

SERVICE MANUAL

VK540EF

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha snowmobiles have a basic understanding of the mechanical concepts and procedures inherent in snowmobile repair. Without such knowledge, attempted repairs or service to this model may render it unfit and/or unsafe to use.

Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

HOW TO USE THIS MANUAL

Particularly important information is distinguished in this manual by the following notations:



The Safety Alert Symbol means ATTENTION! BE ALERT! YOUR SAFETY IS INVOLVED!

WARNING

Failure to follow WARNING instructions could result in severe injury or death to the snowmobile operator, a bystander, or a person inspecting or repairing the snowmobile.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid damage to the snowmobile.

NOTE:

A NOTE provides key information that can make procedures easier or clearer.

MANUAL FORMAT

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all inspection, repair, assembly, and disassembly operations.

In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required to correct the problem will follow the symbol, e.g.,

- Bearings
Pitting/damage → Replace.

EXPLODED DIAGRAM

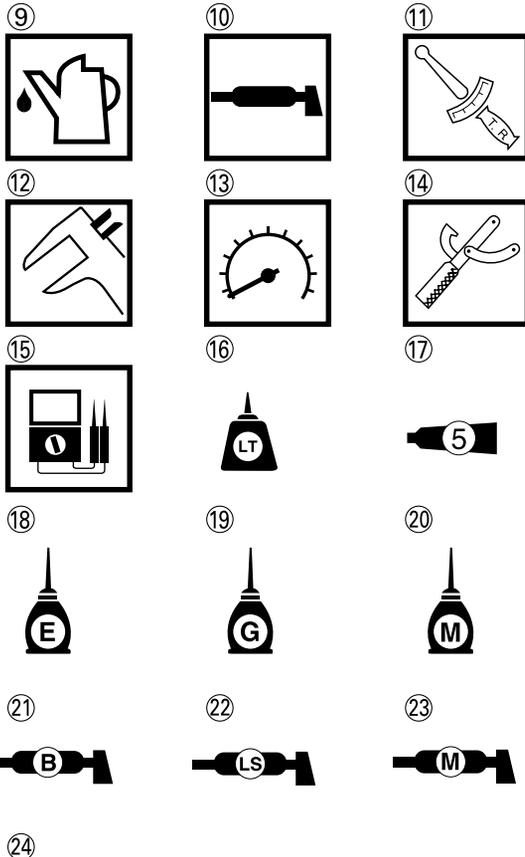
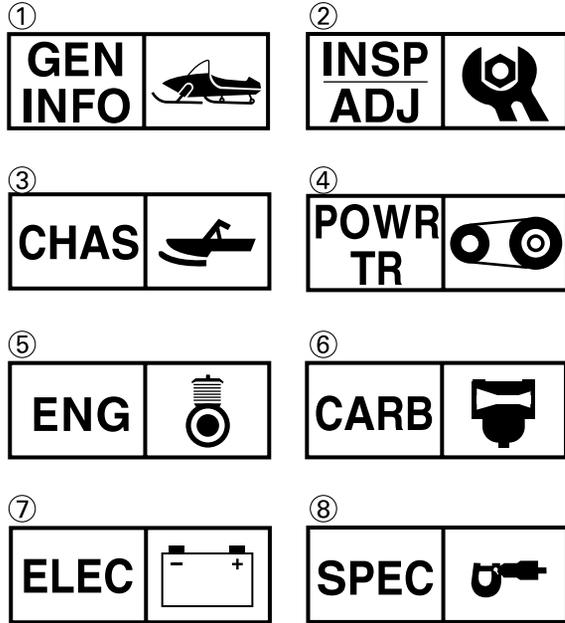
Each chapter provides exploded diagrams before each disassembly section to facilitate correct disassembly and assembly procedures.

VK540E
SERVICE MANUAL
 © 2000 by Yamaha Motor
 Corporation, U.S.A.
 1st Edition, May 2000
 All rights reserved. Any reprinting or
 unauthorized use without the written
 permission of Yamaha Motor Corporation,
 U.S.A. is expressly prohibited.
 Printed in U.S.A.
 LIT-12618-02-13

ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑧ are designed as thumb tabs to indicate the chapter's number and content.

- ① General information
- ② Periodic inspection and adjustment
- ③ Chassis
- ④ Power train
- ⑤ Engine overhaul
- ⑥ Carburetion
- ⑦ Electrical
- ⑧ Specifications



Illustrated symbols ⑨ to ⑮ are used to identify the specifications which appear.

- ⑨ Filling fluid
- ⑩ Lubricant
- ⑪ Tightening
- ⑫ Wear limit, clearance
- ⑬ Engine speed
- ⑭ Special tool
- ⑮ Ω, V, A

Illustrated symbols ⑯ to ⑳ in the exploded diagram indicate grade of lubricant and location of lubrication point.

- ⑯ Apply locking agent (LOCTITE®)
- ⑰ Apply Yamabond No.5®
- ⑱ Apply engine oil
- ⑲ Apply gear oil
- ⑳ Apply molybdenum disulfide oil
- ㉑ Apply wheel bearing grease
- ㉒ Apply low-temperature lithium-soap base grease
- ㉓ Apply molybdenum disulfide grease
- ㉔ Use new one

New

INDEX

GENERAL INFORMATION	
	GEN INFO 1
PERIODIC INSPECTIONS AND ADJUSTMENTS	
	INSP ADJ 2
CHASSIS	
	CHAS 3
POWER TRAIN	
	POWR TR 4
ENGINE	
	ENG 5
CARBURETION	
	CARB 6
ELECTRICAL	
	ELEC 7
SPECIFICATIONS	
	SPEC 8

CHAPTER 1. GENERAL INFORMATION

MACHINE IDENTIFICATION	1-1
FRAME SERIAL NUMBER	1-1
ENGINE SERIAL NUMBER	1-1
IMPORTANT INFORMATION	1-2
PREPARATION FOR REMOVAL AND DISASSEMBLY	1-2
ALL REPLACEMENT PARTS	1-3
GASKETS, OIL SEALS, AND O-RINGS	1-3
LOCK WASHERS/PLATES AND COTTER PINS	1-3
BEARINGS AND OIL SEALS	1-3
CIRCLIPS	1-4
LOCTITE®	1-4
SPECIAL TOOLS	1-5
FOR TUNE UP	1-5
FOR ENGINE SERVICE	1-5
FOR POWER TRAIN SERVICE	1-6
FOR CARBURETION SERVICE	1-7
FOR ELECTRICAL SERVICE	1-7

CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION	2-1
PERIODIC MAINTENANCE TABLE	2-1
ENGINE	2-3
SPARK PLUGS	2-3
OIL PUMP	2-4
OIL FILTER INSPECTION	2-6
ENGINE OIL LINE INSPECTION	2-6
FUEL LINE INSPECTION	2-7
FUEL FILTER INSPECTION	2-7
COOLING FAN BELT TENSION ADJUSTMENT	2-9
ENGINE IDLE SPEED ADJUSTMENT	2-10
THROTTLE CABLE FREEPLAY ADJUSTMENT	2-10

THROTTLE OVERRIDE SYSTEM (T.O.R.S.) CHECK	2-11
STARTER (CHOKE) CABLE FREEPLAY ADJUSTMENT	2-12
EXHAUST SYSTEM INSPECTION	2-12

POWER TRAIN	2-13
DRIVE V-BELT	2-13
SHEAVE DISTANCE AND OFFSET ADJUSTMENT	2-16
ENGAGEMENT SPEED CHECK ...	2-18
ADJUSTING THE BRAKE	2-18
BRAKE PAD INSPECTION	2-19
DRIVE CHAIN	2-19
TRACK TENSION ADJUSTMENT ..	2-21
SLIDE RUNNER INSPECTION	2-22

CHASSIS	2-23
SKI/SKI RUNNER	2-23
STEERING SYSTEM	2-23
LUBRICATION	2-25

ELECTRICAL	2-27
HEADLIGHT BEAM ADJUSTMENT	2-27
BATTERY INSPECTION	2-28
FUSE INSPECTION	2-30

TUNING	2-31
CARBURETOR TUNING	2-31
CLUTCH	2-38
GEAR SELECTION	2-39
HIGH ALTITUDE TUNING	2-43
REAR SUSPENSION	2-44

CHAPTER 3. CHASSIS

STEERING	3-1
INSPECTION	3-3
INSTALLATION	3-4
SKI	3-6
INSPECTION	3-7

FRONT SUSPENSION	3-8
HANDLING NOTES	3-9
INSPECTION	3-9
INSTALLATION	3-10

CHAPTER 4. POWER TRAIN

PRIMARY SHEAVE AND DRIVE	
V-BELT	4-1
REMOVAL	4-3
DISASSEMBLY	4-4
INSPECTION	4-5
ASSEMBLY	4-7
INSTALLATION	4-9
SECONDARY SHEAVE	4-10
DISASSEMBLY	4-12
INSPECTION	4-13
ASSEMBLY	4-14
INSTALLATION	4-15
DRIVE CHAIN HOUSING	4-16
INSPECTION	4-18
INSTALLATION	4-22
SECONDARY SHAFT (JACKSHAFT) .	4-23
INSPECTION	4-25
INSTALLATION	4-25
BRAKE	4-26
BRAKE PAD REPLACEMENT	4-27
BRAKE CALIPER INSPECTION ...	4-30
INSTALLATION	4-31
SLIDE RAIL SUSPENSION	4-33
INSPECTION	4-37
INSTALLATION	4-37
FRONT AXLE AND TRACK	4-38
INSPECTION	4-40
INSTALLATION	4-40

CHAPTER 5. ENGINE

EXHAUST ASSEMBLY	5-1
INSPECTION	5-2

ENGINE ASSEMBLY	5-3
INSPECTION	5-4
INSTALLATION	5-4
CYLINDER HEAD AND CYLINDER	5-5
REMOVAL	5-6
INSPECTION	5-6
INSTALLATION	5-11

OIL PUMP, CRANKCASE AND CRANKSHAFT	5-14
INSPECTION	5-15
OIL PUMP STROKE ADJUSTMENT	5-16
INSTALLATION	5-18
OIL PUMP	5-19

CDI MAGNETO	5-20
REMOVAL	5-21
INSTALLATION	5-22

ENGINE COOLING FAN	5-23
REMOVAL	5-24
INSPECTION	5-25
INSTALLATION	5-26

RECOIL STARTER	5-27
REMOVAL	5-28
INSPECTION	5-28
INSTALLATION	5-29

CHAPTER 6. CARBURETION

CARBURETOR	6-1
INSPECTION	6-3
ASSEMBLY	6-4
INSTALLATION	6-5
FUEL PUMP	6-6
INSPECTION	6-7
INSTALLATION	6-7

CHAPTER 7. ELECTRICAL

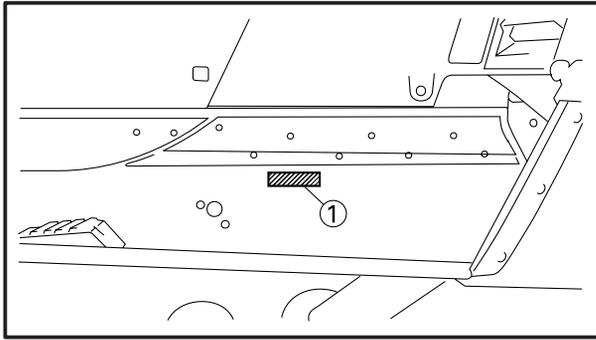
SWITCH INSPECTION	7-1
SWITCH INSPECTION	7-1
INSPECTING A SWITCH SHOWN IN THE MANUAL	7-1
IGNITION SYSTEM	7-2
CIRCUIT DIAGRAM	7-2
TROUBLESHOOTING	7-3
SPARK PLUG CAP	7-4
IGNITION COIL	7-4
SOURCE COIL/PULSER COIL	7-4
SPARK PLUG	7-5
THROTTLE OVERRIDE SYSTEM (T.O.R.S.)	7-5
HANDLEBAR SWITCH (RIGHT)	7-6
CARBURETOR SWITCH	7-6
MAIN SWITCH	7-7
LIGHTING SYSTEM	7-8
CIRCUIT DIAGRAM	7-8
TROUBLESHOOTING	7-9
BULB(S)	7-10
HEADLIGHT BEAM SWITCH	7-10
LIGHTING COIL	7-10
SIGNAL SYSTEM	7-11
CIRCUIT DIAGRAM	7-11
TROUBLESHOOTING	7-12
TROUBLESHOOTING	7-13
TAIL/BRAKE LIGHT BULB	7-14
BRAKE LIGHT SWITCH	7-14
GEAR POSITION SWITCH	7-14
BACK BUZZER	7-14
GRIP WARMER SYSTEM	7-15
CIRCUIT DIAGRAM	7-15
TROUBLESHOOTING	7-16
GRIP AND THUMB WARMER COIL	7-17
GRIP WARMER SWITCH	7-17
ELECTRICAL STARTING SYSTEM ...	7-18
CIRCUIT DIAGRAM	7-18
TROUBLESHOOTING	7-19
MAIN SWITCH	7-20
RECTIFIER	7-20

STARTER MOTOR	7-21
---------------------	------

CHARGING SYSTEM	7-24
CIRCUIT DIAGRAM	7-24
TROUBLESHOOTING	7-25
BATTERY	7-26
CHARGING COIL	7-26

CHAPTER 8. SPECIFICATIONS

GENERAL SPECIFICATIONS	8-1
MAINTENANCE SPECIFICATIONS	8-3
ENGINE	8-3
POWER TRAIN	8-6
CHASSIS	8-9
ELECTRICAL	8-10
HIGH ALTITUDE SETTINGS	8-12
TIGHTENING TORQUE	8-13
GENERAL TORQUE SPECIFICATIONS	8-15
DEFINITION OF UNITS	8-15
CABLE ROUTING	8-16



ESS00011

GENERAL INFORMATION

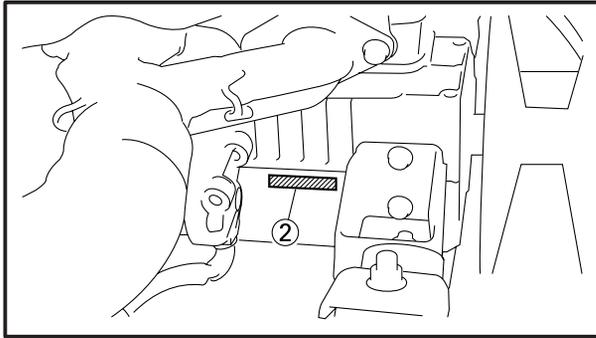
ESS00012

MACHINE IDENTIFICATION

ESS00013

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).



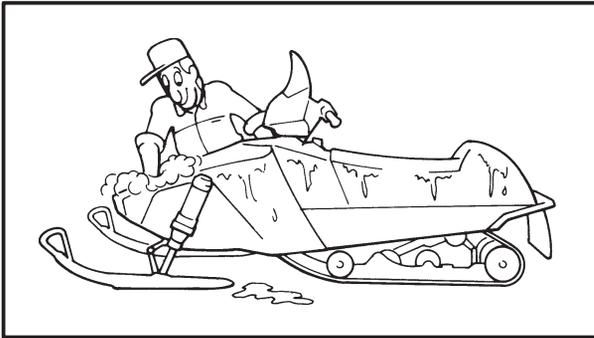
ESS00014

ENGINE SERIAL NUMBER

The engine serial number ② is located on the left hand side of the crankcase.

NOTE:

Designs and specifications are subject to change without notice.



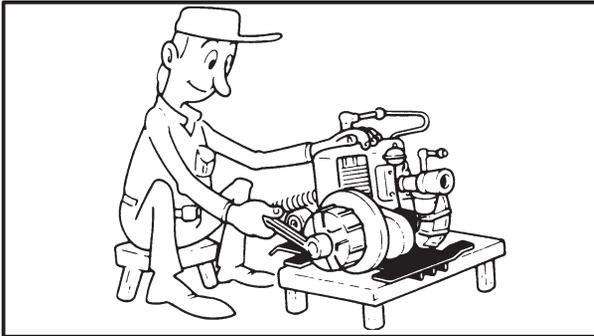
ESS00015

IMPORTANT INFORMATION

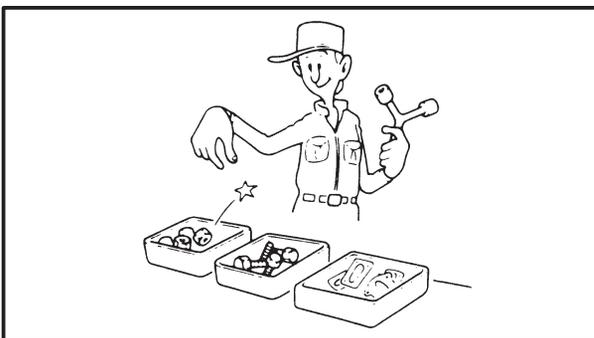
ESS00016

PREPARATION FOR REMOVAL AND DISASSEMBLY

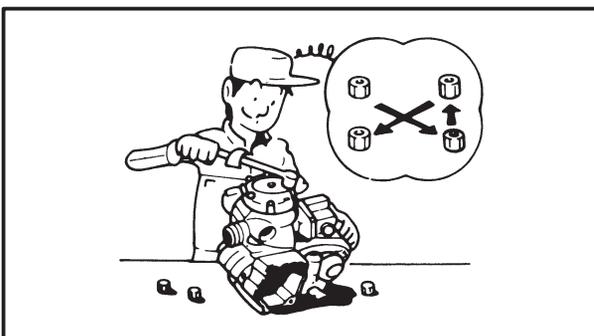
1. Remove all dirt, mud, dust, and foreign material before removal and disassembly. While cleaning, take care to protect the electrical parts, such as relays, switches, motor, resistors, controllers, etc., from high pressure water splashes.
2. Use proper tools and cleaning equipment. Refer to "SPECIAL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



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.

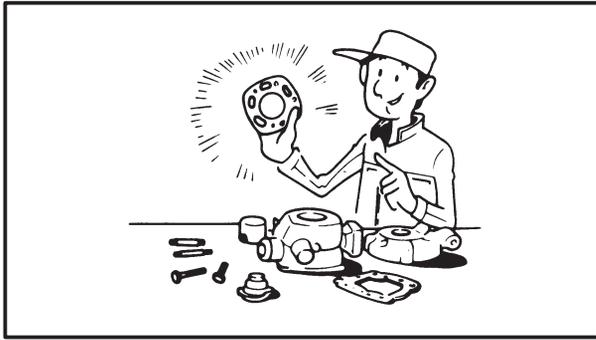


4. During disassembly of the machine, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help ensure that all parts are reinstalled correctly.
5. Keep all parts away from any source of fire.



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 crisscross pattern.

1



ESS00017

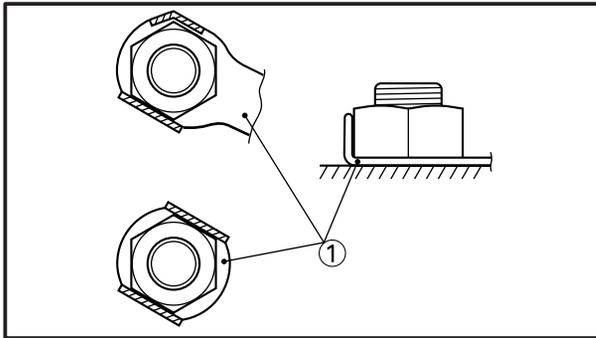
ALL REPLACEMENT PARTS

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

ESS00018

GASKETS, OIL SEALS, AND O-RINGS

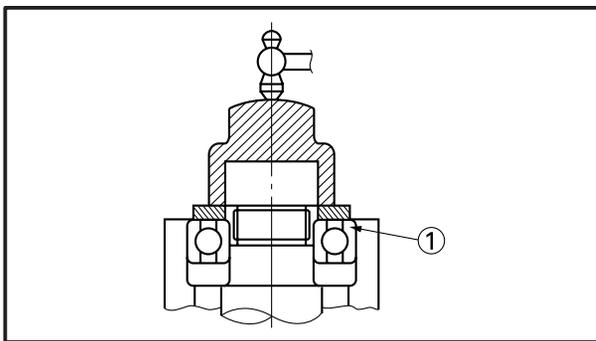
1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.



ESS00019

LOCK WASHERS/PLATES AND COTTER PINS

All lock washers/plates① 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.



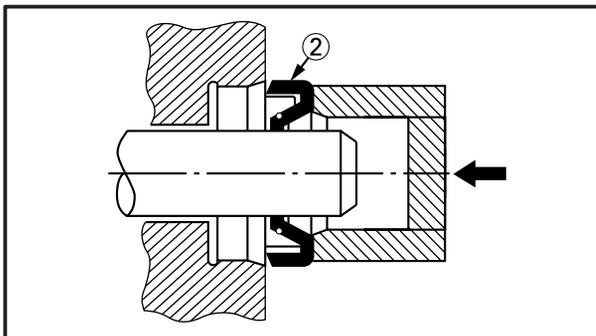
ESS00020

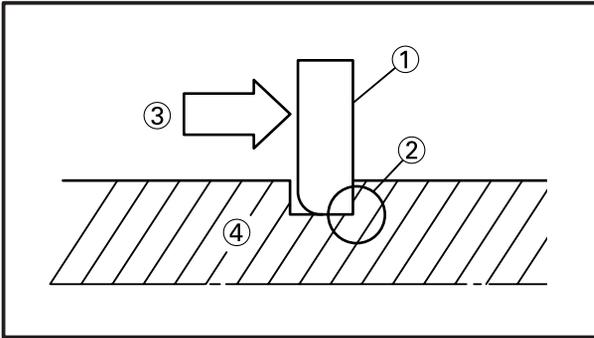
BEARINGS AND OIL SEALS

Install the bearings① and oil seals② 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 light-weight 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.





ESS00021

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

ESS00022

LOCTITE®

After installing fasteners that have LOCTITE® applied, wait 24 hours before using the machine.

This will give the LOCTITE® time to dry properly.

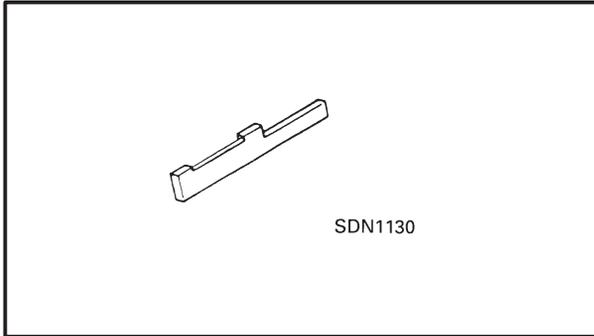
ESS00023

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.

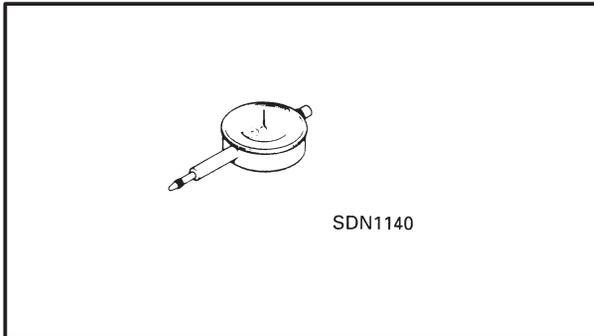


ESS00024

FOR TUNE UP

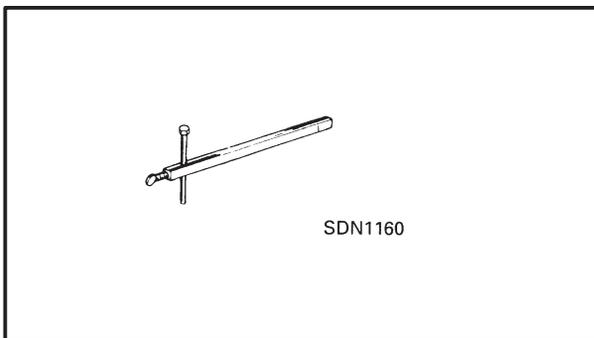
- Sheave gauge
P/N: YS-39506-5 (16 mm offset)

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



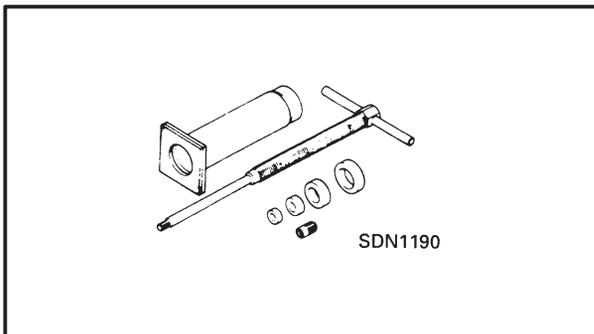
- Dial gauge
P/N: YU-03097 (for U.S.A./Canada)
90890-03097 (for Europe)

This gauge is used for run out measurement.



- Distance gauge
P/N: YS-91047-3 (for U.S.A./Canada)
90890-01702 (for Europe)

This gauge is used to measure the distance between the center of the primary sheave and the center of the secondary sheave.

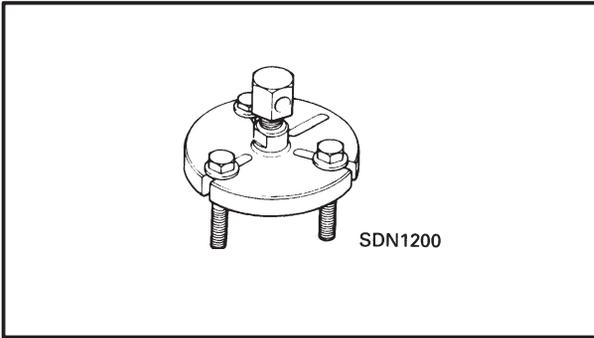


ESS00025

FOR ENGINE SERVICE

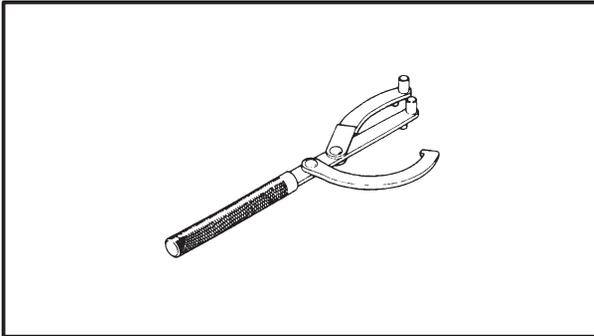
- Piston pin puller
P/N: YU-01304 (for U.S.A./Canada)
90890-01304 (for Europe)

This tool is used to remove the piston pin.



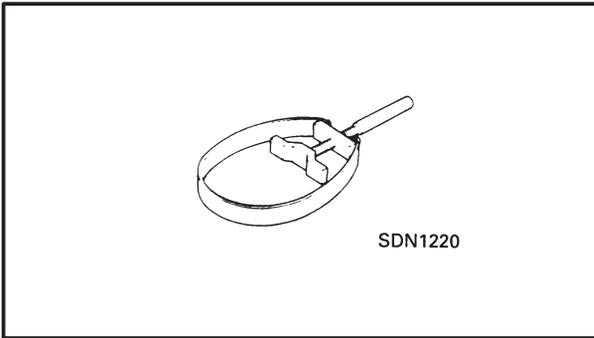
- Rotor holding puller
P/N: YU-33270 (for U.S.A./Canada)
90890-01362 (for Europe)

This tool is used to remove the magneto rotor.



- Rotor holding tool
P/N: YU-01235 (for U.S.A./Canada)
90890-01235 (for Europe)

This tool is used to remove the starter pulley.

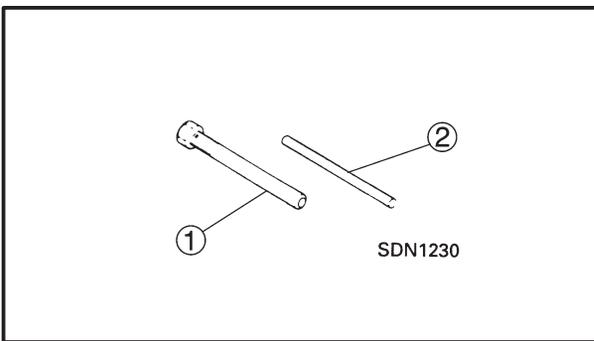


ESS00026

FOR POWER TRAIN SERVICE

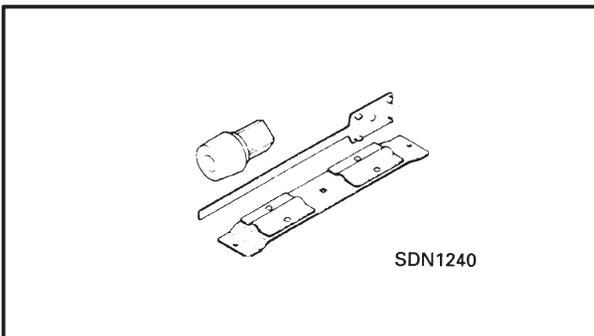
- Primary sheave holder
P/N: YS-01880 (for U.S.A./Canada)
90890-01701 (for Europe)

This tool is used to hold the primary sheave.



- Primary sheave puller
P/N: YS-01881-1 ①, YS-01882-1 ② (18 mm)

This tool is used for removing the primary sheave.

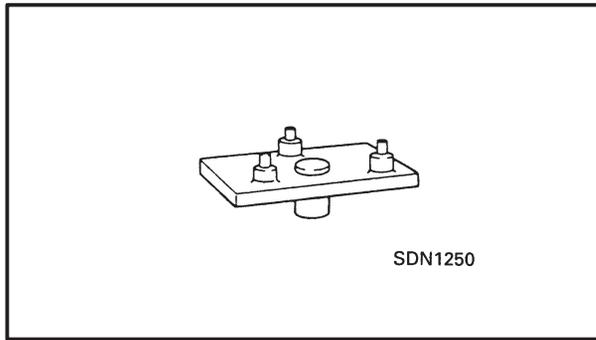


- Clutch spider separator
P/N: YS-28890-B (for U.S.A./Canada)
90890-01711 (for Europe)

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

SPECIAL TOOLS

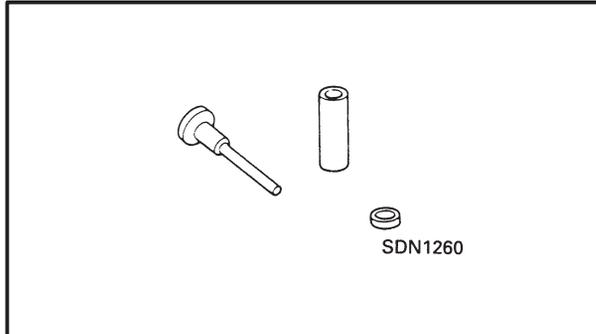
**GEN
INFO**



SDN1250

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

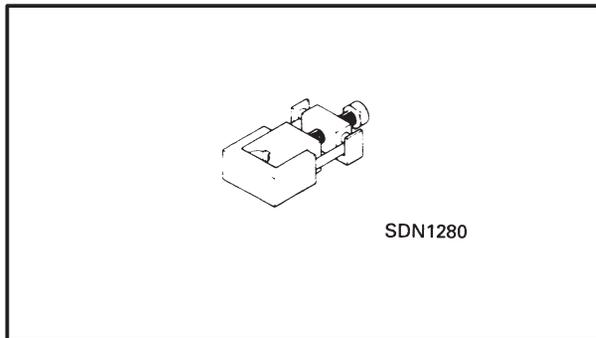
This tool is used when disassembling and assembling the primary sheave.



SDN1260

- YXR clutch bushing jig kit
P/N: YS-39752

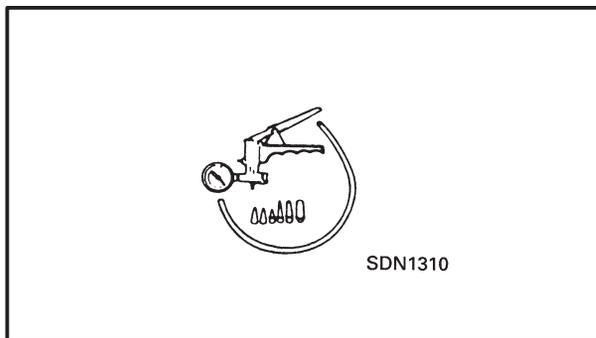
This tool is used for removal and installation of primary clutch weight and roller bushings.



SDN1280

- 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.



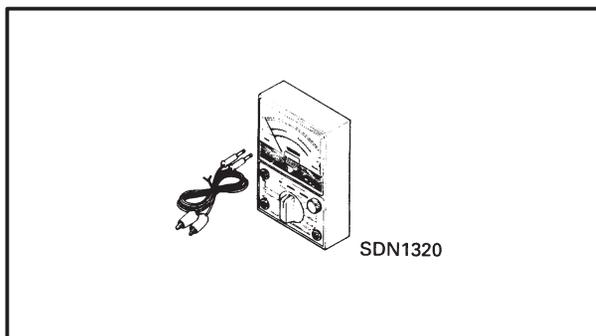
SDN1310

ESS00027

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.



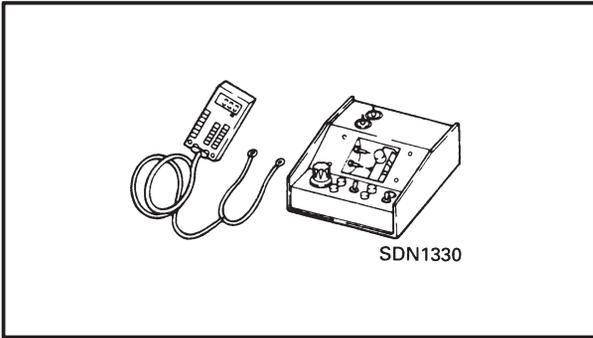
SDN1320

ESS00028

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.

ESS00029

PERIODIC INSPECTIONS AND ADJUSTMENTS

ESS00030

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.

ESS00031

PERIODIC MAINTENANCE TABLE

Item	Remarks	Pre-operation check (Daily)	Initial 1 month or 800 km (500 mi) (40 hr)	Every
				Seasonally or 3,200 km (2,000 mi) (160 hr)
Spark plug	Check condition adjust the gap and clean. Replace if necessary.			•
Engine oil	Check oil level.	•		
	Air bleed the oil pump if necessary.			•
Oil filter	Check condition. Replace if necessary.			•
Fuel	Check fuel level.	•		
Fuel filter	Check condition. Replace if necessary.			•
Fuel line	Check fuel hose for cracks or damage. Replace if necessary.			•
Oil line	Check oil hose for cracks or damage. Replace if necessary.			•
Carburetor	Check throttle lever operation.	•		
	Adjust the jets.	Whenever operating condition (elevation/temperature) is changed.		
Fan belt	Check wear and damage. Replace if necessary.			•
	Adjust fan belt if necessary.			•
Manual starter	Check operation and rope damage. Replace if necessary.	•		
Engine stop switch	Check operation. Repair if necessary.	•		
Throttle override system	Check operation. Repair if necessary.	•		
Throttle lever	Check operation. Repair if necessary.	•		
Exhaust system	Check for leakage. Retighten or replace gasket if necessary.			•
Decarbonization	More frequently if necessary.			•
Drive V-belt guard	Check cracks, bends or damage. Replace if necessary.	•		
Drive V-belt	Check wear and damage. Replace if necessary.	•		

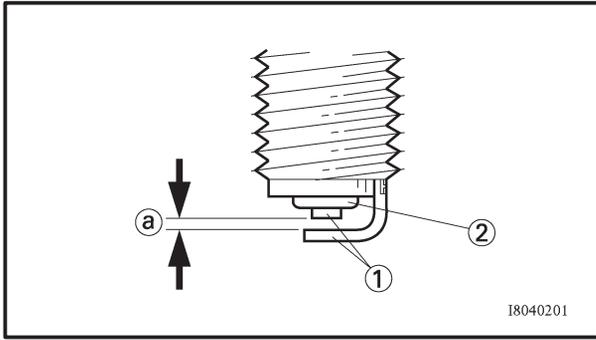
INTRODUCTION/PERIODIC MAINTENANCE TABLE



Item	Remarks	Pre-operation check (Daily)	Initial 1 month or 800 km (500 mi) (40 hr)	Every
				Seasonally or 3,200 km (2,000 mi) (160 hr)
Drive track/Idler wheels	Check deflection, wear and damage. Adjust/replace if necessary.	•		
Slide runners	Check wear and damage.	•		
	Replace if necessary.			•
Brake/ Parking brake	Check operation.	•		
	Adjust free play and/or replace pads if necessary.			•
Drive chain oil	Check oil level.		•	
	Replace.		**•	•
Drive chain	Check deflection. Adjust if necessary.	Initial at 480 km (300 Mi) and every 800 km (500 Mi) thereafter.		
Ski/ Ski runner	Check wear and damage.	•		
	Replace if necessary.			•
Steering system	Check operation.	•		
	Adjust toe-out if necessary.			•
Lights	Check operation. Replace bulbs if necessary.	•		
Battery	Check fluid level.	•		
	Check specific gravity and breather pipe operation. Charge/Correct if necessary.			•
Primary sheave	Check engagement and shift speed.			•
	Adjust if necessary.	Whenever operating elevation is changed.		
	Check wear and damage. Replace if necessary.			•
	Lubricate with specified grease.			•
Secondary sheave	Lubricate with specified grease.			•
	Adjust if necessary.	Whenever operating elevation is changed.		
Steering column bearing	Lubricate with specified grease.			•
Ski and front suspension	Lubricate with specified grease.			•
Suspension component	Lubricate with specified grease.			•
Brake cable end and lever end/Throttle cable end	Lubricate with specified grease.			•
	Check cable damage. Replace if necessary.			•
Shroud latches	Make sure the shroud latches are hooked.	•		
Fittings/Fasteners	Check tightness. Repair if necessary.	•		
Service tools/Spare parts	Check proper placement.	•		

** Apply "initial 1 month or 400 km (250 mi, 20 hr)"

2



ESS00032

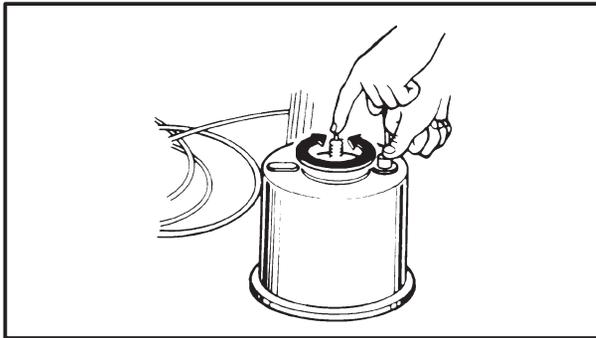
ENGINE

ESS00033

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 ③
 - Out of specification → Regap.
 - Use a wire thickness gauge.

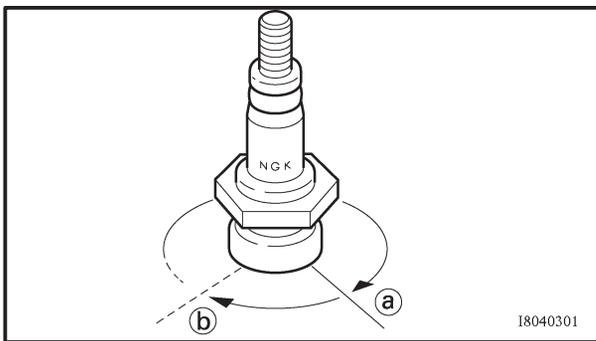
	<p>Spark plug gap ③: 0.7 ~ 0.8 mm (0.028 ~ 0.032 in)</p>
-----------------------------------------------------------------------------------	---------------------------------------------------------------------



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

**Standard spark plug:
BR9ES (NGK)**

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



4. Install:
 - Spark plugs

	<p>Spark plug: 20 Nm (2.0 m•kg, 14 ft•lb)</p>
-------------------------------------------------------------------------------------	----------------------------------------------------------

NOTE: _____

Finger-tighten ③ the spark plug before torquing ④ it to specification.



ESS00034

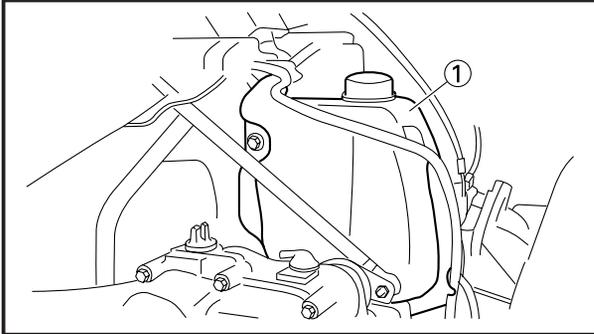
OIL PUMP

ESS00035

Air bleeding**CAUTION:**

The oil pump and oil delivery line must be bled in the following cases:

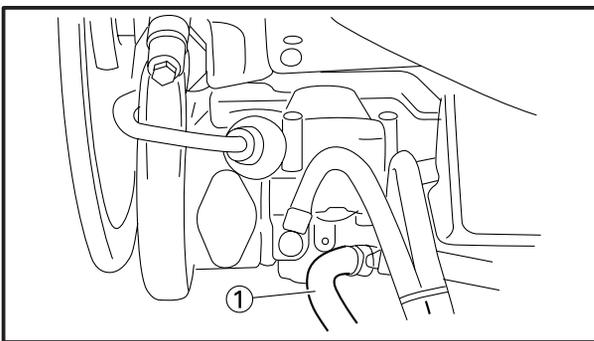
- Any portion of the oil system has been disconnected.
- The machine has been turned on its side.
- The oil tank has been run empty.
- As part of the pre-delivery service.



1. Fill:
 - Oil tank (1)

**Recommended oil:****YAMALUBE 2-cycle oil****Oil tank capacity:****2.5 L (2.2 Imp qt, 2.6 US qt)**

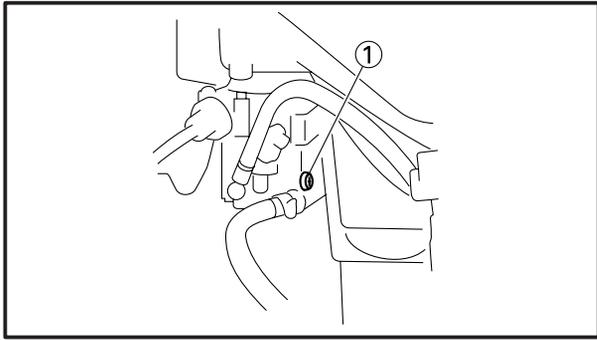
2. Remove:
 - Drive V-belt guard
 - Carburetors
 Refer to "CARBURETORS" in CHAPTER 6.
3. Place a rag under the oil pump assembly to soak up any spilled oil.



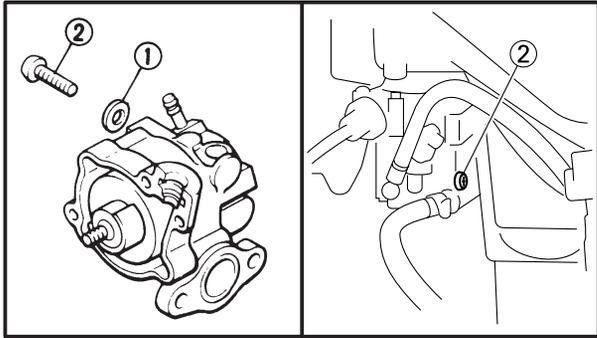
4. Disconnect:
 - Oil hose (1)
5. Drain the oil until no more air bubbles appear in the oil hose (1).
6. Connect:
 - Oil hose (1)



7. Disconnect:
 - Oil delivery hoses (1)
8. Feed the "YAMALUBE 2-cycle oil" into the oil delivery hose using an oil can (2) for complete air bleeding.
9. Connect:
 - Oil delivery hoses (1)



10. Remove:
 - Bleed bolt ①
 - Gasket (bleed bolt)
11. Drain the oil until no more air bubbles appear from the bleed hole.



12. Inspect:
 - Gasket ① (bleed bolt)
Damage/wear → Replace.
13. Install:
 - Gasket ① (bleed bolt)
 - Bleed bolt ②
14. Install:
 - Carburetors
Refer to “CARBURETORS” in CHAPTER 6.

ESS00036

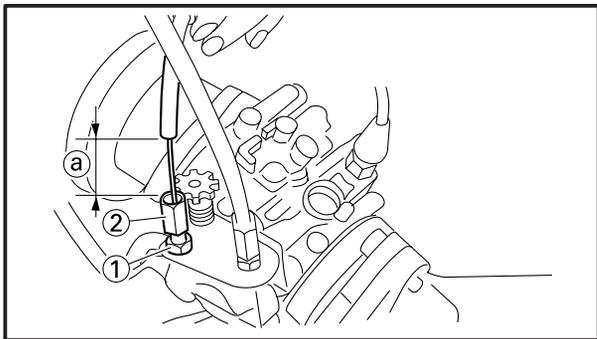
Cable adjustment

NOTE: _____

Before adjusting the oil pump cable, the throttle cable distance should be adjusted.

Adjustment steps:

- Pull back the adjuster cover.
- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified distance is obtained.

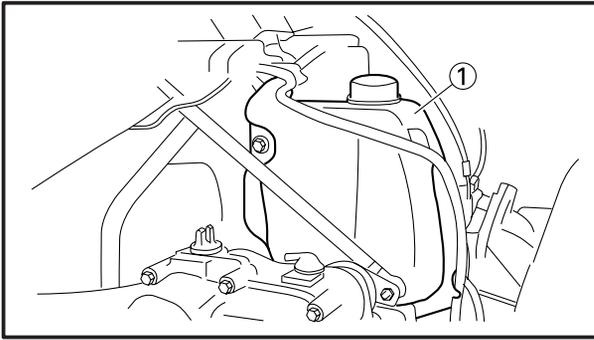


	Oil pump cable adjusting length (a): 24 ~ 26 mm (0.9 ~ 1.0 in)
--	--------------------------------------------------------------------------

Turning in → Length (a) is increased.

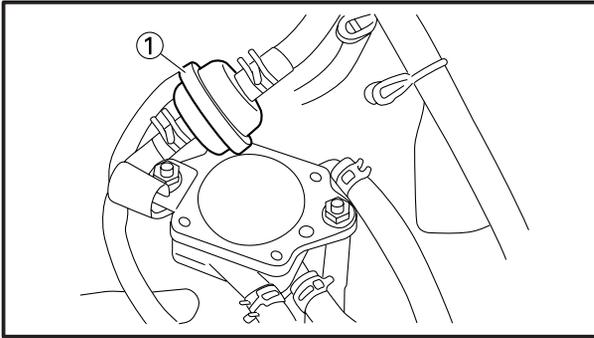
Turning out → Length (a) is decreased.

- Tighten the locknut ① and push in the adjuster cover.



