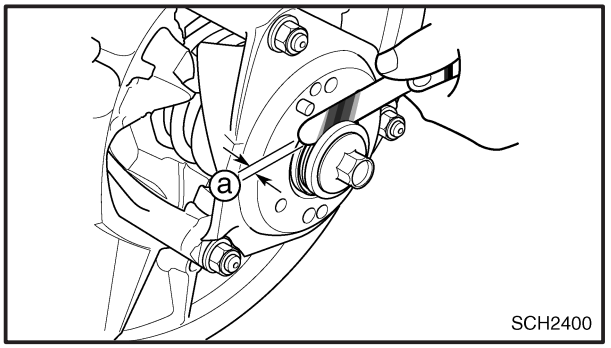
- Install the secondary sheave, bolt (secondary sheave) and washer.

Bolt (secondary sheave):
64 Nm (6.4 m•kg, 46 ft•lb)

- Recheck the sheave offset. If out of specification, repeat the above steps.

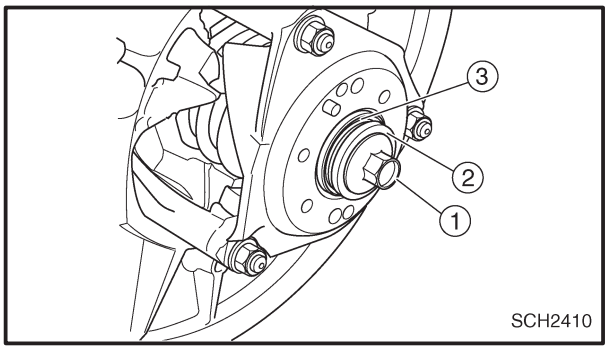
NOTE:

When adjusting the sheave offset, the secondary sheave free play (clearance) should be adjusted.



3. Measure:
   • Secondary sheave freeplay (clearance) ⓐ
   Use a feeler gauge.
   Out of specification → Adjust.

Secondary sheave free play (clearance):
1.0 ~ 2.0 mm (0.04 ~ 0.08 in)



4. Adjust:
   • Secondary sheave freeplay (clearance)

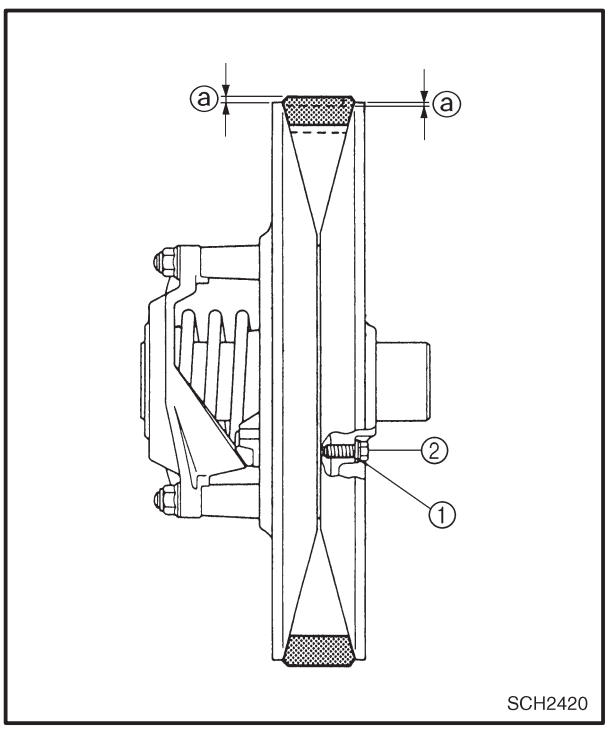
Adjustment steps:
- Apply the brake to lock the secondary sheave.
- Remove the bolt ① and washer ②.
- Adjust the secondary sheave freeplay (clearance) by adding or removing a shim(s) ③.

Shim size	
Part number	**Thickness**
90201-222F0	**0.5 mm (0.02 in)**
90201-225A4	**1.0 mm (0.04 in)**

DRIVE V-BELT

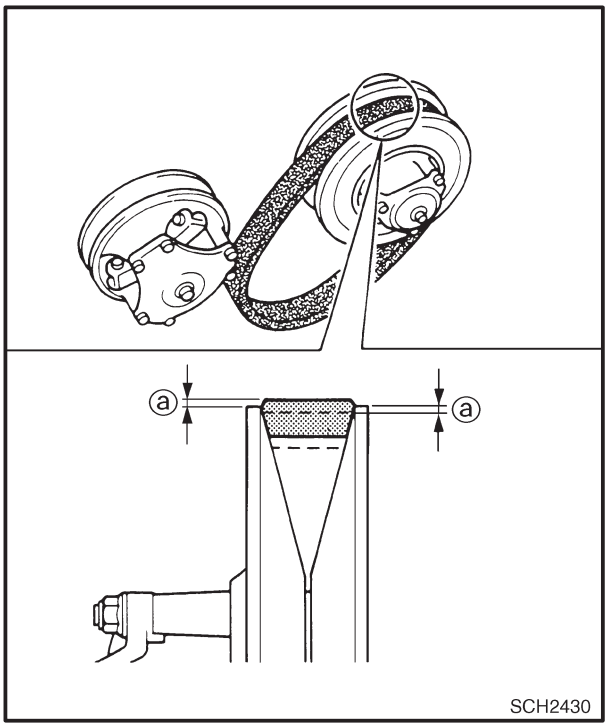
⚠ WARNING

When installing the new V-belt, make sure that it is positioned from 1.5 mm (0.06 in) above the edge of the secondary sheave to –0.5 mm (–0.02 in) below the edge ⓐ.
If the V-belt is not positioned correctly, the clutch engagement speed will be changed. The machine may move unexpectedly when the engine is started.
Adjust the V-belt position by removing or adding a spacer ① on each adjusting bolt ②.



CAUTION:

As the V-belt wears, adjustment may be necessary. To ensure proper clutch performance, the V-belt position should be adjusted by adding a spacer on each adjusting bolt when the V-belt position reaches 1.5 mm (0.06 in) below the edge.



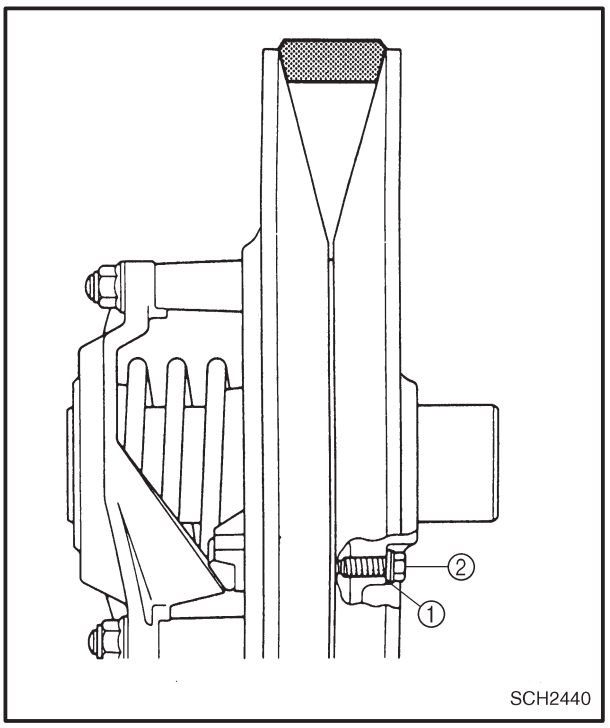
New belt width:
34.5 mm (1.36 in)
Belt wear limit width:
32.5 mm (1.28 in)

1. Measure:
   • V-belt position ⓐ

NOTE:

Install the new V-belt onto the secondary sheave only. Do not force the V-belt between the sheaves; the sliding and fixed sheaves must touch each other.

Standard V-belt height:
−0.5 ~ 1.5 mm
(−0.02 ~ 0.06 in)



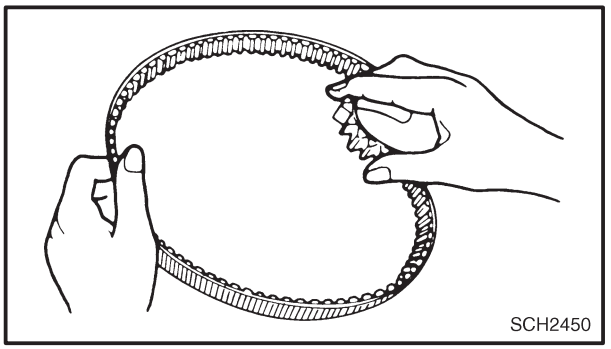
2. Adjust the position of the V-belt by removing or adding a spacer ① on each adjusting bolt ②.