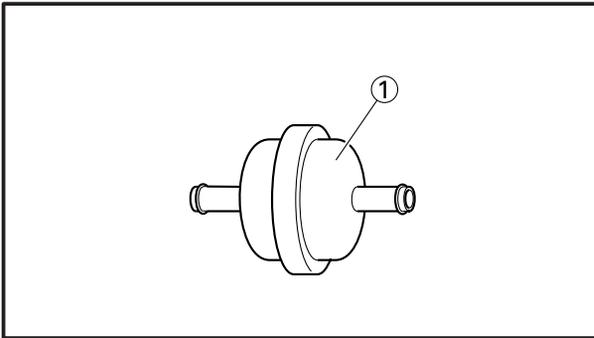
OIL FILTER INSPECTION

1. Remove:
 - Oil tank ①



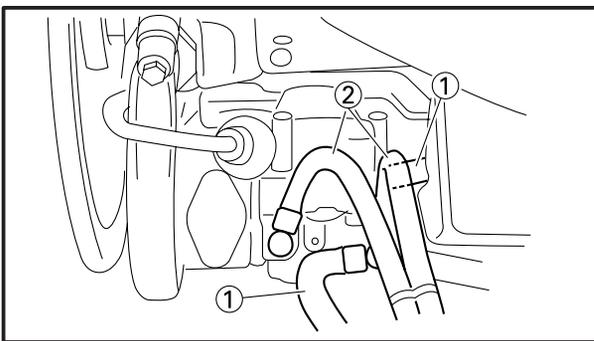
2. Remove:
 - Oil filter ①

NOTE: _____
Plug the oil hoses so that the oil will not run out of the oil tank and oil pump.



3. Inspect:
 - Oil filter ①
 - Contamination → Replace.

Recommended replacement interval:
Every season



ENGINE OIL LINE INSPECTION

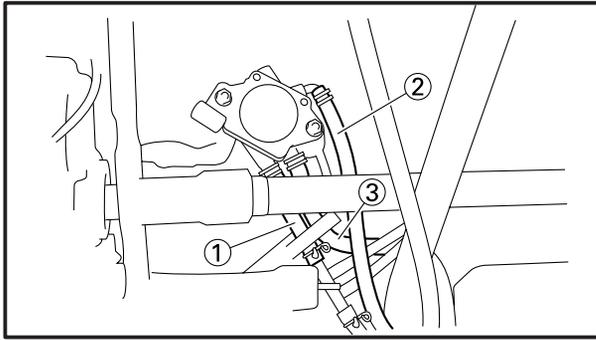
1. Inspect:
 - Oil hoses ①
 - Oil delivery hoses ②
 - Cracks/Damage → Replace.



ESS00037

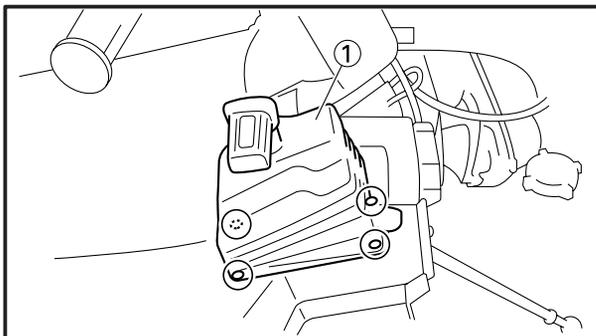
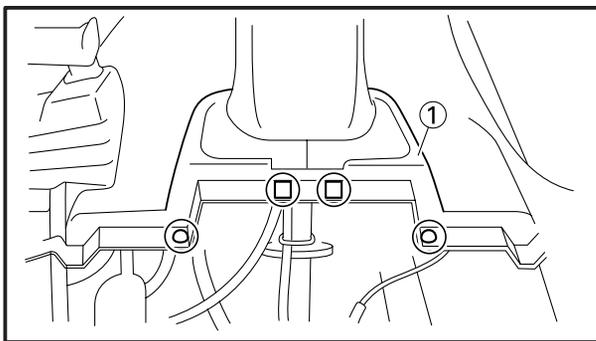
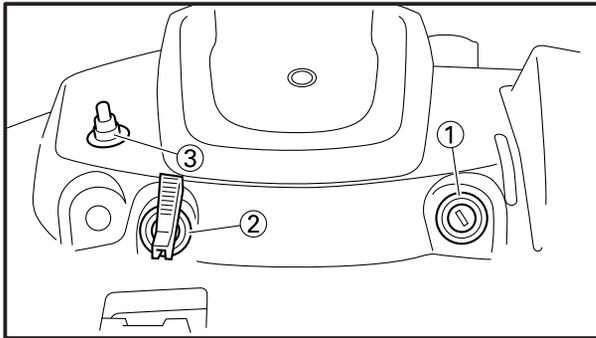
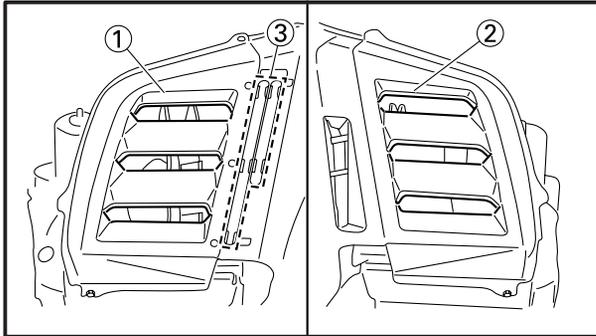
FUEL LINE INSPECTION

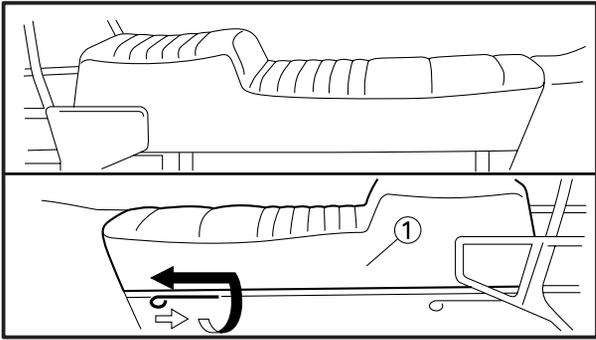
1. Inspect:
 - Fuel hose ①
 - Fuel delivery hoses ②
 - Vacuum hose ③Cracks/damage → Replace.



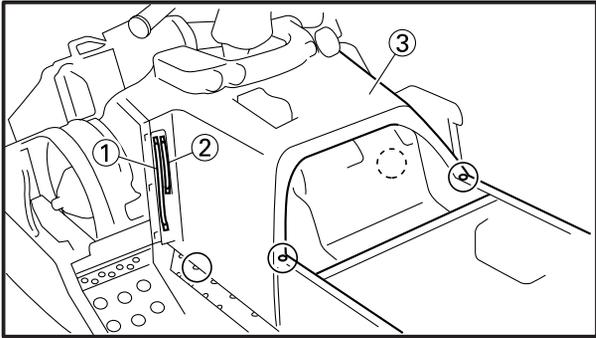
FUEL FILTER INSPECTION

1. Remove:
 - Side cover (left ① and right ②)
 - Plate ③
2. Remove:
 - Main switch holding nut ①
 - "STARTER" lever holding nut ②
 - Grip warmer switch holding nut ③
3. Remove:
 - Handlebar cover (lower) ①
4. Remove:
 - Drive select lever boot ①

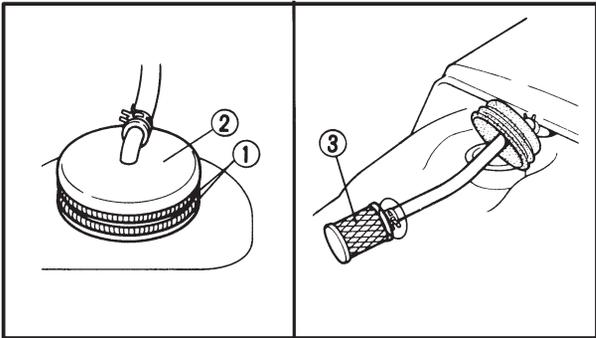




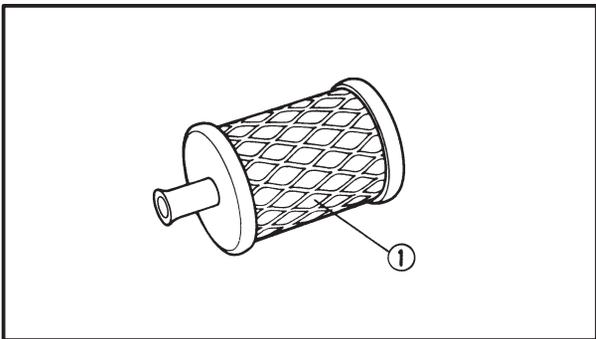
5. Remove:
- Seat ①



6. Remove:
- Fuel lever indicator hose ①
 - Oil level indicator hose ②
 - Center cover ③



7. Remove:
- Spring bands ①
 - Cap ②
 - Fuel filter ③

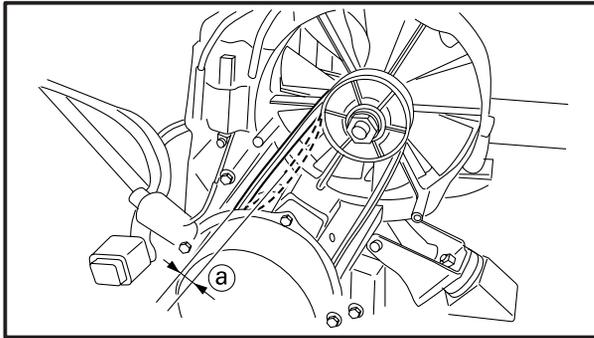


8. Inspect:
- Fuel filter ①
Contamination → Replace.

**Recommended replacement interval:
Every season**

COOLING FAN BELT TENSION ADJUSTMENT

**INSP
ADJ**



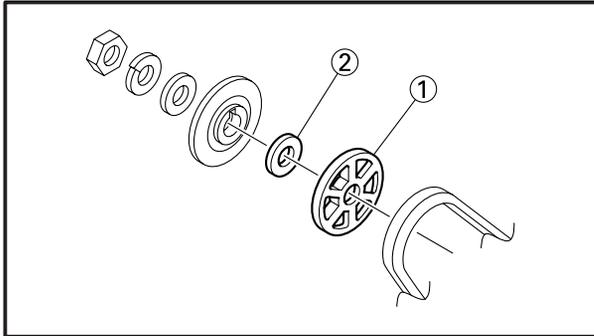
COOLING FAN BELT TENSION ADJUSTMENT

1. Adjust:

- Fan belt deflection (a)
Pushed at belt center by hand.
Out of specification → Adjust.



Fan belt deflection (a) :
8 mm (0.31 in)/
4 ~ 6 kg (8.8 ~ 13.2 lb)



2. Adjust:

- Fan belt deflection.

Adjustment steps:

- Remove the recoil starter assembly, drive pulley and fan belt.
- Remove the driven pulley (outer half) (1) and shim(s) (2).
- Adjust the drive belt tension by adding or removing a shim(s) (2).

NOTE:

Install the removed shim(s) on the outside of the driven pulley. Do not dispose of the removed shim(s).

Adding shim → Belt tension decreases.
Removing shim → Belt tension increases.

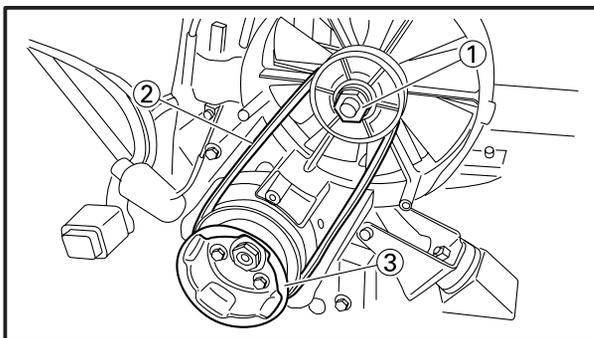
Shim size	
Part number	Thickness
90214-17017	0.5 mm (0.02 in)
90214-17018	1.0 mm (0.04 in)

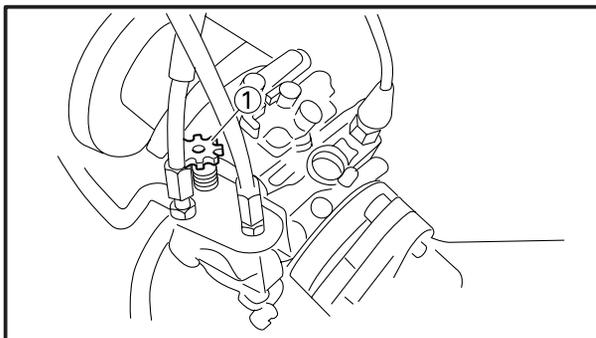
- Tighten the driven pulley nut (1).



Driven pulley nut (1) :
43 Nm (4.3 m•kg, 31 ft•lb)

- Install the fan belt (2) and drive pulley (3).





ESS00044

ENGINE IDLE SPEED ADJUSTMENT

1. Adjust:

- Engine idle speed

Adjustment steps:

- Start the engine and let it warm up.
- 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.



Engine idle speed:
1,200 ± 100 r/min

NOTE:

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

ESS00046

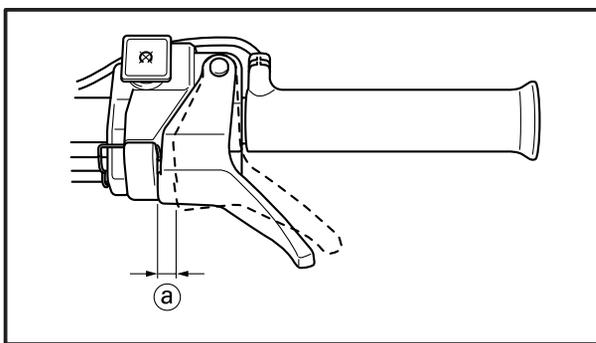
THROTTLE CABLE FREEPLAY ADJUSTMENT

NOTE:

Before adjusting the throttle cable freeplay, the engine idle speed should be adjusted.

1. Measure:

- Throttle cable freeplay ①
- Out of specification → Adjust.



Throttle cable freeplay ①:
1.0 ~ 2.0 mm (0.04 ~ 0.08 in)

2. Adjust:

- Throttle cable freeplay

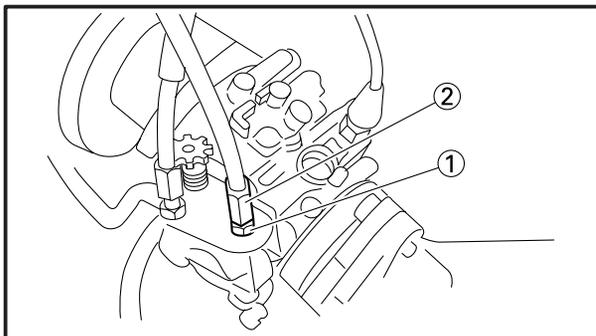
Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified freeplay is obtained.

Turning in → Freeplay is increased.

Turning out → Freeplay is decreased.

- Tighten the locknut ①.



Lock nut ①:
0.8 Nm (0.08 m•kg, 0.58 ft•lb)

NOTE:

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

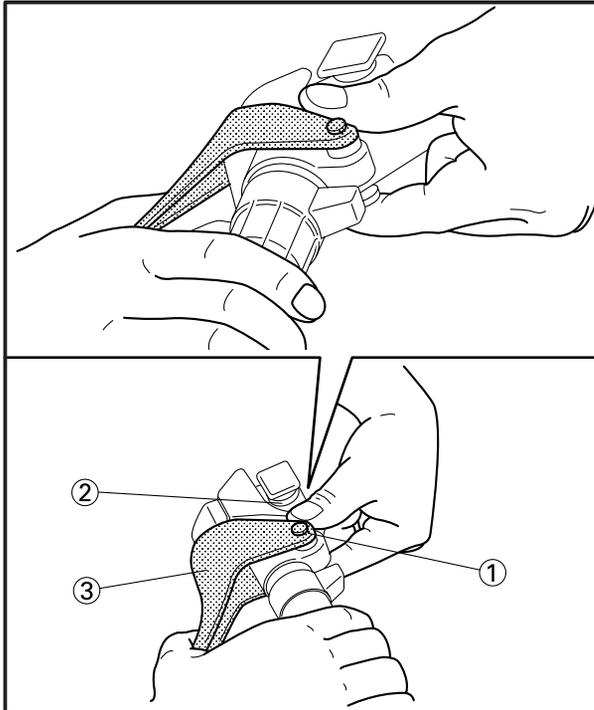
ESS00048

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.



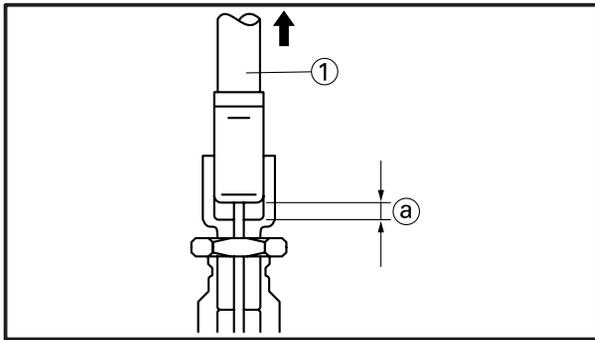
1. Start the engine.
2. Hold the pivot point of the throttle lever away from the throttle switch by putting your thumb (above) and forefinger (below) between the throttle lever pivot ① and stop switch housing ②.

While holding as described above, press the throttle lever ③ gradually.

The engine should stop immediately.

⚠ WARNING

If the engine does not stop, stop the engine by turning the main switch to the "OFF" position and check the electrical system.



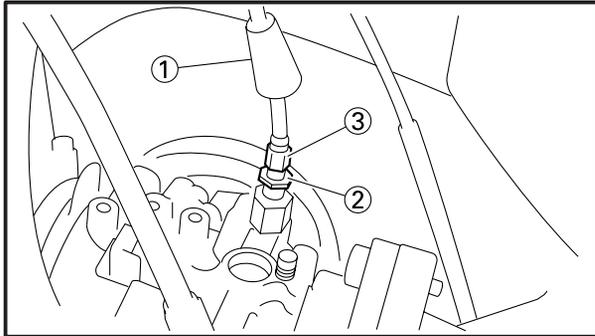
ESS00050

STARTER (CHOKE) CABLE FREEPLAY ADJUSTMENT

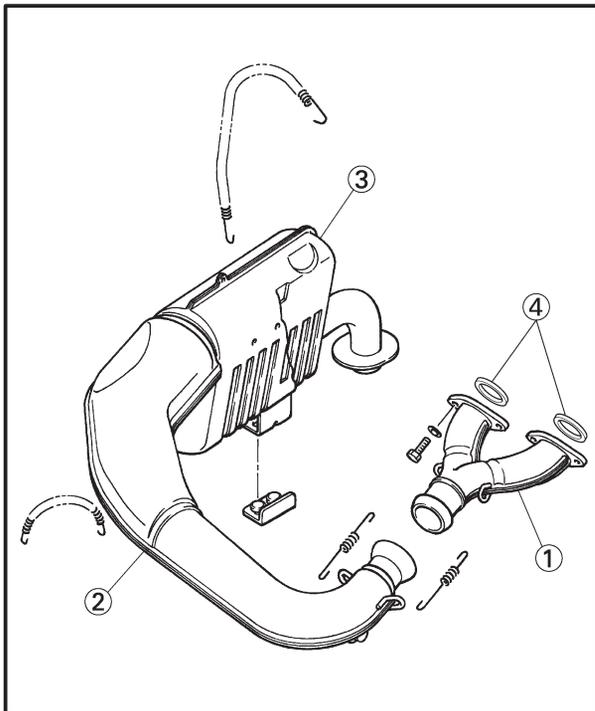
1. Pull back the starter cable outer tube (1).
2. Measure:
 - Starter cable freeplay (a)
 - Out of specification → Adjust.



Starter cable freeplay (a):
0.5 ~ 1.5 mm (0.02 ~ 0.06 in)



3. Adjust:
 - Starter cable freeplay
- Adjustment steps:**
- Pull back the adjuster cover (1).
 - Loosen the locknut (2).
 - Turn the adjuster (3) in or out until the specified freeplay is obtained.
- Turning in → Freeplay is increased.**
Turning out → Freeplay is decreased.
- Tighten the locknut and push in the adjuster cover.



ESS00053

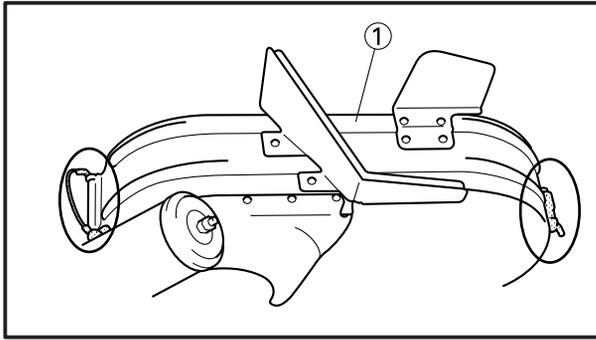
EXHAUST SYSTEM INSPECTION

1. Remove:
 - Springs
 - Refer to “EXHAUST ASSEMBLY” in CHAPTER 5.
2. Inspect:
 - Exhaust joint (1)
 - Exhaust pipe (2)
 - Exhaust silencer (3)
 - Cracks/damage → Replace.
 - Exhaust gaskets (4)
 - Exhaust gas leaks → Replace.
3. Check:
 - Tightening torque



Bolt (exhaust pipe joint):
30 Nm (3.0 m•kg, 22 ft•lb)

4. Install:
 - Springs
 - Refer to “EXHAUST ASSEMBLY” in CHAPTER 5.



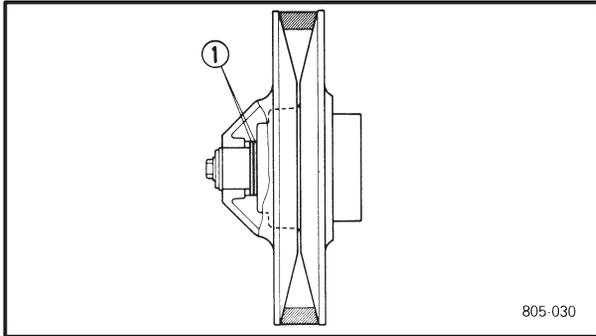
ESS00054

POWER TRAIN

ESS00055

DRIVE V-BELT

1. Remove:
- Drive V-belt guard ①



805-030

⚠ WARNING

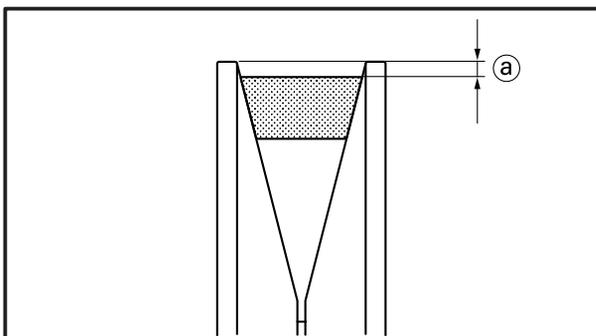
- Be sure there are shims (2 pcs) ① between secondary fixed and sliding sheaves when installing the NEW belt.
- If there is no gap, the clutch engagement speed will be reduced. The machine may move unexpectedly when the engine is started.
- The spacer of the secondary sheave should be adjusted.

CAUTION:

To ensure proper clutch performance, the spacers in the secondary clutch must be re-positioned as the V-belt wears.



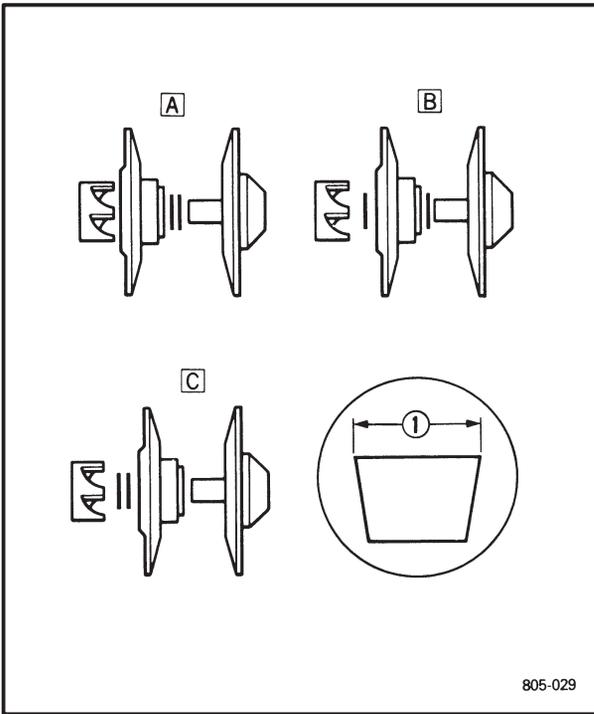
New belt width:
35.0 mm (1.38 in)
Belt wear limit width:
32.0 mm (1.26 in)



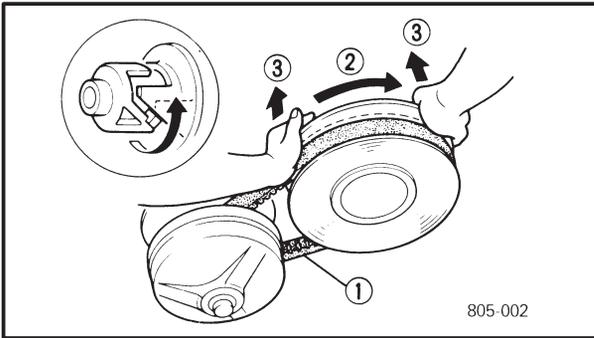
2. Measure:
- V-belt height ②
- Out of specification → Adjust.



Standard V-belt height
(Below sheave surface) ②:
0 ~ 2 mm (0 ~ 0.08 in)



	V-belt width ①	Number of spacers
A	35 mm (1.38 in) or more	2 spacers
B	34 mm (1.34 in)	1 spacer
C	33 mm (1.30 in)	No spacer
	32 mm (1.26 in) or less	Replace the V-belt

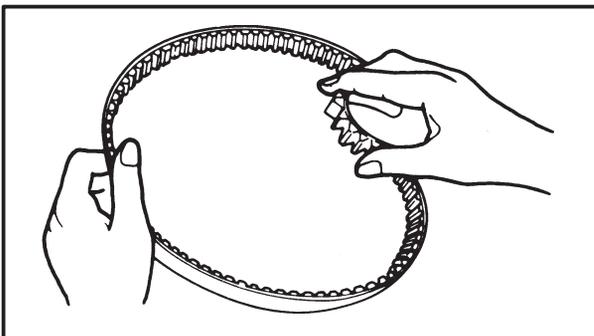
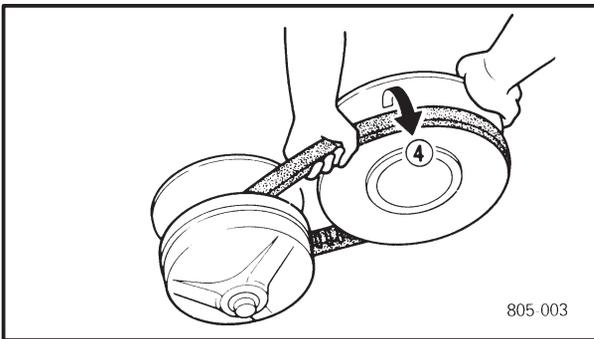


3. Remove:

- Drive V-belt ①

Removal steps:

- Rotate the secondary sliding sheave clockwise ② and push it ③ so that it separates from the fixed sheave.
- Pull ④ the belt up over the secondary fixed sheave.
- Remove the belt from the secondary sheave and primary sheave.

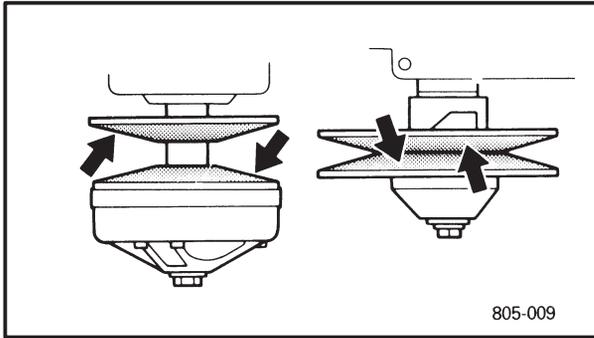


4. Inspect:

- Drive V-belt
Crack/Wear/Damage → Replace.
Oil or grease adhered to the V-belt → Check the primary and secondary sheaves.

DRIVE V-BELT

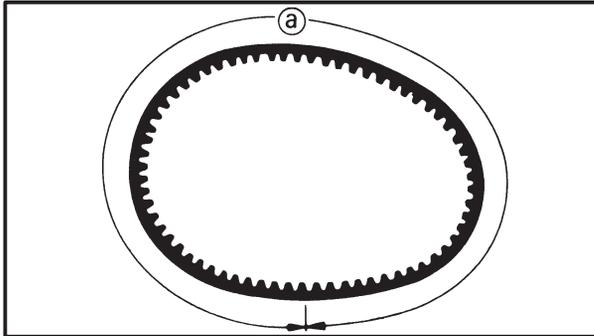
INSP
ADJ



5. Inspect:

- Primary sheave
- Secondary sheave

Oil or grease adhered to the primary and secondary sheaves → Remove the oil or grease using a rag soaked in lacquer thinner or solvent. Check the primary and secondary sheaves.

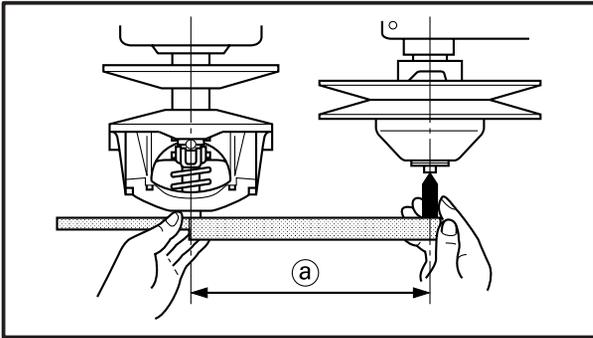


6. Measure:

- Drive V-belt length (a)
Out of specification → Replace.



Drive V-belt length (a):
1,118 ~ 1,128 mm
(44.0 ~ 44.4 in)



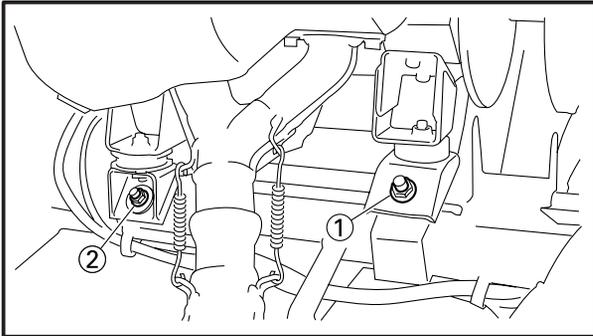
ESS00055

SHEAVE DISTANCE AND OFFSET ADJUSTMENT

- Measure:
 - Sheave distance (a)
 Use the sheave gauge.
 Out of specification → Adjust.

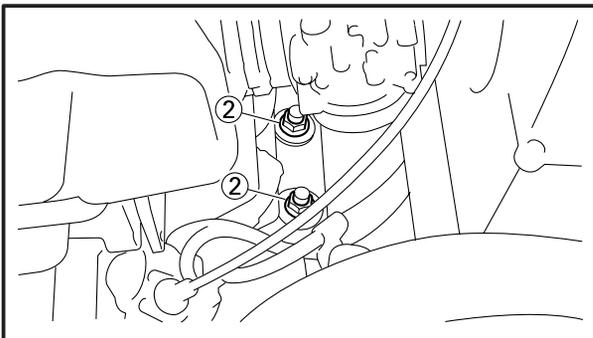


Sheave distance (a):
267 ~ 270 mm (10.5 ~ 10.6 in)

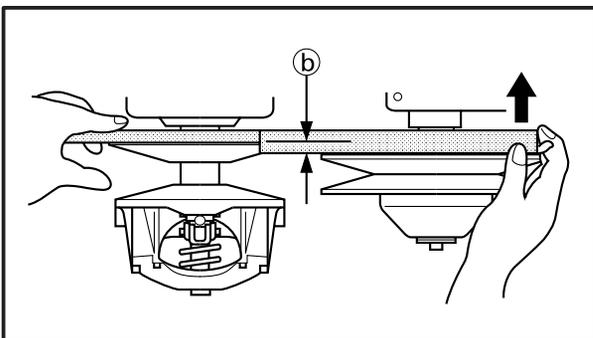


Sheave gauge:
90890-01702, YS-91047-3

- Adjust:
 - Sheave distance**Adjustment steps:**
 - Loosen the engine mounting bolts.
 - Adjust the position of the engine so that the sheave distance is within the specification.
 - Tighten the engine mounting bolts.



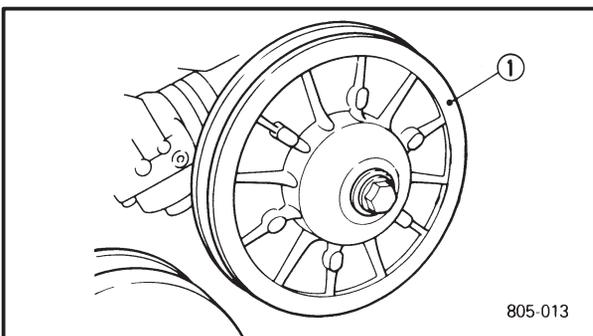
Mounting bolt (front) (1):
103 Nm (10.3 m•kg, 74 ft•lb)
Mounting bolt (front) (rear) (2):
53 Nm (5.3 m•kg, 38 ft•lb)



- Measure:
 - Sheave offset (b)
 Use the sheave gauge.
 Out of specification → Adjust.



Sheave offset (b):
14.5 ~ 17.5 mm (0.57 ~ 0.69 in)



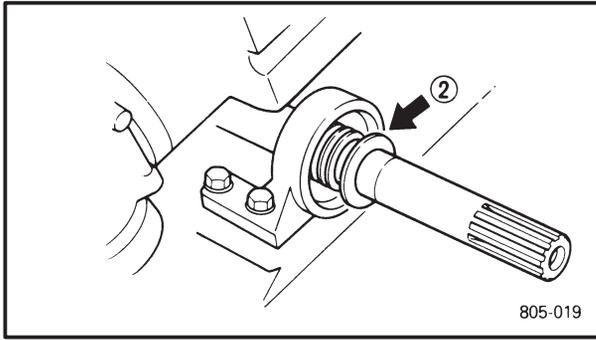
Sheave gauge:
90890-01702, YS-39506-5

- Adjust:
 - Sheave offset**Adjustment steps:**
 - Apply the brake to lock the secondary sheave.
 - Remove the bolt (secondary sheave) and secondary sheave (1).
 - Adjust the sheave offset by adding or removing shim(s) (2).**Adding shim → Offset is increased.**
Removing shim → Offset is decreased.

805-013

SHEAVE DISTANCE AND OFFSET ADJUSTMENT

**INSP
ADJ**



Shim size	
Part Number	Thickness
90201-252F1	0.5 mm (0.02 in)
90201-25527	1.0 mm (0.04 in)
90201-25526	2.0 mm (0.08 in)

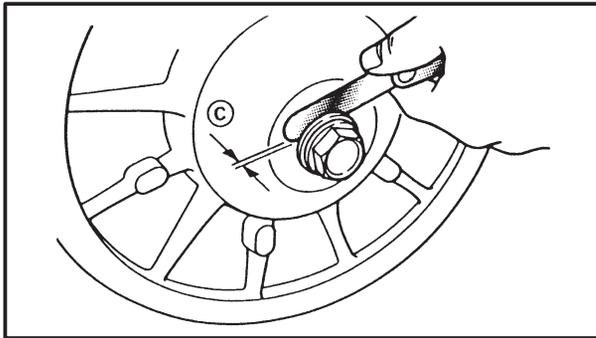
- Install the secondary sheave and bolt (secondary sheave).

	Bolt (secondary sheave): 60 Nm (6.0 m•kg, 43 ft•lb)
-----------------------------------------------------------------------------------	----------------------------------------------------------------

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

NOTE:

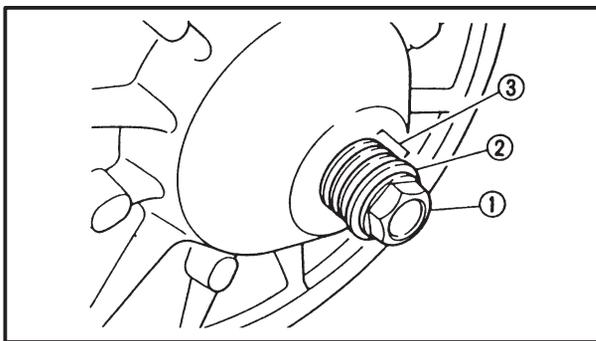
When adjusting the sheave offset, the secondary sheave free play (clearance) should be adjusted.



5. Measure:

- Secondary sheave freeplay (clearance) ©
Use a feeler gauge.
Out of specification → Adjust.

	Secondary sheave freeplay (clearance) ©: 1.5 ~ 2.0 mm (0.06 ~ 0.08 in)
-------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------



6. 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
90201-252F1	0.5 mm (0.02 in)
90201-25527	1.0 mm (0.04 in)
90201-25526	2.0 mm (0.08 in)

ESS00057

ENGAGEMENT SPEED CHECK

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

Checking steps:

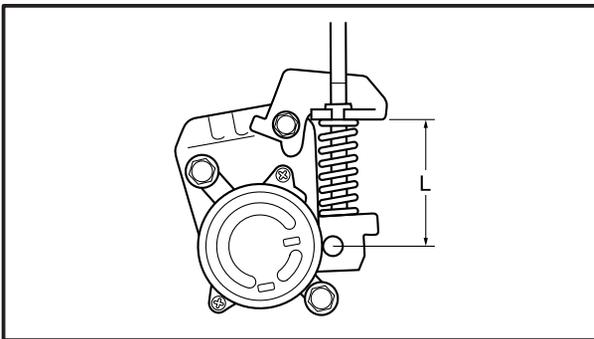
- Start the engine, and open the throttle lever gradually.
 - Check the engine speed when the machine starts moving forward.
- Out of specification → Adjust the primary sheave.

	<p>Engagement speed: 2,600 ± 200 r/min</p>
-----------------------------------------------------------------------------------	-------------------------------------------------------

ESS00060

ADJUSTING THE BRAKE

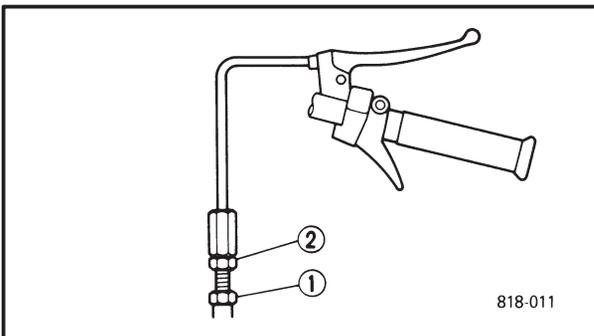
NOTE: _____
Adjust brake every 40 hours of operation, or whenever the brake lever becomes loose during operation.



1. Measure:
 - Distance “L”

Out of specification → Adjust.

	<p>Distance “L” 54 ± 1 mm (2.13 ± 0.04 in)</p>
-------------------------------------------------------------------------------------	-----------------------------------------------------------



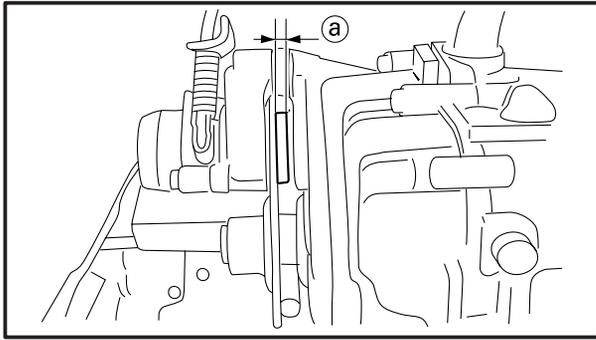
2. Adjust
 - Distance “L”

Adjustment steps:

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

Turning in → Distance “L” is increased.
Turning out → Distance “L” is decreased.

 - Tighten the locknut ①.



ESS00062

BRAKE PAD INSPECTION

1. Apply the brake lever.
2. Inspect:
 - Brake pad thickness (a)
 Out of specification → Replace brake pad as a set.



Wear limit (a):
10 mm (0.39 in)

ESS00065

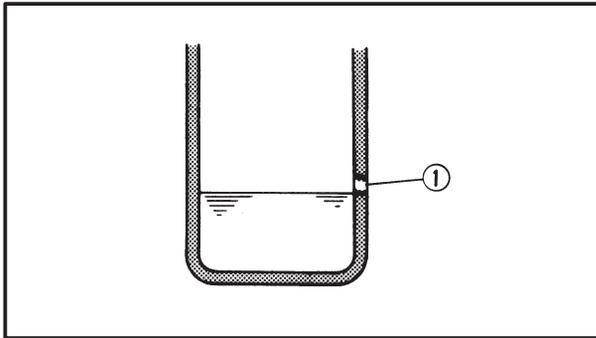
DRIVE CHAIN

ESS00066

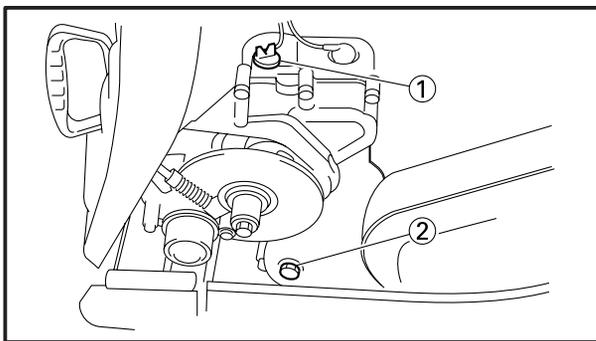
Oil level inspection

⚠ 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. Remove:
 - Muffler
3. Place a rag under the checking hole (1) (oil level).

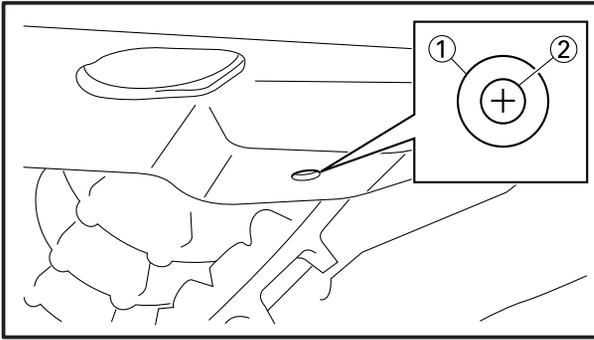


4. Remove:
 - Filler cap (1)
 - Checking screw (2)
 - Gasket (checking screw)
5. Inspect:
 - Oil level (drive chain housing)
 Oil flows out → Oil level is correct.
 Oil does not flow out → Oil level is low.
 Add oil until oil flows out.



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

6. Inspect:
 - Gasket (checking screw)
 Damage → Replace.



ESS00067

Oil replacement

Oil replacement steps:

- Place the oil pan under the drain hole ①.
- Remove the oil drain bolt ② and drain the oil.

CAUTION: _____

Be sure to remove any oil from the heat protector.

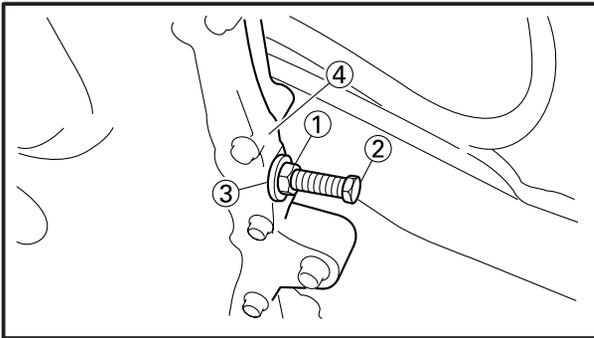
- Install the oil drain bolt ②.



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



Recommended oil:
Gear oil API GL-3 SAE
#75 or #80
Oil capacity:
0.35 L (12.3 Imp oz, 11.8 US oz)



ESS00068

Chain slack adjustment

1. Adjust:

- Drive chain slack

Adjustment steps:

- Loosen the locknut ①.
- Shift the shift lever to the “FORWARD” position.
- Turn the secondary sheave one turn counter-clockwise.
- Slide the seal washer ③ from the case surface ④.
- Turn in the adjusting bolt ②, until it lightly the contacts tensioner, then turn in the adjusting bolt ② 1/2 to 2/3 turn more.
- Tighten the locknut ①.

ESS00069

TRACK TENSION ADJUSTMENT

⚠ WARNING

A broken track or track fittings, and debris thrown by the track could be dangerous to an operator or bystanders. 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.

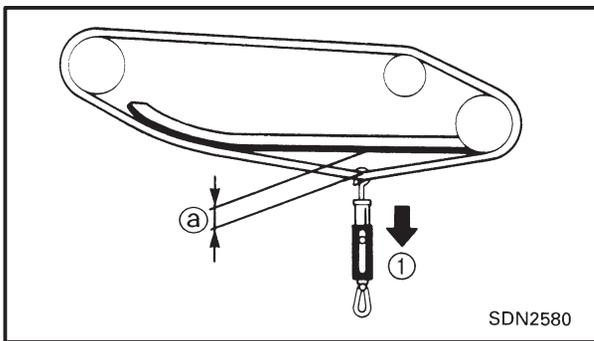
Replace the track if it is damaged to a level where the fabric reinforcement material is visible.

- Never install studs (cleats) closer than 76 mm (3 in) to the edge of the track.

1. Place the machine with the right side facing down.

CAUTION:

If the machine is left on its left side for more than 80 minutes, the fuel may leak out from the fuel breather hose.



2. Measure:

- Track deflection (a)

Using a spring scale (1), pull down on the center of the track with 10 kg (22 lb) of force. Out of specification → Adjust.

	Track deflection (a): 35 ~ 45 mm (1.4 ~ 1.8 in)
-------------------------------------------------------------------------------------	-----------------------------------------------------------

3. Adjust:

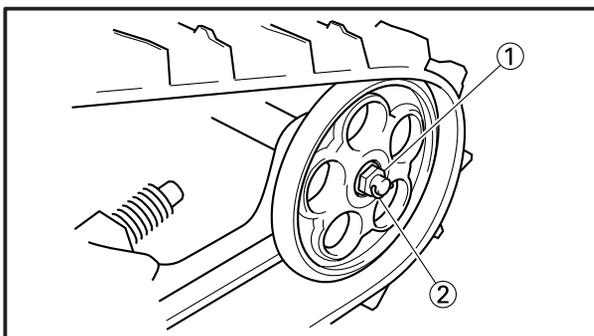
- Track deflection

Adjustment steps:

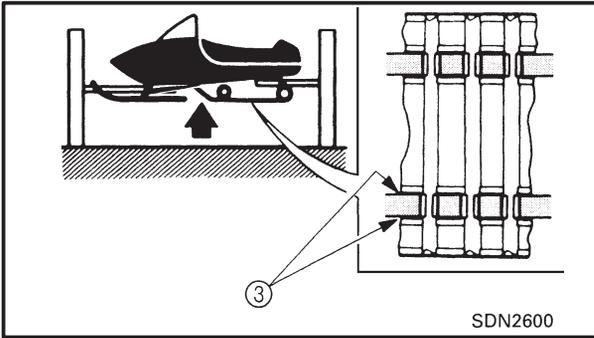
- Place the machine onto a suitable stand to raise the track off of the ground.
- Loosen the rear axle nut (1).