V-belt position	Adjustment
More than 1.5 mm (0.06 in) above the edge	Remove a spacer
From 1.5 mm (0.06 in) above the edge to −0.5 mm (−0.02 in) below the edge	Not necessary (It is correct.)
More than −0.5 mm (−0.02 in) below the edge	Add spacer

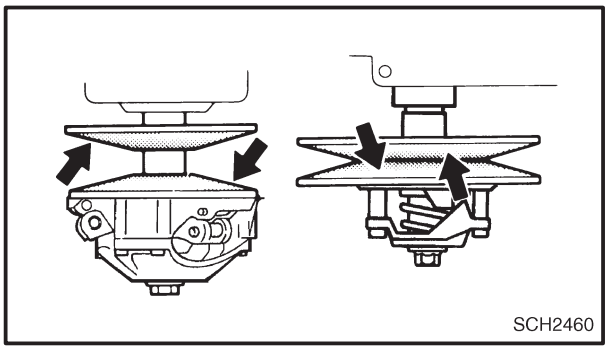
Part number	Thickness
90201-061H1	0.5 mm (0.02 in)
90201-06037	1.0 mm (0.04 in)

3. Tighten:
   • Adjusting bolt ②

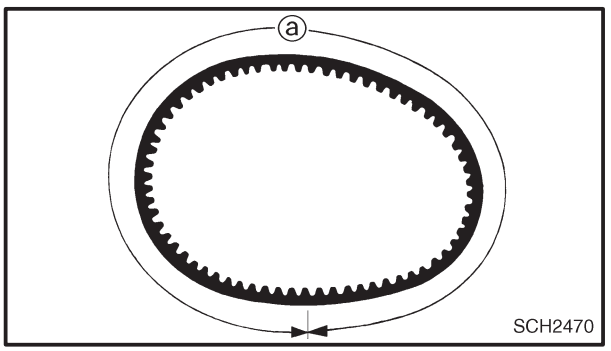
Adjusting bolt:
10 Nm (1.0 m•kg, 7.2 ft•lb)


SCH2450

4. Inspect:
   • Drive V-belt
   Cracks/damage/wear → Replace.
   Oil or grease on the V-belt → Check the primary and secondary sheaves.


SCH2460

5. Inspect:
   • Primary sheave
   • Secondary sheave
   Oil or grease on the primary and secondary sheaves → Use a rag soaked in lacquer thinner or solvent to remove the oil or grease. Check the primary and secondary sheaves.



SCH2470

6. Measure:
   • Drive V-belt circumference ⓐ
   Out of specification → Replace.

V-belt circumference:
1,129 ~ 1,137 mm
(44.4 ~ 44.8 in)

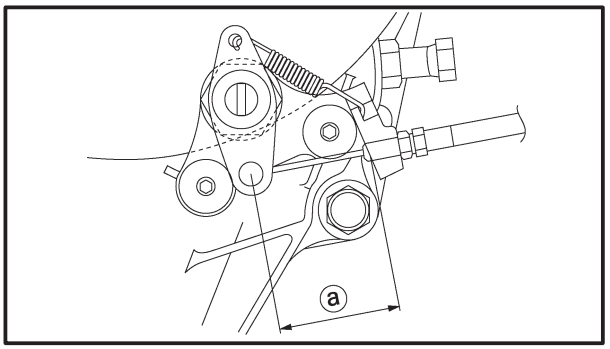
ENGAGEMENT SPEED CHECK

1. Place the machine on a level surface of hard-packed snow.
2. Inspect:
   • Clutch engagement speed

Inspection steps:

• Start the engine, and open the throttle lever gradually.
• Check the engine speed when the machine starts moving forward.
Out of specification → Adjust the primary sheave.

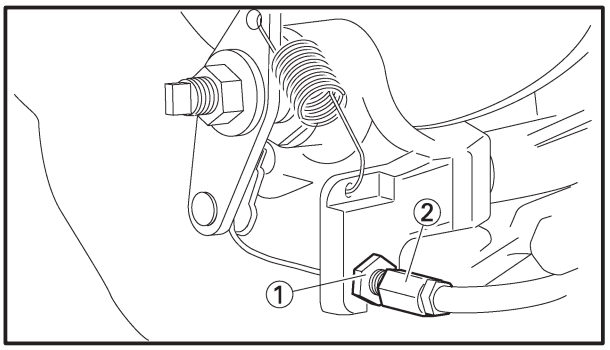
Engagement speed:
3,600 ± 200 r/min
(RX10, RX10S, RX10R, RX10RS)
4,200 ± 200 r/min
(RX10M, RX10MS)



PARKING BRAKE ADJUSTMENT

1. Measure:
   - Parking brake cable distance ⓐ
     Out of specification → Adjust.

Parking brake cable distance:
43.5 ~ 46.5 mm
(1.713 ~ 1.831 in)

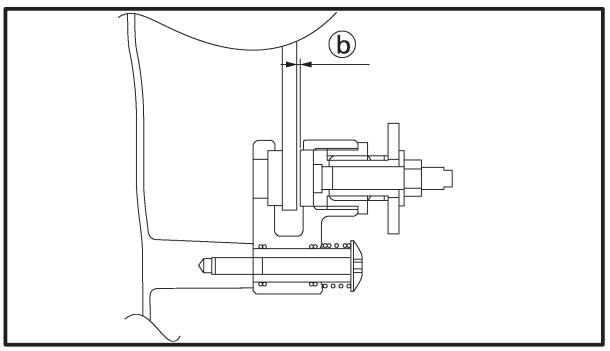


2. Adjust:
   - Parking brake cable

Adjustment steps:
- Loosen the locknut ①
- Turn the adjuster ② in or out until the specified distance ⓐ is obtained.

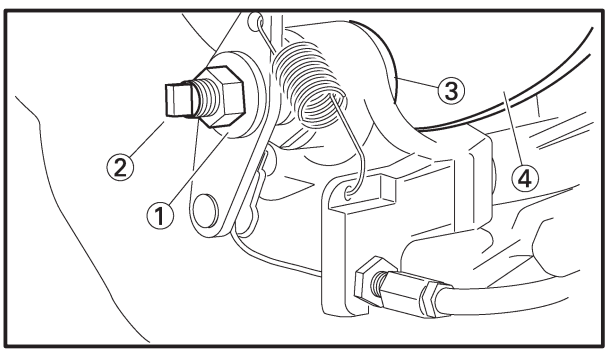
Turning in → Distance ⓐ is increased.
Turning out → Distance ⓐ is decreased.

- Tighten the locknut.



3. Measure:
   - Brake pad clearance ⓑ
     Out of specification → Adjust.

Brake pad clearance:
1.5 ~ 2.0 mm
(0.059 ~ 0.079 in)

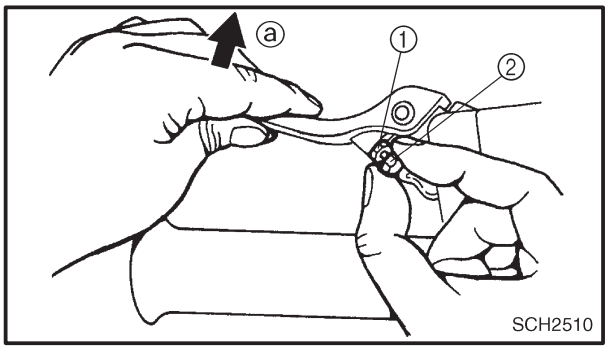


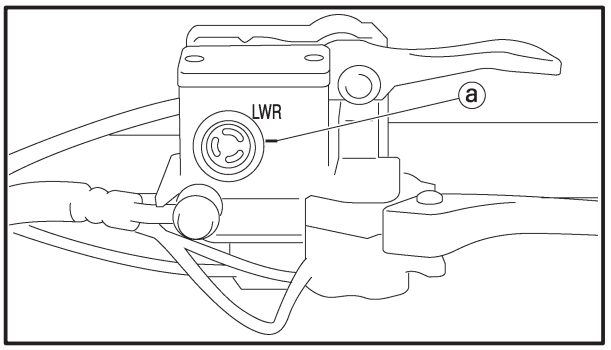
4. Adjust:
   - Brake pad clearance

Adjustment steps:
- Loosen the locknut ①
- Turn the adjuster ② in or out to until the specified clearance between the brake pad ③ and brake disc ④ is obtained.
- Tighten the locknut.