NOTE:

It is not necessary to remove the cotter pin (2).

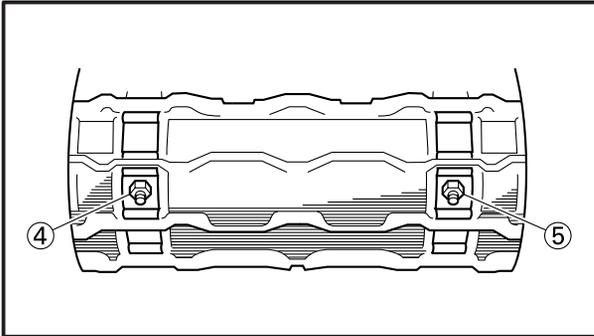


TRACK TENSION ADJUSTMENT/ SLIDE RUNNER INSPECTION



- Start the engine and rotate the track once or twice. Stop the engine.
- Check the track alignment with the slide runner ③.
If the alignment is incorrect, turn the left and right adjusters to adjust.

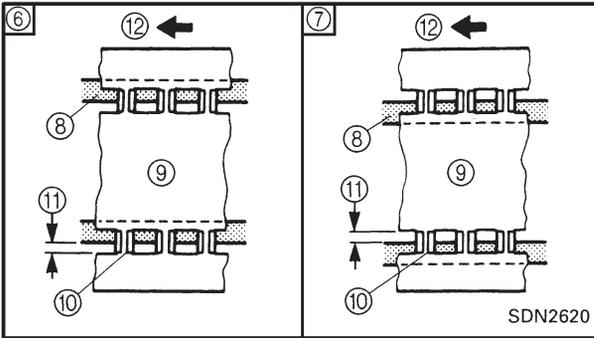
Track alignment	⑥ Shifted to right	⑦ Shifted to left
④ Left adjuster	Turn out	Turn in
⑤ Right adjuster	Turn in	Turn out



- ⑧ Slide runner ⑨ Track
⑩ Track metal ⑪ Gap ⑫ Forward

- 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

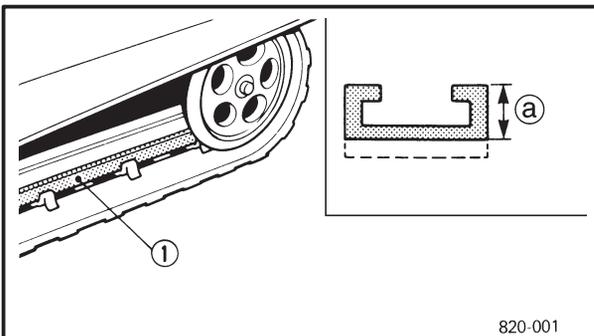


CAUTION:

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):
80 Nm (8.0 m•kg, 58 ft•lb)

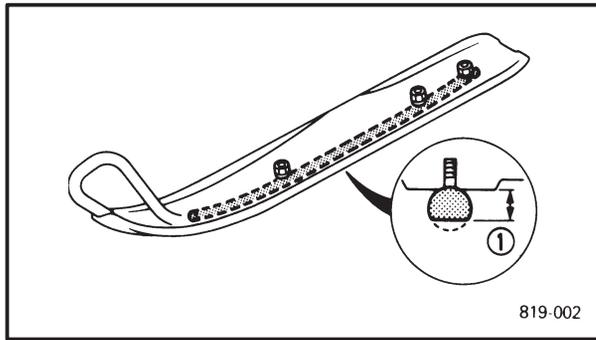


ESS00070

SLIDE RUNNER INSPECTION

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

Slide runner wear limit ②:
10 mm (0.39 in)



819-002

ESS00071

CHASSIS

ESS00072

SKI/SKI RUNNER

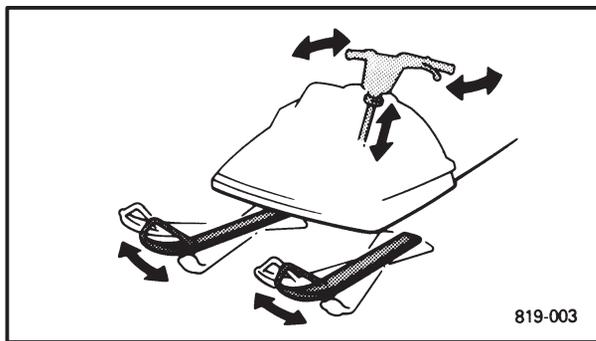
1. Check:

- Ski
- Ski runner

Wear/Damage → Replace.



Ski runner wear limit ①:
4.5 mm (0.18 in)



819-003

ESS00073

STEERING SYSTEM

ESS00074

Freeplay check

1. Check:

- Steering system freeplay

Move the handlebar up and down and back and forth.

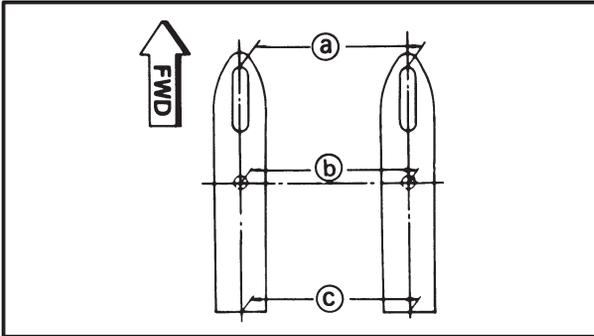
Turn the handlebar slightly to the right and left.

Excessive freeplay → Check that the handlebar, tie rod ends and relay rod ends are installed securely in position. If freeplay still exists, check the steering bearing, front suspension links and ski mounting area for wear. Replace if necessary.

ESS00075

Toe-out adjustment

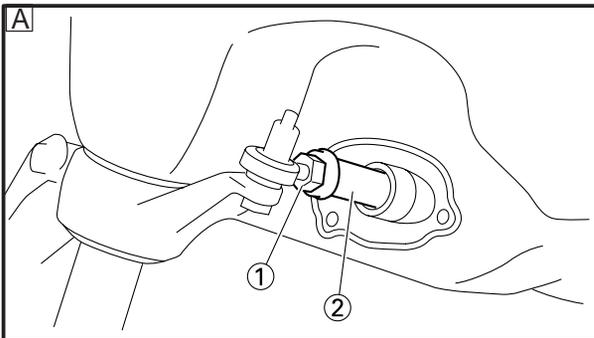
1. Place the machine on a level surface.



2. Check:
- Ski toe-out
Point the skis forward.
Out of specification → Adjust.



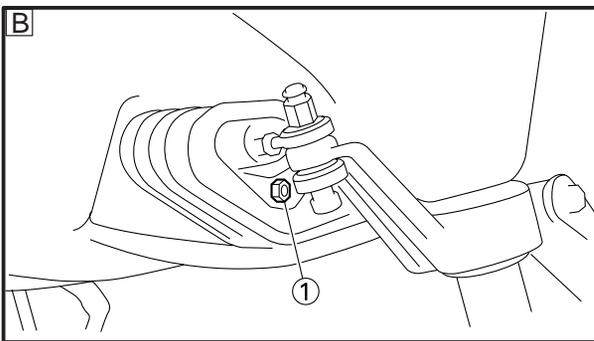
Ski toe-out (a - c):
 0 ~ 15 mm (0 ~ 0.59 in)
Ski stance (b) (center to center):
 960 mm (37.8 in)



3. Adjust:
- Ski toe-out
- Adjustment steps:**
- Loosen the locknuts (tie-rod) ①.
 - Turn the tie-rod 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®

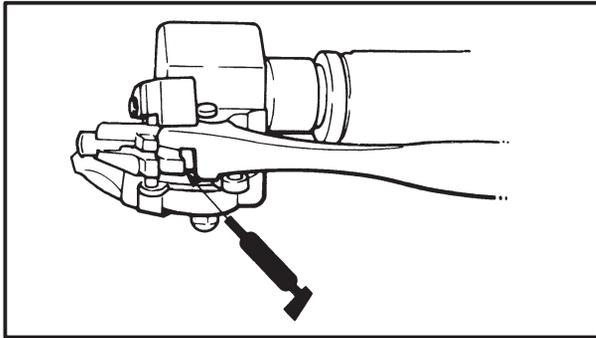


CAUTION:

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

A Left side

B Right side



ESS00076

LUBRICATION

ESS00077

Brake lever, throttle lever and throttle cable end

1. Lubricate the brake lever pivot, throttle lever and the ends of the throttle cable and brake cable.

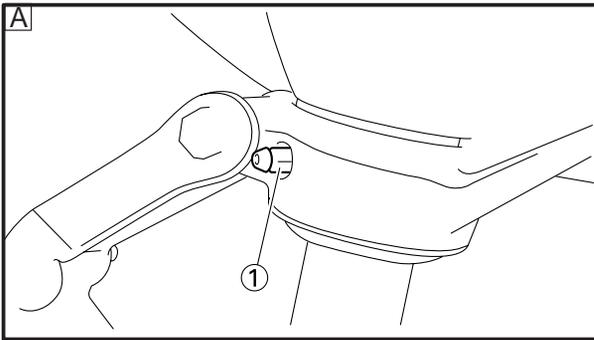
	Recommended lubricant: Esso Beacon 325 Grease
-----------------------------------------------------------------------------------	----------------------------------------------------------------

⚠ WARNING

Apply a dab of grease onto only the end of the cable.

Do not grease the throttle cables.

They could freeze and cause a loss of control.



ESS00078

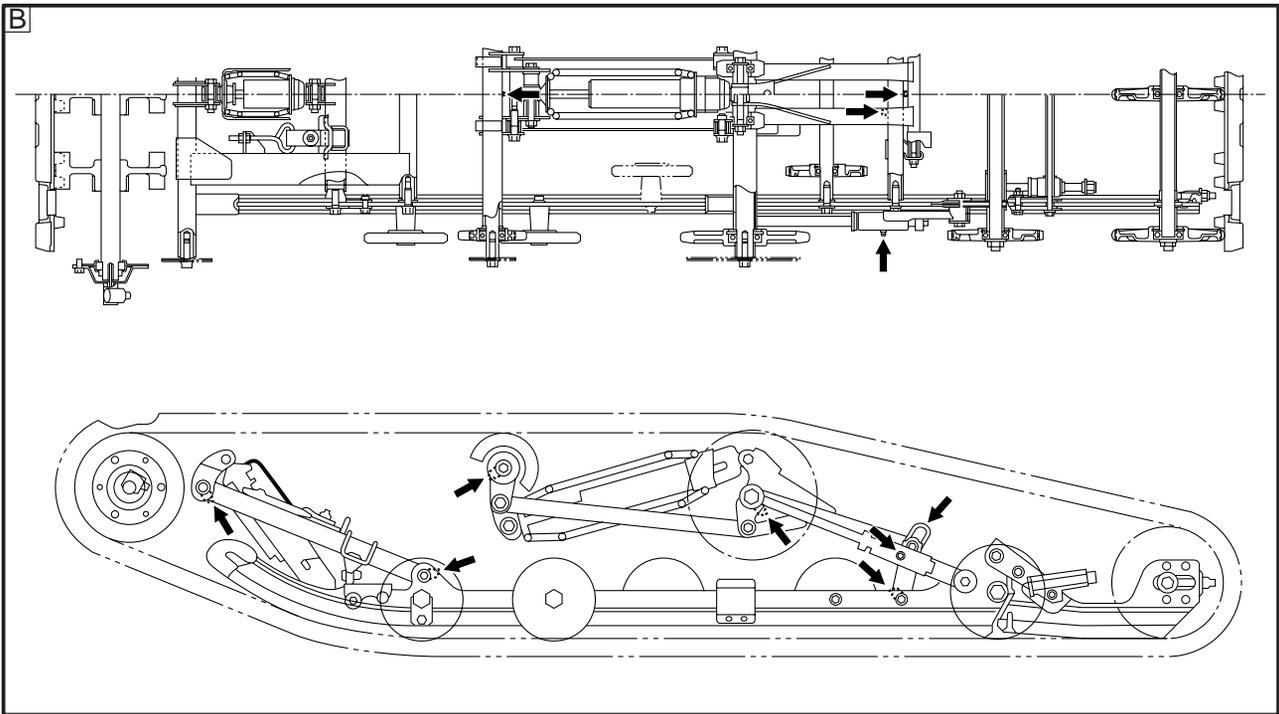
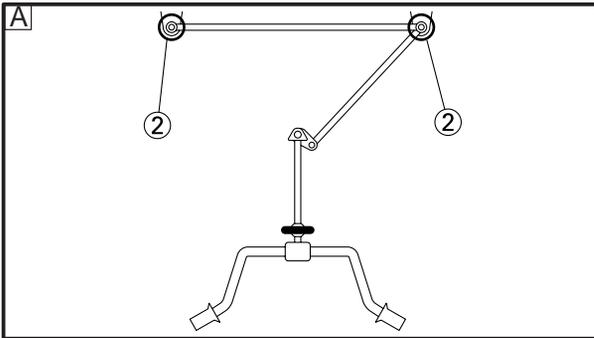
Front and rear suspension

1. Use a grease gun to inject grease into the nipples ① and ball joints ②.

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

A Front

B Rear





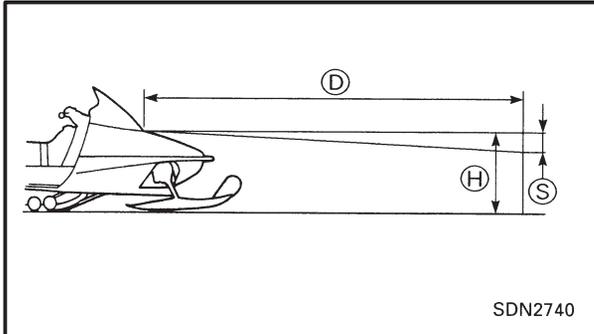
ESS00079

ELECTRICAL

ESS00080

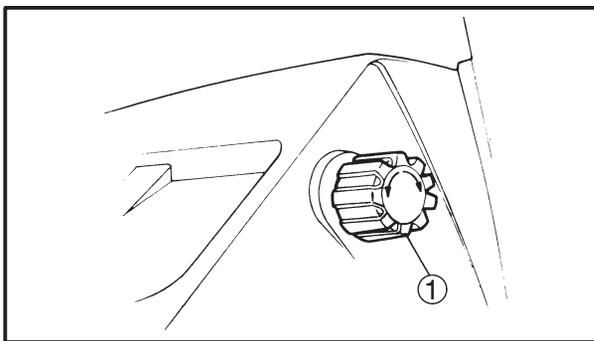
HEADLIGHT BEAM ADJUSTMENT

1. Place the machine on a level surface.
2. Measure the distance from the floor to the center of the headlight and place a mark on the wall equal to distance \textcircled{H} from the floor.
3. Place the machine from the wall at a distance \textcircled{D} indicated by the chart below.
4. With a person sitting on the machine, apply the parking brake, start the engine and let it idle.
5. Turn the headlight to high beam and check the headlight projection height on the wall. The projection should be at the parallel mark on the wall \textcircled{H} to $1/2^\circ$ down \textcircled{S} from the mark. If not, adjust the headlight angle.



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

\textcircled{D} : Distance \textcircled{S} : Set range

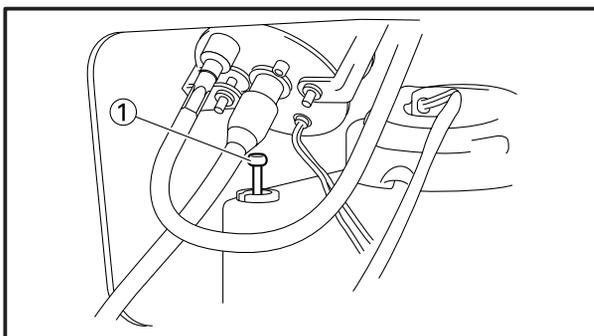


6. Adjust:
 - Headlight beam (vertically)

Vertical adjustment

Higher Turn the adjusting screw $\textcircled{1}$ counterclockwise.

Lower Turn the adjusting screw $\textcircled{1}$ clockwise.



7. Adjust:
 - Headlight beam (horizontally)

Horizontal adjustment

Right Turn the adjusting screw $\textcircled{1}$ counterclockwise.

Left Turn the adjusting screw $\textcircled{1}$ clockwise.



ESS00081

BATTERY INSPECTION

⚠ WARNING

Battery electrolyte is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.

Always follow these preventive measures:

- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.
- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):

- SKIN – Flush with water.
- EYES – Flush with water for 15 minutes and get immediate medical attention.

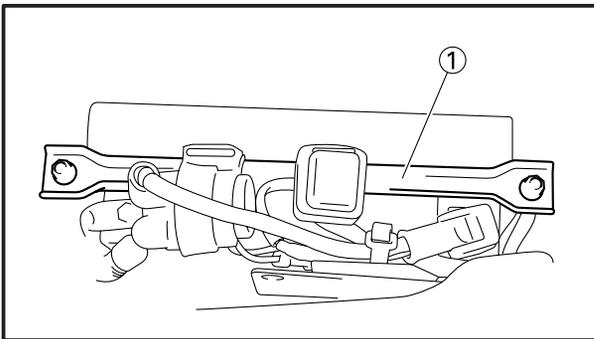
Antidote (INTERNAL):

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

Batteries also generate explosive hydrogen gas, therefore, you should always follow these preventive measures:

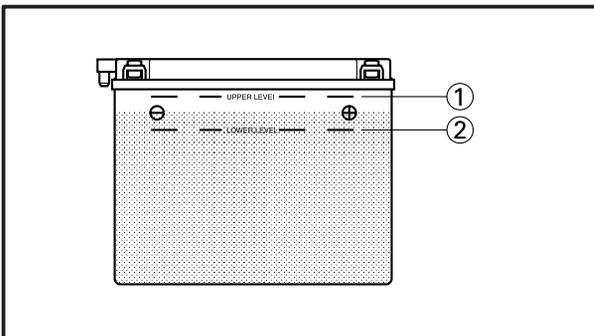
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)
- **DO NOT SMOKE** when charging or handling batteries.

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.



1. Remove:

- Battery holder ①
- Battery

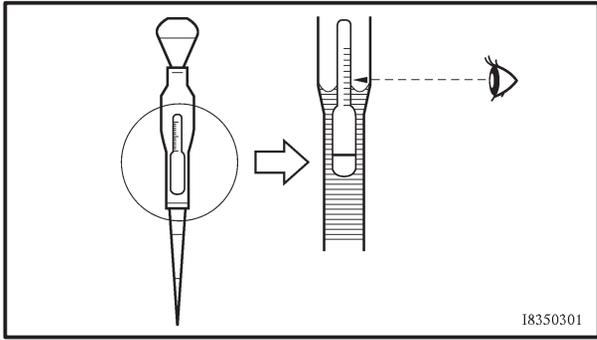


2. Inspect:

- Battery fluid level
Fluid level should be between upper ① and lower ② level marks.
Incorrect → Refill.

CAUTION:

Refill with distilled water only; tap water contains minerals harmful to a battery.



3. Check:
- Specific gravity
Less than 1.280 → Recharge battery.

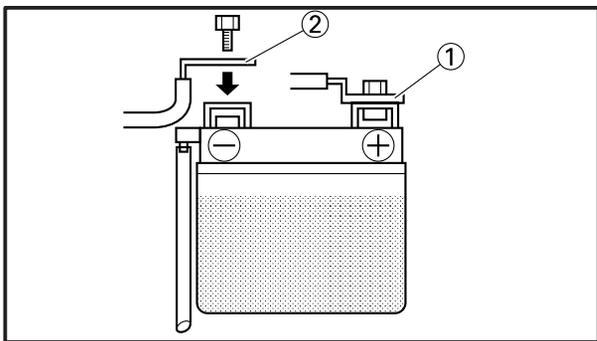
Charging current:
1.4 amps/10 hrs
Specific gravity:
1.280 at 20°C (68°F)

Replace the battery if:

- Battery voltage will not rise to a specific value or if bubbles fail to rise even after many hours of charging.
- Sulfation of one or more cells occurs, as indicated by the plates turning white, or if an accumulation of material exists in the bottom of the cell.
- Specific gravity readings after a long, slow charge indicate one cell to be lower than the rest.
- Warpage or buckling of plates or insulators is evident.

CAUTION: _____

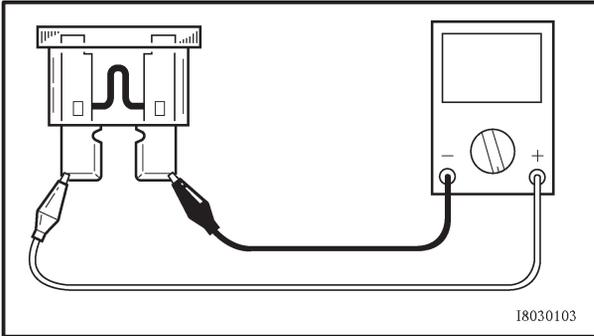
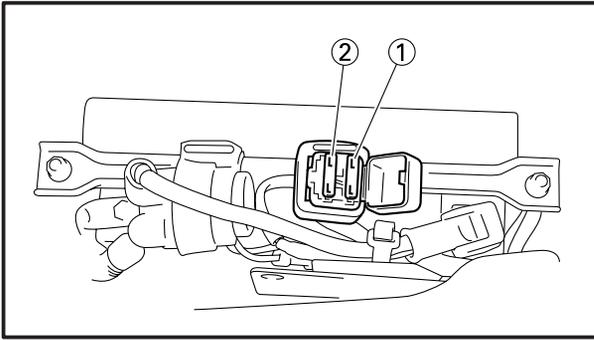
Always charge a new battery before using it to ensure maximum performance.



4. Install:
- Battery
 - Battery holder

CAUTION: _____

Connect the positive lead ① first and then connect the negative lead ②.



FUSE INSPECTION

1. Remove:

- Fuse ①
- Spare fuse ②

2. Inspect:

- Fuse

Inspection:

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

NOTE: _____

Set the tester selector to “Ω × 1” position.



Pocket tester:
90890-03112, YU-03112

- If the tester indicates ∞ the fuse is blown. It must be replaced.

3. Replace:

- Blown fuse

Replacement steps:

- Turn off the ignition and the circuit.
- Install a new fuse of proper amperage.
- Turn on the switches to verify operation of the electrical device.
- If the fuse blows again immediately, check the circuit in question.

NOTE: _____

Install new fuses of proper amperage.

Description	Amperage	Quantity
Main	10A	1
Spare	10A	1

⚠ WARNING _____

Do not use fuses of higher amperage rating than that which is recommended. Extensive electrical system damage and fire could result from the substitution of a fuse of improper amperage.

ESS00083

TUNING

ESS00084

CARBURETOR TUNING

The carburetors are set at the factory to run at temperatures of 0°C ~ -20°C (32°F ~ -4°F) at sea level. If the machine is to be operated under conditions other than those specified above, the carburetors must be properly adjusted. Special care should be taken in carburetor setting so that the pistons will not be damaged or will not seize.

CAUTION:

Engine oil is mixed with fuel just before the fuel enters the carburetors. During initial fuel flow to the carburetors, it is not always possible to supply the optimum fuel/oil mixture depending on the throttle opening. Therefore, after the carburetors have been tuned or maintained, or after the float chambers are removed for cleaning or jet replacement, be sure to idle the engine for about three minutes in order to avoid engine trouble.

CAUTION:

Before performing the carburetor tuning, make sure that the following items are set to specification.

- Engine idle speed
- Throttle cable freeplay
- Carburetor synchronization
- Starter cable freeplay
- Oil pump cable freeplay

ESS00085

Carburetor tuning data

1. Standard specifications

A Type	B38-34/1
B Manufacturer	MIKUNI
C Main jet (M.J.)	#141.3
D Pilot jet (P.J.)	#90
E Pilot screw (P.S.)	1-1/4 turn out
F Float height	12 ~ 16 mm (0.47 ~ 0.63 in)
G Idle speed	1,200 ± 100 r/min

ESS00066

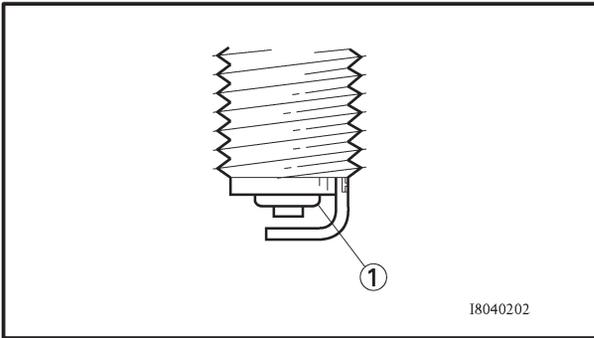
Mid-range and high speed tuning

Adjustments are normally not required, but may sometimes be necessary, depending on temperatures, altitude or both.

Mid-range speed and high speed tuning (from 1/4 to full-throttle) can be done by adjusting the main jet.

CAUTION:

Never run the engine without the air intake silencer installed. Severe engine damage may result.



1. Start the engine and operate the machine under normal conditions to make sure that the engine operates smoothly. Stop the engine.
2. Remove:
 - Spark plugs
3. Check:
 - Spark plug insulator ① color
A medium to light tan color indicates normal conditions.
Distinctly different color → Replace the main jet.
4. The main jet should be adjusted on the basis of the “Main jet selection chart”.

NOTE:

By checking the condition of the spark plugs, it is easy to get some idea of the condition of the engine. This may diagnose potential problems before engine damage occurs.

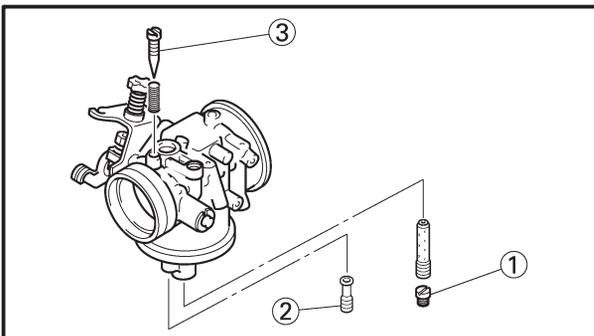
ESS00087

High altitude tuning

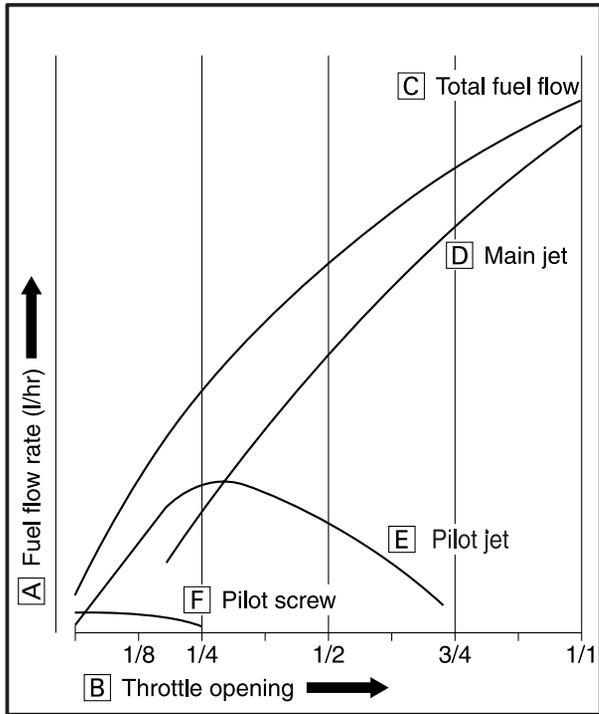
Use the chart in CHAPTER 8 to select main jets according to variations in elevation and temperature.

NOTE:

These jetting specifications are subject to change. Consult the latest technical information from Yamaha to be sure you have the most up-to-date jetting specifications.



- ① Main jet
- ② Pilot jet
- ③ Pilot screw



ESS00088

Guide for carburetion

2E301

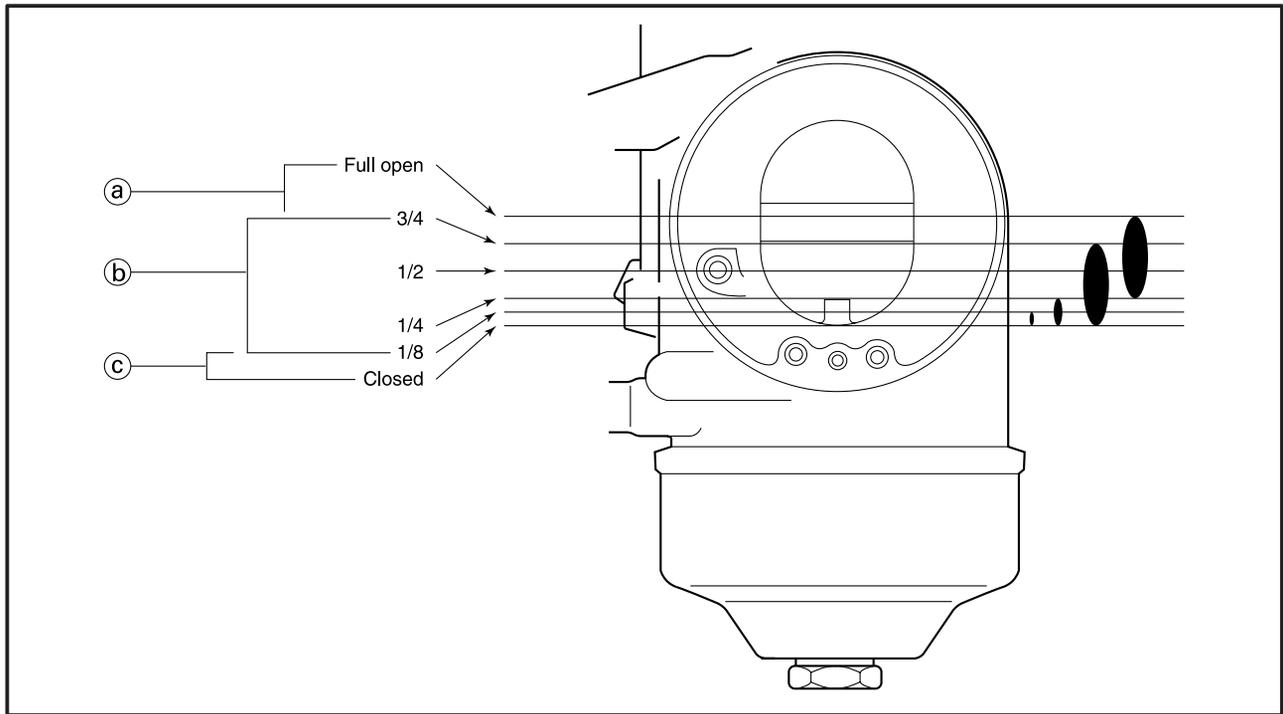
1. Fuel flow chart:

A guide to the fuel flow rate according to the throttle opening.

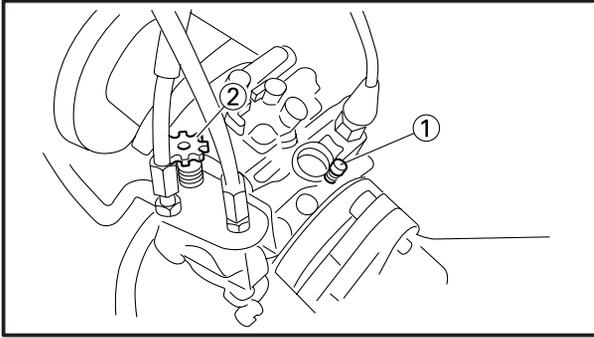
CAUTION:

If the air intake silencer and air chamber are removed from the carburetors, the change in pressure in the intake will create a lean mixture that could result in severe engine damage.

Removal of the air intake silencer and the air chamber do not improve performance characteristics. They must be secured to the carburetor during tuning and adjustment, and must always be in place when the engine is operated. Examine the intake silencer and air chamber regularly for cleanliness and freedom from obstruction.



- (a) High speed tuning range
- (b) Mid-range speed tuning range
- (c) Low speed tuning range



ESS00089

Low speed tuning

The carburetors are built so that low speed tuning can be done by adjusting the pilot screw ① and throttle stop screw ②.

CAUTION:

Never run the engine without the air intake silencer installed. Severe engine damage may result.

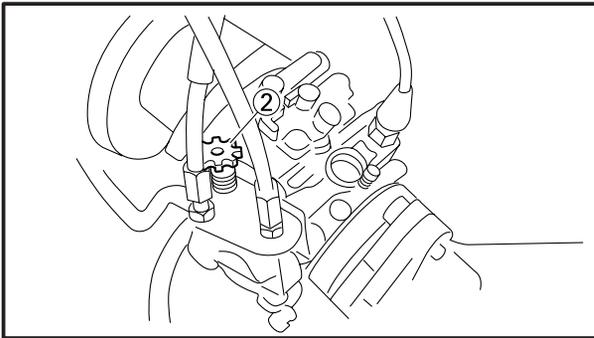
1. Tighten the pilot screw until it is lightly seated and then back it out the specified number of turns.

Pilot screw ①:

1-1/4 turns out

Pilot screw effects:

Turn in	←	STD setting	→	Turn out
Leaner Mixture	←		→	Richer Mixture



2. Set the engine idle speed by turning the throttle stop screw ② in (to increase engine speed) or out (to decrease engine speed).

	Standard idle speed: 1,200 ± 100 r/min
-------------------------------------------------------------------------------------	---------------------------------------------------------

3. If low-speed performance is still poor at higher elevations under extreme conditions, the standard pilot jets may need to be replaced. In this way, the proper air/fuel mixture is obtained.

NOTE:

In this case, use a larger numbered pilot jet to enrich the air/fuel mixture.

Standard pilot jet:

#90



ESS00090

Main jet selection chart

Main jet selection chart		
Spark plug color	Diagnosis	Remedy
Light tan or gray	Carburetors are tuned properly.	
Dry black or fluffy deposits	Mixture is too rich.	Replace the main jet with the next smaller size.
White or light gray	Mixture is too lean.	Replace the main jet with the next larger size.
White or gray insulator with small black or grayish brown spots and electrodes having a bluish-burnt appearance	Mixture is too lean. The piston is damaged or seized.	Replace the piston and spark plug. Tune the carburetors again. Begin with low-speed tuning.
Melted electrodes and possible a blistered insulator Metallic deposits on insulator	Mixture is too lean. The spark plug melted.	Check the piston for holes or seizure. Check the cooling system, gasoline octane rating and ignition timing. After replacing the spark plug with a colder type, tune the carburetors again. Begin with low-speed tuning.

ESS00091

Troubleshooting

Trouble	Diagnosis	Adjustment
Hard starting	Insufficient fuel	Add gasoline.
	Excessive use of the starter or choke	Return the starter lever to its seated position so that the starter valve is fully closed.
	Fuel passage is clogged or frozen	<ul style="list-style-type: none"> • Check and, if necessary, clean the fuel tank air vent, the fuel filter and all of the fuel passages. • Check and, if necessary, clean the carburetor air vents, fuel passages and the float valve. • Clean the float chamber of any ice or water.
	Overflow	Adjust the fuel level.
Poor idling: • Poor performance at low speeds • Poor acceleration • Slow response to throttle • Engine tends to stall	Improper idling speed adjustment	Adjust the engine idle speed. Refer to “Low speed tuning”.
	Damaged pilot screw	Replace the pilot screw.
	Clogged bypass hole	Clean the bypass hole.
	Clogged or loose pilot jet	<ul style="list-style-type: none"> • Remove the pilot jet, clean it with compressed air and then install it. • Make sure that the pilot jet is fully tightened.
	Air leaking into the carburetor joint	Retighten the clamp screws on the carburetor joints.
	Defective starter valve seat	Clean or replace the starter valve seat.
	Overflow	Adjust the fuel level.
Poor performance at mid-range speeds: • Momentary slow response to the throttle • Poor acceleration	Clogged or loose pilot jet	<ul style="list-style-type: none"> • Remove the pilot jet, clean it with compressed air, and then install it. • Make sure that the pilot jet is fully tightened.
	Lean mixture	Overhaul the carburetors.
Poor performance at normal speeds: • Excessive fuel consumption • Poor acceleration	Clogged air vent	Remove the air vent hose and clean it.
	Clogged or loose main jet	<ul style="list-style-type: none"> • Remove the main jet, clean it with compressed air, and then install it. • Make sure that the main jet is fully tightened.
	Overflow	Check and, if necessary, clean the float and float valve.

CARBURETOR TUNING

INSP
ADJ



Trouble	Diagnosis	Adjustment
Poor performance at high speeds: • Power loss • Poor acceleration	Starter valve is left open	Return the starter lever to its seated position so that the starter valve is fully closed.
	Clogged air vent	Remove and clean the air vent.
	Clogged or loose main air jet	<ul style="list-style-type: none"> • Remove the main jet, clean it with compressed air, and then install it. • Make sure that the main jet is fully tightened.
	Clogged fuel line	Clean or replace the fuel line.
	Dirty fuel tank	Clean the fuel tank.
	Air leaks into the fuel line	Tighten or replace the fuel line joint.
	Low fuel pump performance	Repair or replace the fuel pump.
	Clogged fuel filter	Replace the fuel filter.
	Clogged intake	Remove any obstructions (e.g., ice).
Abnormal combustion: • Backfiring	Lean mixture	Clean and adjust the carburetors.
	Dirty carburetors	Clean the carburetors.
	Dirty or clogged fuel line	Clean or replace the fuel line.
Overflow: • Poor idling • Poor performance at low, mid-range, and high speeds • Excessive fuel consumption • Hard starting • Power loss • Poor acceleration	Clogged air vent	Clean the air vent.
	Clogged float valve	<ul style="list-style-type: none"> • Disassemble and clean the float valve. • Do not scratch the valve seat.
	Scratched or unevenly worn float valve or valve seat	<ul style="list-style-type: none"> • Clean or replace the float valve and valve seat. • The valve seat and body must be replaced as a set.
	Broken float	Replace the float.
	Incorrect float level	Check and, if necessary, replace the following parts: <ul style="list-style-type: none"> • Float tang • Float (entire assembly) • Arm pin

CLUTCH



ESS00092

CLUTCH

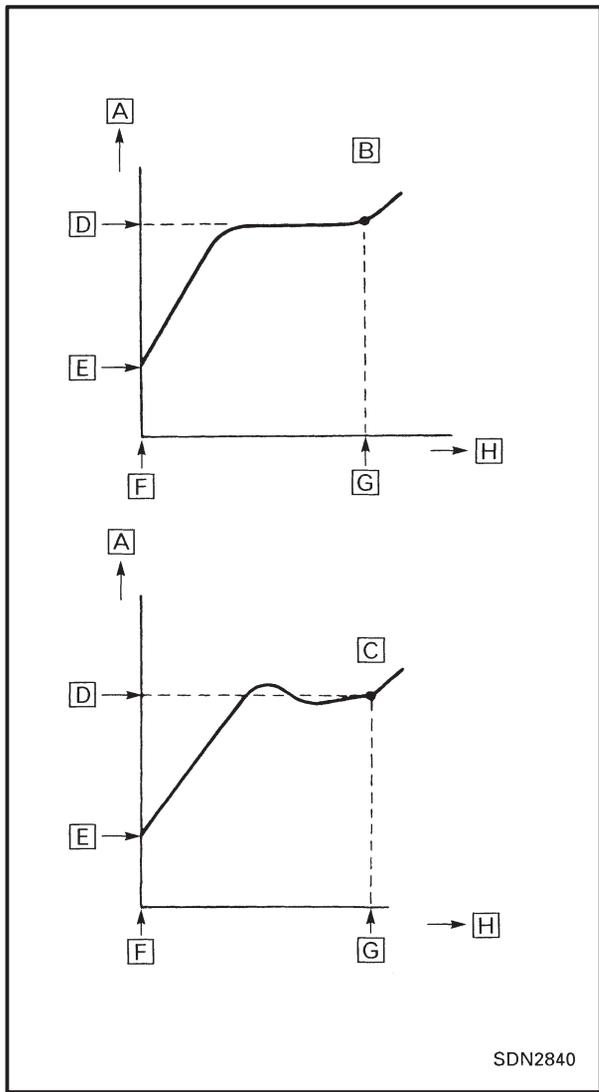
ESS00093

High altitude

Specifications Model: VK540E

S	Silver	Y	Yellow
L	Blue	W	White

A ELEVATION	~ 1,000 m (~ 3,500 ft)	1,200 ~ 1,800 m (3,000 ~ 6,500 ft)	1,800 m ~ (6,500 ft ~)
B Idle speed	APPROX. 1,200 r/min	←	←
C Clutch engagement	APPROX. 2,600 r/min	APPROX. 2,800 r/min	APPROX. 3,000 r/min
D Shift speed	APPROX. 6,700 r/min	←	←
E Gearing	17/39 (70 links)	←	←
F Primary spring	90501-481J1	90501-556G6	90501-581J7
G Color	S-L-S	L	Y
H Length	85.4 mm (3.36 in)	75.4 mm (2.97 in)	←
I Preload rate	20 kg – 1.0 kg/mm	20 kgf – 2.0 kg/mm	25 kgf – 2.5 kg/mm
J Wire diameter	4.8 mm (0.19 in)	5.5 mm (0.22 in)	5.8 mm (0.23 in)
K Outside diameter	60 mm (2.36 in)	←	←
L Weight (ID)	8AT	←	←
M Weight rivet	STEEL 13.3 mm (0.52 in)	STEEL 11.3 mm (0.44 in)	←
N Weight bushing	VESPEL	←	←
O Roller outer dia.	15.6 mm (0.61 in)	←	←
P Roller bushing	VESPEL	←	←
Q Pri. clutch shim	None	←	←
R Secondary spring	90508-50746	←	←
S Color	W	←	←
T Length	93.5 mm (3.68 in)	←	←
U Preload rate	40° (C-2) 721 kgmm/rad	←	←
V Wire diameter	5.0 mm (0.20 in)	←	←
W Outside diameter	65 mm (2.56 in)	←	←
X Sec. torque cam	37°	←	←
Y Sec. clutch shim	None	←	←
	(STANDARD)		



SDN2840

The clutch may require tuning depending upon where the machine will be operated and the desired handling characteristics. The clutch can be tuned by changing the engagement and shifting speeds.

Clutch engagement speed is defined as the engine speed at which the machine first begins to move from a complete stop.

Clutch shifting speed is defined as the engine speed reached when the machine has travelled 200 ~ 300 m (650 ~ 1,000 ft) after being started at full-throttle from a dead stop.

Normally, when a machine reaches shifting speed, the vehicle speed increases but the engine speed remains nearly constant. Under unfavorable conditions (wet snow, icy snow, hills, or rough terrain), however, engine speed may decrease after the shifting speed has been reached.

- A** Engine speed
- B** Good condition
- C** Bad condition
- D** Clutch shifting speed
- E** Clutch engagement speed
- F** Starting position
- G** 200 ~ 300 m (650 ~ 1,000 ft)
- H** Distance travelled

ESS00094

GEAR SELECTION

The reduction ratio of the driven gear to the drive gear must be set according to the snow conditions. If there are many rough surfaces or unfavorable snow conditions, the drive/driven gear ratio should be increased. If the surfaces are fairly smooth or better snow conditions exist, decrease the ratio.

ESS00095

Gear ratio chart

The drive and driven gears and the chains shown in the gear ratio chart are available as options. The figures containing a decimal point represent the drive/driven gear ratios, while the bottom numbers designate the number of links in the chain.

① Chain and sprocket pat number

A Part name	B Teeth & links	C Part no.	D Standard
E Drive sprocket	17 teeth	83R-17682-00	VK540E
F Driven sprocket	39 teeth	83R-47548-00	VK540E
G Chain	70 links	94880-06070	VK540E

② Gear ratio

A Drive gear	17 teeth
B Driven gear	39 teeth
	2.29 70 links

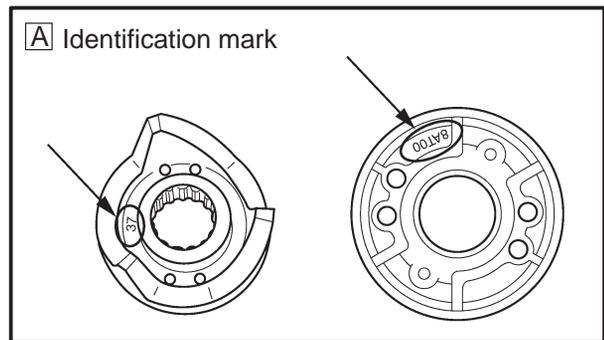
③ Secondary spring

A Part no.	B Spring rate N•mm/rad (kg•mm/rad)	C Preload N/m (kg/mm) (lb/in)	D Color	E Wire gauge mm (in)	F No. of coils	G Free length mm (in)	H Outside diameter mm (in)	I Standard
90508-50746	7066 (721)	8.7 (0.89), 48.72	White	5.0 (0.196)	4.74	93.5 (3.68)	65 (2.559)	VK540E

④ Secondary spring twist angle
90508-50746 (White)

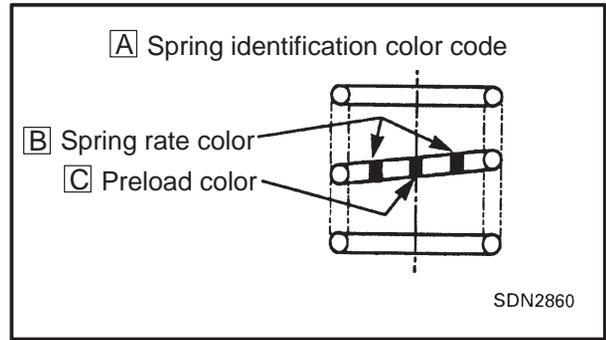
B Sheave	A Seat	1	2	3	4
A		20°	50°	80°	110°
B		30°	60°	90°	120°
C		10°	40° (STD)	70°	100°

⑤ Torque cam (secondary spring seat)



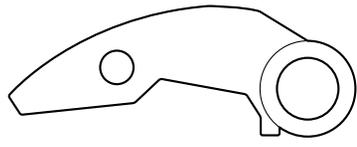
B Part no.	C Cam angle	D Identification mark	E Standard
8AT-17684-00	37°	8AT00	VK540E

⑥ Primary spring



D Parts No.	E Spring rate N/mm (kg/mm)	F Preload N (kg)	G Color	H Wire gauge mm (in)	I Outside diameter mm (in)	J No. of coils	K Free length mm (in)	L Standard
90501-481J1	9.8 (1.0)	196 (20)	Silver-Blue-Silver	4.8 (0.188)	60 (2.362)	5.16	85.4 (3.362)	VK540E
90501-556G6	19.6 (2.0)	196 (20)	Blue	5.5 (0.216)	60 (2.362)	4.95	75.4 (2.969)	
90501-581J7	24.5 (2.5)	245 (25)	Yellow	5.8 (0.228)	60 (2.362)	4.96	75.4 (2.969)	

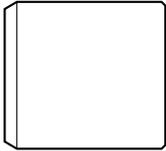
⑦ Clutch weights

A Standard
<p>8AT-17605-00 44.0 g (1.55 oz)</p>  <p>VK540E</p>

⑧ Rivets

A Part No.	B Material	C Length mm (in)	D Weight g (oz)	E Standard	F Effects
90261-06019	G Steel	13.3 (0.52)	3.1 (0.109)	VK540E	I Increase Force  J Decrease Force
90261-06017	H Steel	11.3 (0.44)	2.7 (0.095)		

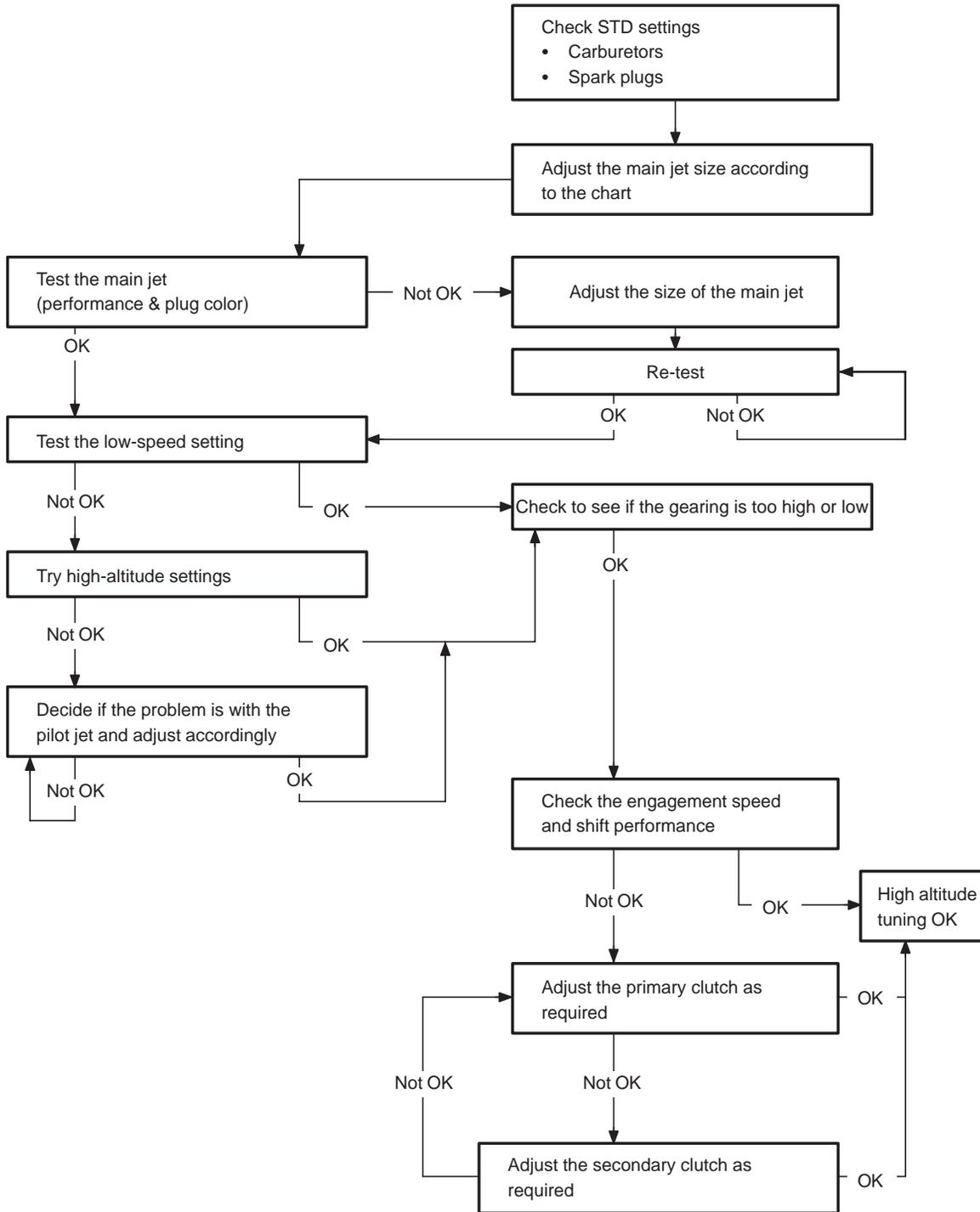
⑨ Rollers

I.D. 8 mm (0.3 in)				
A ROLLER with BUSHING PART NUMBER	B OUTSIDE DIAMETER	C BUSHING TYPE (P/N)	D IDENTIFICATION MARK (Width)	E Standard
88R-17624-01	15.6 mm (0.61 in)	Vespel 90380-08183	F No Mark  14.6 mm (0.57 in)	VK540E

ESS00096

HIGH ALTITUDE TUNING

To attain the best performance in high altitude conditions, carefully tune the snowmobile as outlined below.



ESS00100

REAR SUSPENSION

ESS00101

Stopper band

- Adjust:
 - Stopper band tension

CAUTION: _____

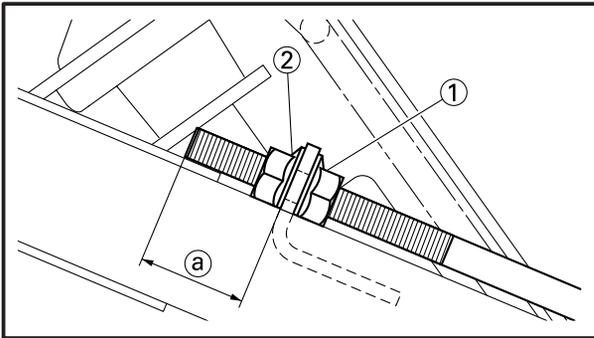
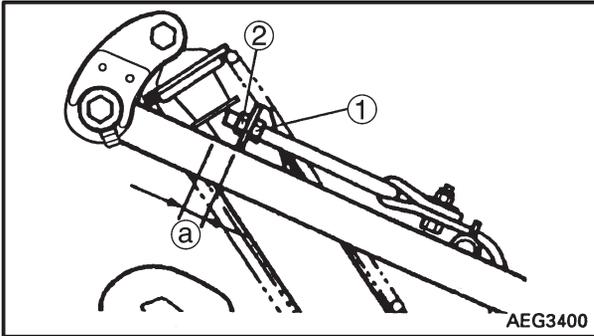
Make sure the left and right sides of the rear suspension stopper band are adjusted evenly.

NOTE: _____

This adjustment affects the handling characteristics of the machine.

Adjustment steps:

- Loosen the locknut ①.
- Turn the adjusting nut ② in or out to adjust the stopper band tension.



Adjuster thread length^a	25 ± 0.5 mm (0.98 ± 0.02 in)
	Longer (Maximum) Shorter (Minimum)
Effects	More weight on skis; less weight transfer Less weight on skis; more weight transfer

- Tighten the locknut.

	Locknut: 16 Nm (1.6 m•kg, 11 ft•lb)
-------------------------------------------------------------------------------------	------------------------------------------------------

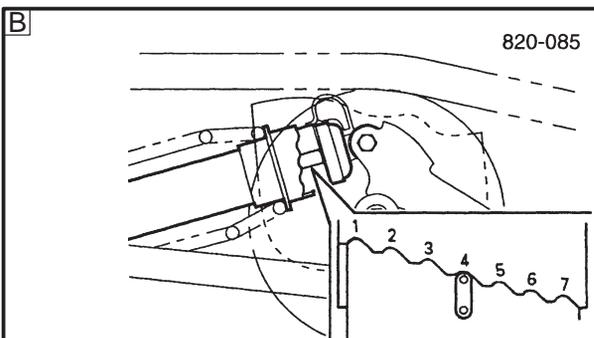
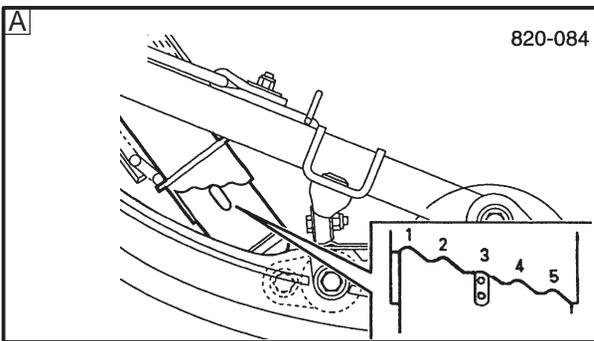
ESS00102

Spring preload

- Adjust:
 - Spring preload

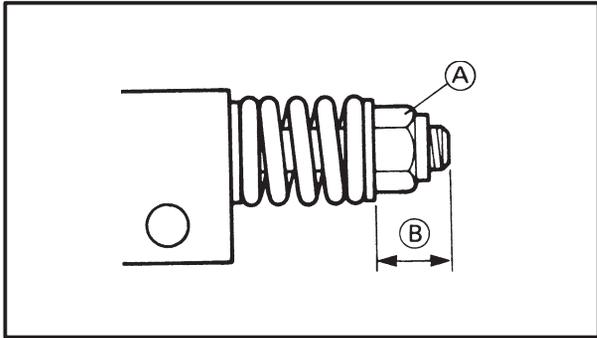
Adjustment steps:

- Turn the adjusting ring to the proper position.



Spring adjuster position	1	2	3	4	5
Preload	Softer ← → Harder				
A Front Standard	3				

Spring adjuster position	1	2	3	4	5	6	7
Preload	Softer ← → Harder						
B Rear Standard	4						



Extension spring preload

1. Adjust:
 - Extension spring preload

Adjuster A	Turn in	Turn out
Preload	Harder	Softer
Snow Condition	Icy	Soft
Standard Length B	16 mm (0.63 in)	

CAUTION: _____

Be sure the left and right spring preload is same.

ESS00103

Rear suspension-full rate

1. Adjust:

- Full rate adjuster

Adjustment steps:

- Loosen the nut ① 1/2 or 3/4 turns, while holding the adjusting bolt ② securely with a wrench so it does not move.

CAUTION: _____

Never allow the adjusting bolt ② to move while loosening the nut.

- Turn the adjusting bolt ② to the desired position.

Installation position	A	B	C
Spring rate and damping	Soft	Medium	Hard
Standard	A		

NOTE: _____

- Be sure to make this adjustment when there is no load (rider or cargo) on the snowmobile.
- Rotating the track will help to move the shock absorber assembly.

CAUTION: _____

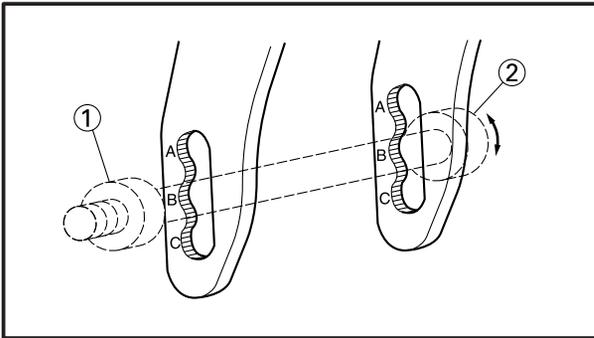
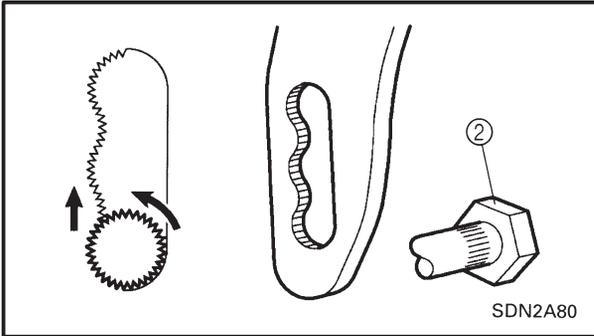
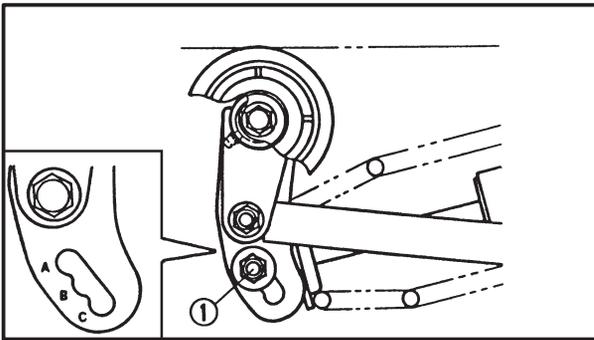
Be sure the adjusting bolt ends are set at the same position on each side.

- While holding the adjusting bolt securely, tighten the nut ①.

	Nut (full rate adjuster) ①: 49 Nm (4.9 m•kg, 35 ft•lb)
-------------------------------------------------------------------------------------	------------------------------------------------------------------

CAUTION: _____

Never allow the adjusting bolt to move while tightening the nut.





This model has a “Easy adjust” system for the Full rate adjuster. The bolt has teeth on it. So when the bolt is turned, it rides up and down the bracket.

NOTE: _____

- The nut has to be loosen first, while the bolt is held in place with a wrench.
 - Then the bolt can be turned to adjust the shock position up or down.
 - If the bolt is turned with the nut tight, it is possible to strip the teeth off the bolt.
-



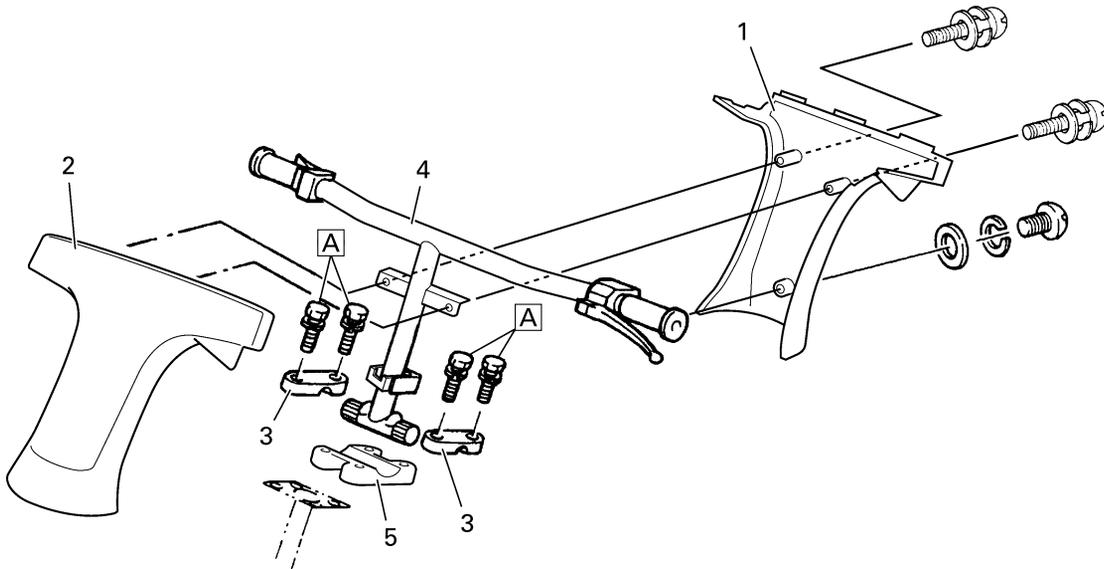
ESS00104

CHASSIS

ESS00105

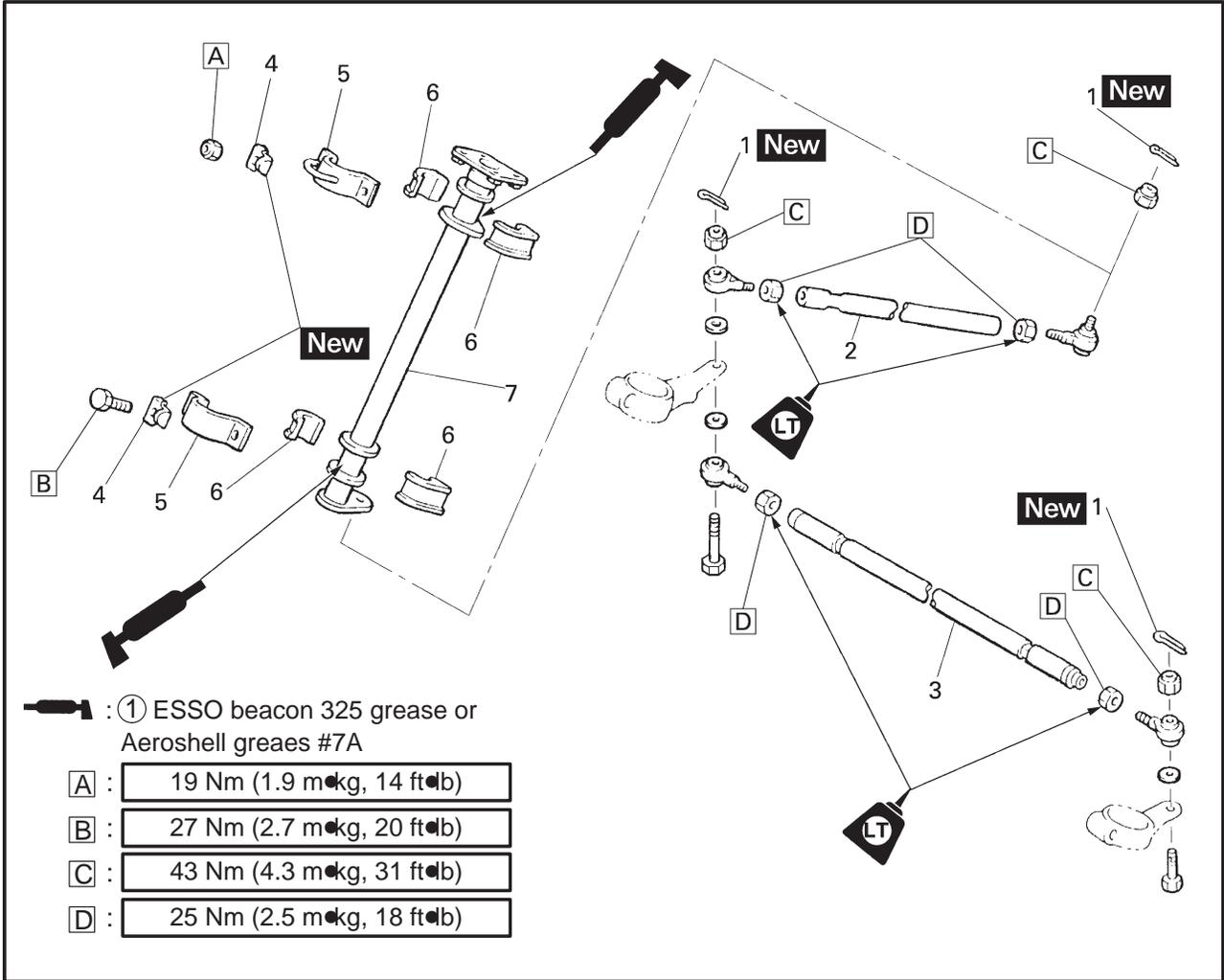
STEERING

A : 15 Nm (1.5 m•kg, 11 ft•lb)

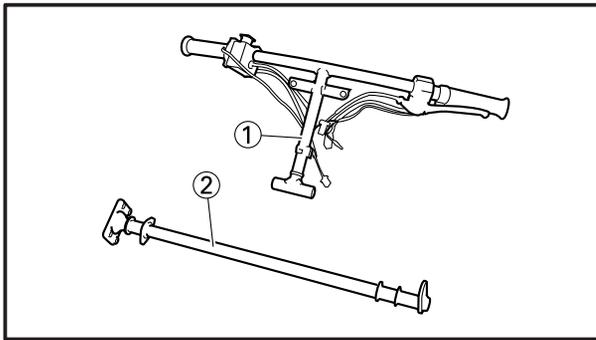


3

Order	Job name/Part name	Q'ty	Remarks
	Handlebar removal		Remove the parts in the order listed below.
1	Steering pad (rear)	1	
2	Steering pad (front)	1	
3	Handlebar holder (upper)	2	
4	Handlebar	1	
5	Handlebar holder (lower)	1	
			For installation, reverse the removal procedure.



Order	Job name/Part name	Q'ty	Remarks
	Steering column and tie rod removal		Removing the parts in the order listed below.
1	Handlebar	3	
2	Cotter pin	1	
3	Relay rod	1	
4	Tie rod	1	
5	Lock washer	4	
6	Bearing holder	2	
7	Plane bearing	4	
		1	For installation, reverse the removal procedure.



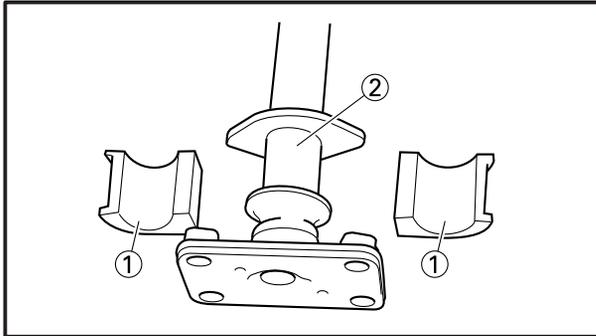
ESS00106

INSPECTION

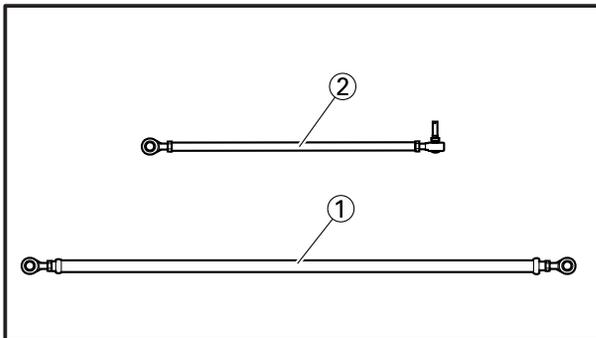
1. Inspect:
 - Handlebar ①
 - Steering column ②
 Bends/cracks/damage → Replace.

⚠ WARNING

Do not attempt to straighten a bent column. This may dangerously weaken the column.



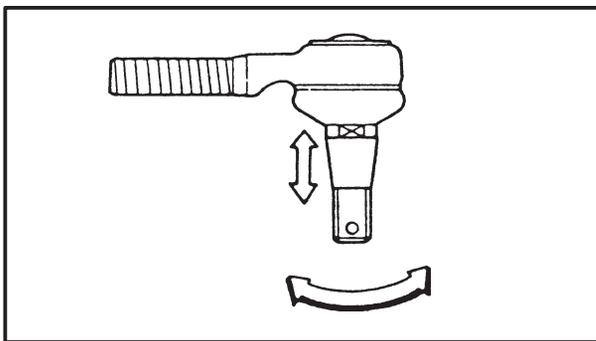
2. Inspect:
 - Bearings (steering column) ①
 - Steering column ② (bearing contact surfaces)
 Scratches/wear/damage → Replace.



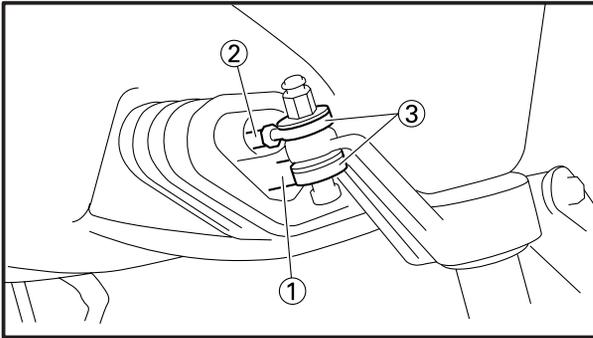
3. Inspect:
 - Relay rod ①
 - Tie-rods ②
 Bends/cracks/damage → Replace.

⚠ WARNING

Do not attempt to straighten bent rods. This may dangerously weaken the rods.



4. Check:
 - Rod end movement
 Rod end freeplay exists → Replace the rod end.
 Rod end turns roughly → Replace the rod end.



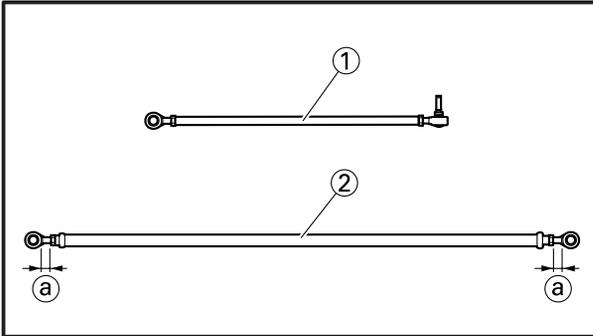
ESS00107

INSTALLATION

1. Install:
 - Tie-rod ①
 - Relay rod ②

NOTE:

- Install the rod end ③ with the left-hand thread onto the tie-rod on the right side.
- The threads on both ③ rod ends must be the same length.

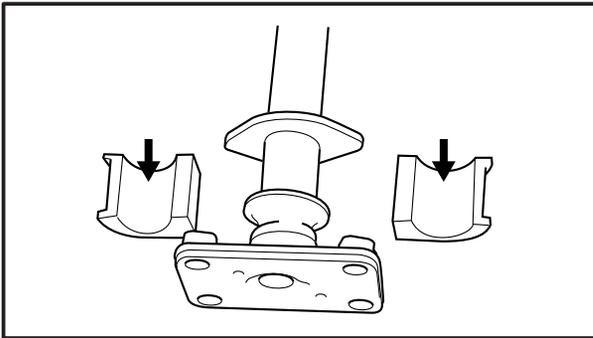


CAUTION:

Always use new cotter pins.



Locknut (rod end):
 25 Nm (2.5 mkg, 18 ftlb)
 LOCTITE®
Nut (suspension arm-tie-rod):
 43 Nm (4.3 mkg, 31 ftlb)



2. Apply
 - Low temperature lithium soap base grease (to bearing inner surface)
3. Tighten:



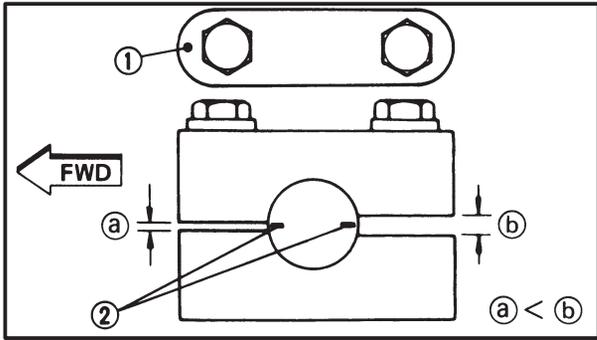
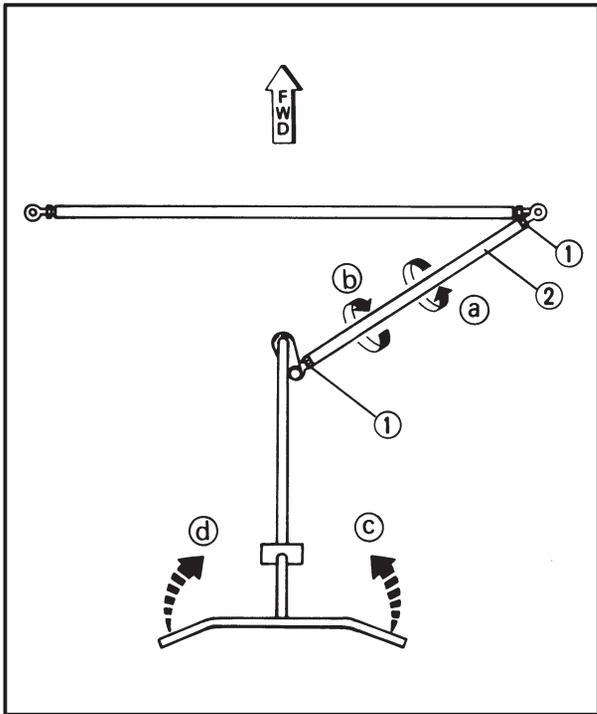
Bearing holder nut:
 19 Nm (1.9 mkg, 14 ftlb)
Bearing holder bolt:
 27 Nm (2.7 mkg, 20 ftlb)
Relay rod nut:
 43 Nm (4.3 mkg, 31 ftlb)

CAUTION:

Always use a new lock washer and cotter pin.

NOTE:

Bend the lock washer top along the bolts and nuts flats.



4. Adjust:

- Skis

Adjustment steps:

- Temporarily install the handlebar.
- Hold the handlebar straight and check that the skis are at right angles to the handlebar.
- Loosen the locknuts (relay rod) ①.
- Position the skis parallel in the riding direction.
- With the skis in this position, turn the relay rod ② in either direction until the handlebars at right angles with respect to the direction of movement.

Turning the relay rod in direction ①	Turning the handlebar in direction ③
Turning the relay rod in direction ②	Turning the handlebar in direction ④

- Tighten the locknuts (relay rod) ①.



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

5. Install:

- Handlebar

CAUTION: _____

- The upper handlebar holder should be installed with the punch mark ① forward.
- Align the punch marks ② with the handlebar holder gaps respectively.
- Tighten the bolts to specification so that the front clearance ① is smaller than the rear clearance ②.



Bolt (handlebar holder):
 15 Nm (1.5 m•kg, 11 ft•lb)

CAUTION: _____

First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.



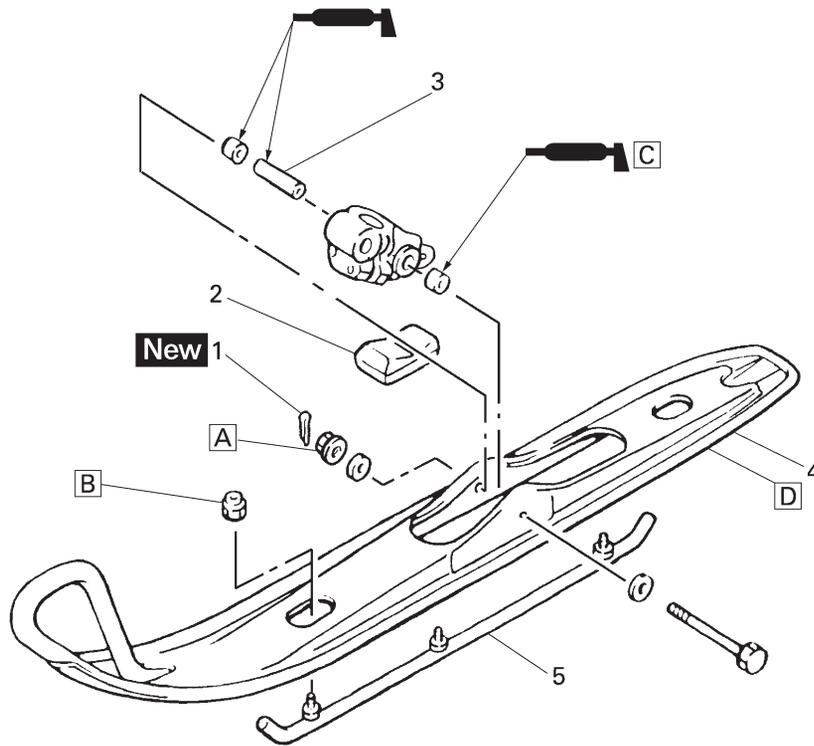
ESS00108

SKI

A : 43 Nm (4.3 m•kg, 31 ft•lb)

B : 21 Nm (2.1 m•kg, 15 ft•lb)

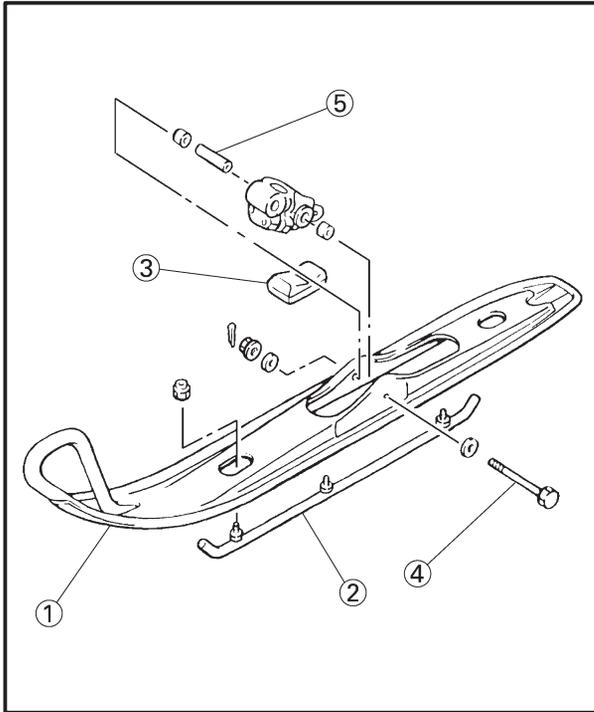
 : ① ESSO beacon 325 grease or Aeroshell greaes #7A



C : Fit the stopper with its raised portion positioned in front.

D : Be careful not to reverse the mounting positions of the left and right ski assemblies.

Order	Job name/Part name	Q'ty	Remarks
	Ski removal		Remove the parts in the order listed below.
1	Cotter pin	1	
2	Ski stopper	1	
3	Collar	1	
4	Ski	1	
5	Ski runner	1	
			For installation, reverse the removal procedure.



ESS00109

INSPECTION

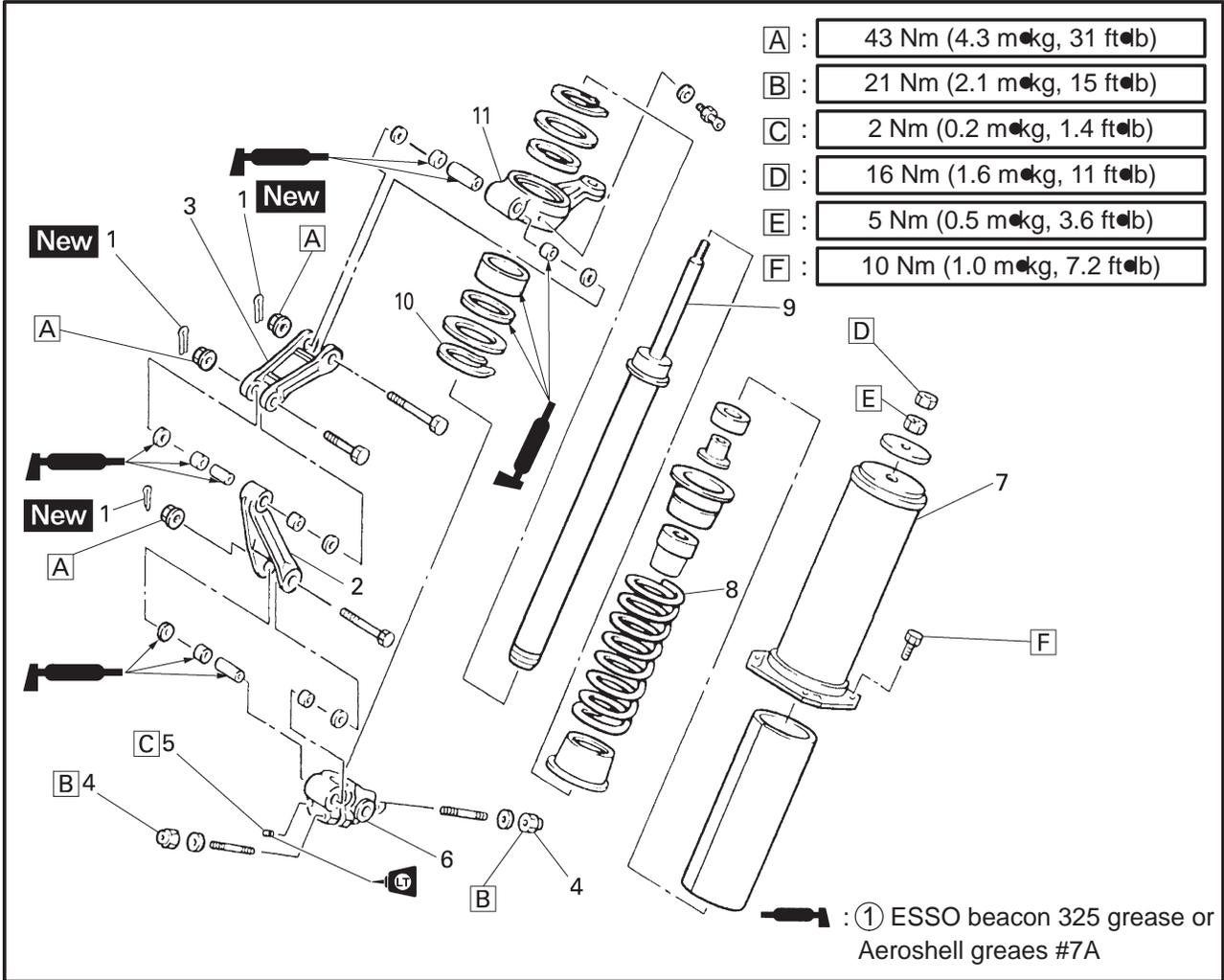
1. Inspect:

- Ski ①
- Ski runner ②
- Ski stopper ③
Wear/cracks/damage → Replace.
- Mounting bolt ④
- Collar ⑤
Wear/damage → Replace.



ESS00111

FRONT SUSPENSION



Order	Job name/Part name	Q'ty	Remarks
	Front suspension removal		
	SKI		Remove the parts in the order listed below. Refer to "SKI".
1	Cotter pin	3	
2	Front arm (lower)	1	
3	Front arm (upper)	1	
4	Flange nut	2	Loosen.
5	Set screw	1	Loosen.
6	Suspension bracket	1	
7	Absorber holder	1	
8	Spring	1	
9	Shock absorber	1	
10	Circlip	1	
11	Suspension arm	1	
			For installation, reverse the removal procedure.

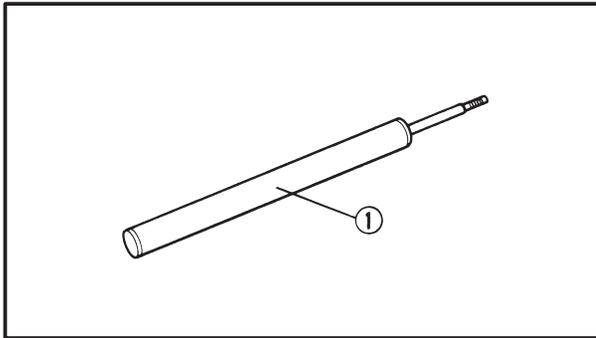
ESS00112

HANDLING NOTES

⚠ WARNING

This shock absorber contains highly compressed nitrogen gas. Before handling the shock absorber read and make sure that you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

- Do not tamper or attempt to open the gas chamber.
- Do not subject the shock absorber to flames or any other source of high heat. This may cause the unit to explode due to excessive gas pressure.
- Do not deform or damage the gas chamber in any way. Gas chamber damage will result in poor damping performance.

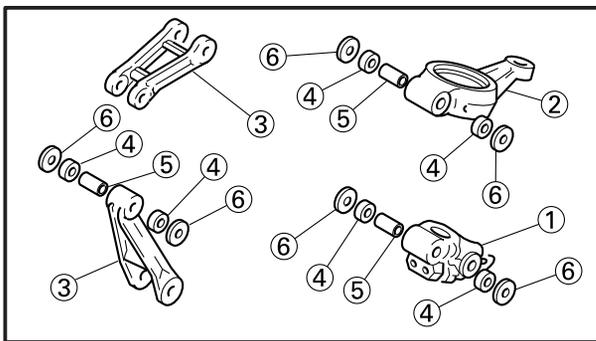


ESS00113

INSPECTION

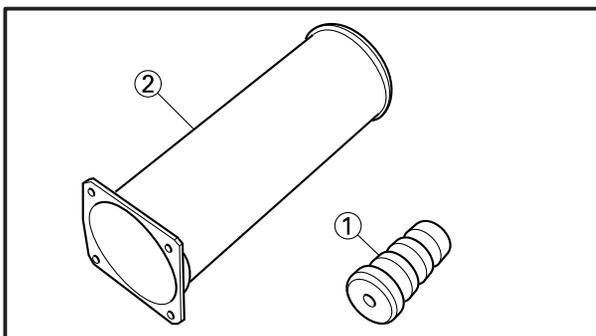
1. Inspect:

- Shock absorber ①
Oil leaks/bending/damage → Replace.



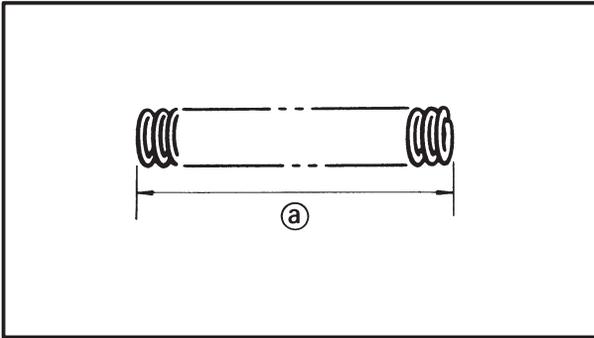
2. Inspect:

- Suspension brackets ①
- Suspension arm ②
- Front arms ③
Cracks/wear/damage → Replace.
- Bushings ④
- Collars ⑤
- Thrust washers ⑥
Wear/scratches/damage → Replace.



3. Inspect:

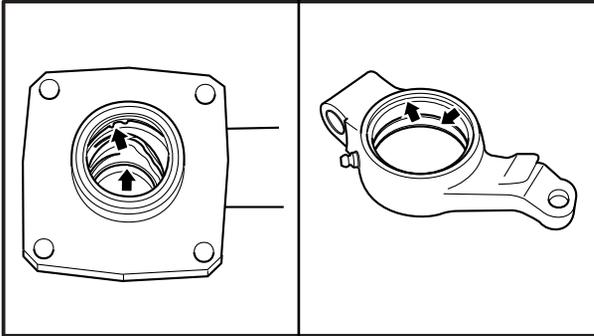
- Bump rubber ①
Wear/damage → Replace.
- Absorber holder ②
Cracks/bending/damage → Replace.



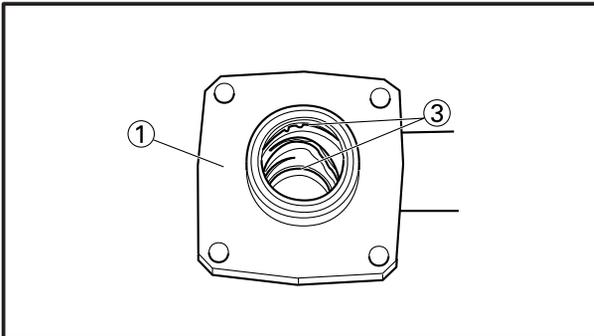
4. Inspect:
 - Spring
 - Wear/cracks/damage → Replace.
5. Measure:
 - Spring free length (a)
 - Out of specification → Replace.



Spring free length limit:
235.0 mm (9.25 in)



6. Inspect:
 - Oil seals
 - Damage → Replace.



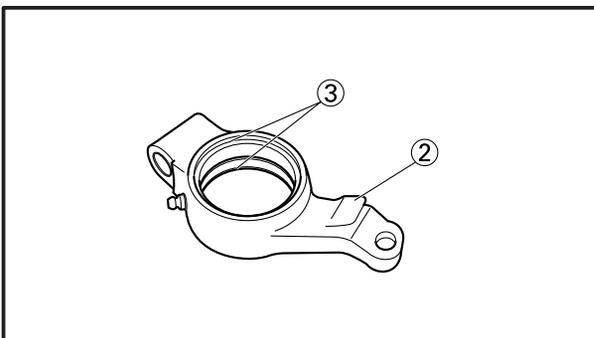
ESS00114

INSTALLATION

1. Lubricate:
 - Bushing (suspension support ①)
 - Bushing (suspension arm ②)
 - Oil seal lips ③



Recommended grease:
ESSO beacon 325 grease or
Aeroshell grease #7A



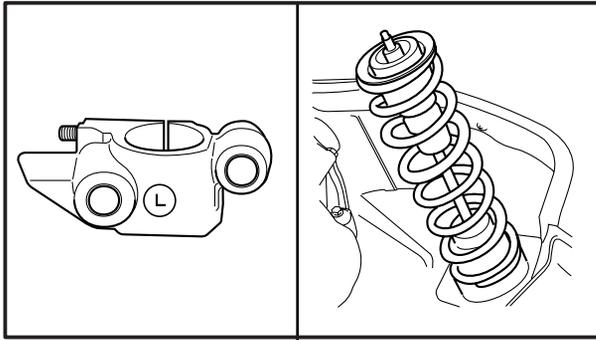
2. Install:
 - Suspension arm

CAUTION: _____

Always use a new circlip.

NOTE: _____

Install the suspension arm so the “L” mark is on the left side and the “R” mark is on the right side.



3. Tighten:

	Suspension bracket nut: 43 Nm (4.3 m•kg, 31 ft•lb)
	Set screw: 2 Nm (0.2 m•kg, 1.4 ft•lb) LOCTITE®

NOTE: _____

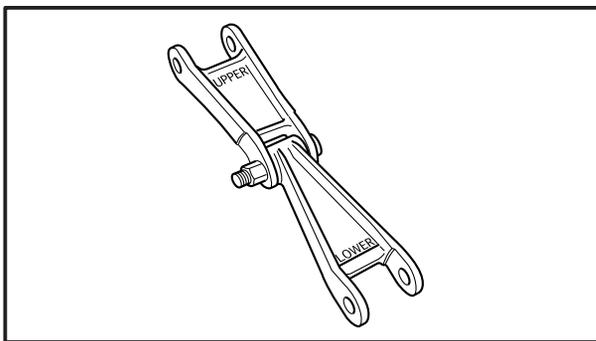
Install the suspension bracket so that the “L” mark is on the left side and the “R” mark is on the right side.

4. Tighten:

	Absorber holder bolt: 10 Nm (1.0 m•kg, 7.2 ft•lb)
	Shock absorber nut: 5 Nm (0.5 m•kg, 3.6 ft•lb)
	Locknut (shock absorber): 16 Nm (1.6 m•kg, 11 ft•lb)
	Front arm nut: 43 Nm (4.3 m•kg, 31 ft•lb)

NOTE: _____

Be sure to install the front arms so that the “UPPER” mark is located in the upper position and the “LOWER” mark is in the lower position.