BRAKE LEVER ADJUSTMENT

1. Adjust:
   - Brake lever position
     (distance from the grip to the brake lever)





Adjustment steps:
- Loosen the locknut ①.
- While lightly pushing the brake lever in direction ⓐ, turn the adjusting bolt ② by fingers to set the brake lever to the desired position.
- Tighten the locknut securely after adjusting.

Locknut:
6 Nm (0.6 m•kg, 4.3 ft•lb)

BRAKE FLUID LEVEL INSPECTION

1. Place the machine on a level surface.
2. Check:
   - Fluid level
     Fluid level is under the "LOWER" level line ⓐ
     → Fill to the proper level.

Recommended brake fluid:
DOT 4

NOTE:

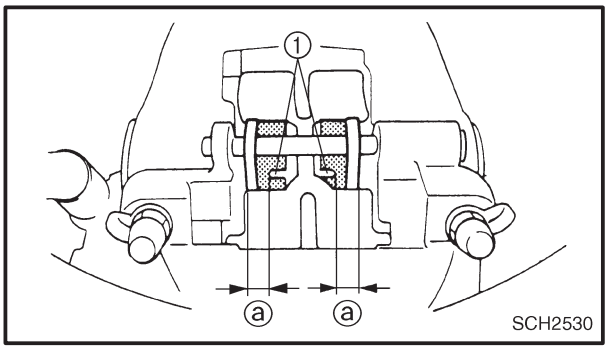
For a correct reading of the brake fluid level, make sure that the top of the handlebar brake master cylinder reservoir is horizontal.

CAUTION:

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

⚠ WARNING

- **Use only the designated brake fluid. Other fluids may deteriorate the rubber seals, causing leakage and poor brake performance.**
- **Refill with the same type of fluid. Mixing fluids may result in a harmful chemical reaction leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the fluid and may cause vapor lock.**



BRAKE PAD INSPECTION

1. Apply the brake lever.
2. Inspect:
   • Brake pad wear ⓐ
   Wear indicator ① nearly contacts the brake disc → Replace as a set.

Wear limit:
7.5 mm (0.30 in)

BRAKE HOSE INSPECTION

1. Inspect:
   • Brake hose
   Cracks/damage/wear → Replace.
2. Check:
   • Fluid leakage
   Apply the brake lever several times.
   Fluid leakage → Replace the defective parts.

AIR BLEEDING
(HYDRAULIC BRAKE SYSTEM)

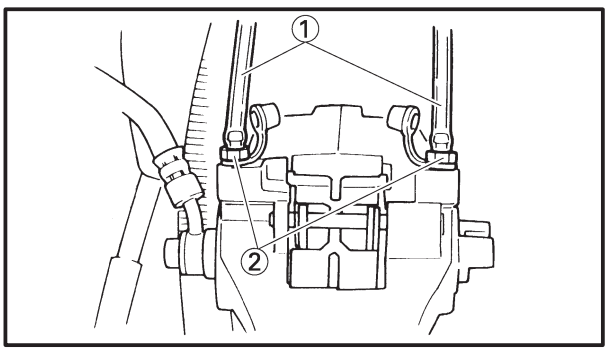
⚠ WARNING

Bleed the brake system in the following cases:
• The system has been disassembled.
• A brake hose is loosened or removed.
• The brake fluid has been very low.
• Brake operation is faulty.
If the brake system is not properly bled a loss of braking performance may occur.

1. Bleed:
   • Brake system

Air bleeding steps:

• Fill the brake master cylinder reservoir with the proper brake fluid.
• Install the diaphragm. Be careful not to spill any fluid or allow the brake master cylinder reservoir to overflow.
• Connect clear plastic hoses ① tightly to the brake caliper bleed screws ②.
• Place the other ends of the hoses in a container.



a. Slowly apply the brake lever several times.
b. Pull the lever in, then hold the lever in position.
c. Loosen the bleed screws and allow the brake lever to travel towards its limit.
d. Tighten the bleed screws when the brake lever limit has been reached, then release the lever.
   • Repeat steps (a) to (d) until all of the air bubbles have disappeared from the fluid.
   • Tighten the bleed screws.

Bleed screw:
6 Nm (0.6 m•kg, 4.3 ft•lb)

NOTE:

If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours.
Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

• Add brake fluid to the proper level.
  Refer to "BRAKE FLUID LEVEL INSPECTION".

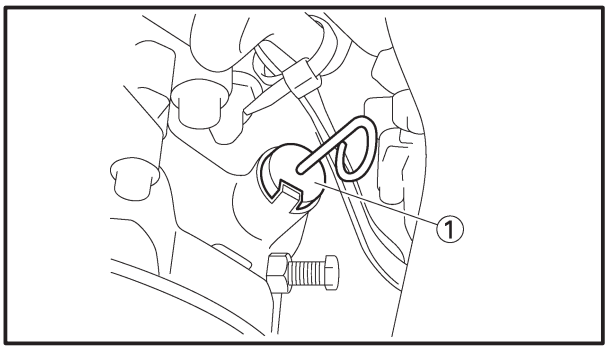
⚠ WARNING

After bleeding the brake system, check the brake operation.

DRIVE CHAIN
Oil level inspection

⚠ WARNING

The engine and muffler will be very hot after the engine has run. Avoid touching a hot engine and muffler while they are still hot with any part of your body or clothing during inspection or repair.

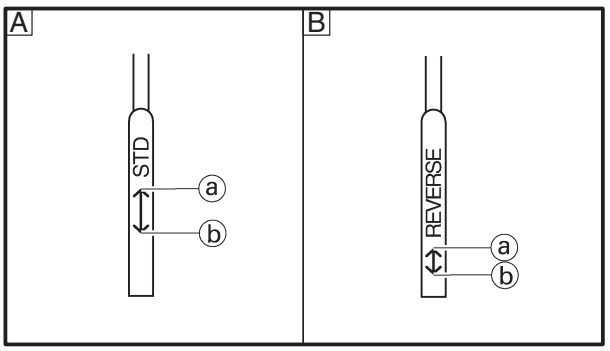


1. Place the machine on a level surface.
2. Check:
   • Oil level

Checking steps:
• Remove the dipstick ① and wipe it off with a clean rag.
  Reinsert the dipstick.

CAUTION:

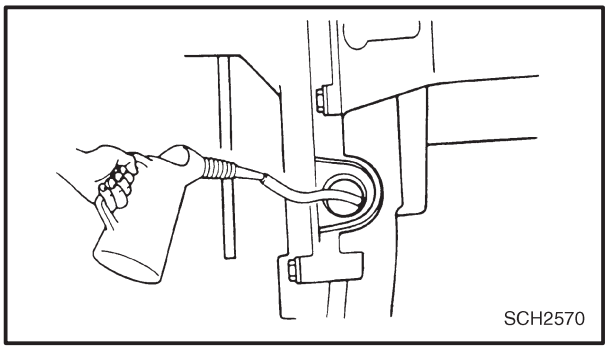
There is a magnet attached to the end of the dipstick. It is used to remove any metal particles that may accumulate in the drive chain housing.
Be sure to:
- **Pull the dipstick out slowly and gently so the metal particles do not fall off the magnet back into the drive chain housing.**
- **Wipe off the magnet before reinserting the dipstick into the drive chain housing.**



• Remove the dipstick and check that the oil is between the upper ⓐ and lower ⓑ levels. If not, add oil to the upper level.