CAUTION: _____

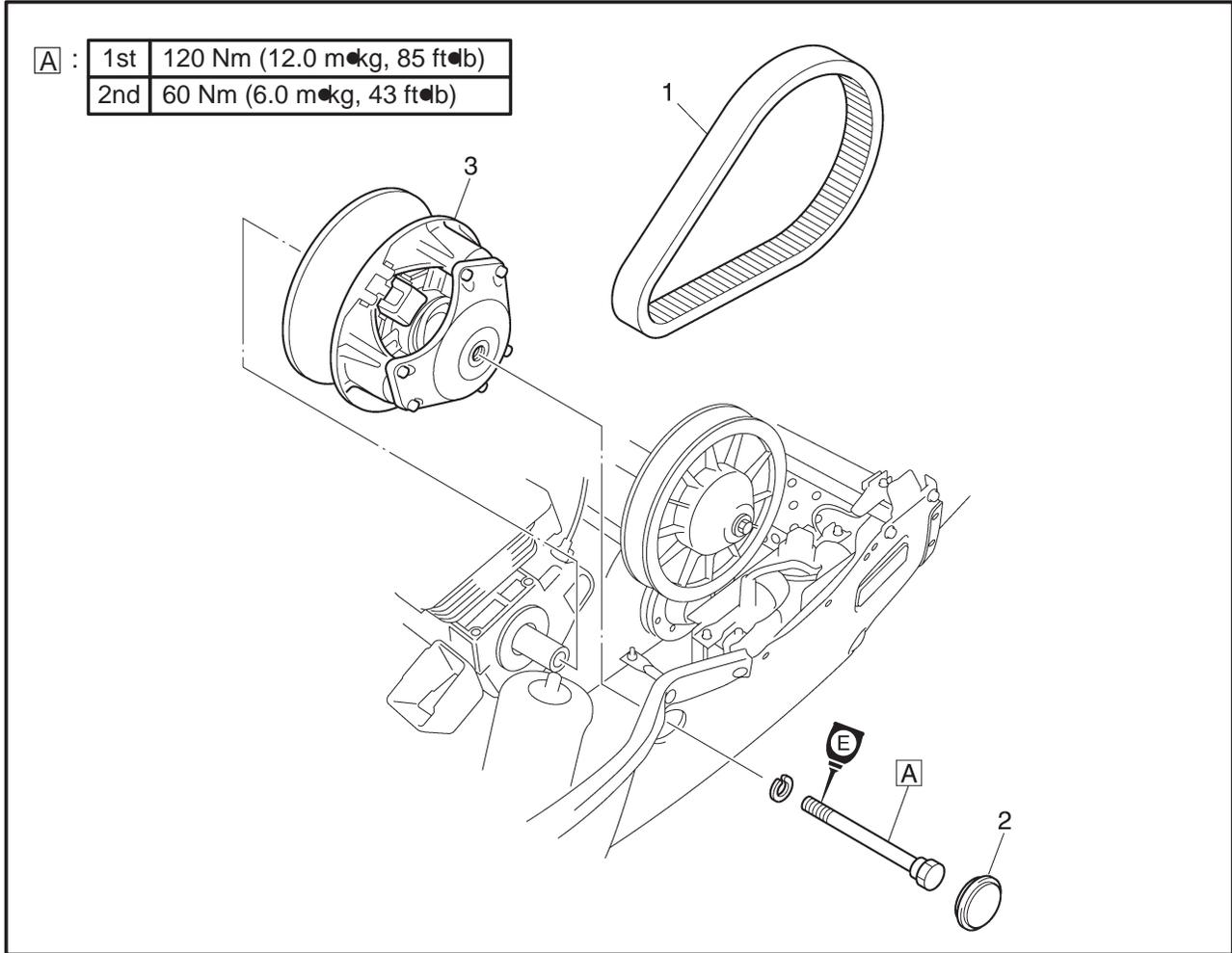
Always use a new cotter pin.

ESS00117

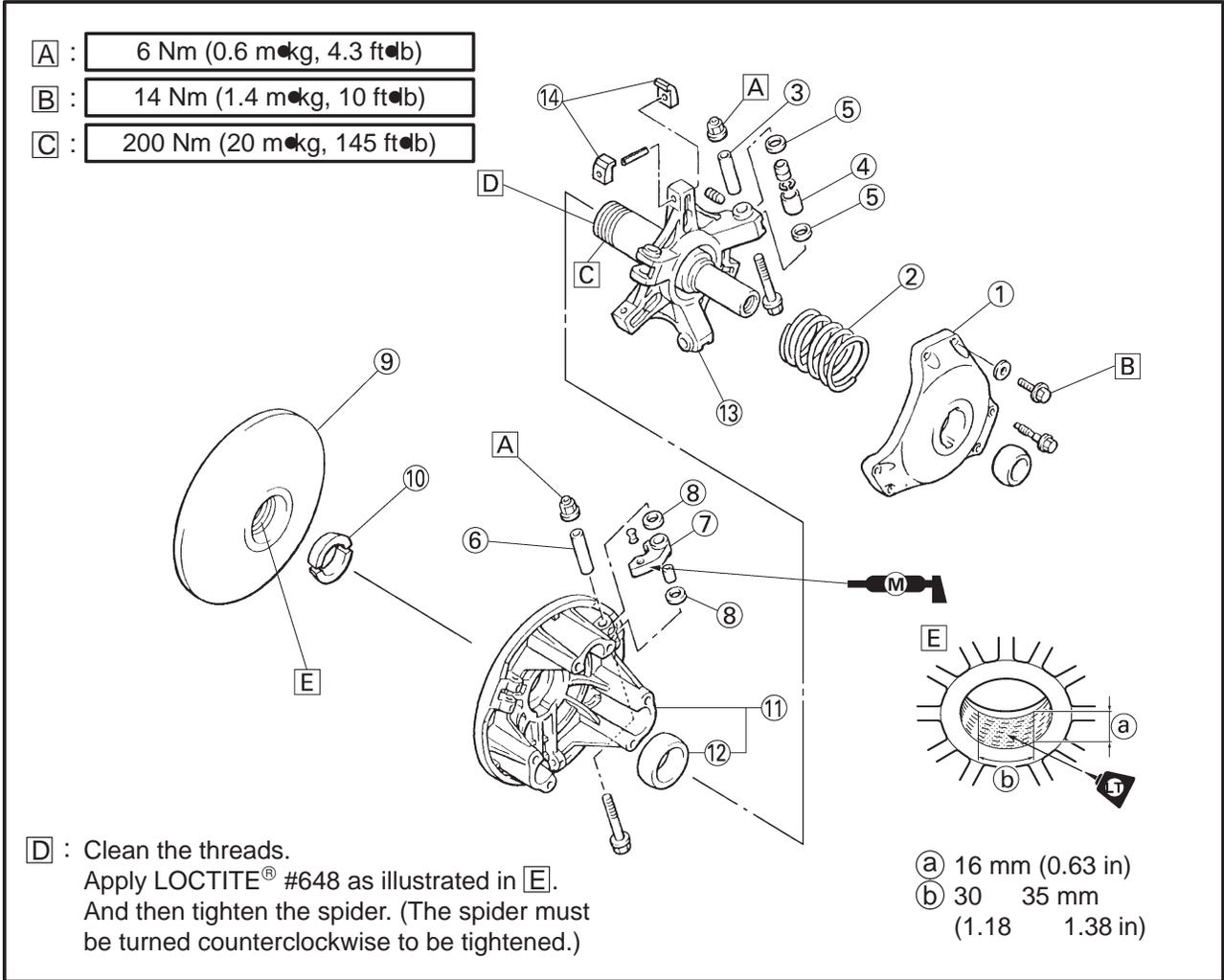
POWER TRAIN

ESS00118

PRIMARY SHEAVE AND DRIVE V-BELT



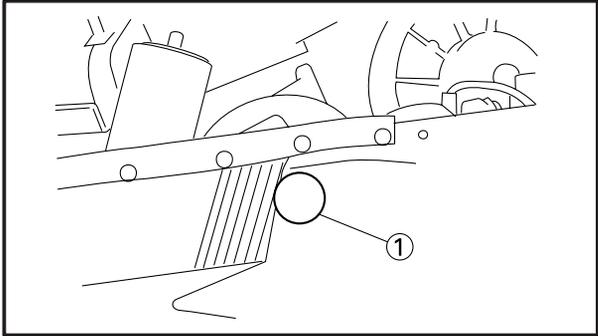
Order	Job name/Part name	Q'ty	Remarks
	Primary sheave removal		
1	V-belt	1	Remove the parts in the order listed below. For installation, reverse the removal procedure.
2	Blind cap	1	
3	Primary sheave assembly	1	



4

Order	Job name/Part name	Q'ty	Remarks
	Primary sheave disassembly		Remove the parts in the order listed below.
①	Primary sheave cap	1	
②	Primary sheave spring	1	
③	Collar	3	
④	Roller	3	
⑤	Washer	6	
⑥	Collar	3	
⑦	Weight	3	
⑧	Washer	6	
⑨	Fixed sheave	1	
⑩	Stopper	1	
⑪	Sliding sheave	1	
⑫	Bushing	1	
⑬	Spider	1	
⑭	Slider	6	
			For assembly, reverse the disassembly procedure.

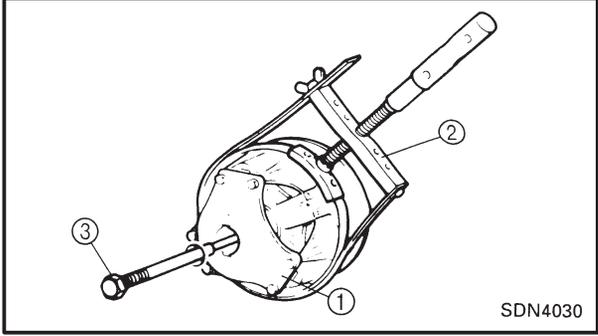
PRIMARY SHEAVE AND DRIVE V-BELT



ESS00119

REMOVAL

- 1. Remove:
 - Drive V-belt guard
 - Drive V-belt
 - Grommet ①



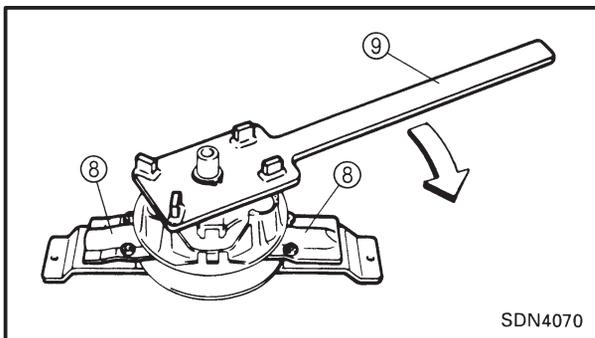
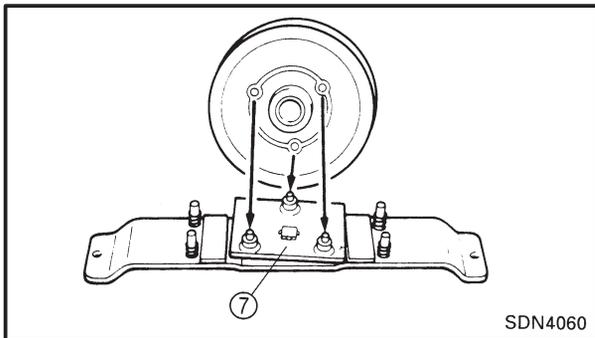
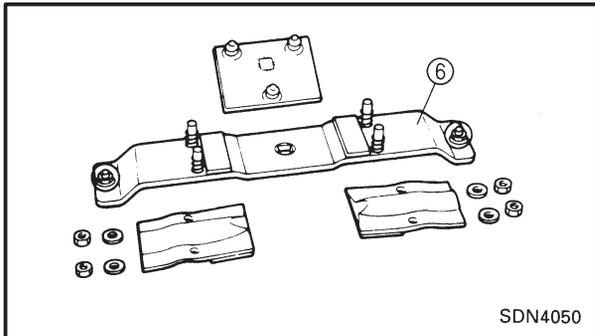
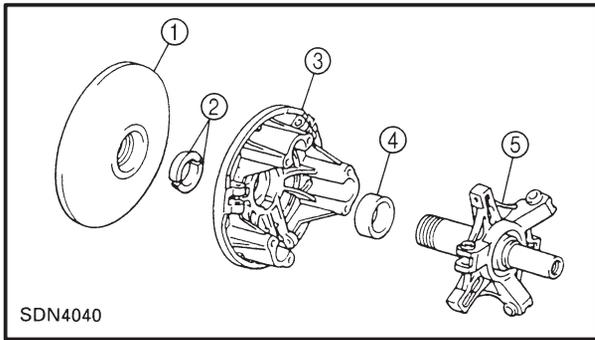
SDN4030

- 2. Remove:
 - Primary sheave assembly ①

NOTE: _____
Use the primary sheave holder ② and primary sheave puller ③.



Primary sheave holder:
90890-01701, YS-01880
Primary sheave puller:
YS-01881-1, YS-01882-1



ESS00120

DISASSEMBLY

1. Remove:
 - Fixed sheave ①
 - Stopper ②
 - Sliding sheave ③
 - Bushing ④
 - Spider ⑤

Removal steps:

- Immerse the primary sheave assembly in 80° ~ 100°C (176° ~ 212°F) water for several minutes.
- Attach the lower piece of the clutch spider separator ⑥ onto a rigid table using suitable mounting bolts. Then, install the clutch separator adapter ⑦ onto the separator.



Clutch spider separator:
90890-01711, YS-28890-B
Clutch separator adapter:
90890-01740, YS-34480

- Fit the primary sheave assembly onto the adapter and secure the supporting plates ⑧.

NOTE:

Securely fit the projections on the adapter into the fixed sheave holes.

- Set the clutch spider separator (bar wrench) ⑨ onto the spider and turn the special tool clockwise to loosen the spider.



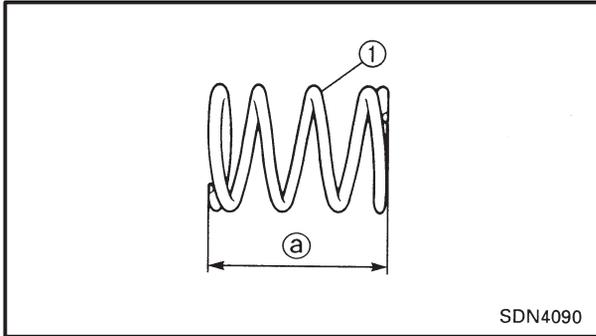
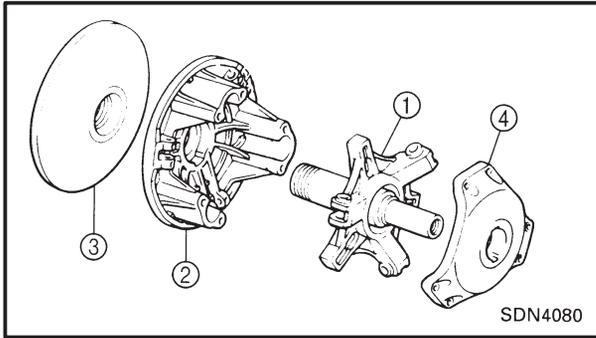
Clutch spider separator (bar wrench):
90890-01711, YS-28890-B

CAUTION:

- The spider has a left-handed thread.
- Since a high torque is required to loosen the spider, make sure that the spider, fixed sheave and special tool are well secured. Loosen the spider carefully to prevent cracks and damage to the sheaves and spider.

- Remove the fixed sheave, fixed sheave stopper, and sliding sheave from the spider.

PRIMARY SHEAVE AND DRIVE V-BELT



ESS00121

INSPECTION

1. Inspect:

- Spider ①
 - Sliding sheave ②
 - Fixed sheave ③
 - Primary sheave cap ④
- Cracks/damage → Replace.

2. Inspect:

- Primary sheave spring ①
- Cracks/damage → Replace.

3. Measure:

- Primary sheave spring free length (a)
- Out of specification → Replace the primary sheave spring.

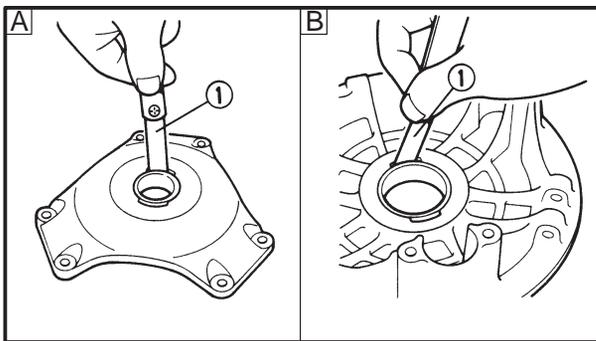


Primary sheave spring free length

(a):
85.4 mm (3.36 in)

NOTE:

When changing the primary sheave springs, refer to "GEAR SELECTION" in CHAPTER 2.



4. Measure:

- Bushing-to-sheave clearance
- Out of specification → Replace bushing.
Use a feeler gauge ①

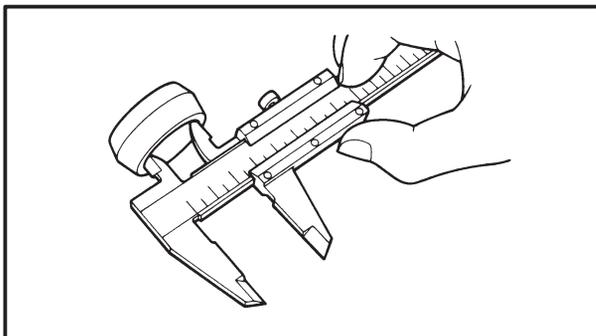


Bush clearance (primary sheave cap) (A):

0.25 mm (0.01 in)

Bush clearance (sliding sheave) (B):

0.25 mm (0.01 in)



5. Measure:

- Bushing inside diameter
- Out of specification → Replace.



Bushing inside diameter:

Primary sheave cap

New: 28.0 mm (1.10 in)

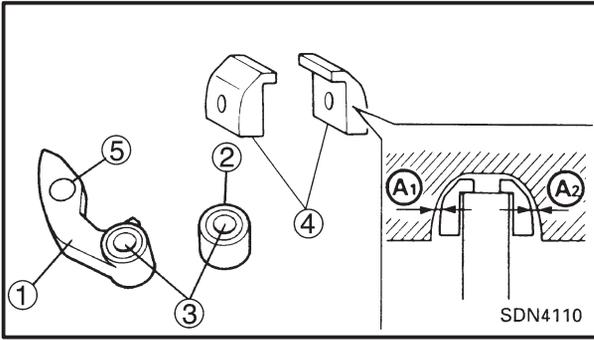
Wear limit: 28.2 mm (1.11 in)

Sliding sheave

New: 40.0 mm (1.57 in)

Wear limit: 40.2 mm (1.58 in)

PRIMARY SHEAVE AND DRIVE V-BELT



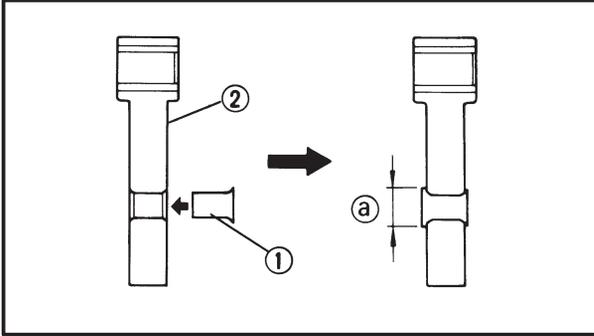
6. Inspect:

- Weight ①
- Roller ②
- Bushing ③
- Slider ④
- Rivet ⑤
- Collar

Wear/scratches/damage → Replace.



Slider inside clearance $A_1 + A_2$:
Min. 0 mm (0 in)
Max. 0.3 mm (0.0118 in)

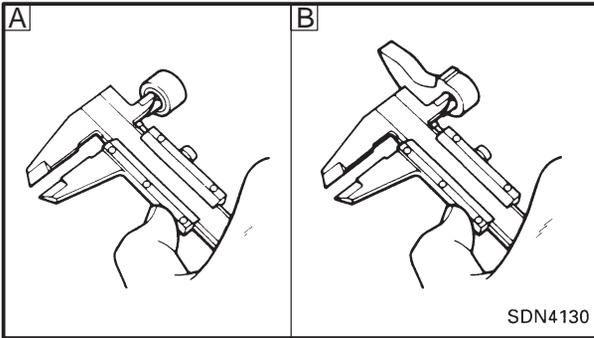


Rivet replacement steps:

- Remove old rivet with the appropriate drill.
- Insert the rivet ① from the ID mark ② side.
- Press or peen the rivet head so that the diameter ③ of the rivet head measures 8.5 mm (0.33 in) or larger.

7. Measure:

- Bushing inside diameter
 Out of specification → Replace the bushings as a set.

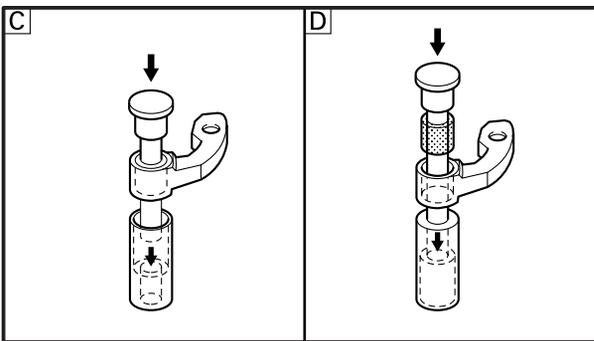


Bushing inside diameter:

- A Roller**
New: 8.0 mm (0.31 in)
Wear limit: 8.2 mm (0.32 in)
- B Weight**
New: 8.0 mm (0.31 in)
Wear limit: 8.2 mm (0.32 in)

NOTE:

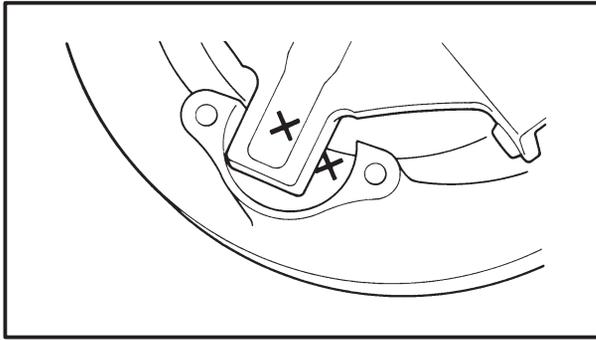
When replacing the weight and roller bushings, use the YXR clutch bushing jig kit.



YXR clutch bushing jig kit:
YS-39752

- C** Removing
- D** Installing

PRIMARY SHEAVE AND DRIVE V-BELT



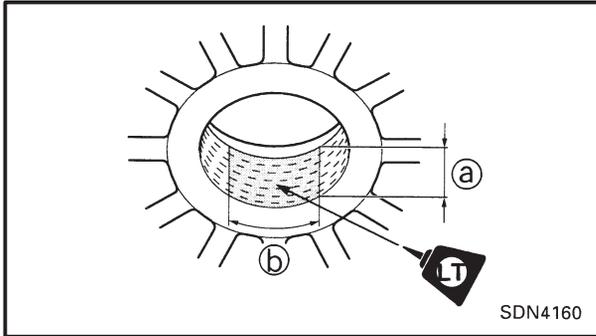
ESS00122

ASSEMBLY

1. Install:
 - Sliding sheave (onto the spider)

NOTE:

Be sure the sliding sheave match mark (X) is aligned with the spider match mark (X).



SDN4160

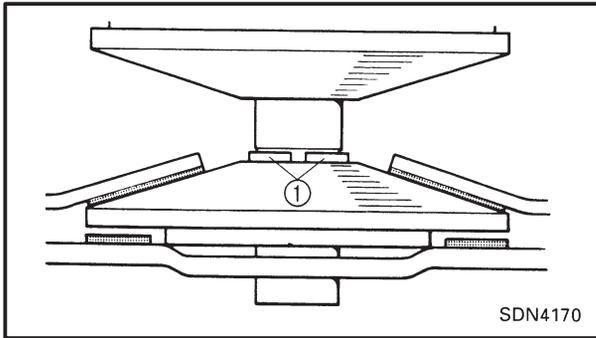
2. Install:
 - Fixed sheave (onto the spider)

NOTE:

Apply LOCTITE® to the fixed sheave as shown.

CAUTION:

LOCTITE® should be applied only to the specified area. Never apply it to the bushings and other areas.



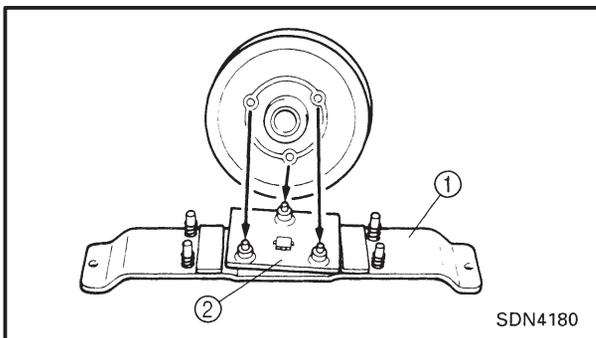
SDN4170

- ① 16 mm (0.63 in)
- ② 30 ~ 35 mm (1.18 ~ 1.38 in)

3. Install:
 - Fixed sheave stoppers ①

NOTE:

Stopper tapered portion should face fixed sheave.



SDN4180

4. Tighten:
 - Spider

Tightening steps:

- Finger-tighten the spider until it is stopped by the fixed sheave stopper.
- Hold the fixed sheave with the clutch spider separator ①.

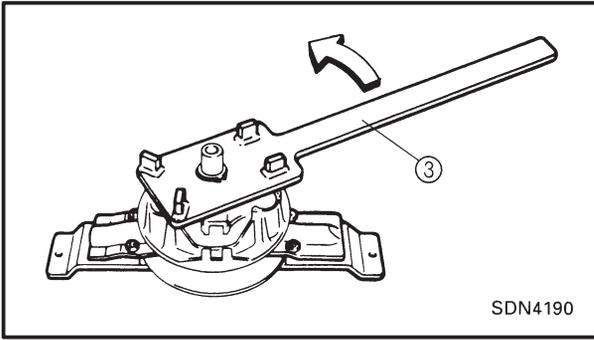


Clutch spider separator:
90890-01711, YS-28890-B

NOTE:

Securely fit the projections on the clutch separator adapter ② into the fixed sheave holes.

PRIMARY SHEAVE AND DRIVE V-BELT



- Tighten the spider to specification using the clutch spider separator (bar wrench) (3).

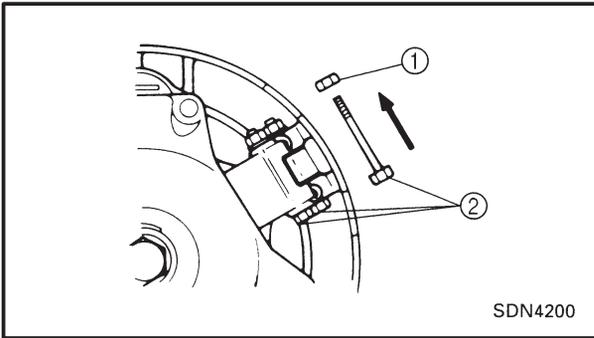
	Spider: 200 Nm (20 m•kg, 145 ft•lb)
--	-----------------------------------------------

CAUTION:

The spider has a left-handed thread.

WARNING

- Do not operate the primary sheave until the LOCTITE® has dried completely. Wait 24 hours before operating the primary sheave.
- Since a high torque is required to tighten the spider, make sure the spider, fixed sheave, and special tool are well secured. Tighten the spider carefully to prevent cracks and damage to the sheaves and spider.

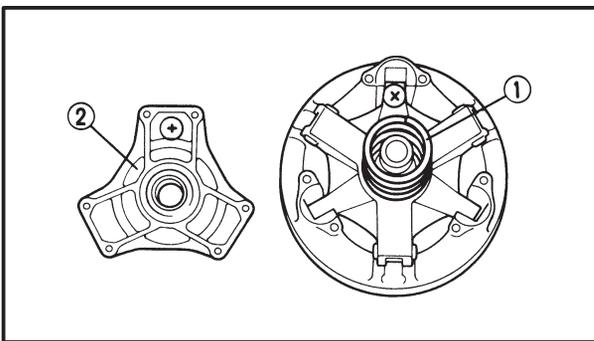


5. Install:
 - Weight

	Nut (1): 6 Nm (0.6 m•kg, 4.3 ft•lb)
--	-----------------------------------------------

NOTE:

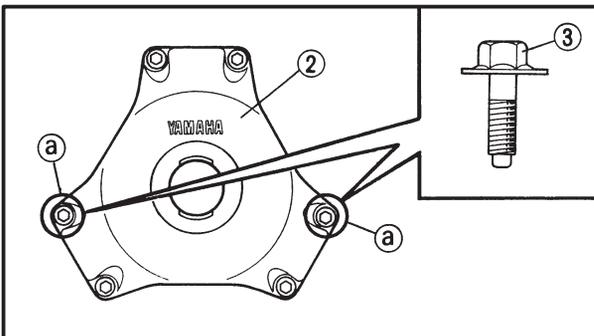
To maintain the primary sheave balance, the bolts (2) must be installed with their threaded portions pointing in a counterclockwise direction, as illustrated.



6. Install:
 - Primary sheave spring (1)
 - Primary sheave cap (2)

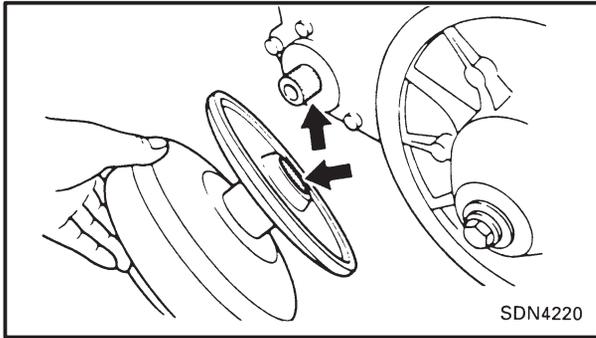
NOTE:

- Be sure the sheave cap match mark (X) is aligned with the spider match mark (X).
- Be sure to use the flange bolts (3) to position (a) to maintain the balance of primary sheave.



	Primary sheave cap bolt: 14 Nm (1.4 m•kg, 10 ft•lb)
--	---------------------------------------------------------------

PRIMARY SHEAVE AND DRIVE V-BELT



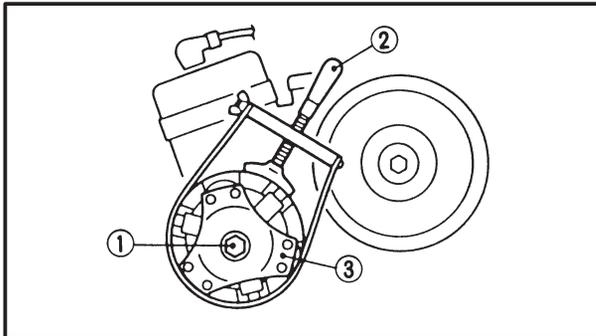
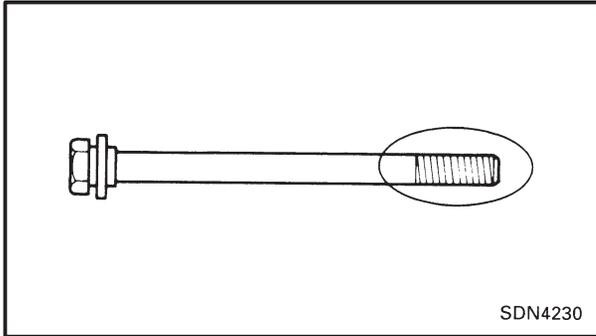
ESS00123

INSTALLATION

1. Install:
 - Primary sheave assembly

CAUTION:

Be sure to remove any oil or grease from the tapered portion of the crankshaft and spider using a cloth dampened with thinner.



2. Apply:
 - YAMALUBE 2-cycle oil or an equivalent grease (to threads of primary sheave bolt)

3. Tighten:
 - Bolt (primary sheave) ①

Tightening steps:

- Hold the primary sheave ③ using the primary sheave holder ② and tighten the bolt (primary sheave) to specification.



Primary sheave holder:
90890-01701, YS-01880



Bolt (primary sheave) ①:
(initial tightening)
120 Nm (12 m•kg, 87 ft•lb)

- Loosen the bolt (primary sheave) completely.
- Retighten the bolt (primary sheave) to specification.

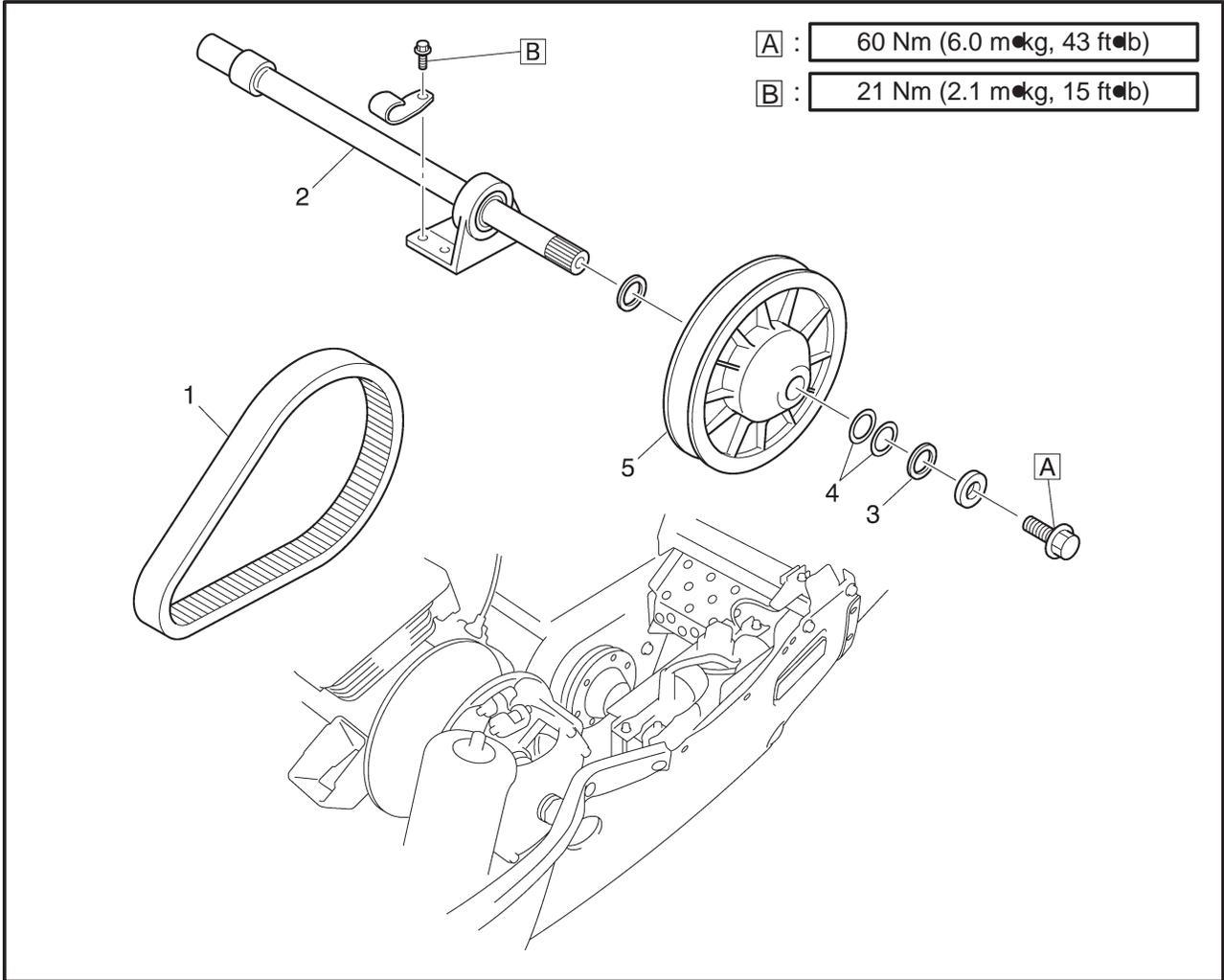


Bolt (primary sheave) ①:
60 Nm (6.0 m•kg, 43 ft•lb)

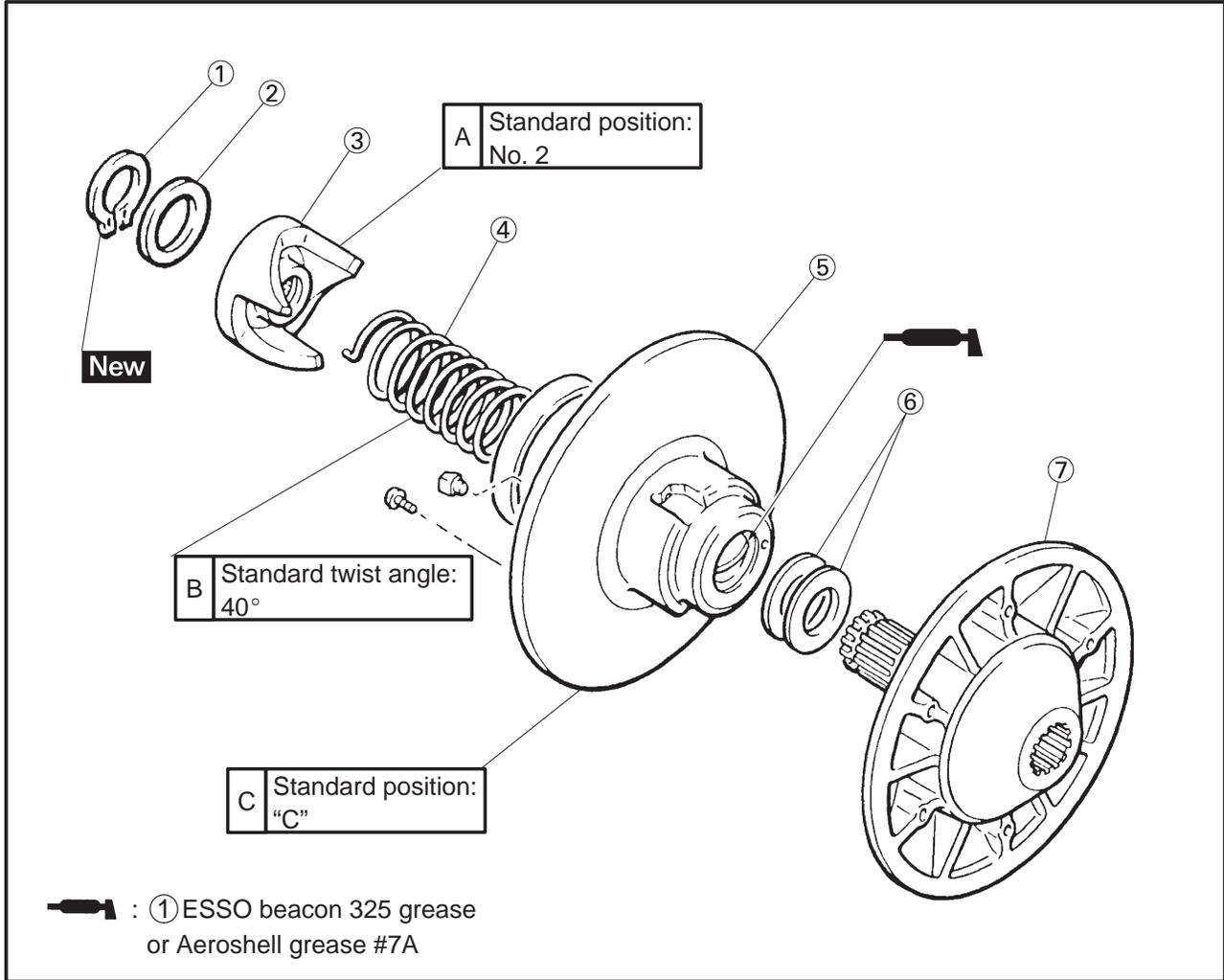
4. Adjust:
 - V-belt position
Refer to "DRIVE V-BELT" in CHAPTER 2.
 - Sheave distance
 - Sheave offset
 - Secondary sheave freeplay (clearance)
Refer to "SHEAVE DISTANCE AND OFFSET ADJUSTMENT" in CHAPTER 2.

ESS00124

SECONDARY SHEAVE



Order	Job name/Part name	Q'ty	Remarks
	Secondary sheave removal		Remove the parts in the order listed below.
1	V-belt	1	
2	Secondary shaft (jackshaft)	1	With secondary sheave
3	Washer	1	
4	Shim	–	Refer to “SHEAVE DISTANCE AND OFFSET ADJUSTMENT” in CHAPTER 2.
5	Secondary sheave assembly	1	For installation, reverse the removal procedure.



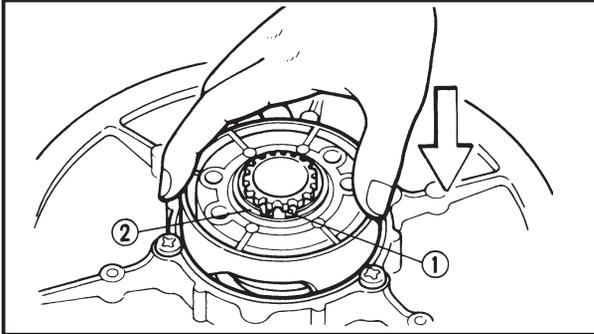
Order	Job name/Part name	Q'ty	Remarks
	Secondary sheave disassembly		Remove the parts in the order listed below.
①	Circlip	1	
②	Washer	1	
③	Spring seat	1	
④	Secondary spring	1	
⑤	Sliding sheave	1	
⑥	Shim	2	
⑦	Fixed sheave	1	
			For assembly, reverse the removal procedure.

ESS00125

DISASSEMBLY

⚠ WARNING

- Use extreme **CAUTION** when disassembling the secondary sheave since serious injury can occur due to the sudden release of spring tension. Use the sheave compressor to contain the spring tension before removing the nuts (spring seat).
- Do not attempt this procedure unless you have the proper tools and understand the instructions thoroughly.



1. Remove:

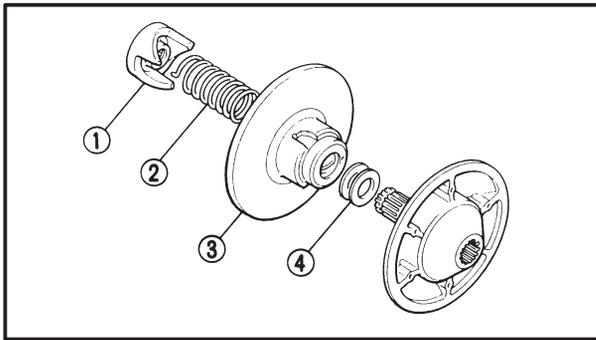
- Circlip ①
- Washer ②

ESS00126

INSPECTION

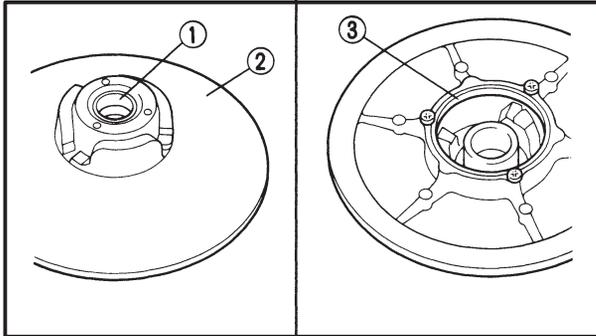
1. Inspect:

- Sliding sheave ①
 - Fixed sheave ②
 - Spring seat ③
 - Shims ④
- Cracks/damage → Replace.



2. Inspect:

- Bushing (spring seat) ①
- Sliding sheave (V-belt contact surface) ②
- Scratches/wear/damage → Replace.
- Sliding bushing ③
- Unsymmetrical wear/damage → Replace.

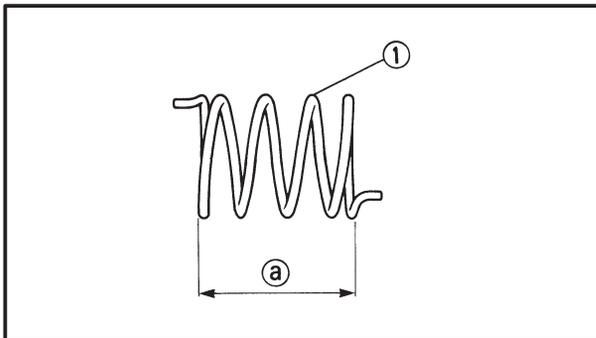


3. Inspect:

- Secondary sheave spring ①
- Cracks/damage → Replace.

4. Measure:

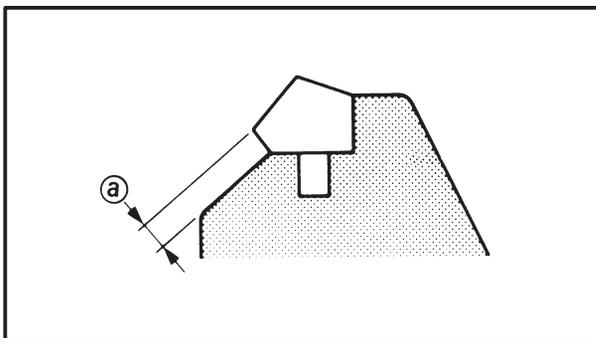
- Secondary sheave spring free length ①
- Below specification → Replace the secondary sheave spring.



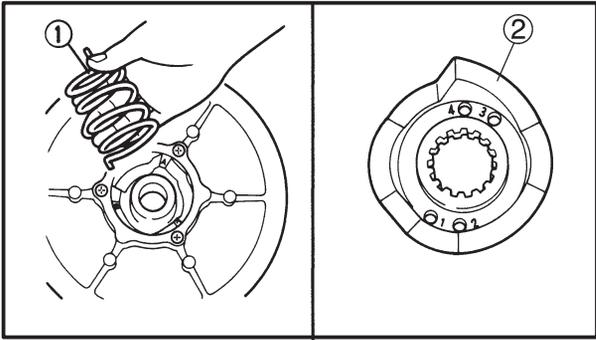
Free length limit ①:
93.5 mm (3.68 in)

5. Measure:

- Ramp shoe thickness ①
- Out of specification → Replace the ramp shoe.



Wear limit ①:
1.0 mm (0.04 in)



ESS00127

ASSEMBLY

1. Install:
- Secondary sheave spring ①
 - Spring seat ②

NOTE: _____

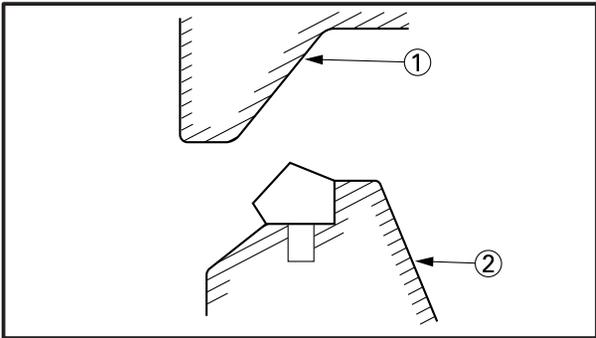
Hook the end of the secondary sheave spring into the spring holes in the sliding sheave. Hook the other end of the spring into the holes in the spring seat.

Standard spring position:

C-2

Installation steps:

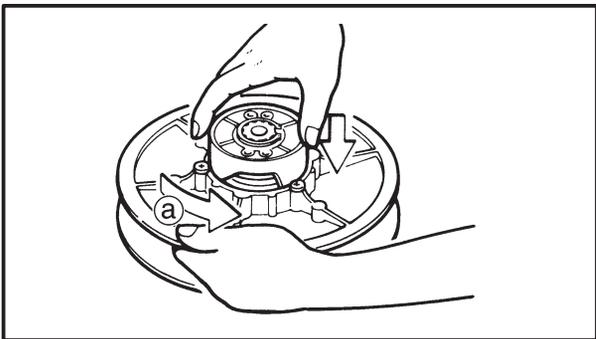
- Turn in the screw for the sheave compressor so that the spring seat splines engage with the fixed sheave splines.