A For models without reverse transmissions (RX10, RX10S, RX10M, RX10MS)

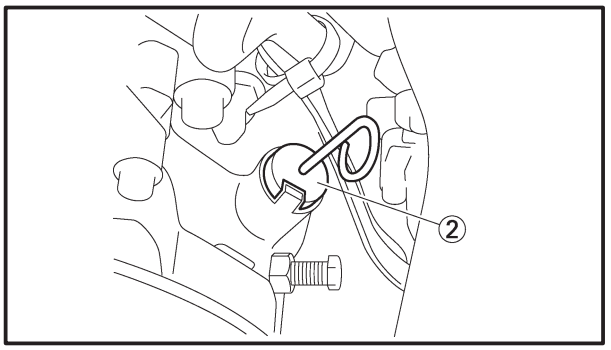
B For models with reverse transmissions (RX10R, RX10RS)



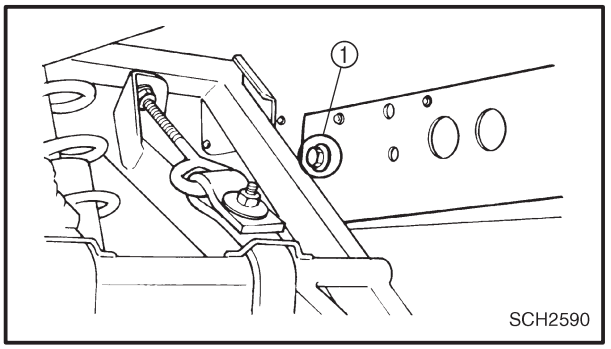
Recommended oil:
Gear oil API "GL-3"
SAE #75 or #80

CAUTION:

Make sure that no foreign material enters the gear case.



• Reinsert the dipstick ②.



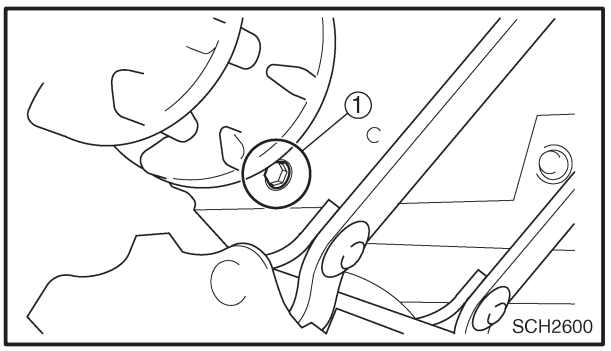
Oil replacement
Oil replacement steps:
• Place the oil pan under the drain hole.
• Remove the oil drain bolt ① and drain the oil.

CAUTION:

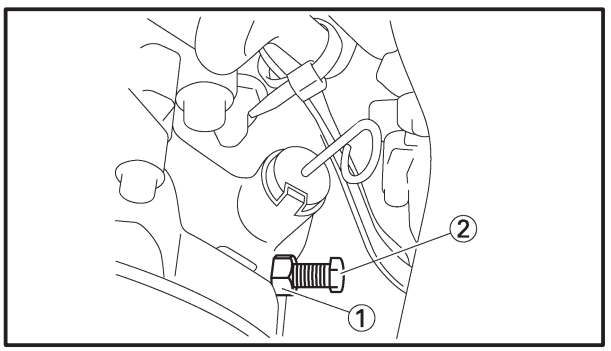
Be sure to remove any oil from the heat protector.

• Install the oil drain bolt ①.

Oil drain bolt:
16 Nm (1.6 m•kg, 12 ft•lb)



Recommended oil:
Gear oil API "GL-3"
SAE #75 or #80
Oil capacity:
0.25 L (8.8 Imp oz, 8.5 US oz)



Chain slack adjustment
1. Adjust:
   • Drive chain slack

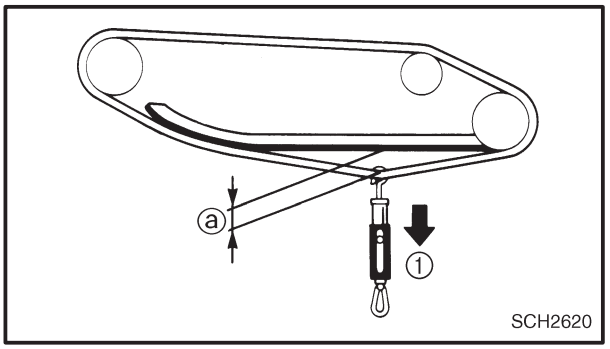
Adjustment steps:
• Loosen the locknut ①.
• Turn the adjusting bolt ② in until it is finger tight.
• Tighten the locknut.

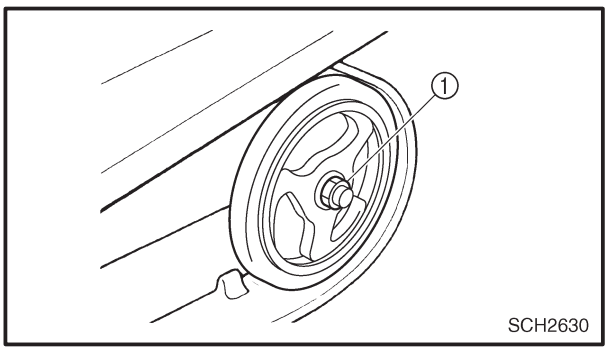
TRACK TENSION ADJUSTMENT

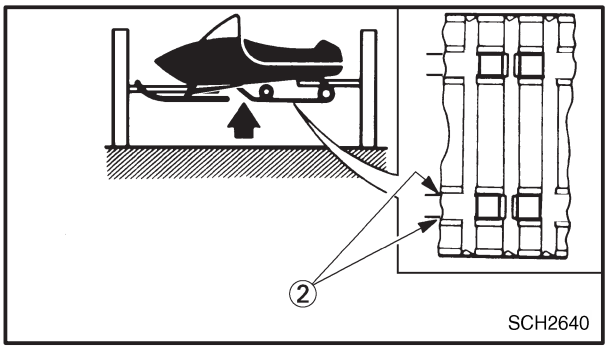
⚠ WARNING

A broken track or track fittings, and debris thrown by the track could be dangerous to an operator or by standers. Observe the following precautions.

- **Do not allow anyone to stand behind the machine when the engine is running.**
- **When the rear of the machine is raised to allow the track to spin, a suitable stand must be used to support the rear of the machine. Never allow anyone to hold the rear of the machine off the ground to allow the track to spin. Never allow anyone near a rotating track.**
- **Inspect the condition of the track frequently. Replace the track if it is damaged to a level where the fabric reinforcement material is visible.**







1. Lift the rear of the machine onto a suitable stand to raise the track off the ground.
2. Measure:
   - Track deflection ⓐ
     Using a spring scale ①, pull down on the center of the track with 100 N (10 kg, 22 lb) of force.
     Out of specification → Adjust.

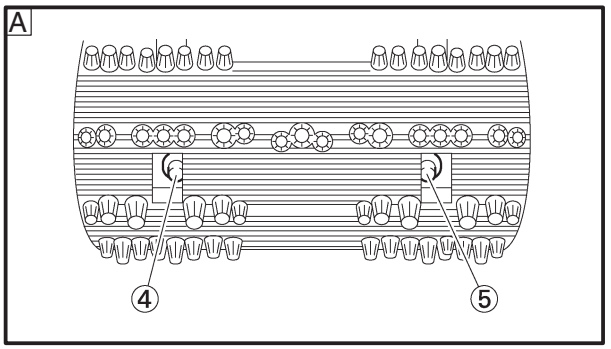
Track deflection:
25 ~ 30 mm (0.98 ~ 1.18 in)

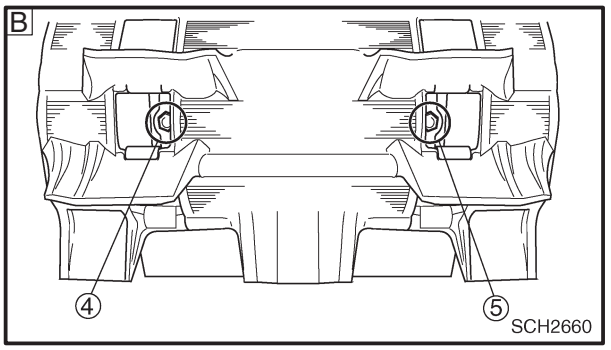
3. Adjust:
   - Track deflection

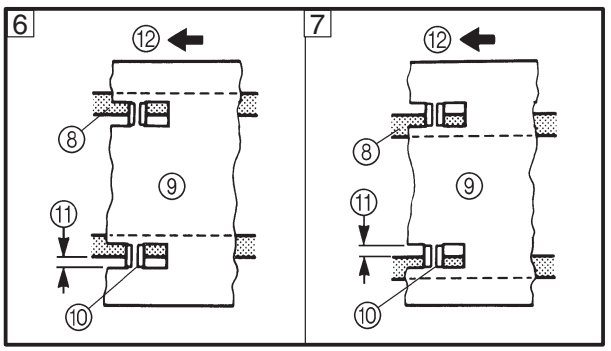
Adjustment steps:

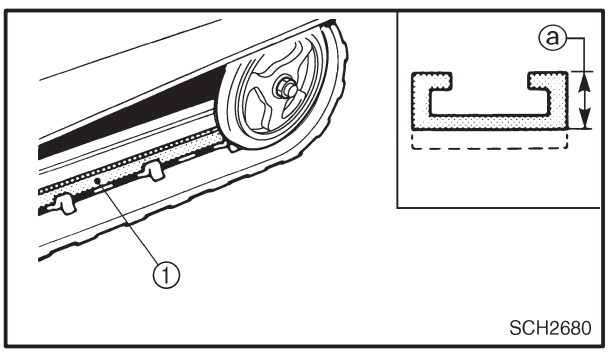
- Place the machine onto a suitable stand to raise the track off of the ground.
- Loosen the rear axle nut ①.

a. Start the engine and rotate the track once or twice. Stop the engine.
b. Check the track alignment with the slide runner ②. If the alignment is incorrect, turn the left and right adjusters to adjust.









Track alignment	6 Shifted to right	7 Shifted to left
④ Left adjuster	Turn out	Turn in
⑤ Right adjuster	Turn in	Turn out

⑧ Slide runner ⑨ Track
⑩ Track metal ⑪ Gap ⑫ Forward
A RX10, RX10S, RX10R, RX10RS
B RX10M, RX10MS

c. Adjust the track deflection until the specified amount is obtained.

Track deflection	More than specified	Less than specified
④ Left adjuster	Turn in	Turn out
⑤ Right adjuster	Turn in	Turn out

CAUTION:

The adjusters should be turned an equal amount.

- Recheck the alignment and deflection. If necessary, repeat steps (a) to (c) until the specified amount is obtained.
- Tighten the rear axle nut.

Nut (rear axle):
75 Nm (7.5 m•kg, 54 ft•lb)

SLIDE RUNNER INSPECTION

1. Inspect:
   - Slide runner ①
     Cracks/damage/wear → Replace.
2. Measure:
   - Slide runner thickness ⓐ
     Out of specification → Replace.

Slide runner wear limit:
10 mm (0.39 in)

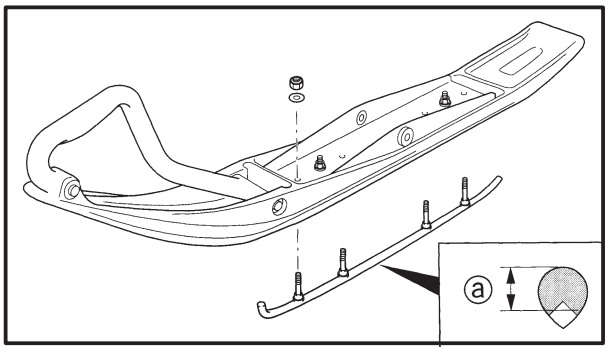
MAXIMIZING DRIVE TRACK LIFE
Recommendations

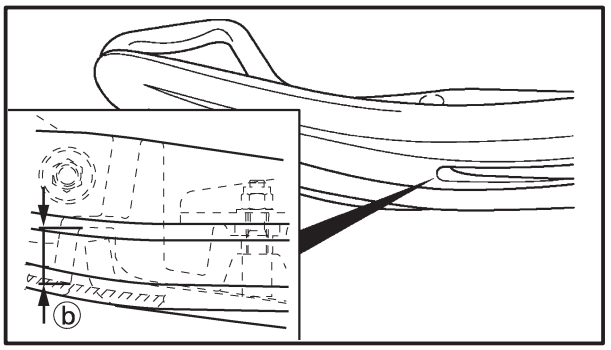
Track tension
During initial break-in, the new drive track will tend to stretch quickly as the track settles. Be sure to correct the track tension and alignment frequently. (See pages 2-36 ~ 2-37 for adjustment procedures.) A loose track can slip (ratchet), derail or catch on suspension parts causing severe damage. Do not overtighten the drive track, otherwise it may increase the friction between the track and the slide runners, resulting in the rapid wear of both components. Also, this may put an excessive load on the suspension components, resulting in component failure.

Marginal snow
The drive track and the slide runners are lubricated and cooled by snow and water. To prevent the drive track and slide runners from overheating, avoid sustained high-speed usage in areas such as icy trails, frozen lakes and rivers that have minimal snow coverage. An overheated track will be weakened internally, which may cause failure or damage.

Off-trail riding
Avoid off-trail riding until there is sufficient snow coverage. It generally takes several feet of snow to provide a good overall base to properly cover debris, such as rocks, logs, etc. If snow coverage is not sufficient, stay on trails to avoid impact damage to the drive track.

Studded track
In general, track life will be shortened when studs are installed. Drilling stud holes into the drive track will cut the internal fibers, which weakens the track. Avoid spinning the drive track. Studs may catch on an object and pull out of the track, leaving tears and damage around the already weakened area. To minimize possible damage, consult your stud manufacturer for installation and stud pattern recommendations.
Yamaha does not recommend track studding.





CHASSIS

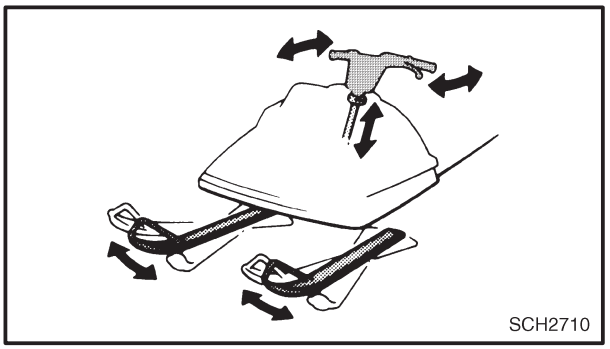
SKI/SKI RUNNER

1. Inspect:
   - Ski
   - Ski runner
     Damage/wear → Replace.
   - Ski runner thickness ⓐ
   - Plastic ski thickness ⓑ
     Out of specification → Replace.

Ski runner wear limit:
8 mm (0.31 in)
Plastic ski wear limit:
24 mm (0.95 in)

CAUTION:

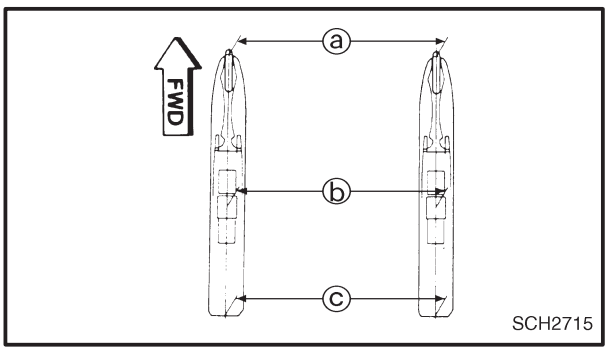
To avoid scratching, wearing and damaging the plastic skis, be careful when loading and unloading the snowmobile and avoid riding in areas with little or no snow and on surfaces with sharp edges such as concrete, curbs, etc.


SCH2710

STEERING SYSTEM

Free play check

1. Check:
   - Steering system free play
     Move the handlebar up and down and back and forth.
     Turn the handlebar slightly to the right and left.
     Excessive free play → Check that the handlebar, tie rod ends and relay rod ends are installed securely in position. If free play still exists, check the steering bearing, front suspension links and ski mounting area for wear. Replace if necessary.