NOTE: _____

Turn in this screw to a position where the spring seat cam ① does not come in to contact with the sliding sheave cam ②.

- Turn the sliding sheave through the specified angle, in the counterclockwise direction.
- Holding the sliding sheave and fixed sheave in this position.



	<p>Standard angle (a): 40°</p>
-------------------------------------------------------------------------------------	--------------------------------------------------

- Turn in the screw for the sheave compressor so that the spring seat engages with the sliding sheave.
- Install the washer and circlip in their proper positions.



ESS00128

INSTALLATION

1. Lubricate:

- Splines (fixed sheave)



Recommended grease:
Esso beacon 325 grease or
Aeroshell grease #7A

2. Tighten:



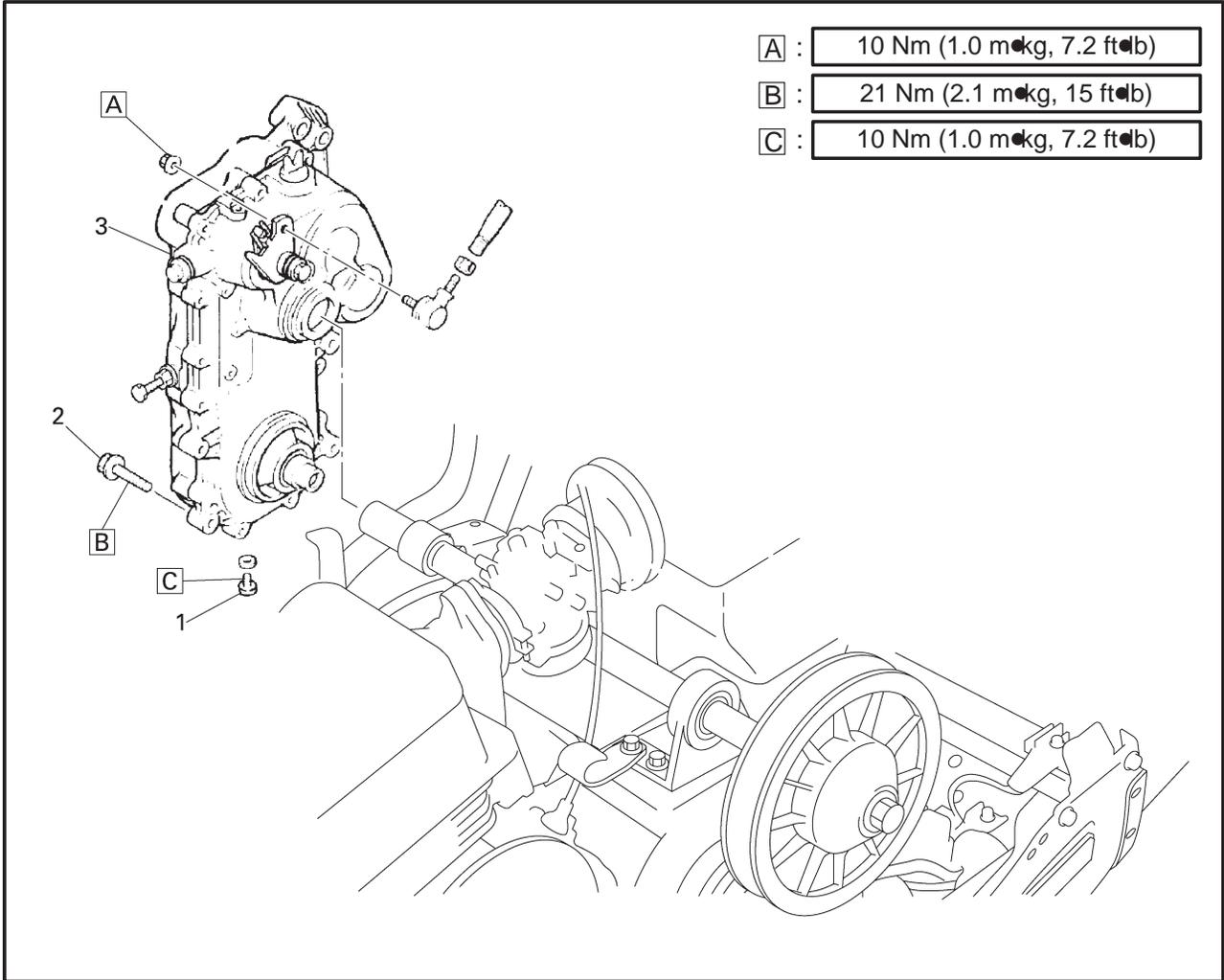
Secondary sheave bolt:
60 Nm (6.0 m•kg, 43 ft•lb)

3. Adjust:

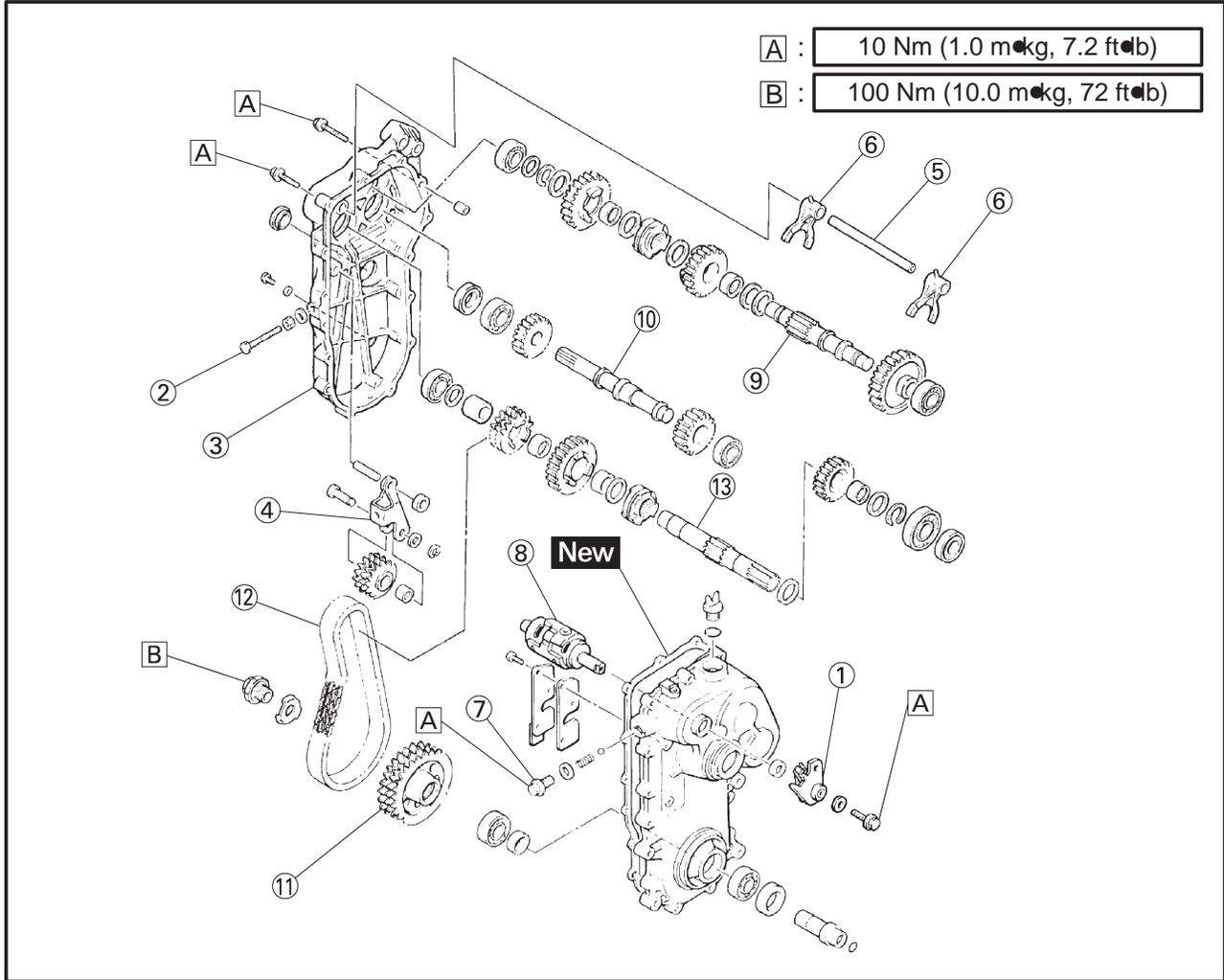
- V-belt position
Refer to "DRIVE V-BELT" in CHAPTER 2.
- Sheave distance
- Sheave offset
- Secondary sheave freeplay (clearance)
Refer to "SHEAVE DISTANCE AND OFFSET ADJUSTMENT" in CHAPTER 2.

ESS00132

DRIVE CHAIN HOUSING



Order	Job name/Part name	Q'ty	Remarks
	Drive chain housing removal		Remove the parts in the order listed below. Refer to "BRAKE"
1	Brake caliper	1	Drain the oil
2	Drain bolt	4	
3	Bolt	1	
	Drive chain housing assembly		For installation, reverse the removal procedure.



Order	Job name/Part name	Q'ty	Remarks
	Drive chain housing disassembly		Remove the parts in the order listed below.
①	Shift link lever	1	
②	Chain tensioner adjuster	1	
③	Chain housing cover	1	
④	Chain tensioner	1	
⑤	Shift fork guide bar	1	
⑥	Shift fork	2	
⑦	Shift cam stopper	1	
⑧	Shift cam	1	
⑨	Counter axle	1	
⑩	Idle axle	1	
⑪	Driven sprocket	1	
⑫	Drive chain	1	
⑬	Drive axle	1	
			For assembly, reverse the removal procedure.

ESS00133

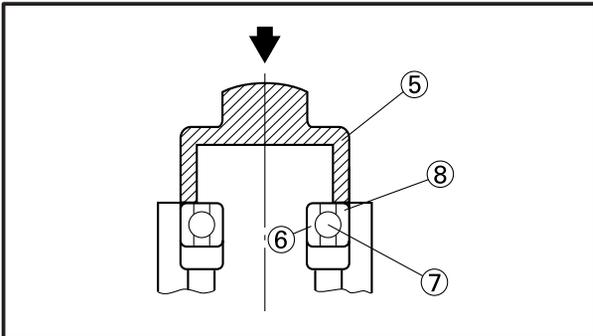
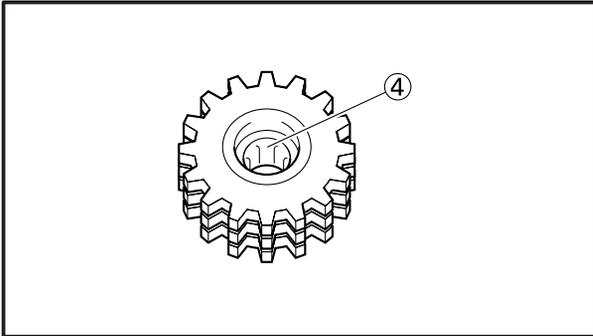
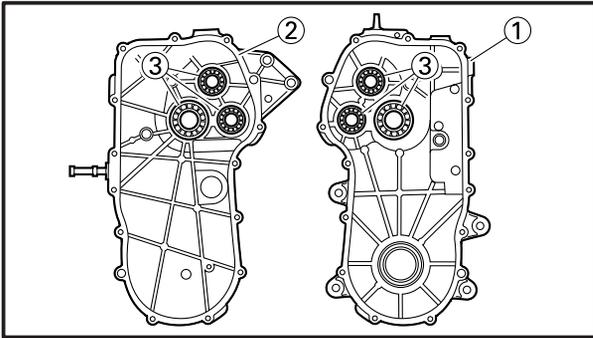
INSPECTION

1. Inspect:

- Drive chain housing ①
- Drive chain housing cover ②
Cracks/damage → Replace.
- Oil seals (drive chain housing)
Wear/damage → Replace.
- Bearings (drive chain housing and cover) ③
Pitting/damage → Replace.
- Bearing (chain tensioner) ④
Pitting/damage → Replace the bearing and the inner race holder as a set.

Replacement steps:

- Remove the bearing(s) ③ using a general bearing puller.
- Install the new bearing(s).



NOTE:

Use a socket ⑤ that is the same size as the outside diameter of the race of the bearing race.

CAUTION:

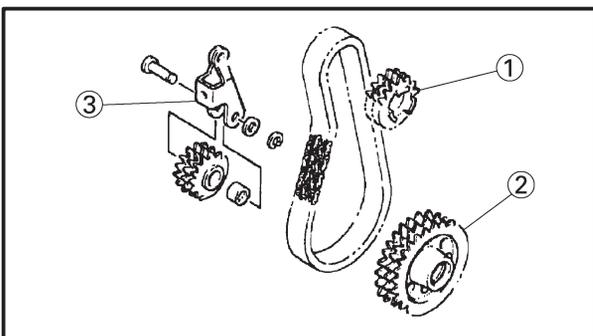
Do not strike the inner race ⑥ or ball bearings ⑦.

Contact only the outer race ⑧.

- Install a new circlip (drive chain housing).

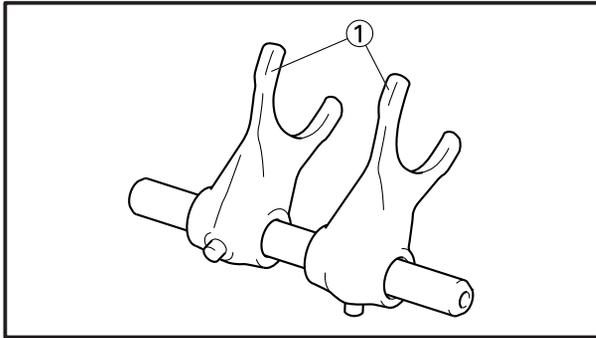
CAUTION:

Always use new circlips.

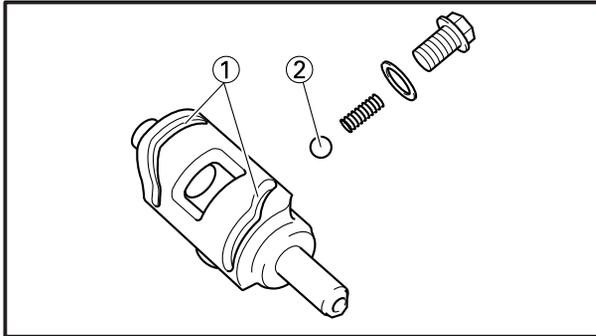


2. Inspect:

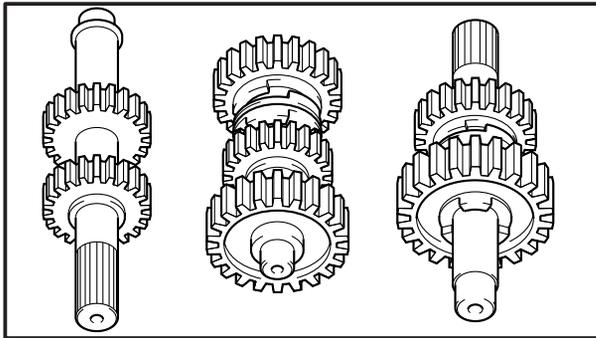
- Drive sprocket teeth ①
- Driven sprocket teeth ②
- Chain tensioner ③
Pitting/wear/damage → Replace.



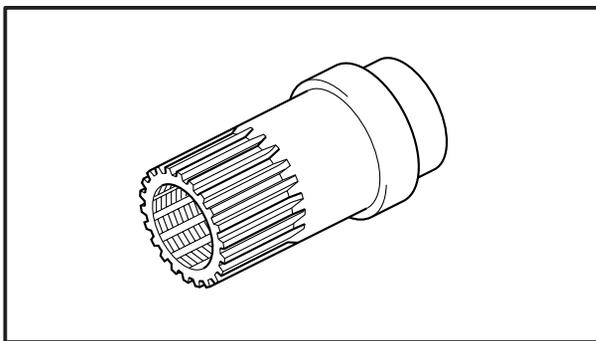
3. Inspect:
 - Shift forks ①
On the gear and shift cam contact surfaces.
Wear/chafing/bends/damage → Replace.
4. Check:
 - Shift fork movement
On its guide bar.
Unsmooth operation → Replace fork and/or guide bar.



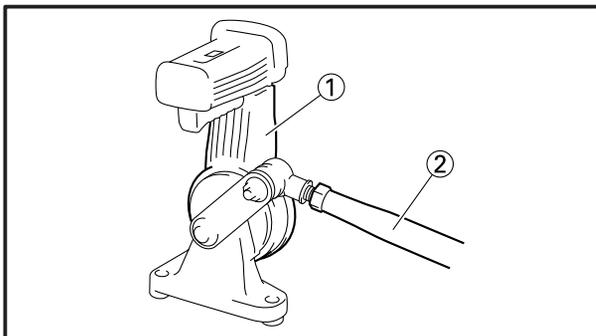
5. Inspect:
 - Shift cam grooves ①
Wear/damage/scratches → Replace.
 - Shift cam segment
Damage/wear → Replace.
 - Stopper ball ②
Damage/wear → Replace.



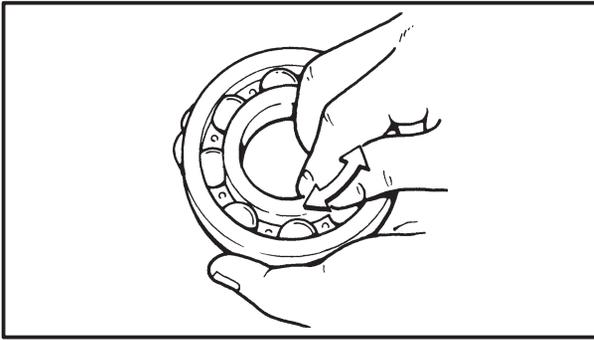
6. Inspect:
 - Gears
Damage/wear → Replace.
7. Check:
 - Gear movement
Unsmooth operation → Replace.
8. Inspect:
 - Mating dogs
Cracks/wear/damage → Replace.



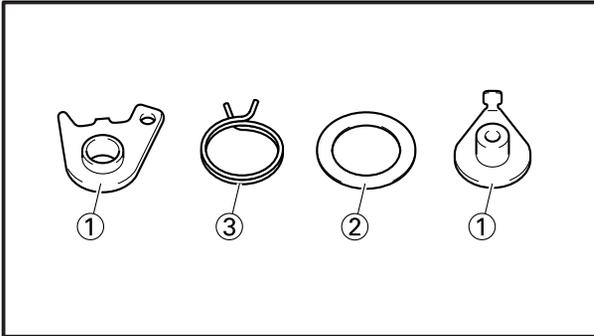
9. Inspect:
 - Splines
Damage → Replace.



10. Inspect:
 - Drive select lever ①
 - Shift rod ②
Wear/damage → Replace.

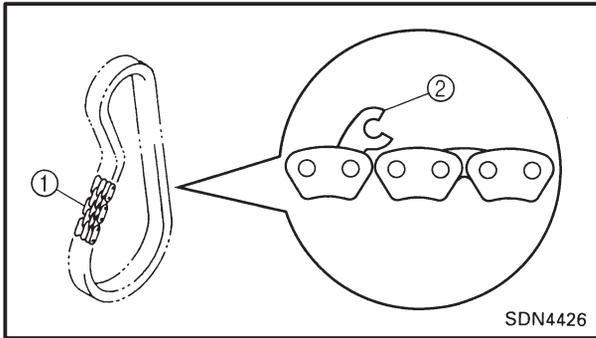
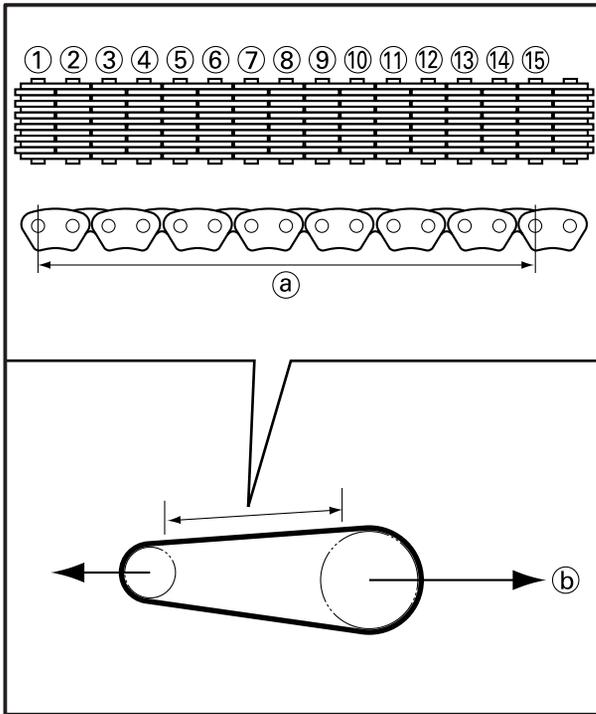


11. Inspect:
- Axle bearings
 - Shift cam bearing
- Pitting/damage → Replace.



12. Inspect:
- Shift linkage levers ①
 - Spacer ②
 - Torsion spring ③
- Wear/damage → Replace.

13. Inspect:
- Circlips
 - Washers
- Damage/looseness/bends → Replace.



14. Measure:

- 14 link section (a) of the drive chain
- Using a spring scale, pull on the drive chain with 36 kg (80 lbs) of force (b).
- Out of specification → Replace the drive chain.



Maximum 14 link drive chain section length (a):
133.35 mm (5.25 in)
Limit 137.35 mm (5.41 in)

NOTE:

- Measure the length between drive chain pin (1) and (15) as shown.
- Perform this measurement at two or three different places.

If replacement is necessary, always replace the chain and the sprockets as a set.

15. Inspect:

- Drive chain (1)
Stiffness → Clean and lubricate or replace.
- Drive chain plates (2)
Damage/wear → Replace the drive chain.
Cracks → Replace the drive chain.

ESS00134

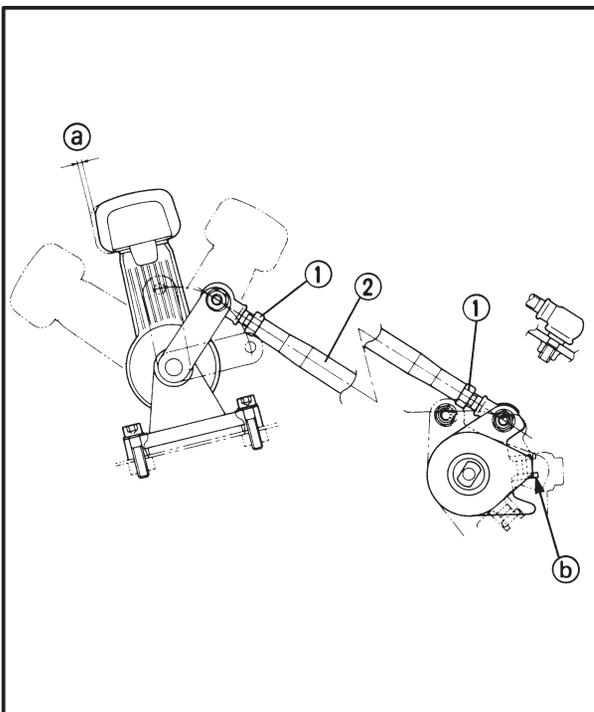
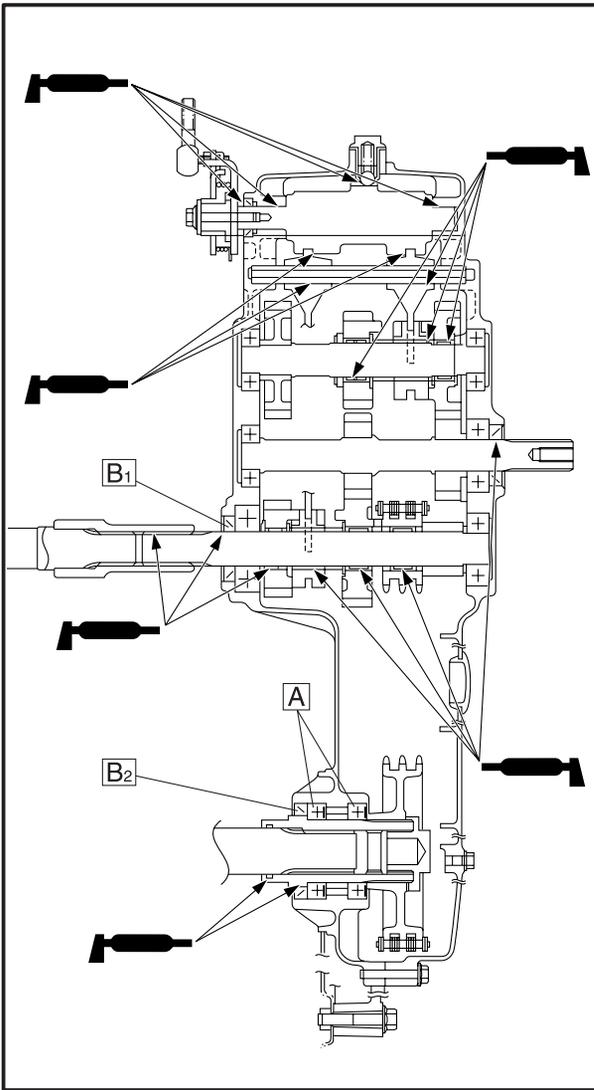
INSTALLATION

1. During installation, pay attention to the following.

A Make sure that the bearing seals face towards the drive chain as shown.

B₁ **B₂** Be sure to install the spacers in their original positions, otherwise the brake disc and jackshaft will stick.

 : ESSO beacon 325 grease or Aeroshell grease #7A



2. Adjust:

- Shift rod

Adjustment steps:

- Move the shift lever to the “R” position.
- Loosen the locknut ①.
- Turn the shift rod ② in or out until the specified free play ③ is attained.



Free play ③:

3 ~ 6 mm (0.12 ~ 0.24 in)

- Be sure that the free play ④ between the shift linkage lever and torsion spring is less than 1 mm (0.04 in).
- Tighten the locknut ①.

3. Fill:

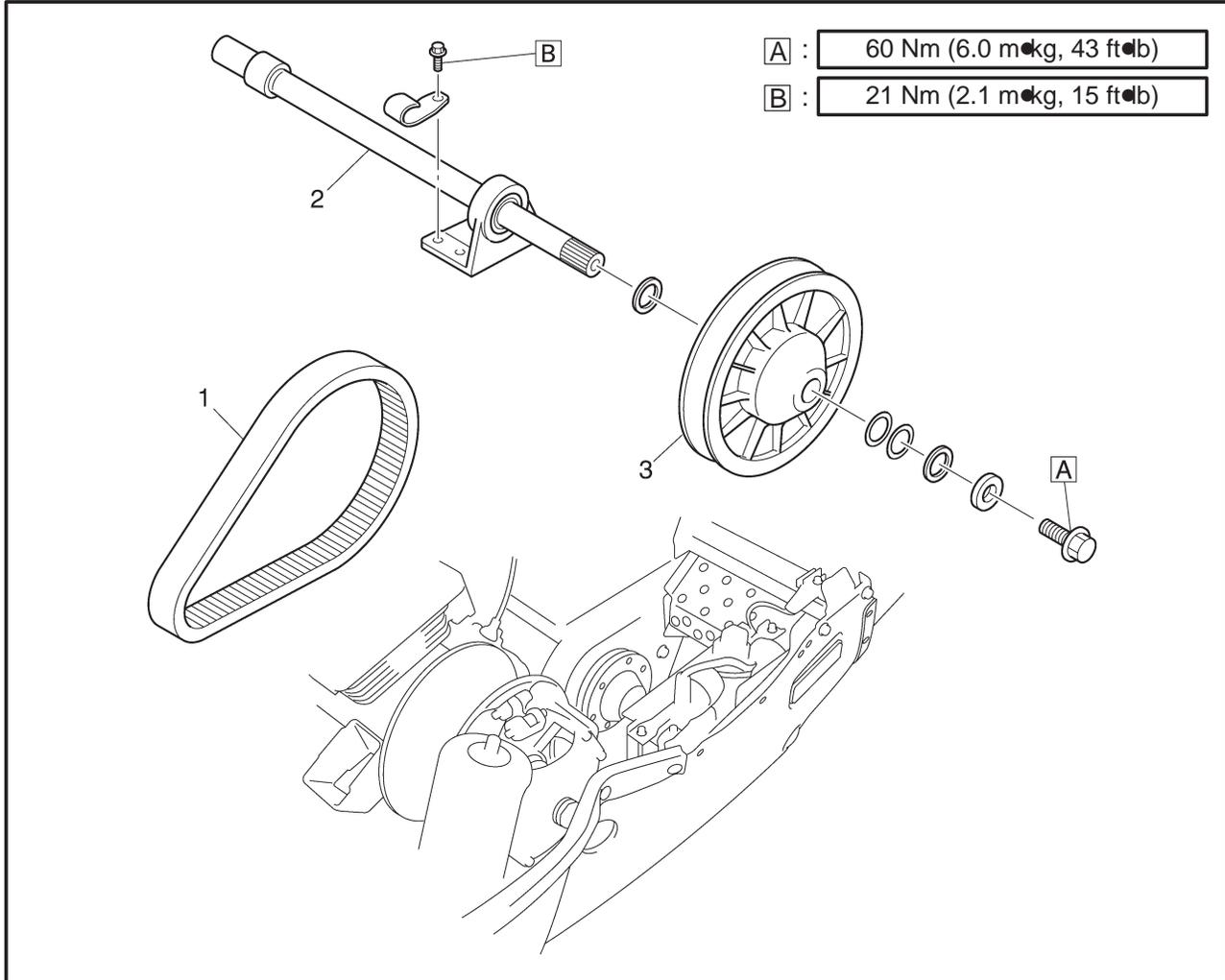
- Drive chain housing oil
Refer to “DRIVE CHAIN” in CHAPTER 2.

4. Adjust:

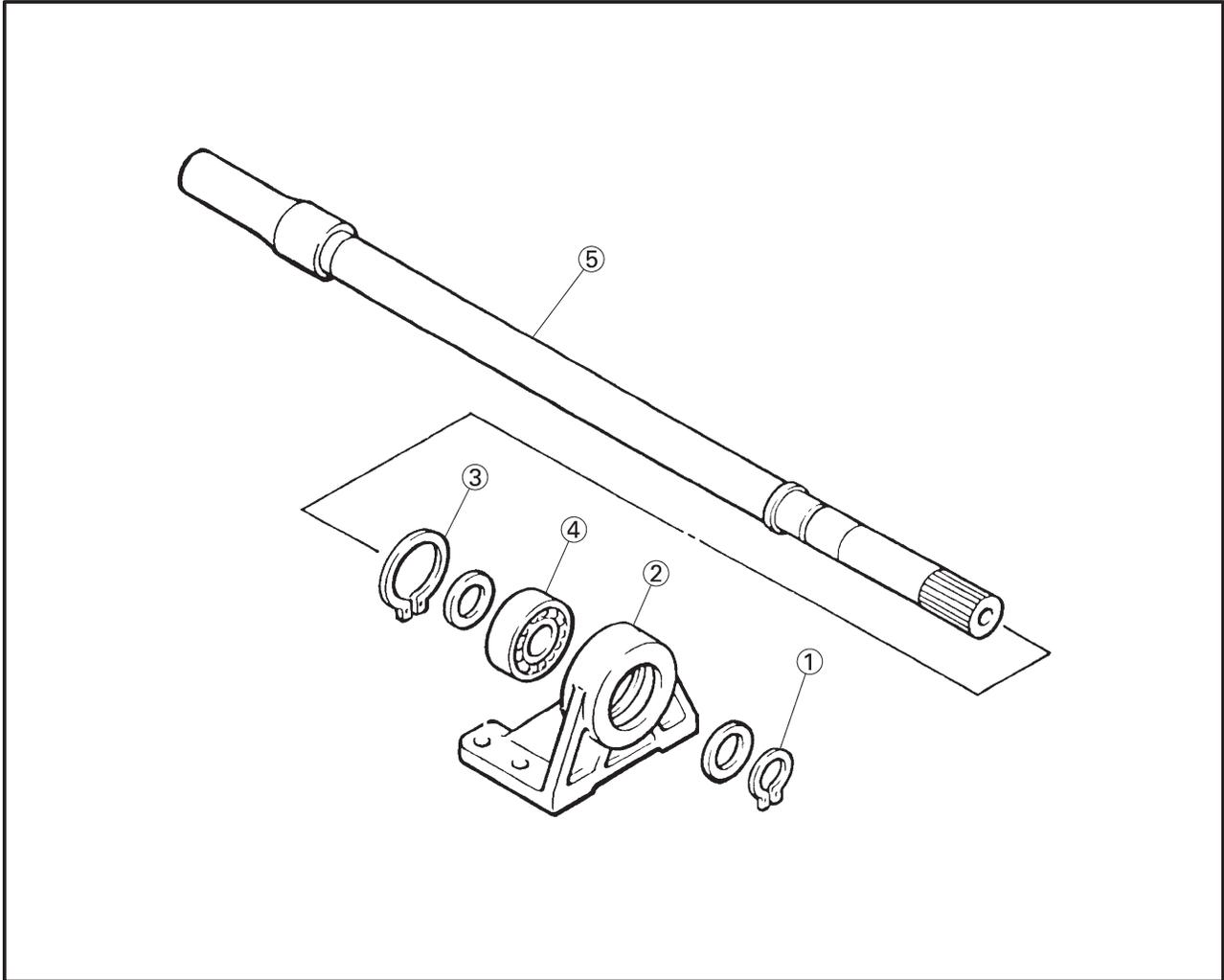
- Drive chain slack
Refer to “DRIVE CHAIN” in CHAPTER 2.

ESS00135

SECONDARY SHAFT (JACKSHAFT)

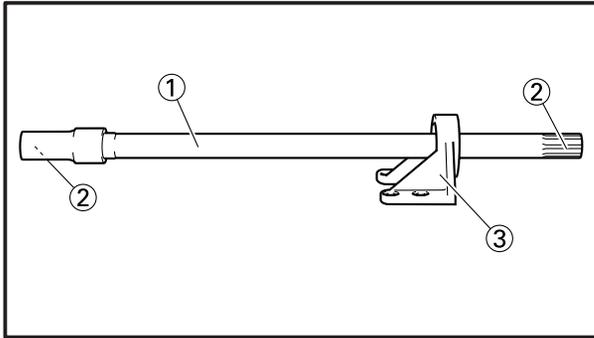


Order	Job name/Part name	Q'ty	Remarks
	Secondary shaft (jackshaft) removal		
1	V-belt	1	
2	Secondary shaft (jackshaft)	1	With secondary sheave
3	Secondary sheave	1	
			For installation, reverse the removal procedure.



Order	Job name/Part name	Q'ty	Remarks
	Secondary shaft (jackshaft) disassembly		Remove the parts in the order listed below.
	Secondary sheave		
①	Circlip	1	
②	Bearing housing	1	
③	Circlip	1	
④	Bearing	1	
⑤	Secondary shaft (jackshaft)	1	
			For assembly, reverse the removal procedure.

SECONDARY SHAFT (JACKSHAFT)

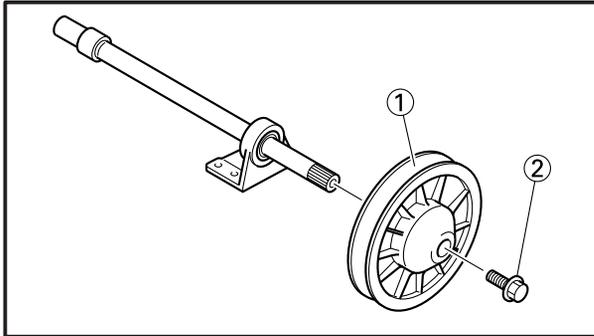


ESS00136

INSPECTION

1. Inspect:

- Secondary shaft (jackshaft) ①
Scratches (excessive)/damage → Replace.
- Splines ②
Wear/damage → Replace the jackshaft.
- Bearing ③
Scratches/wear/damage → Replace the jackshaft.



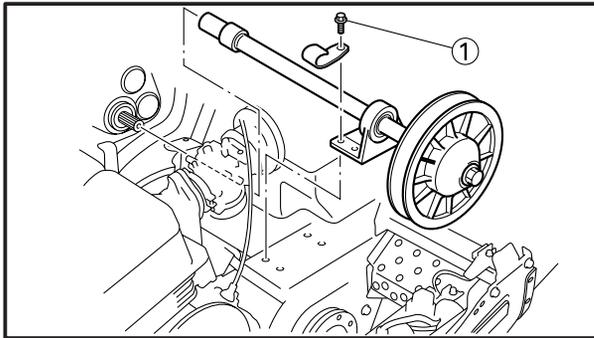
INSTALLATION

1. Install:

- Secondary sheave ①



Secondary sheave bolt ②:
60 Nm (6.0 m•kg, 43 ft•lb)



2. Install:

- Secondary shaft (jackshaft) assembly

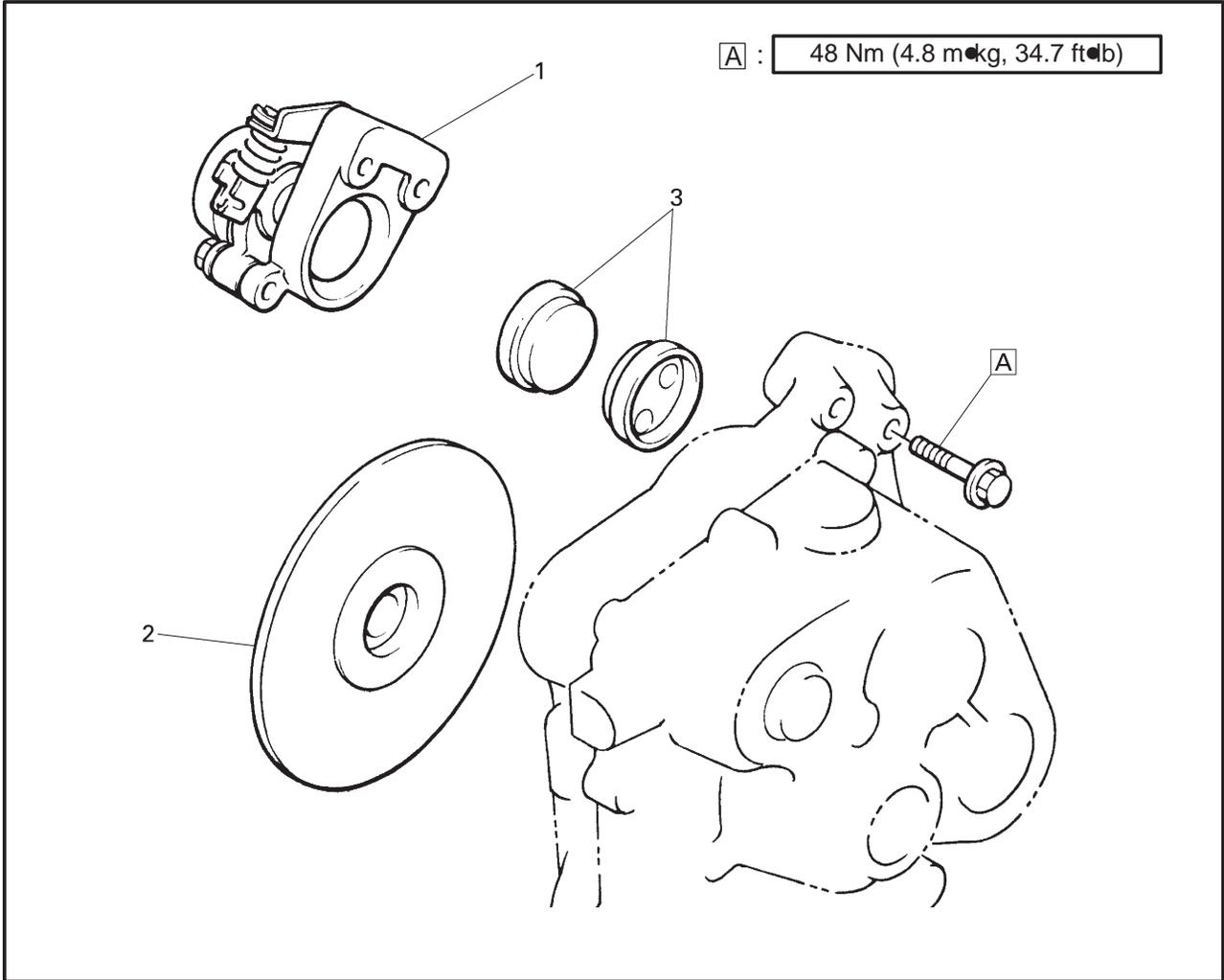


Bolt (Secondary shaft (jackshaft) assembly) ①:
21 Nm (2.1 m•kg, 15 ft•lb)

3. Adjust:

- Sheave distance
 - Sheave offset
- Refer to "SHEAVE DISTANCE AND OFFSET ADJUSTMENT" in CHAPTER 2.

ESS00138
BRAKE



Order	Job name/Part name	Q'ty	Remarks
	Brake pad removal		
1	Brake caliper assembly	1	Remove the parts in the order listed below.
2	Brake disc	1	
3	Brake pads	2	
			For installation, reverse the removal procedure.

ESS00139

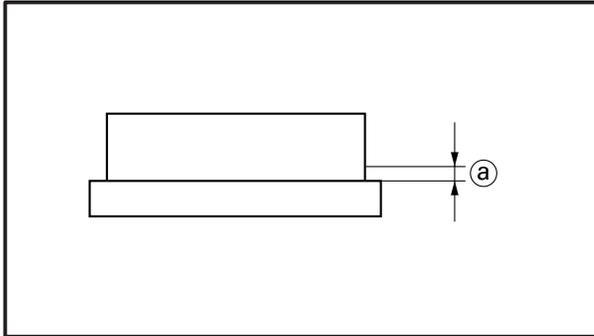
BRAKE PAD REPLACEMENT

1. Remove:

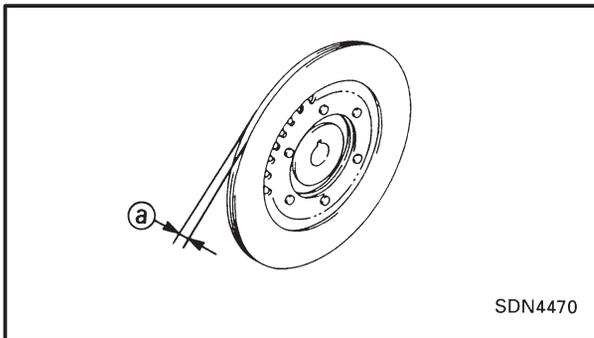
- Brake caliper

NOTE:

- Do not depress the brake lever when the caliper or disc is off the machine otherwise the brake pads will be forced shut.
- Replace the pads as a set if either one is found to be worn to the wear limit (a).



Wear limit (a):
10 mm (0.39 in)



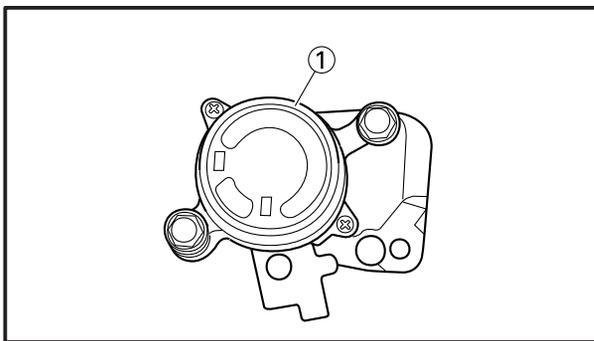
2. Measure:

- Brake disc thickness (a)
Out of specification → Replace the brake disc.



Minimum thickness (a):
3.5 mm (0.14 in)

Measuring point: 1 ~ 3 mm (0.04 ~ 0.12 in)
from the edge of the brake disc.



3. Install:

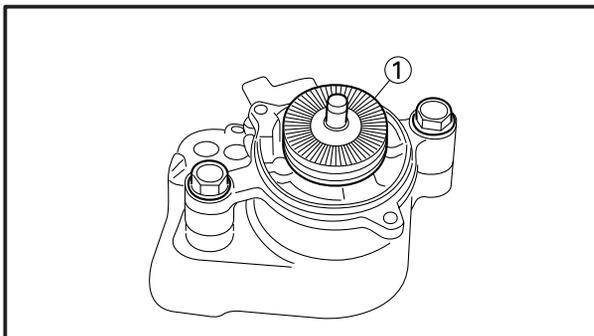
- Brake pads
- Brake caliper

Installation steps:

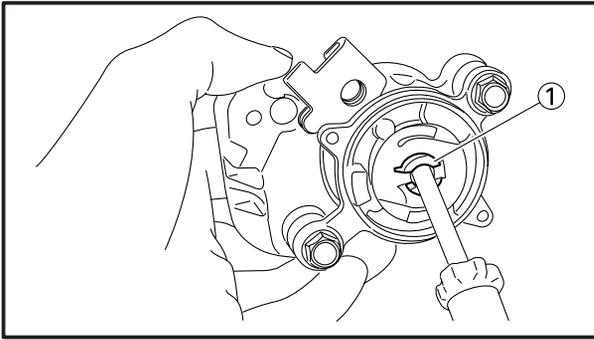
- Removing the end cover (1).

CAUTION:

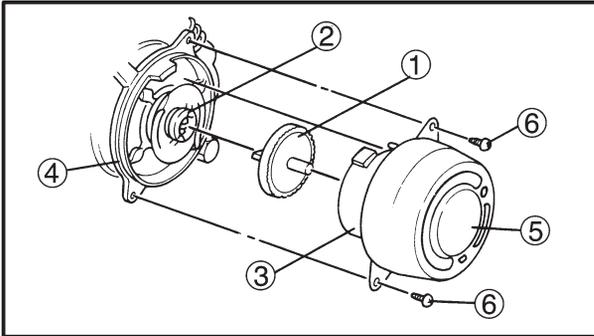
Do not disassemble the torsion spring from the end cover and the guide.



- Removing the adjusting ratchet (1).



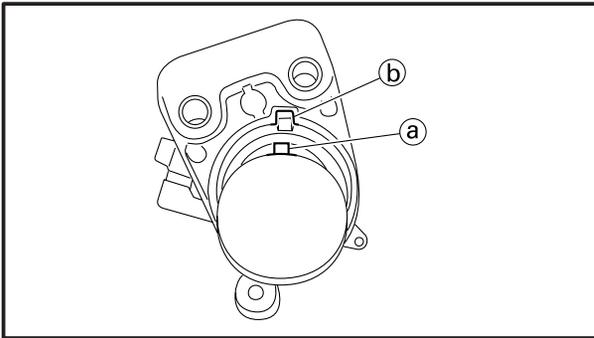
- Screw in the adjusting screw (1), and when it contacts lightly with the end of the back up plate, then back out the adjusting screw (1) 1/2 to turn.



- Fit the end of the adjusting ratchet (1) into the adjusting screw (2), and align the cut in the guide (3) with the projection of the stationary cover (4), then install the guide (3), which is fitted to the end cover (5) twisting the end cover clockwise approximately 30 degrees and tighten the screws (end cover) (6).



Screw (end cover) (6):
2 Nm (0.2 m•kg, 1.4 ft•lb)



- Installing the brake pads.