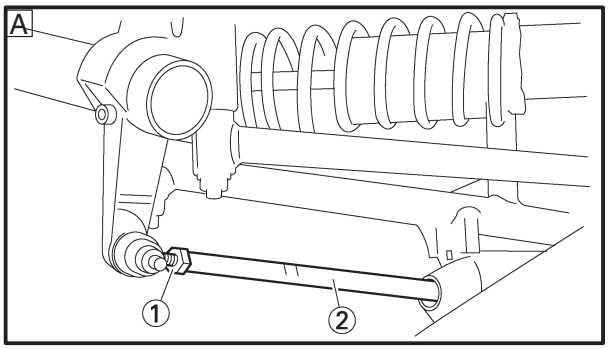


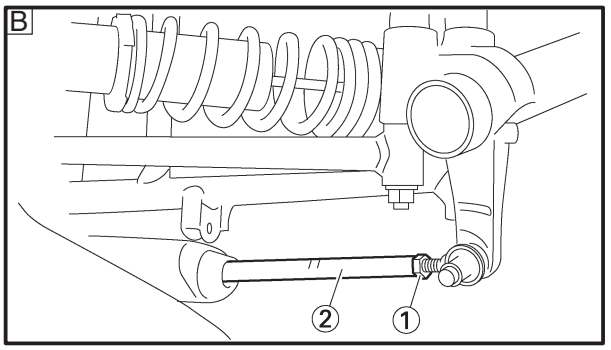
SCH2715

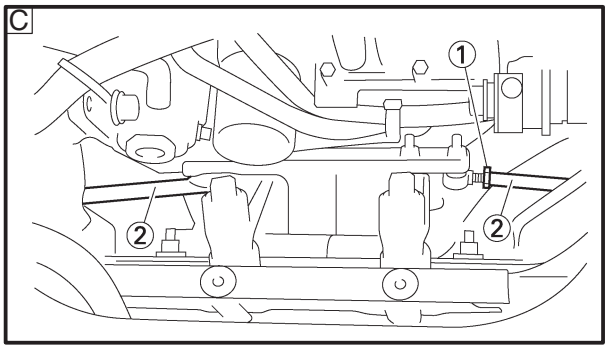
Toe-out adjustment

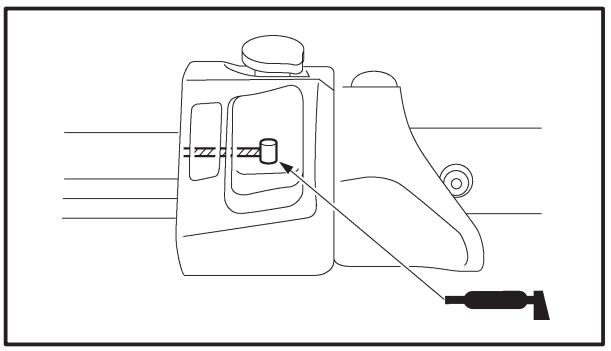
1. Place the machine on a level surface.
2. Check:
   - Ski toe-out (ⓐ – ⓒ)
   - Ski stance ⓑ
     Point the skis forward.
     Out of specification → Adjust.

Ski toe-out:
0 ~ 15 mm (0 ~ 0.59 in)
Ski stance (center to center):
RX10, RX10S, RX10R, RX10RS
1,068 mm (42.0 in)
RX10M, RX10MS
980 mm (38.6 in)









3. Adjust:
   • Ski toe-out

Adjustment steps:
- Loosen the locknuts (tie-rod) ①.
- Turn the tie rods ② in or out until the specified toe-out is obtained.
- Tighten the locknuts (tie-rod) ①.

Locknut (rod end):
25 Nm (2.5 m•kg, 18 ft•lb)
LOCTITE®

CAUTION:

After tightening the inside and outside ball joint locknuts ①, make sure the tie rod ② can be rotated freely through the ball joint travel. If not, loosen the locknut ① and reposition the ball joint so that the tie rod ② can be rotated freely. Tighten the locknuts to specification.

A Left side
B Right side
C Inside

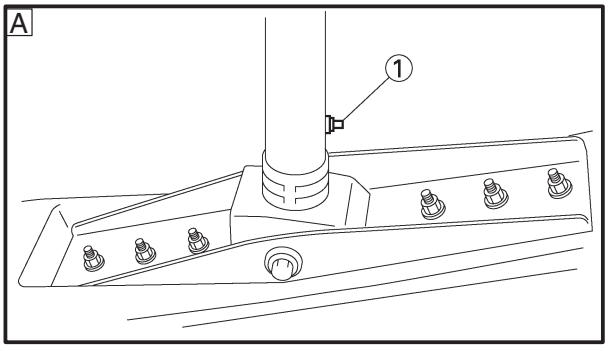
LUBRICATION
Brake lever, throttle lever and throttle cable end
1. Lubricate the brake lever pivot, throttle lever and the ends of the throttle cables.

Recommended lubricant:
ESSO Beacon 325 Grease

⚠ WARNING

Apply a dab of grease onto only the end of the cables.
Do not grease the throttle cables.
They could freeze and cause a loss of control.

A



Front and rear suspension

1. Use a grease gun to inject grease into the nipples ①.

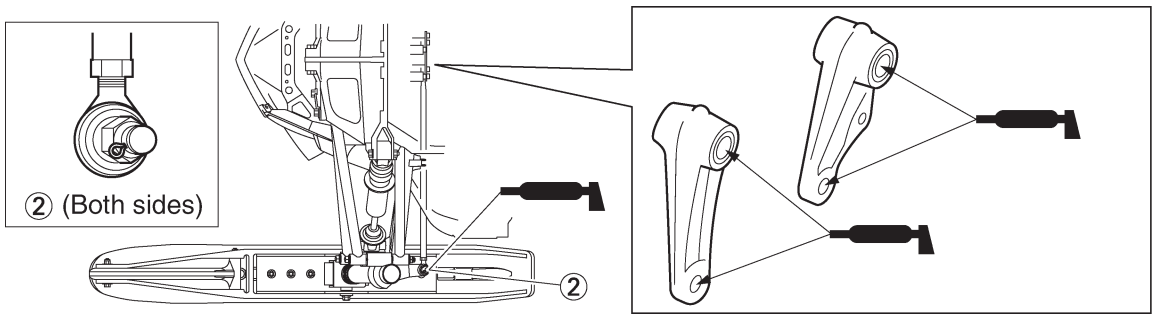
Recommended lubricant:
Esso Beacon 325 Grease or
Aeroshell Grease #7A

A Front

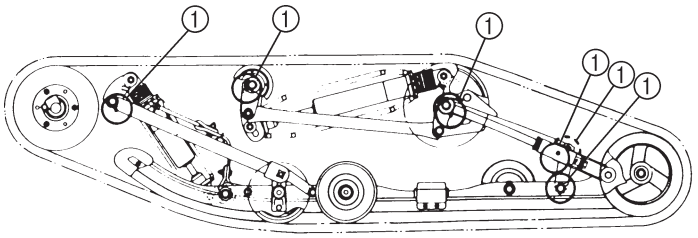
B Rear (RX10, RX10S, RX10R, RX10RS)

C Rear (RX10M, RX10MS)

A

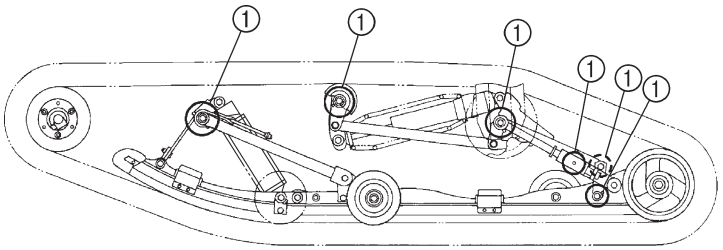


B



SCH2755

C



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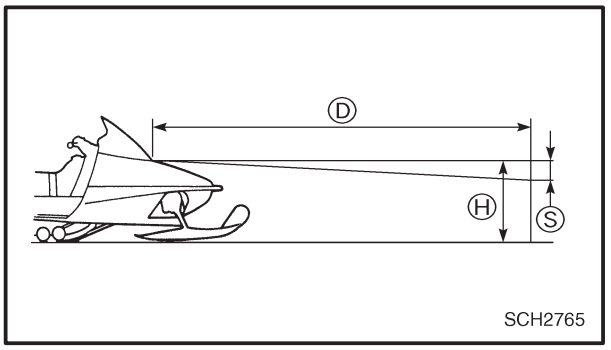


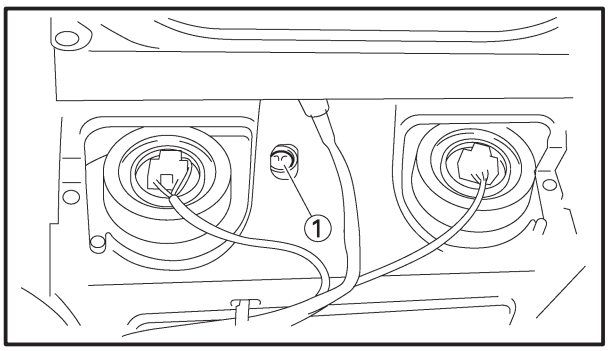
ELECTRICAL

HEADLIGHT BEAM ADJUSTMENT

1. Place the machine on a level surface.
2. Place the machine in front of a wall at the recommended distance Ⓓ. Refer to the table below.
3. Measure the distance Ⓗ from the floor to the center of the headlight and place a mark on the wall at that height.
4. With a person sitting on the machine, apply the parking brake, start the engine and let it idle.
5. Switch on the headlight's high beam and check the height of the projected beam on the wall. The projection should be at the position marked in step 3 or 1/2° lower (set range Ⓢ).

Ⓓ	3.0 m (10 ft)	7.6 m (25 ft)
Ⓢ	26 mm (1.0 in)	66 mm (2.6 in)

Ⓓ: Distance Ⓢ: Set range

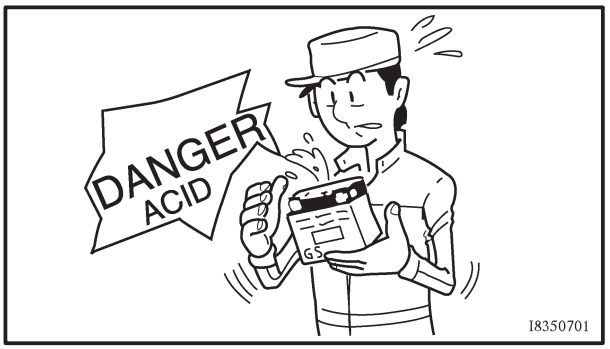


6. Adjust:
   - Headlight beam (vertically)

   Vertical adjustment

   Higher **Turn the adjusting screw ① clockwise.**

   Lower **Turn the adjusting screw ① counterclockwise.**



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BATTERY INSPECTION

⚠ 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:

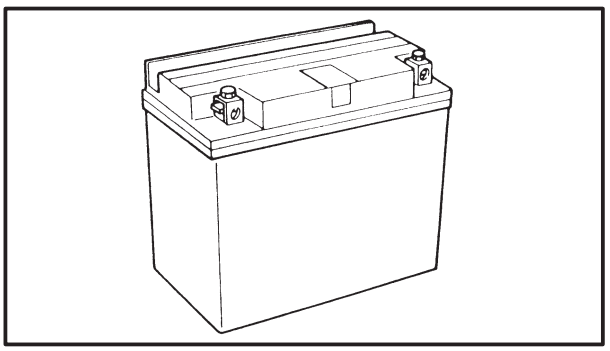
- **Wear protective eye gear when handling or working near batteries.**
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).**
- **DO NOT SMOKE when charging or handling batteries.**
- **KEEP BATTERIES 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 a 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.**

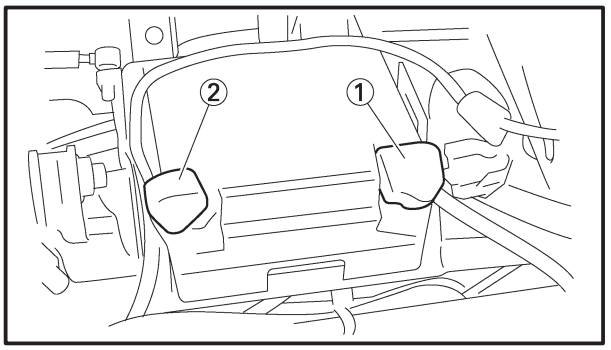
NOTE:

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. Disconnect:
   - Battery leads
     (from the battery terminals)

CAUTION:

First, disconnect the negative lead ①, then the positive lead ②.

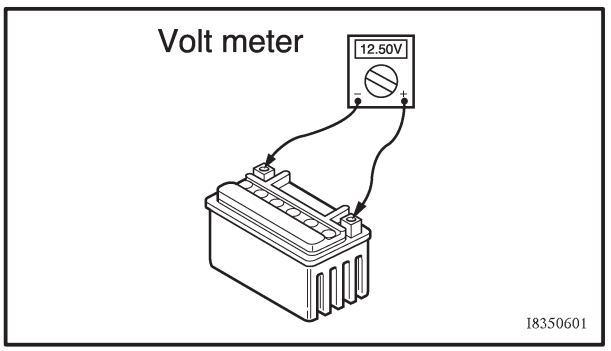


2. Remove:
   - Battery
3. Inspect:
   - Battery charge

Inspection steps:

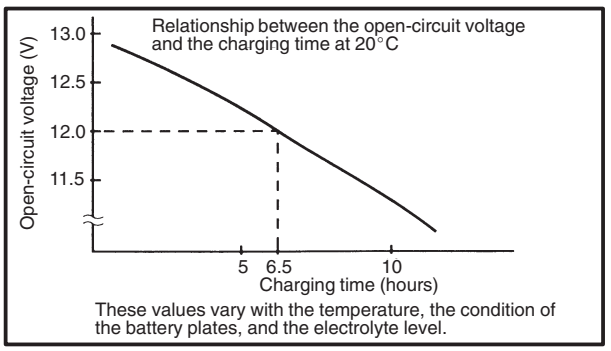
- Connect a pocket tester to the battery terminals.

Tester positive lead →	**battery positive terminal**
Tester negative lead →	**battery negative terminal**



NOTE:

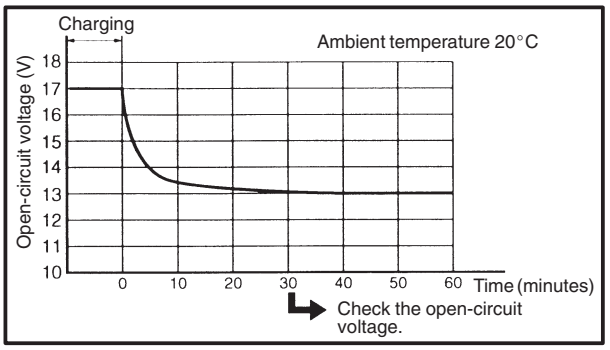
- The charge state of a MF battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive terminal is disconnected).
- No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

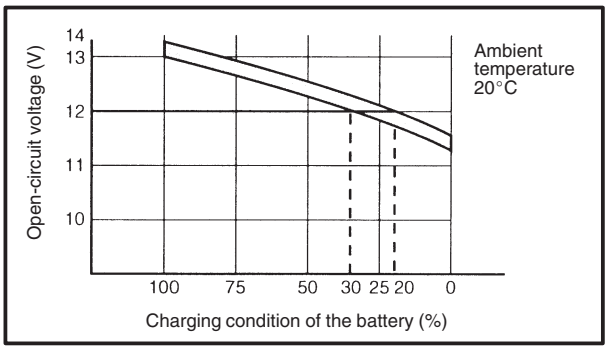


- Check the charge of the battery, as shown in the charts and the following example.

Example

- Open-circuit voltage = 12.0 V
- Charging time = 6.5 hours
- Charge of the battery = 20 ~ 30%





4. Charge:
   - battery
   (refer to the appropriate charging method illustration)

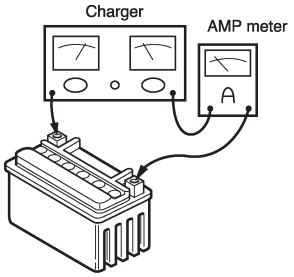
⚠ WARNING

Do not quick charge a battery.