NOTE: _____

When installing the brake pad at the caliper body side, make sure that projection (a) on the brake pad are meshed with slot (b) on the caliper body.

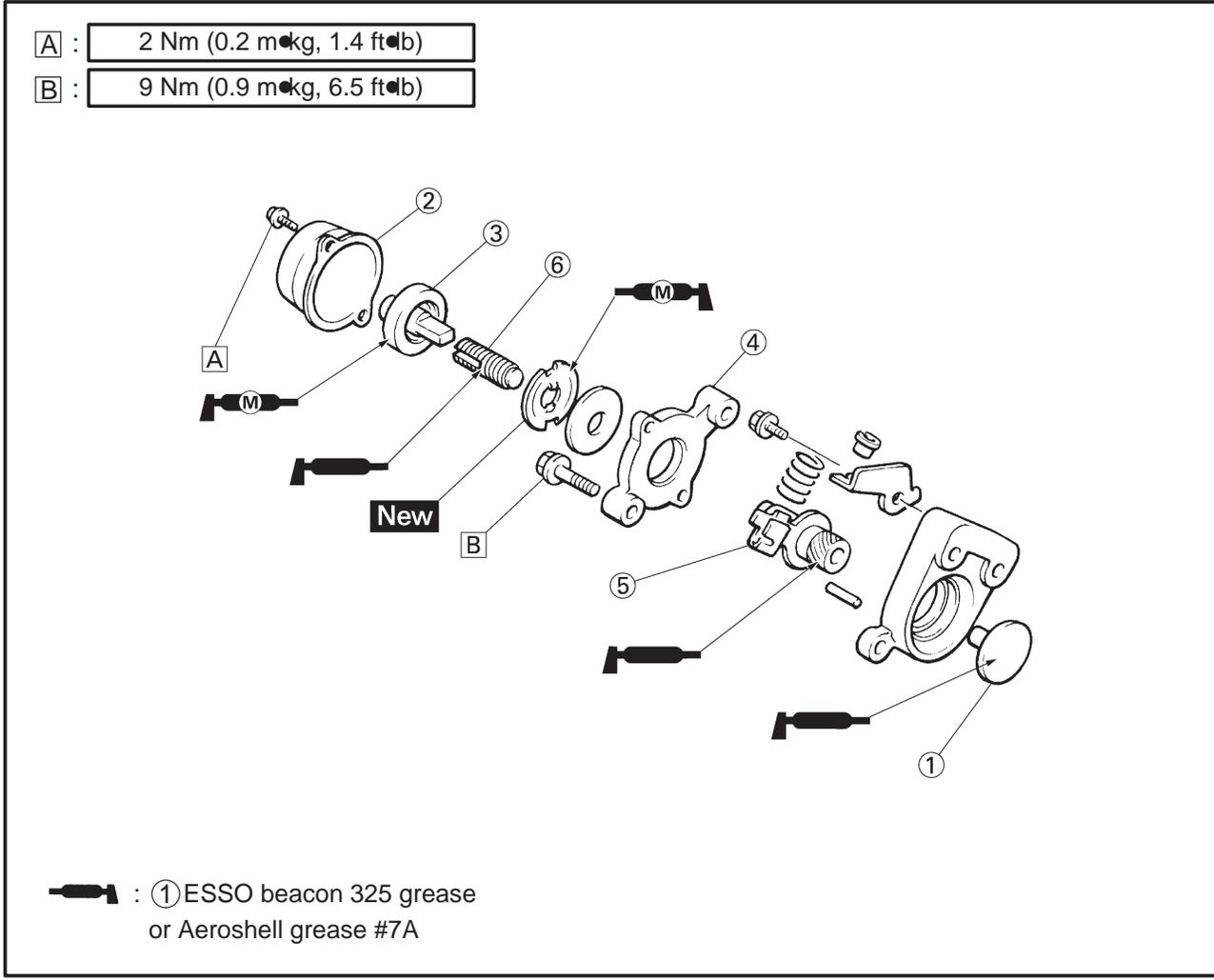
4. Tighten:



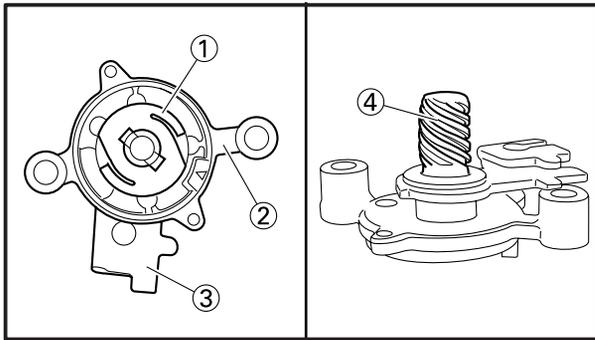
Brake caliper body bolt:
48 Nm (4.8 m•kg, 34.7 ft•lb)

5. Adjust:

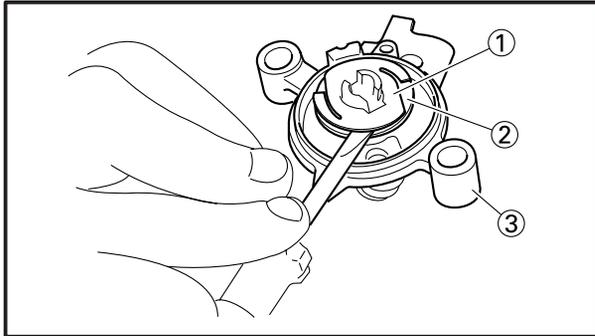
- Brake lever free play



Order	Job name/Part name	Q'ty	Remarks
	Brake caliper disassembly		Remove the parts in the order listed below.
①	Back up plate	1	
②	End cover	1	
③	Adjusting ratchet	1	
④	Stationary cover	1	
⑤	Lever	1	
⑥	Adjusting screw	1	
			For assembly, reverse the removal procedure.


BRAKE CALIPER INSPECTION
1. Inspect:

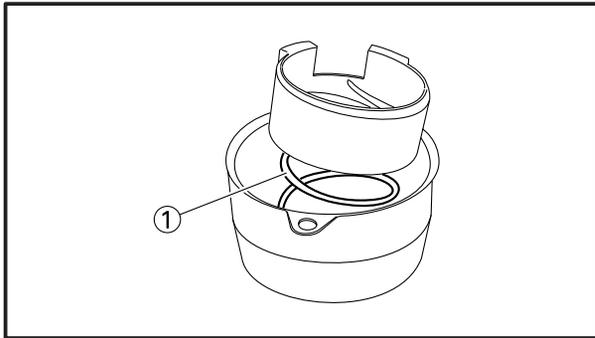
- One way lock 2 ①
- Stationary cover ②
- Lever ③
- Spiral gear ④ (lever)
Cracks/wear/damage → Replace.


Replacement steps:

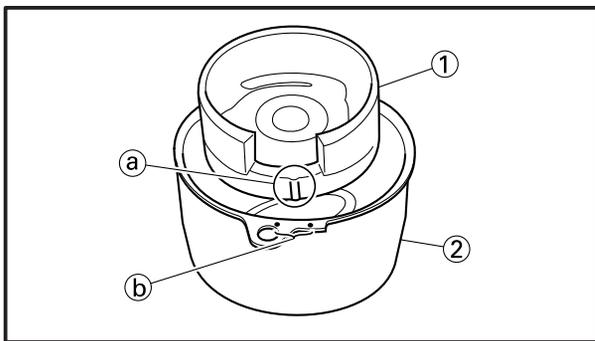
- Remove the one way lock 2 ① using a thin flat-head screw driver.
- Remove the washer ② and stationary cover ③.
- Replace a damaged part(s) use a new one.
- Reassemble the removed part(s) and reverse the above steps.

CAUTION:

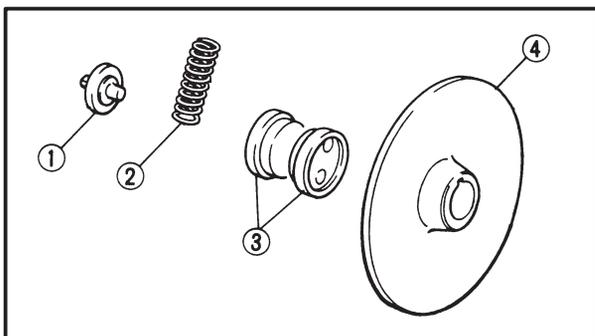
Always use a new one way lock 2.


2. Inspect:

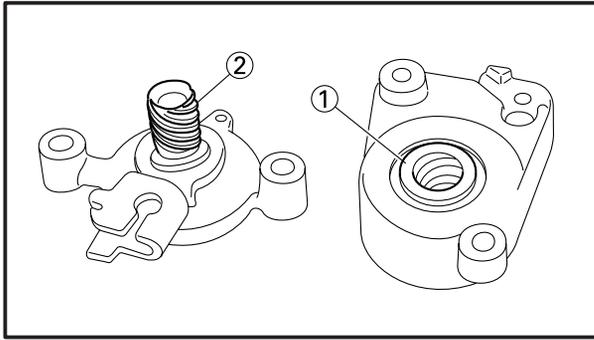
- Torsion spring ①
Fatigue/damage → Replace end cover unit.


Inspection steps:

- Check the fatigue of the torsion spring by the projection mark (a) on the guide ① located between the base marks (b) on the end cover ②. If projection mark (a) is not in the range between the base marks (b), replace the end cover unit.


3. Inspect:

- Adjusting ratchet ①
Cracks/wear/damage → Replace.
- Spring ② (brake cable)
Fatigue/damage → Replace.
- Brake pad ③ thickness
- Brake disc ④
Bend/cracks/damage → Replace.

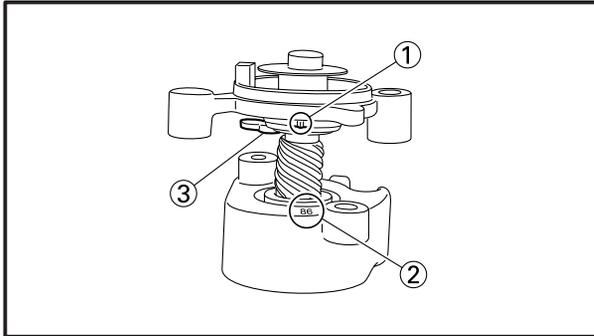
**INSTALLATION**

1. Assemble:

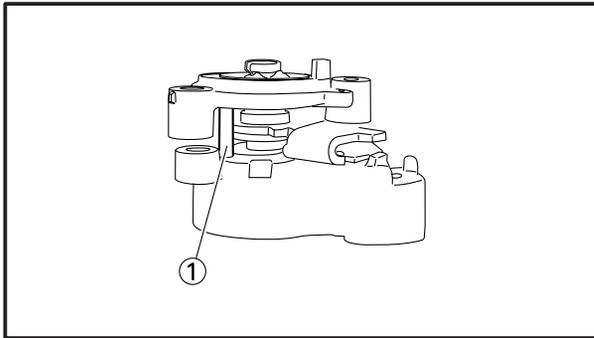
- Caliper body

Assemblage steps:

- Lubricate the spiral gears ① on the caliper body and lever ② with silicone grease.



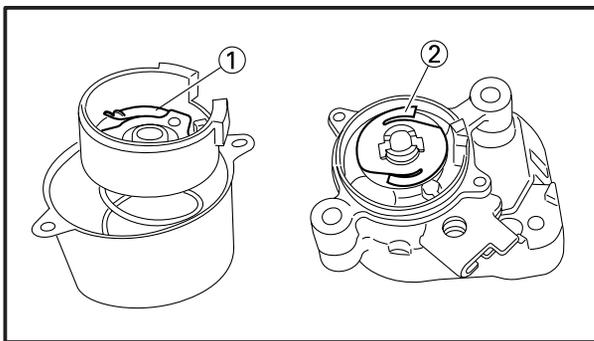
- Align the projection mark ① on the lever with the "86" mark ② on the caliper body, screw the lever ③ counterclockwise to the caliper body.



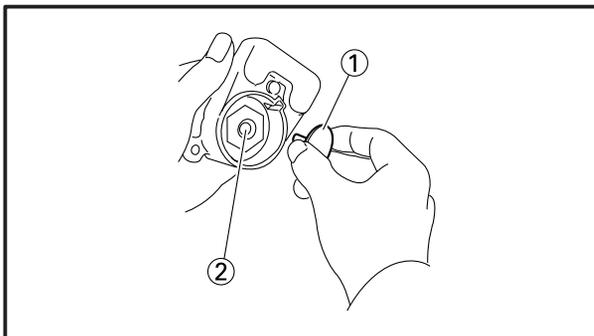
- Install the stopper pin ① into the holes on the caliper body and stationary cover, then tighten the bolts (stationary cover).



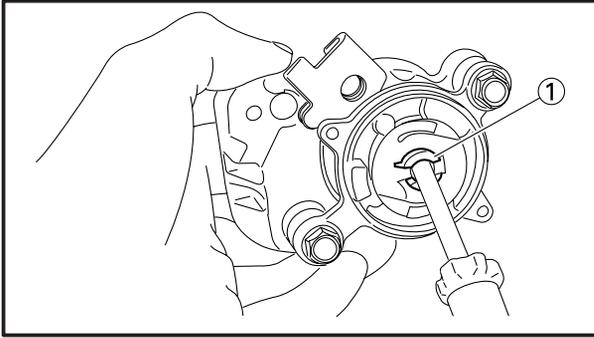
Bolt (stationary cover):
9 Nm (0.9 m•kg, 6.5 ft•lb)



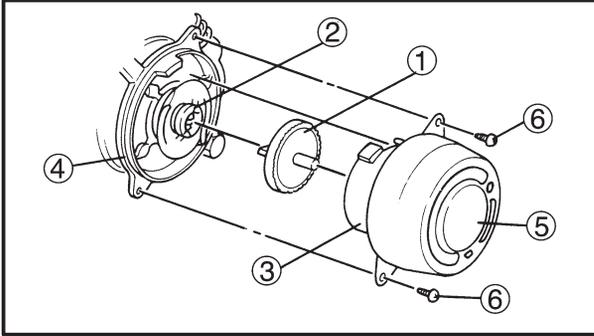
- Lubricate the one way locks 1 ① and 2 ② with a lithium grease.



- Lubricate the adjusting screw and back up plate with a silicone grease.
- Insert the back up plate ① into the lever shaft hole ②.



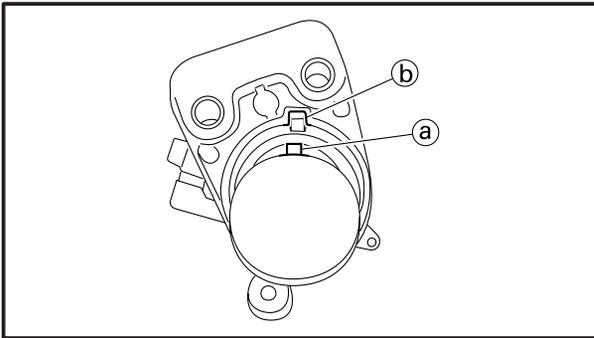
- Screw in the adjusting screw ①, and when it contacts lightly with the end of the back up plate, then back out the adjusting screw ① 1/2 to turn.



- Fit the end of the adjusting ratchet ① into the adjusting screw ②, and align the cut in the guide ③ with the projection of the stationary cover ④, then install the guide ③, which is fitted to the end cover ⑤ twisting the end cover clockwise approximately 30 degrees and tighten the screws (end cover) ⑥.



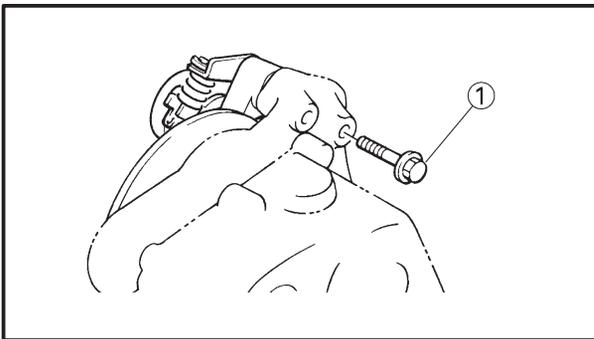
Screw (end cover) ⑥:
2 Nm (0.2 m•kg, 1.4 ft•lb)



2. Install:
- Brake pads

NOTE: _____

When installing the brake pad at the caliper body side, make sure that projection (a) on the brake pad are meshed with slot (b) on the caliper body.



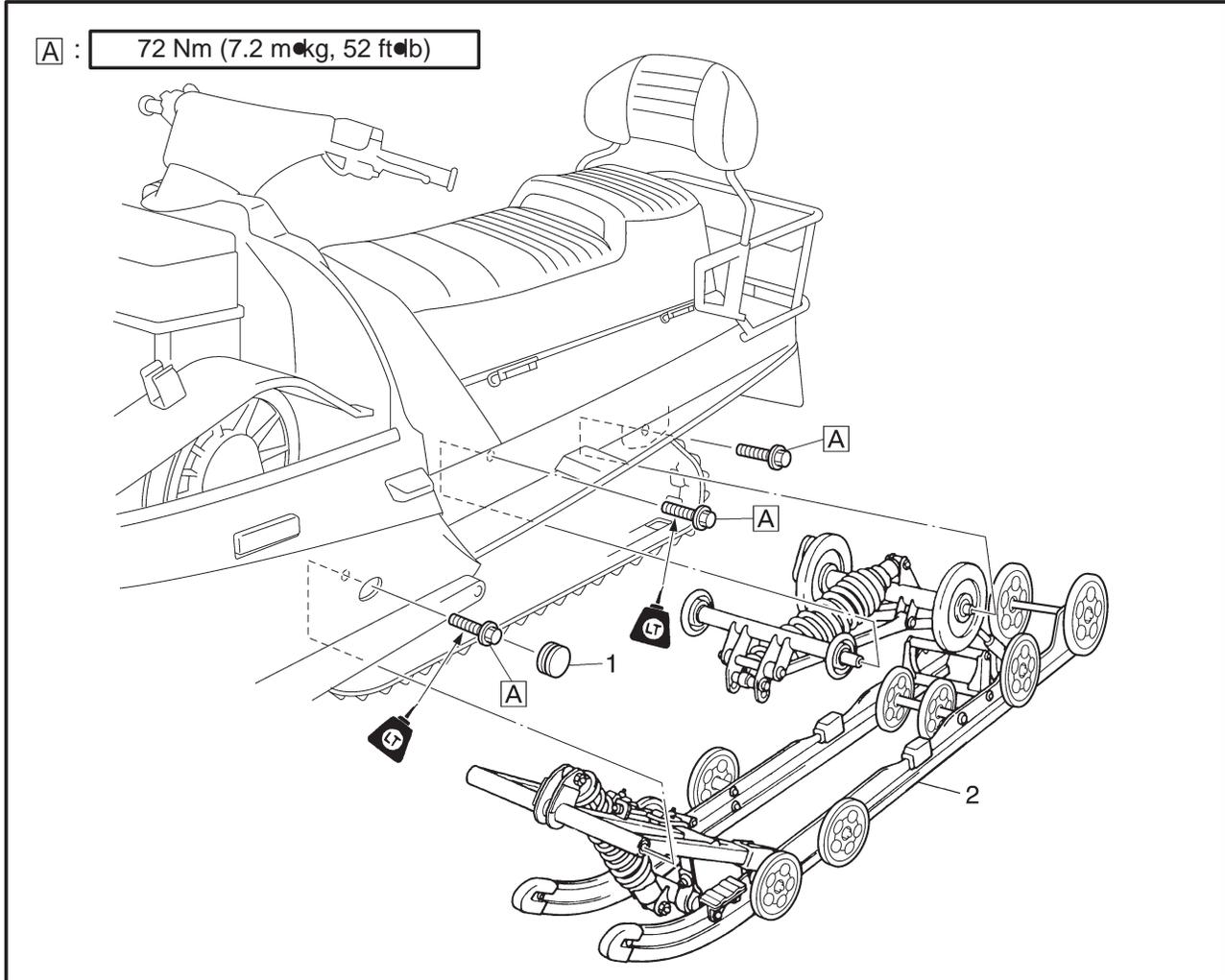
3. Tighten:



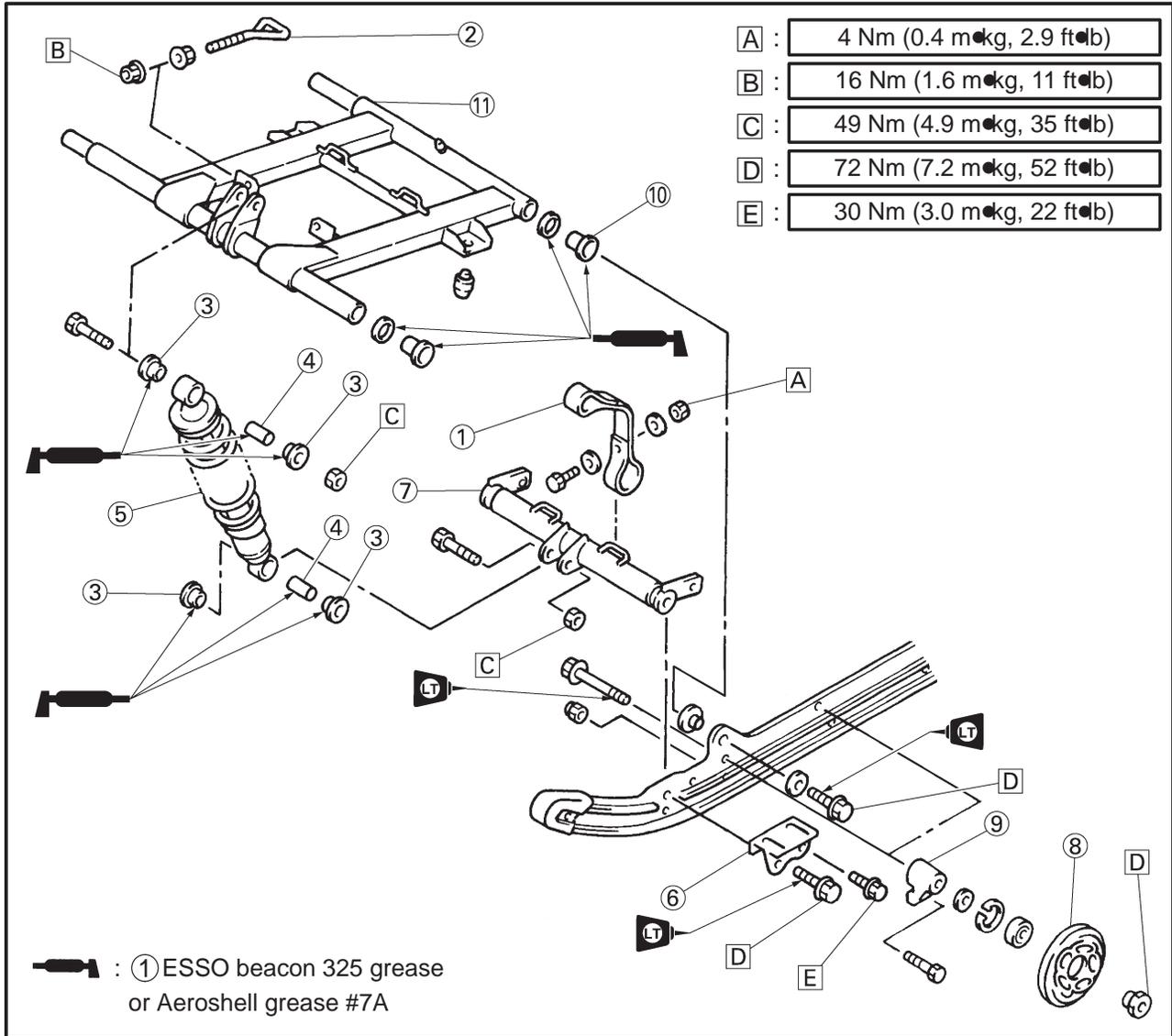
Brake caliper body bolt ①:
48 Nm (4.8 m•kg, 34.7 ft•lb)

4. Adjust:
- Brake lever free play

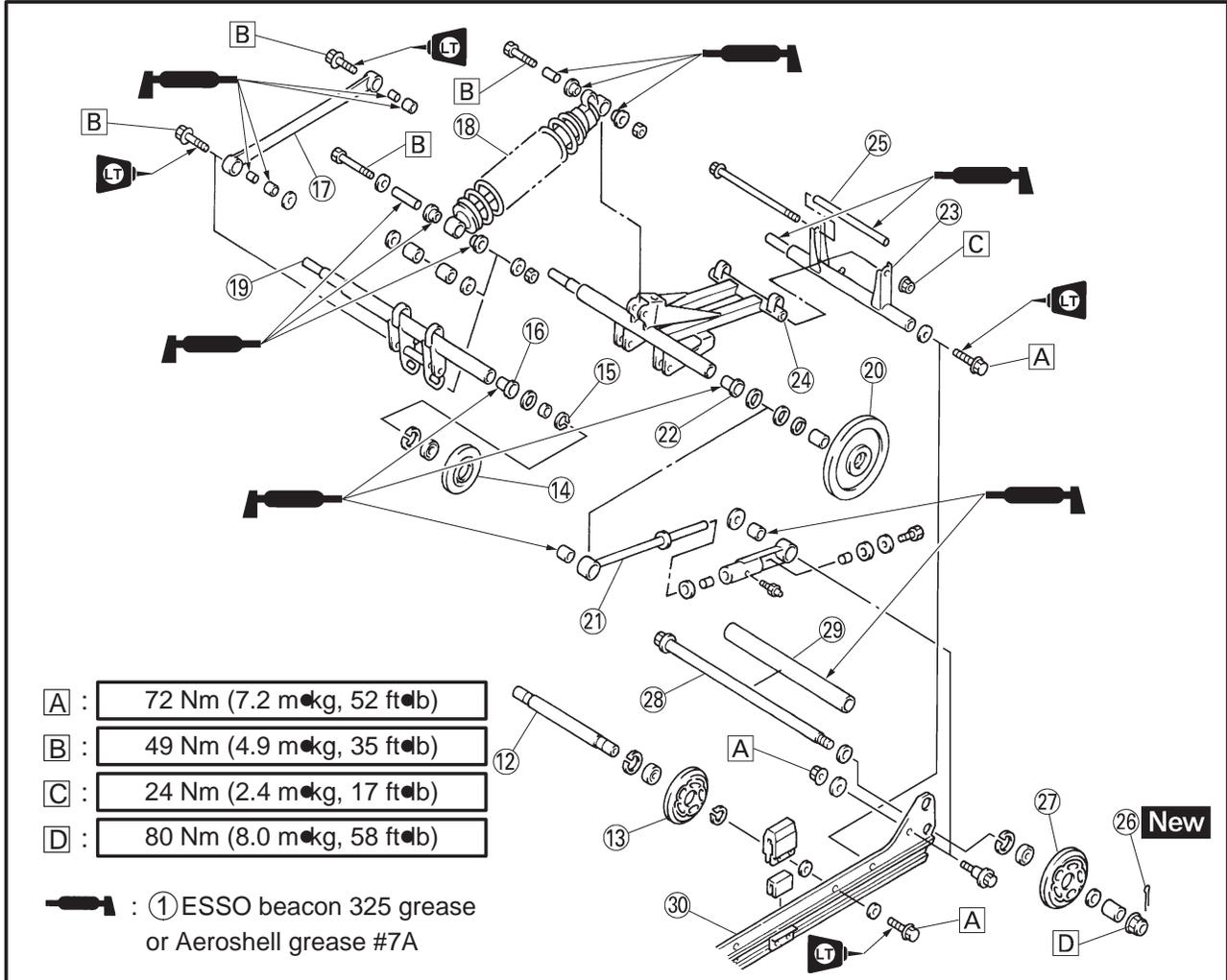
SLIDE RAIL SUSPENSION



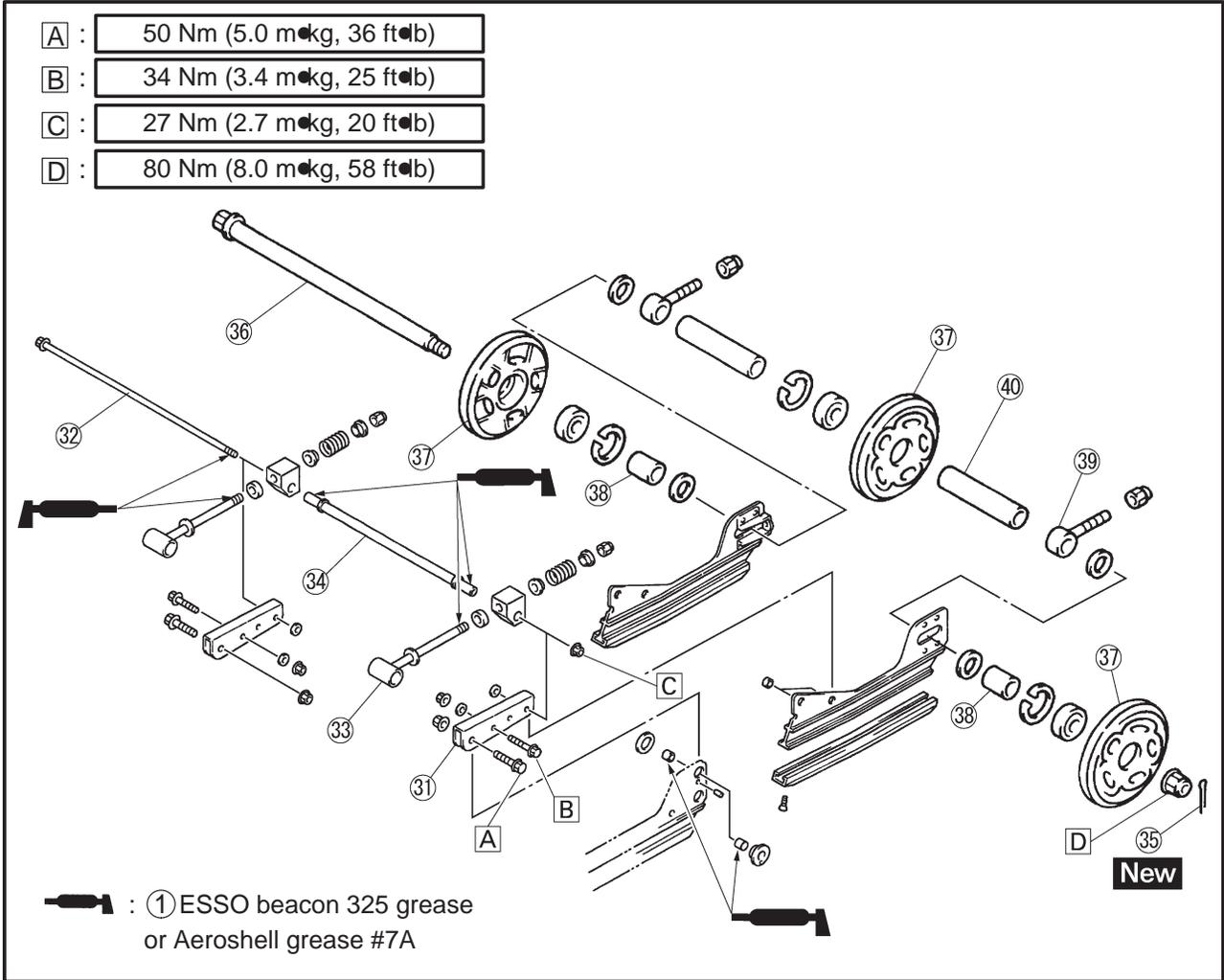
Order	Job name/Part name	Q'ty	Remarks
	Slide rail suspension removal		
1	Tension adjuster	2	Remove the parts in the order listed below. Loosen.
	Blind cap		
2	Slide rail suspension	1	For installation, reverse the removal procedure.



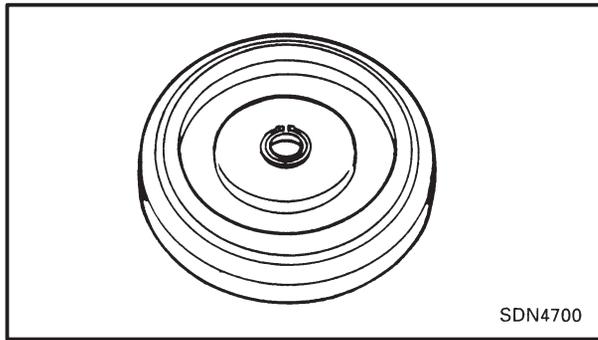
Order	Job name/Part name	Q'ty	Remarks
	Slide rail suspension disassembly		Remove the parts in the order listed below.
①	Stopper band	2	
②	Hook	2	
③	Bushing	4	
④	Coller	2	
⑤	Front shock abosrber	1	
⑥	Bracket	2	
⑦	Front suspension brakcet	1	
⑧	Snsension wheel	2	
⑨	Wheel bracket	2	
⑩	Bushing	2	
⑪	Front pivot arm	1	



Order	Job name/Part name	Q'ty	Remarks
⑫	Spacer	1	
⑬	Suspension wheel	2	
⑭	Suspension wheel	2	
⑮	Circlip	2	
⑯	Bushing	2	
⑰	Pull rod	2	
⑱	Rear shock absorber	1	
⑲	Rear suspension bracket	1	
⑳	Suspension wheel	2	
㉑	Control rod	2	
㉒	Bushing	2	
㉓	Rear pivot arm bracket	1	
㉔	Rear pivot arm	1	
㉕	Coller	1	
㉖	Cotter pin	2	
㉗	Suspension wheel	2	
㉘	Wheel base bolt	1	
㉙	Coller	1	
㉚	Sliding frame	2	



Order	Job name/Part name	Q'ty	Remarks
③①	Pivot arm	2	For installation, reverse the removal procedure.
③②	Base bolt	1	
③③	Pivot shaft	2	
③④	Collar	1	
③⑤	Cotter pin	2	
③⑥	Rear axle	1	
③⑦	Guide wheel	3	
③⑧	Collar	2	
③⑨	Tension adjuster	2	
④①	Collar	2	

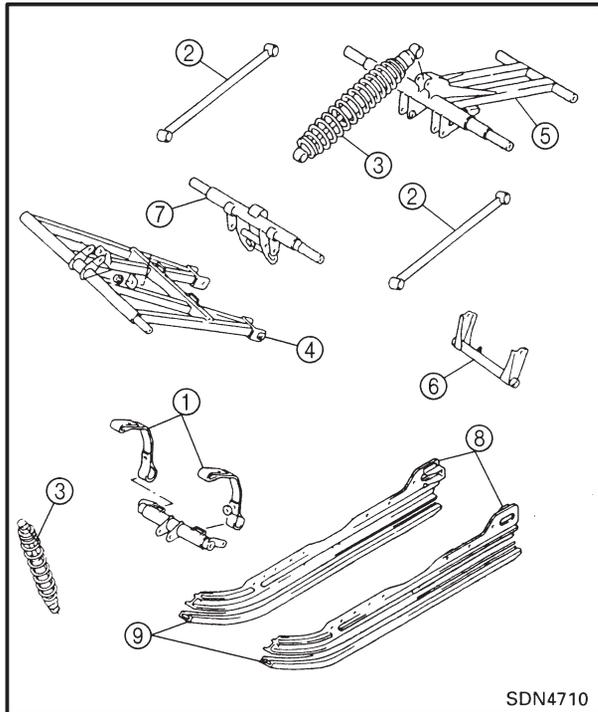


ESS00148

INSPECTION

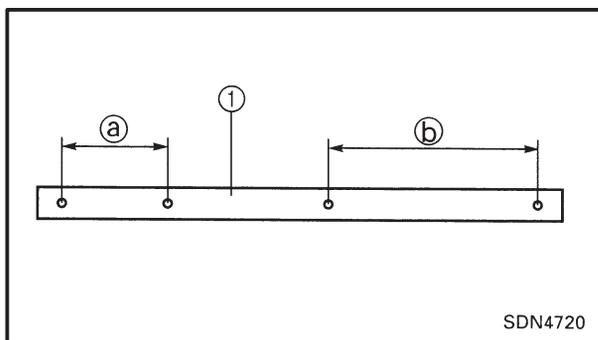
1. Inspect:

- Suspension wheel
- Guide wheel
- Cracks/damage → Replace.
- Wheel bearing
- Wheel turns roughly → Replace.



2. Inspect:

- Stopper band ①
- Frayed/damage → Replace.
- Pull rods ②
- Bends/damage → Replace.
- Shock absorbers ③
- Oil leaks/damage → Replace.
- Bushings
- Wear/cracks/damage → Replace.
- Front pivot arm ④
- Rear pivot arm ⑤
- Rear pivot arm bracket ⑥
- Suspension wheel bracket ⑦
- Sliding frame ⑧
- Cracks/damage → Replace.
- Slide runner ⑨
- Wear/damage → Replace.



INSTALLATION

1. Install:

- Stopper band ①

NOTE:

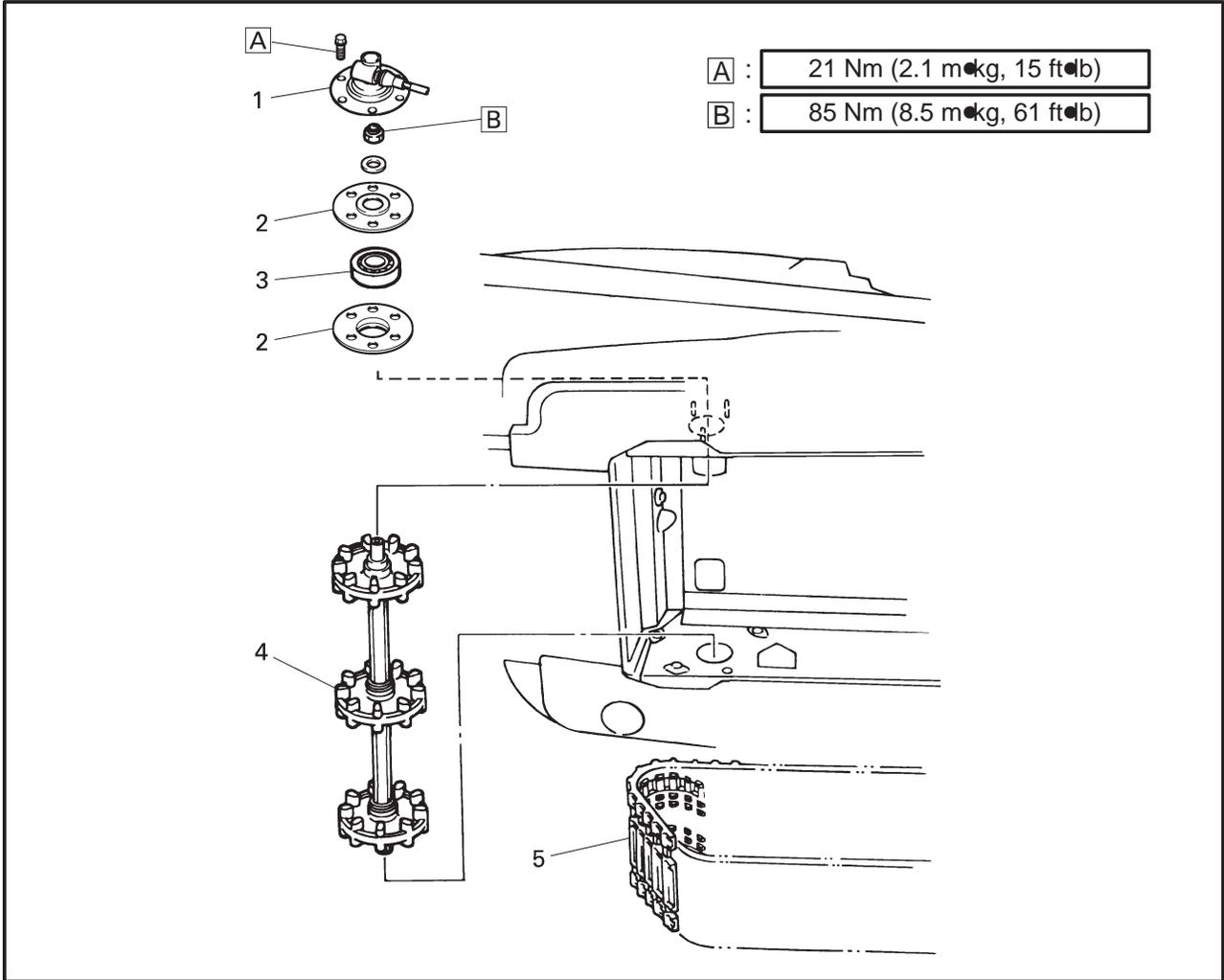
Install the stopper band with (a) toward the hook and (b) toward the shaft.



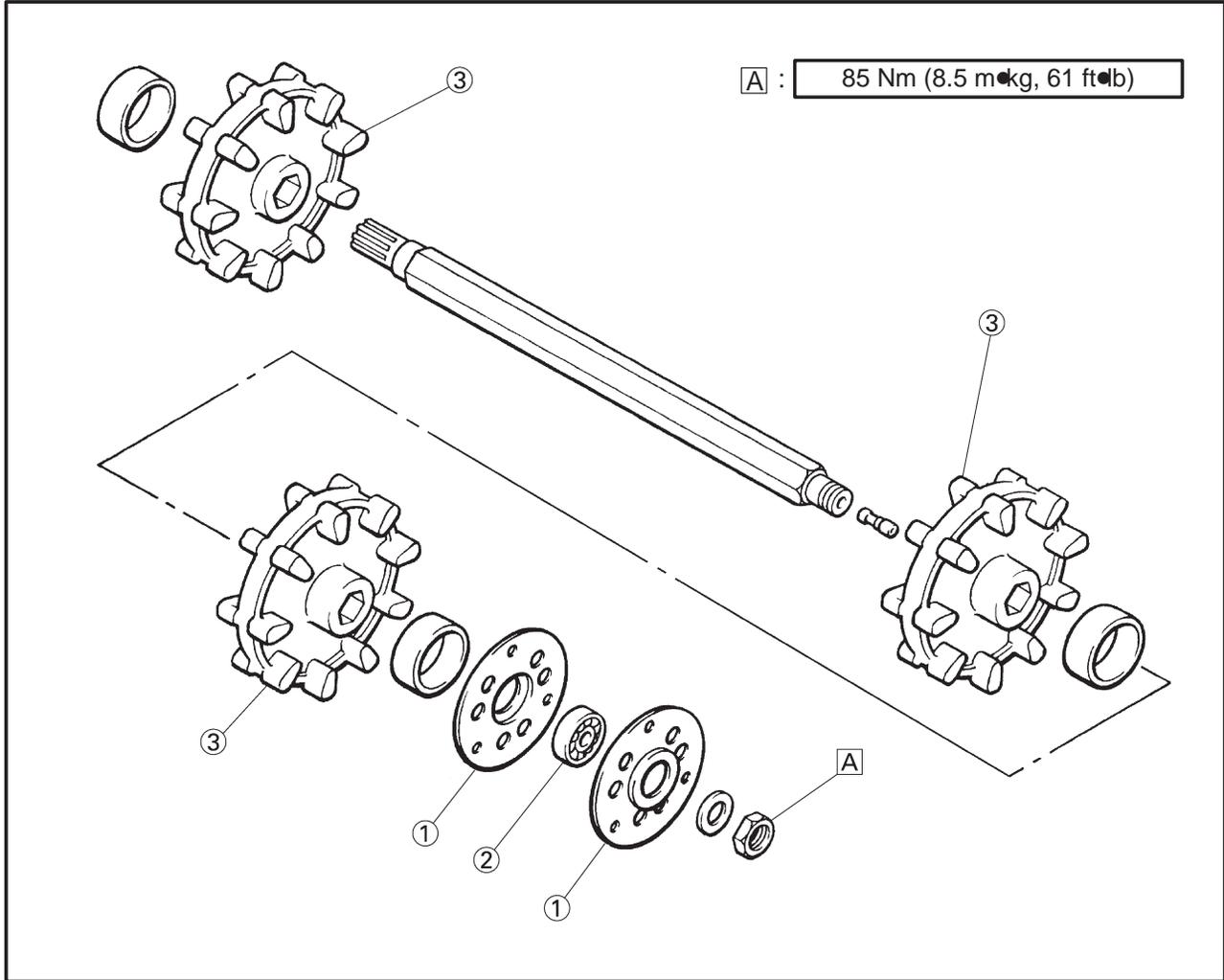
Nut (stopper band):
4 Nm (0.4 m•kg, 2.9 ft•lb)

ESS00149

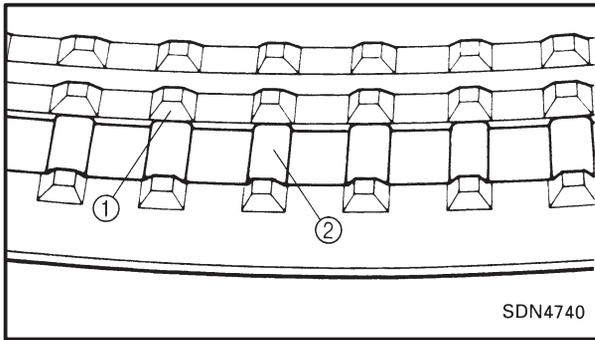
FRONT AXLE AND TRACK



Order	Job name/Part name	Q'ty	Remarks
	Front axle and track removal		Remove the parts in the order listed below. Refer to "DRIVE CHAIN HOUSING".
	Drive chain housing		Refer to "SLIDE RAIL SUSPENSION".
	Slide rail suspension		Refer to "SECONDARY SHEAVE".
	Secondary sheave		
1	Speedometer gear assembly	1	
2	Front axle housing	2	
3	Bearing	1	
4	Front axle assembly	1	
5	Track	1	
			For installation, reverse the removal procedure.



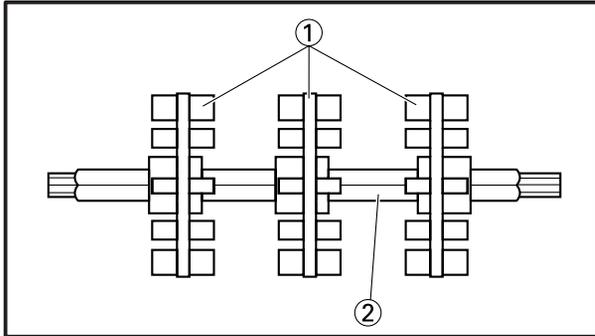
Order	Job name/Part name	Q'ty	Remarks
	Front axle disassembly		Remove the parts in the order listed below.
①	Front axle housing	2	
②	Bearing	1	
③	Sprocket wheel	3	
			For assembly, reverse the removal procedure.



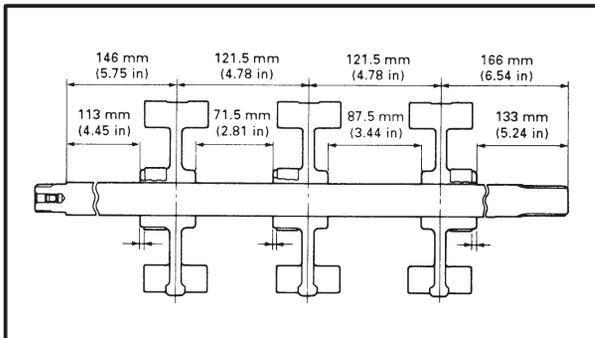
ESS00150

INSPECTION

1. Inspect:
 - Track ①
 - Slide metal ②
 Wear/cracks/damage → Replace.



2. Inspect:
 - Sprocket wheel ①
 - Wear/break/damage → Replace.
 - Front axle ②
 - Bends/scratches (excessive)/damage → Replace.