CAUTION:

- **Make sure that the battery vent is free of obstructions.**
- **Never remove the MF battery sealing caps.**
- **Do not use a high-rate battery charger. They force 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 motorcycle. (If charging has to be done with the battery mounted on the motorcycle, disconnect the negative 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 that 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 a 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.**

Charging method using a variable voltage charger



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Measure the open-circuit voltage prior to charging.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped.

Connect a charged and AMP meter to the battery and start charging.

NOTE:
Set the charging voltage at 16 ~ 17 V. (If the setting is lower, charging will be insufficient. If too high, the battery will be over-charged.)

Make sure that the current is higher than the standard charging current written on the battery.

YES

NO

By turning the charging voltage adjust dial, set the charging voltage at 20 ~ 24 V.

Monitor the amperage for 3 ~ 5 minutes to check if the standard charging current is reached.

YES

Adjust the voltage so that the current is at the standard charging level.

NO

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

Set the time according to the charging time suitable for the open-circuit voltage.
Refer to “Battery condition checking steps”.

If charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current.

Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.
12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped.

Connect a charger and AMP meter to the battery and start charging.

Make sure that the current is higher than the standard charging current written on the battery.

YES

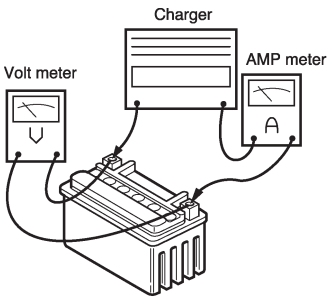
Charge the battery until the battery's charging voltage is 15 V.

NOTE:
Set the charging time at 20 hours (maximum).

Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.
12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

NO

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



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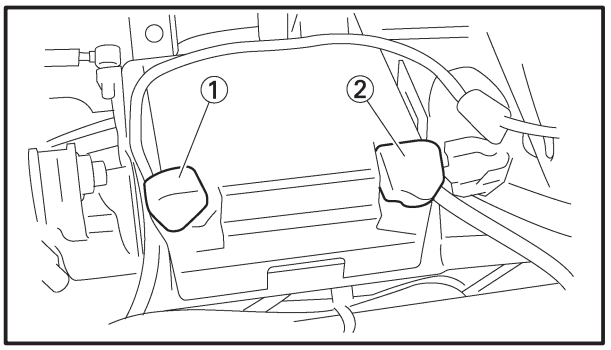
5. Install:
   • Battery



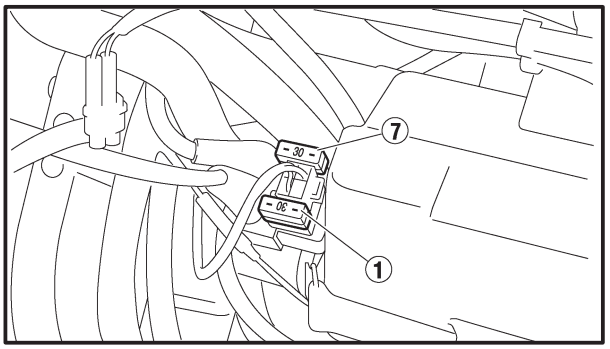
6. Connect:
   • Battery leads
   (to the battery terminals)

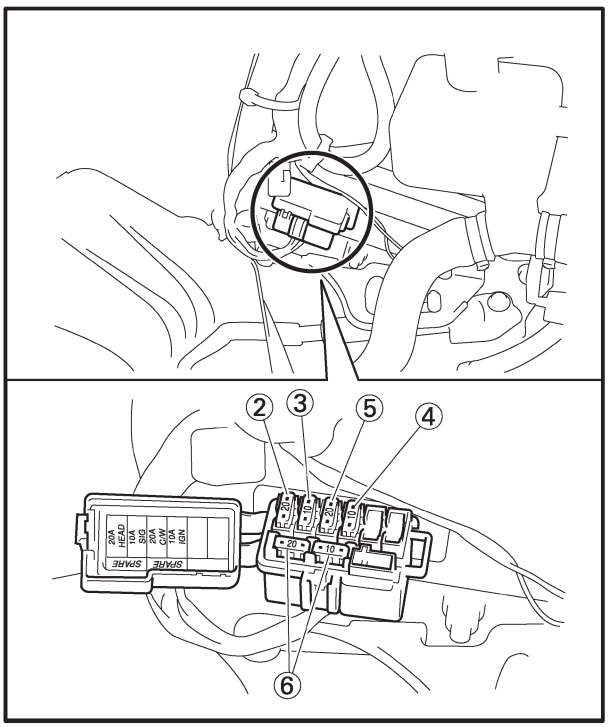
CAUTION:

First, connect the positive lead ①, then the negative lead ②.

7. Check:
   • Battery terminals
   Dirt → Clean with a wire brush.
   Loose connection → Connect properly.
8. Lubricate:
   • Battery terminals

	Recommended lubricant **Dielectric grease**





FUSE INSPECTION

The following procedure applies to all of the fuses.

CAUTION:

To avoid a short circuit, always set the main switch to "OFF" when checking or replacing a fuse.

1. Inspect:
   - Continuity

Inspection steps:

- Connect the pocket tester to the fuse and check the continuity.

NOTE:

Set the pocket tester selector to "Ω × 1".

Pocket tester:
90890-03112, YU-03112

- If the pocket tester indicates "∞", replace the fuse.

2. Replace:
   - Blown fuse

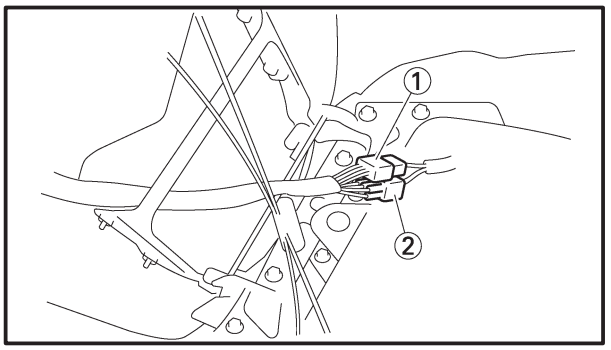
Replacing steps:

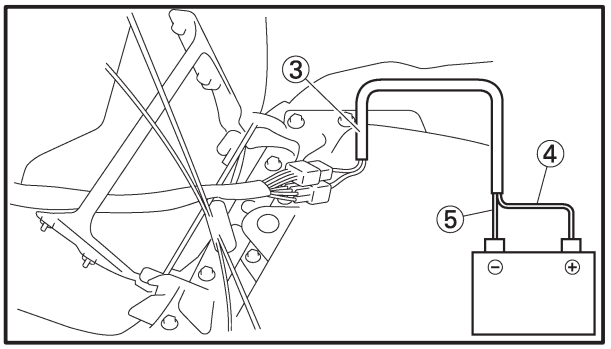
- Set the main switch to "OFF".
- Install a new fuse of the correct amperage.
- Set the main switch to "ON" and verify if the electrical circuit is operational.
- If the fuse immediately blows again, check the electrical circuit.

Item	Amperage	Q'ty
① Main fuse	30 A	1
② "HEAD" fuse	20 A	1
③ "SIGNAL" fuse	10 A	1
④ "IGNITION" fuse	10 A	1
⑤ "CARBURETOR HEATER" fuse	20 A	1
⑥ Reserve fuse	20 A 10 A	1 1
⑦ Reserve fuse	30 A	1

⚠ WARNING

Never use a fuse with an amperage other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting, ignition, grip warmer, signal and meter systems to malfunction and could possibly cause a fire.





SPEEDOMETER UNIT INSPECTION

1. Inspect:
   • Speedometer unit

Inspection steps:

• Remove the speedometer coupler ① and headlight coupler ②.
• Connect the speedometer unit test coupler ③ to the speedometer coupler and headlight coupler.
• Connect the speedometer unit test coupler leads as follows.

Speedometer unit test coupler lead (red) ④ → Battery (+) terminal
Speedometer unit test coupler lead (black) ⑤ → Battery (–) terminal

	Speedometer unit test coupler: 8EK-82507-09, YS–45686

• Check that the light and LCD in the speedometer light up.
• If the light does not light up. → Check the bulbs.
  Refer to “BULB(S)” in CHAPTER 8.
• If the LCD is not indicated. → Replace the speedometer unit.