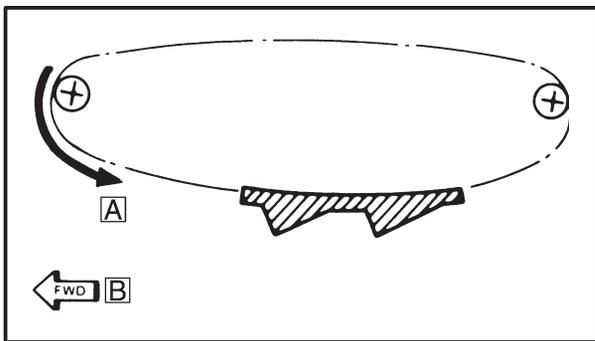
ESS00151

INSTALLATION

1. Install:
 - Sprocket wheels
 - Guide wheels

NOTE:

- When pressing the sprocket wheels onto the front axle, align the lugs on each sprocket wheel.
- Position each sprocket wheel on the axle as shown in the illustration.



2. Place the track in the chassis.

NOTE:

Be sure it is positioned as shown in the illustration.

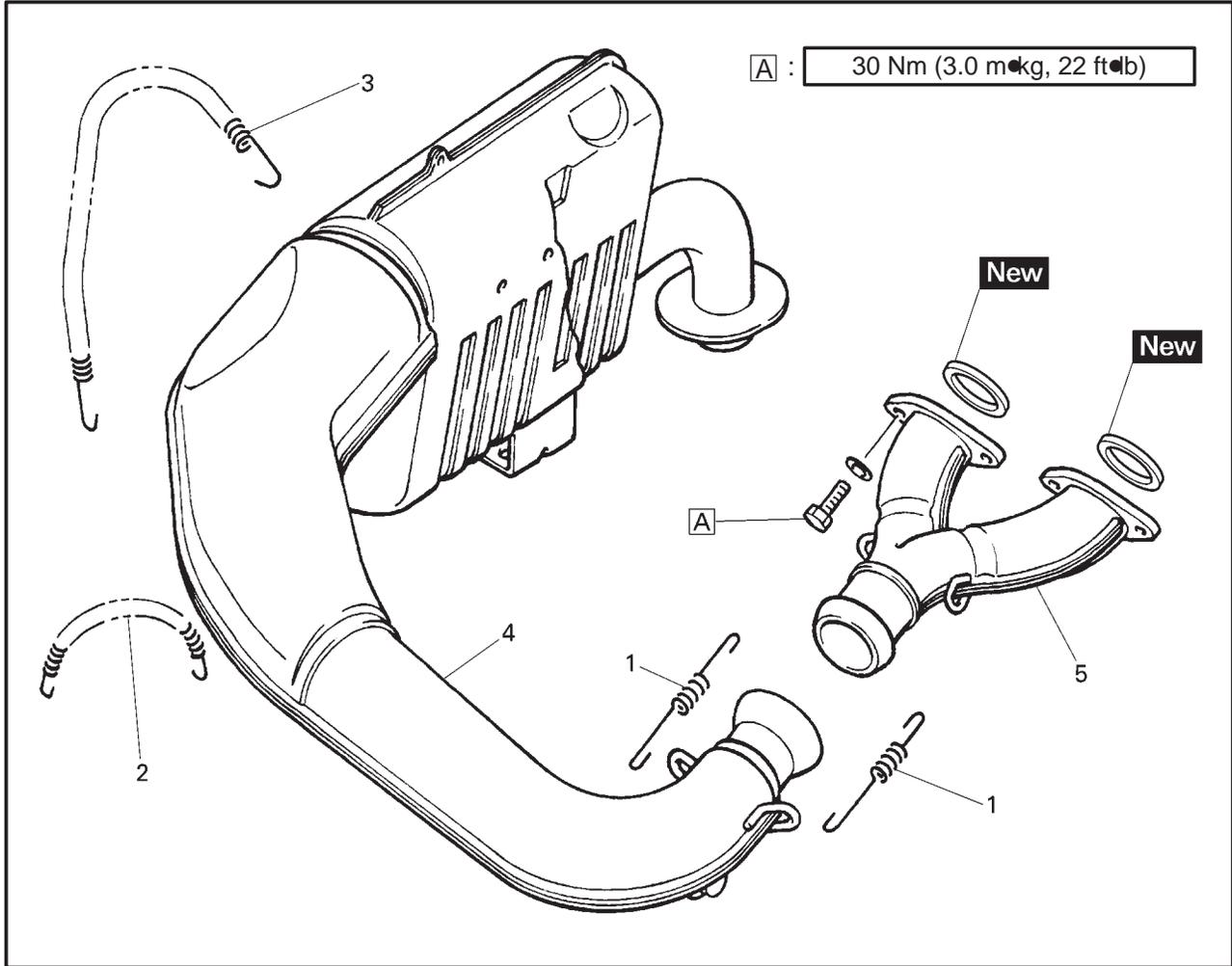
- A** Turning direction
- B** Forward

ESS00152

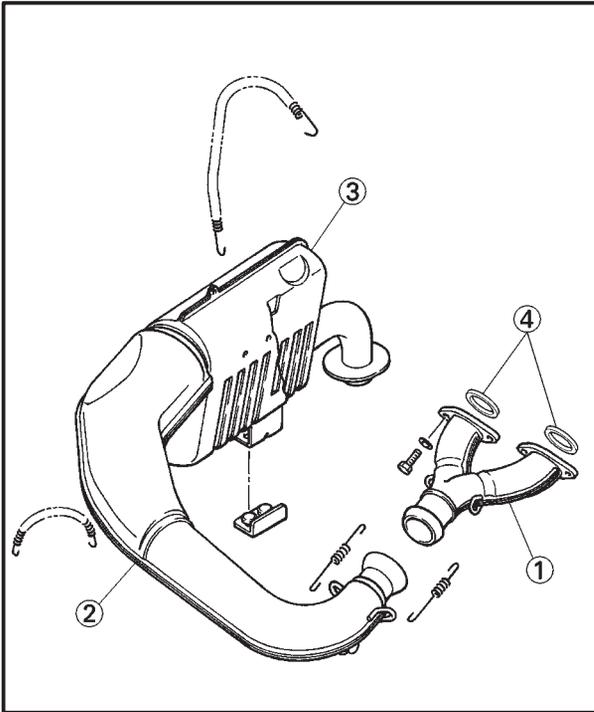
ENGINE

ESS00153

EXHAUST ASSEMBLY



Order	Job name/Part name	Q'ty	Remarks
	Exhaust assembly removal		Remove the parts in the order listed below.
1	Spring 1	2	
2	Spring 2	1	
3	Spring 3	1	
4	Exhaust assembly	1	
5	Exhaust pipe joint	1	
			For installation, reverse the removal procedure.



ESS00154

INSPECTION

1. Inspect:

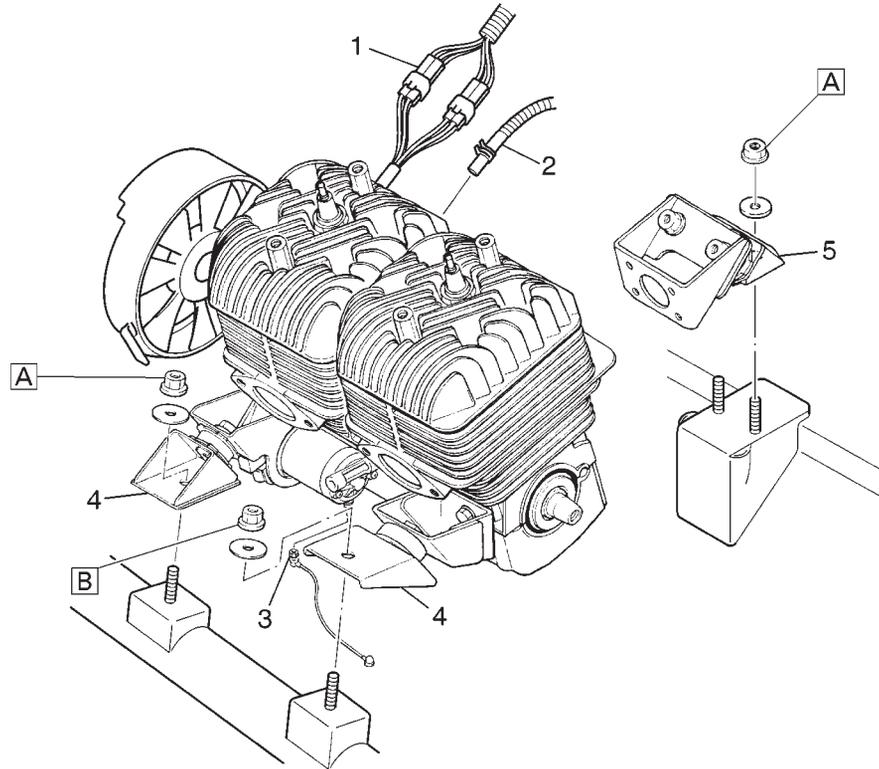
- Exhaust joint ①
- Exhaust pipe ②
- Exhaust silencer ③
Cracks/damage → Replace.
- Exhaust gaskets ④
Exhaust gas leaks → Replace.



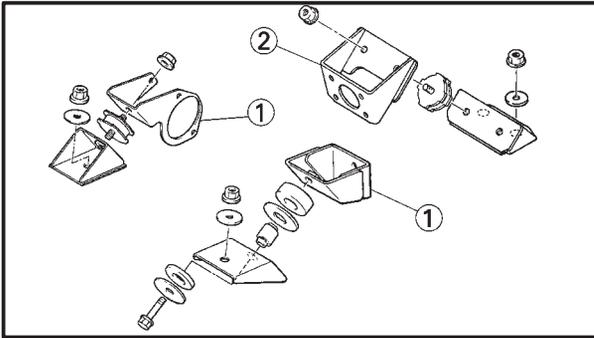
ESS00156

ENGINE ASSEMBLY

- A : 53 Nm (5.3 m•kg, 38 ft•lb)
- B : 103 Nm (10.3 m•kg, 74 ft•lb)



Order	Job name/Part name	Q'ty	Remarks
	Engine removal		Remove the parts in the order listed below. Refer to "EXHAUST ASSEMBLY".
	Exhaust assembly		Refer to "CARBURETOR" in CHAPTER 6.
	Carburetor		Refer to "RECOIL STARTER".
	Recoil starter		Refer to "ENGINE COOLING FAN".
	Engine cooling fan		Refer to "PRIMARY SHEAVE AND DRIVE V-BELT" in CHAPTER 4.
	Primary sheave		
1	CDI magneto lead	2	
2	Vacuum hose	1	
3	Starter motor lead	1	
4	Front engine bracket	2	
5	Rear engine bracket	1	
			For installation, reverse the removal procedure.



ESS00157

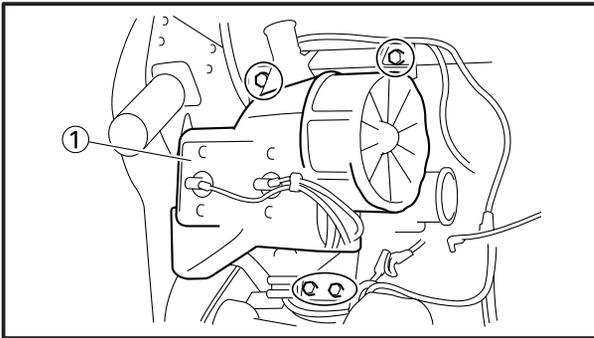
INSPECTION

1. Inspect:
 - Engine bracket (front) ①
 - Engine bracket (rear) ②
 Cracks/damage → Replace.

ESS00158

INSTALLATION

NOTE: _____
 After installing all parts, refer to “CABLE ROUTING” in CHAPTER 8, to check the cable, lead and hose routings.



1. Install:
 - Engine assembly ①

	Front engine mount (left)
	103 Nm (10.3 m•kg, 74 ft•lb)
	Front engine mount (right)
	53 Nm (5.3 m•kg, 38 ft•lb)
	Rear engine mount
	53 Nm (5.3 m•kg, 38 ft•lb)

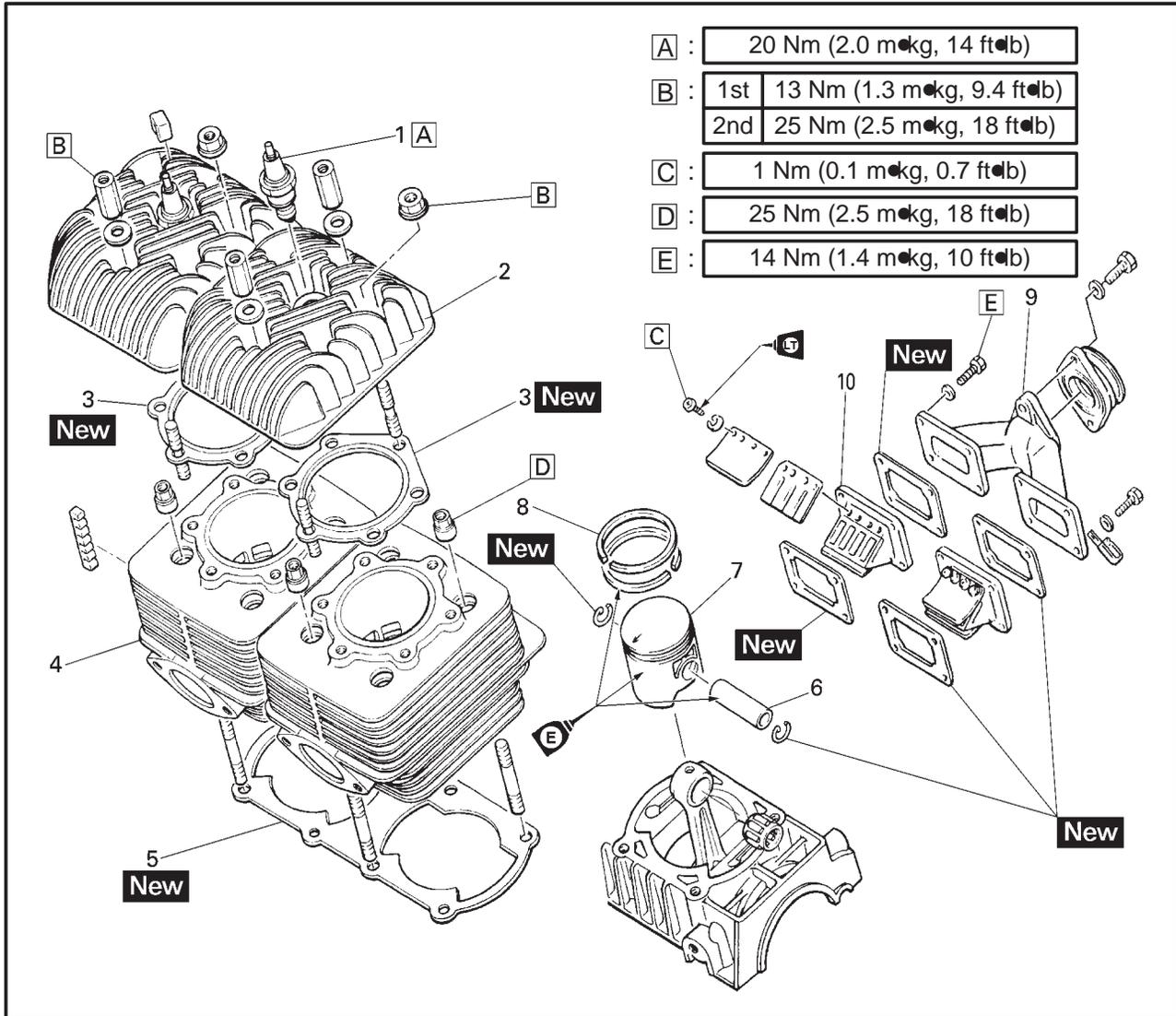
NOTE: _____
 Connect the oil hose to the oil pump when installing the engine assembly.

2. Air bleed:
 - Oil pump
3. Adjust:
 - Sheave distance
 - Throttle cable
 - Oil pump cable
 - Starter cable

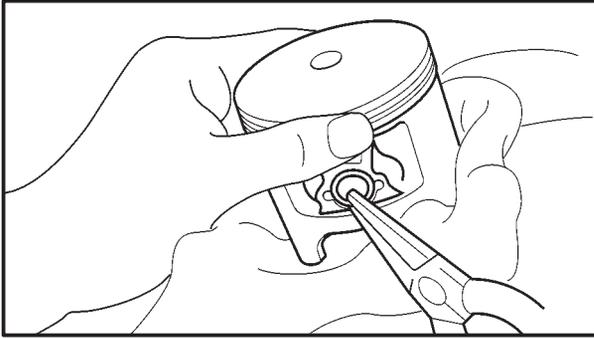


ESS00159

CYLINDER HEAD AND CYLINDER



Order	Job name/Part name	Q'ty	Remarks
	Cylinder head and cylinder removal		Remove the parts in the order listed below.
1	Spark plug	2	
2	Cylinder head	2	
3	Cylinder head gasket	2	
4	Cylinder	2	
5	Cylinder gasket	1	
6	Piston pin	2	
7	Piston	2	
8	Piston ring	4	
9	Carburetor joint	1	
10	Reed valve	2	
			For installation, reverse the removal procedure.



ESS00160

REMOVAL

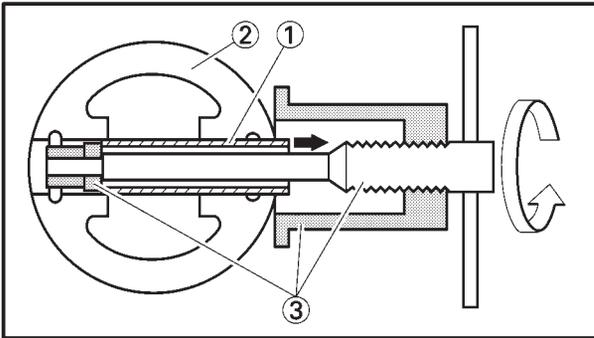
1. Remove:
 - Piston pin clips
 - Piston pins
 - Pistons
 - Small end bearings

NOTE:

- Before removing the piston pin clip, cover the crankcase with a clean rag so that you will not accidentally drop the clip into the crankcase.
- Before removing the piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and the piston pin is still difficult to remove, use the piston pin puller.
- Put identification marks on each piston head for reference during reinstallation.



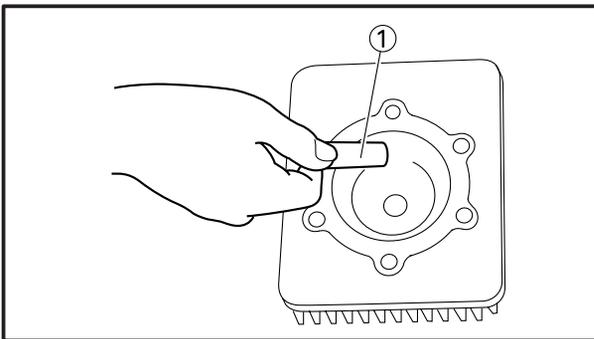
Piston pin puller:
90890-01304, YU-01304



CAUTION:

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

- ① Piston pin
- ② Piston
- ③ Piston pin puller



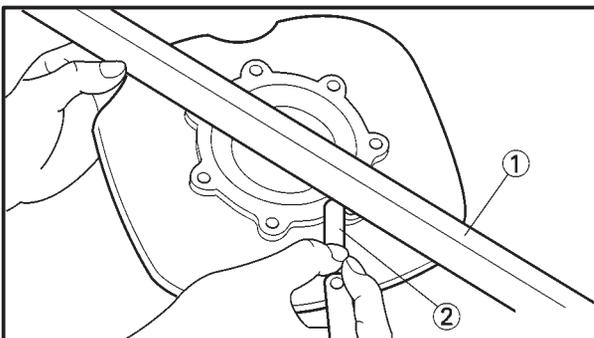
ESS00161

INSPECTION

1. Eliminate:
 - Carbon deposits (from the combustion chamber)
 Use the rounded scraper ①.

CAUTION:

Do not use a sharp instrument. Avoid damaging or scratching the surface.



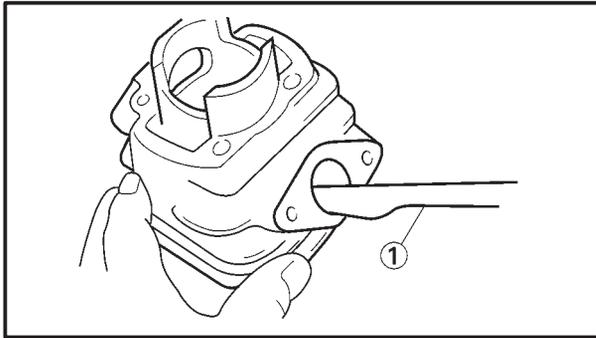
2. Measure:

- Cylinder head warpage
- Out of specification → Resurface.



Warpage limit:
0.03 mm (0.0012 in)

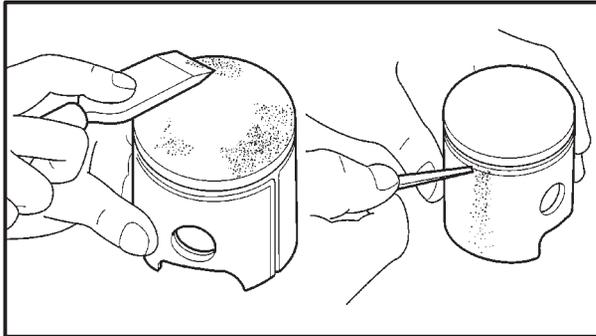
- Straight edge ①
- Thickness gauge ②



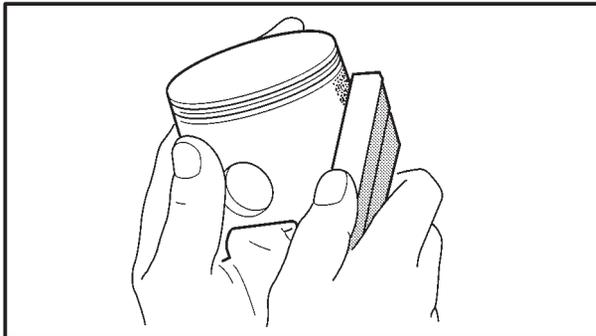
3. Eliminate:
- Carbon deposits (from the cylinders)
- Use the rounded scraper ①.

CAUTION: _____

Do not use a sharp instrument. Avoid damaging or scratching the surface.



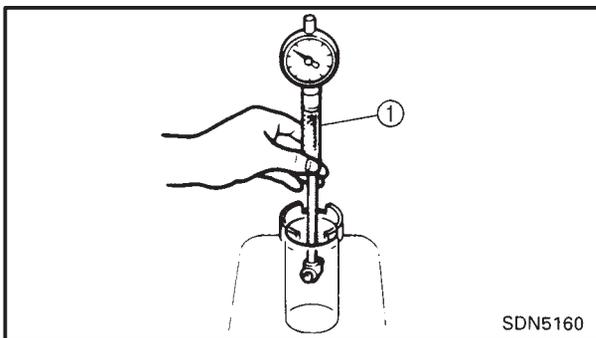
4. Eliminate:
- Carbon deposits (from the piston crown and ring grooves)
5. Inspect:
- Piston crown
- Burrs/nicks/damage → Replace.



6. Eliminate:
- Score marks and lacquer deposits (from the piston wall)
- Use 600 ~ 800 grit wet sandpaper.

NOTE: _____

Sand in a crisscross pattern. Do not sand excessively.



7. Measure:
- Piston-to-cylinder clearance

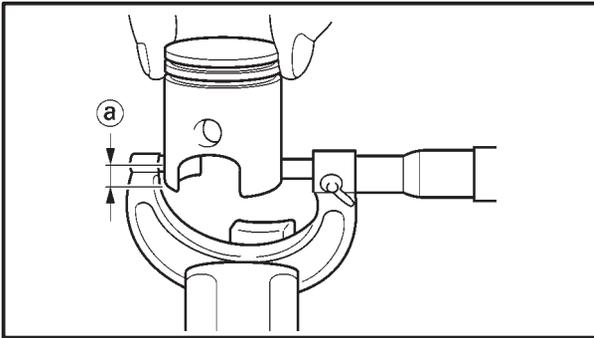
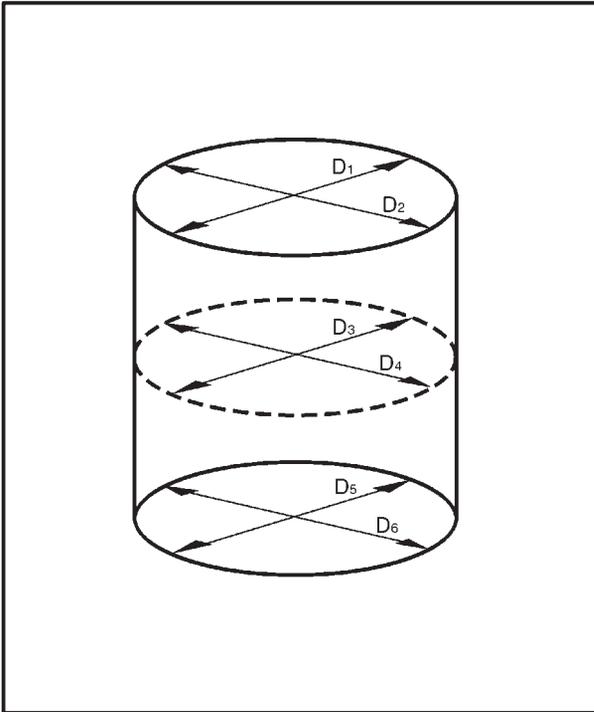
Measurement steps:

1st step:

- Measure the cylinder bore (C) with a cylinder bore gauge ①.

NOTE: _____

Measure the cylinder bore (C) parallel to and at right angles to the crankshaft. Then find the average of the measurements.



	Standard	Wear limit
Cylinder bore (C)	73.00 ~ 73.02 mm (2.874 ~ 2.875 in)	73.10 mm (2.878 in)
Taper (T)	–	0.05 mm (0.002 in)
Out of round (R)	–	0.01 mm (0.0004 in)
C = Maximum D T = (Maximum of D₁ or D₂) – (Maximum of D₅ or D₆) R = (Maximum of D₁, D₃ or D₅) – (Minimum of D₂, D₄ or D₆)		

●If out of specification, replace cylinder, and replace piston and piston rings as a set.

2nd step:

●Measure the piston skirt diameter (P) with a micrometer.

Ⓐ 10 mm (0.39 in) from the bottom edge of the piston

	Piston size (standard) (P):
	72.94 ~ 72.95 mm (2.871 ~ 2.872 in)

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

3rd step:

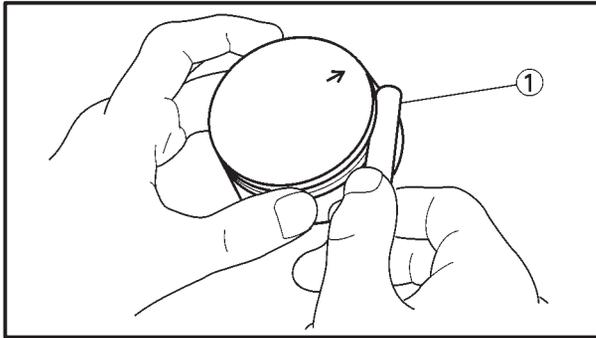
●Calculate the piston-to-cylinder clearance with the following formula:

Piston-to-cylinder clearance =

Cylinder bore (C) –
Piston skirt diameter (P)

●If out of specification, rebore or replace cylinder, and replace piston and piston rings as a set.

	Piston-to-cylinder clearance:
	0.055 ~ 0.060 mm (0.0022 ~ 0.0024 in)
	Limit 0.1 mm (0.004 in)



8. Measure:

- Side clearance (piston rings)

Use the feeler gauge ①.

Out of specification → Replace the piston and/or rings.

NOTE:

Eliminate the carbon deposits from the piston ring grooves and rings before measuring the side clearance.



Side clearance (top):

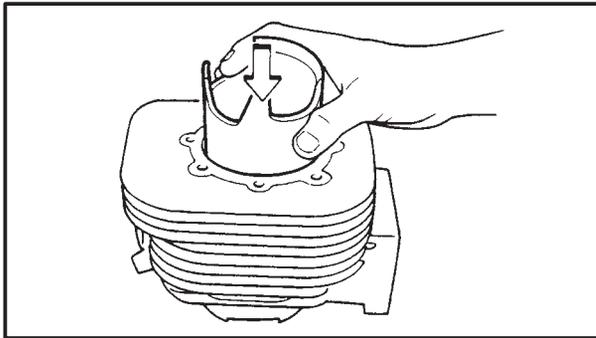
0.02 ~ 0.06 mm

(0.00079 ~ 0.0024 in)

Side clearance (2nd):

0.02 ~ 0.06 mm

(0.00079 ~ 0.0024 in)



9. Install:

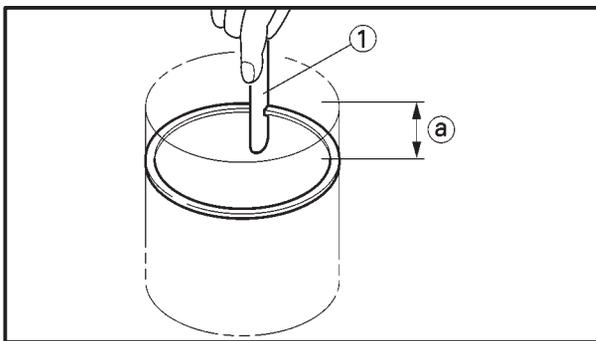
- Piston ring

(into the cylinder)

Push in the ring with the piston crown.

NOTE:

Insert the ring into the cylinder, and push it approximately 20 mm (0.8 in) into the cylinder. Push in the ring with the piston crown so that the ring is at right angles to the cylinder bore.



10. Measure:

- End gap (piston rings)

Use the feeler gauge ①.

Out of specification → Replace the rings as a set.



End gap (top):

0.20 ~ 0.40 mm

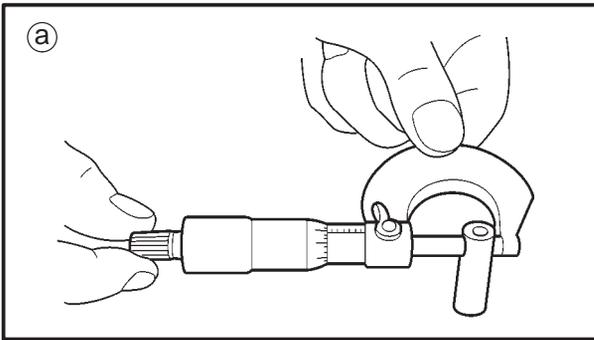
(0.008 ~ 0.016 in)

End gap (2nd):

0.20 ~ 0.40 mm

(0.008 ~ 0.016 in)

① 20 mm (0.8 in)

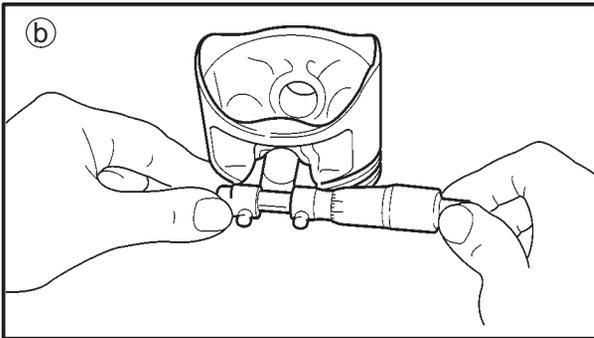


11. Measure:

- Outside diameter (piston pin) (a)
Out of specification → Replace the piston pin.



Outside diameter (piston pin) (a) :
19.995 ~ 20.000 mm
(0.7872 ~ 0.7874 in)



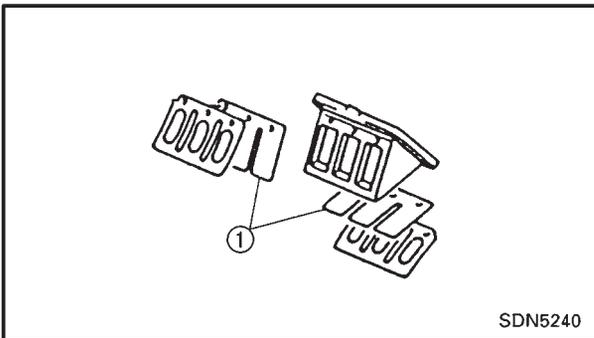
12. Measure:

- Piston pin-to-piston clearance
Out of specification → Replace the piston.

Piston pin-to-piston clearance =
Bore size (piston pin) (b) –
Outside diameter (piston pin) (a)



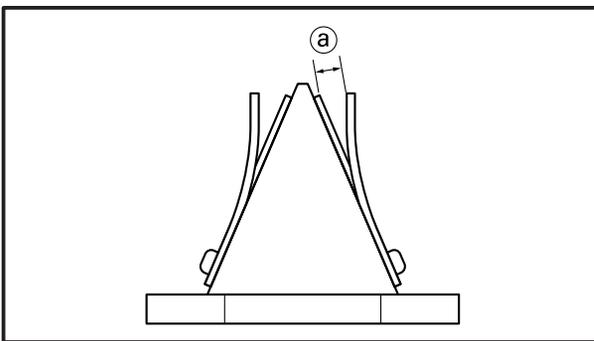
Piston pin-to-piston clearance =
0.004 ~ 0.0065 mm
(0.00016 ~ 0.00026 in)



SDN5240

13. Inspect:

- Reed valves (1)
Bends/cracks/damage → Replace.

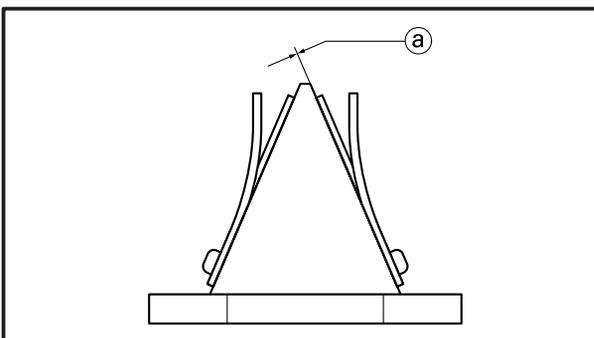


14. Measure:

- Valve stopper height (a)
Out of specification → Replace the valve stopper.



Valve stopper height (a) :
9.5 ~ 9.9 mm (0.37 ~ 0.39 in)

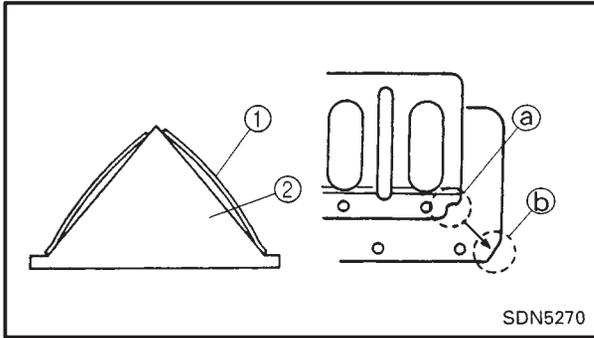


15. Measure:

- Reed valve bending limit (a)
Out of specification → Replace the reed valve.



Reed valve bending limit (a) :
less than 0.6 mm (0.023 in)



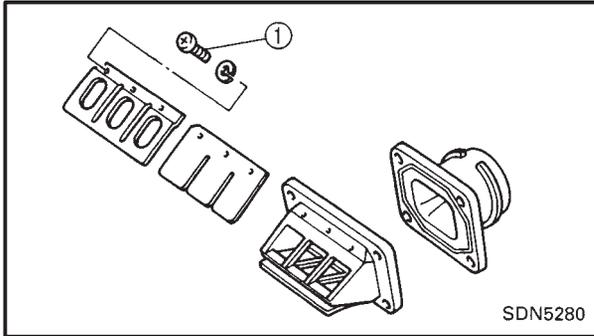
ESS00162

INSTALLATION

1. Install:
 - Reed valves
 - Reed valve stoppers

NOTE:

- Place the reed valve ① with its concave surface facing toward the reed valve seat ②.
- Fit the reed valve stopper cut (a) into the corresponding cut (b) on the reed valve.



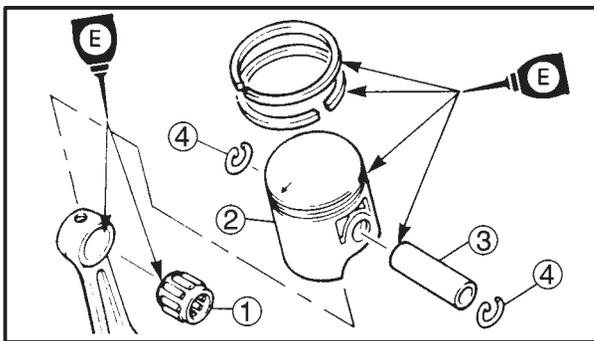
2. Tighten:
 - Screws (reed valve) ①

Screws (reed valve) ① :
1 Nm (0.1 m•kg, 0.7 ft•lb)
LOCTITE®

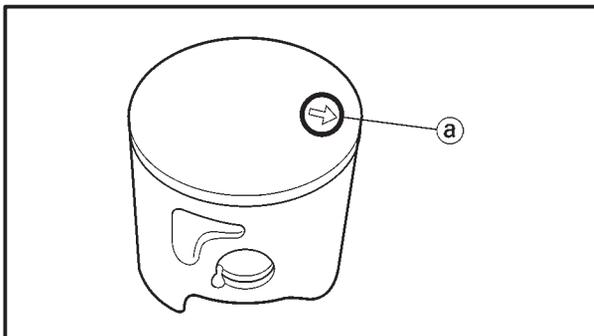
NOTE:

Tighten each screw gradually to avoid warping.

3. Install:
 - Gasket (read valve)

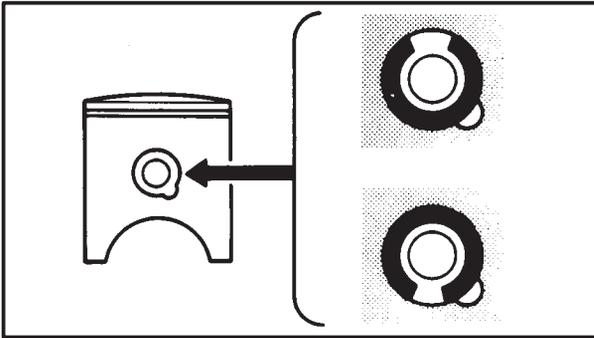


4. Install:
 - Small end bearing ①
 - Piston ②
 - Piston pin ③
 - Piston pin clip ④
 - Piston rings



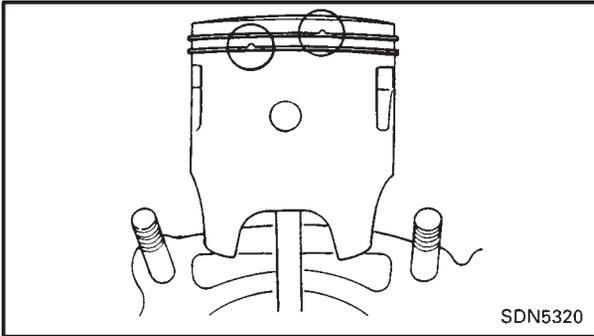
NOTE:

- The arrow (a) on the piston must point toward to the front of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean rag so that you do not accidentally drop the pin clip and other material into the crankcase.
- Position each piston very carefully in its original place.



CAUTION: _____

- Always use new piston pin clips.
- Do not allow the clip gap to align with the piston pin slot.

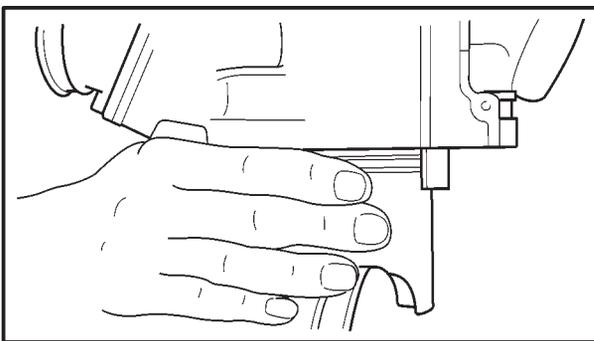


5. Check:
- Piston ring position

CAUTION: _____

- Make sure that the ring ends are properly fitted around the ring locating pins in the piston grooves.
- Be sure to check that the manufacturer's marks or numbers stamped on the rings face upward.

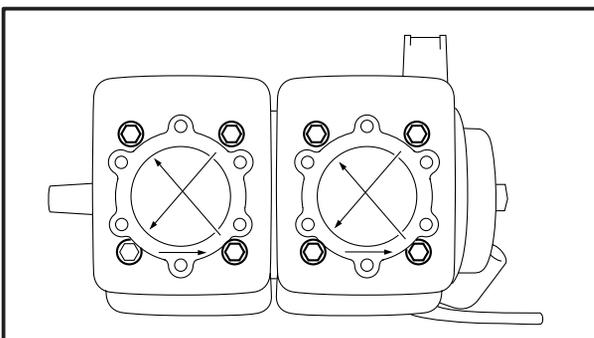
6. Install:
- Gasket (cylinder)



7. Install:
- Cylinder

NOTE: _____

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



8. Tighten:
- Nuts (cylinder)



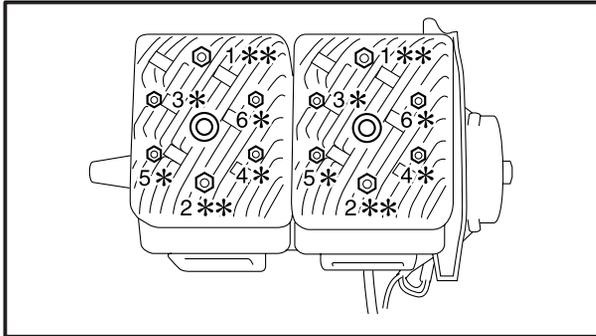
Nuts (cylinder):
25 Nm (2.5 m•kg, 18 ft•lb)

NOTE: _____

Tighten nuts in crisscross pattern.



9. Install:
- Gasket (cylinder head)
 - Cylinder heads



10. Tighten:
- Nuts (cylinder head)

Tightening steps:

- Temporarily tighten the cylinder head nuts ① ~ ⑥ as follows.

1st step:

- Tighten the nuts ① ~ ⑥



Nut (cylinder head) ① ~ ⑥ :
13 Nm (1.3 m•kg, 9.4 ft•lb)

2nd step:

- Retighten the nuts ① ~ ⑥

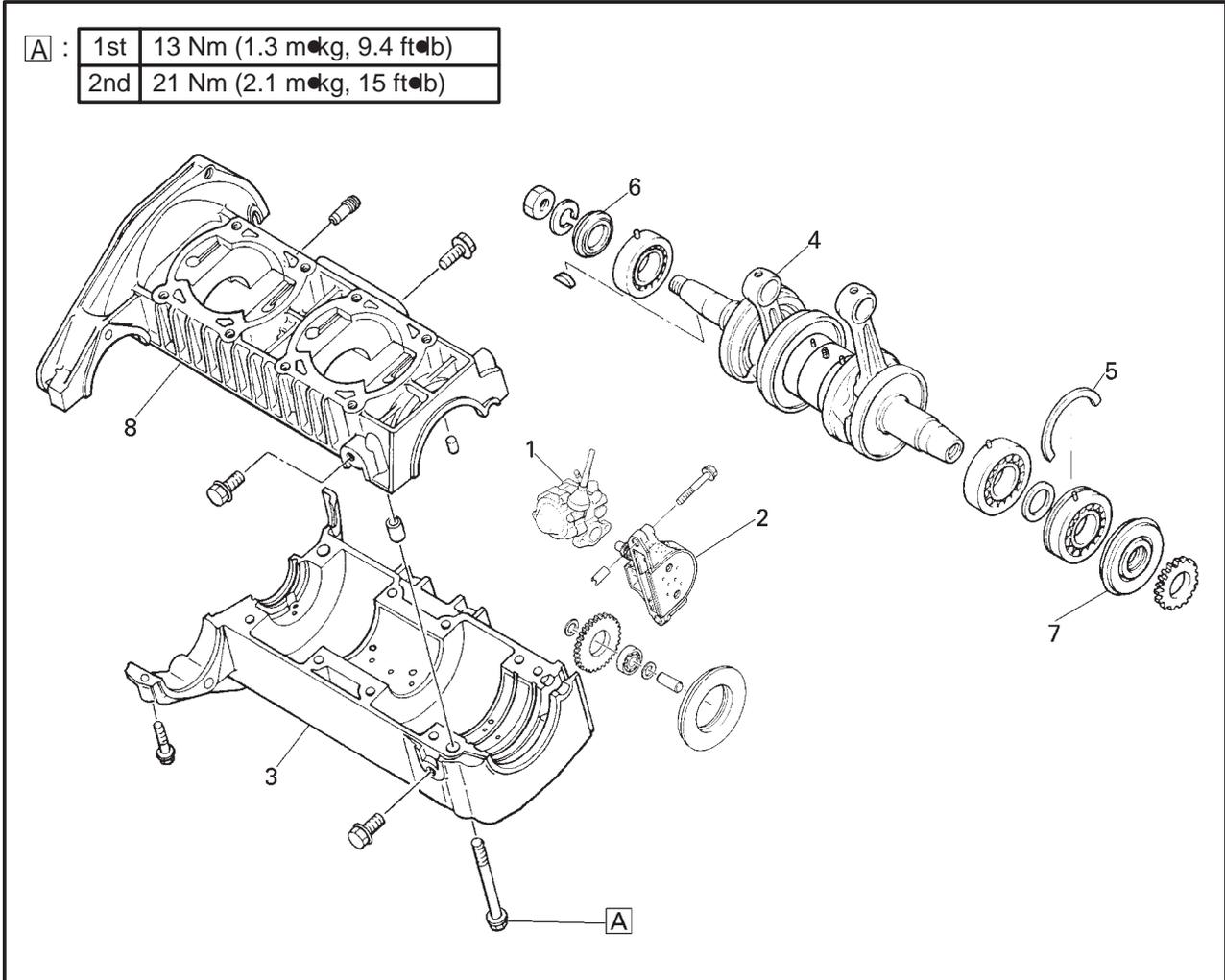


Nut (cylinder head) ① ~ ⑥ :
25 Nm (2.5 m•kg, 18.1 ft•lb)



ESS00167

OIL PUMP, CRANKCASE AND CRANKSHAFT



Order	Job name/Part name	Q'ty	Remarks
	Oil pump, crankcase and crankshaft removal		Remove the parts in the order listed below.
1	Oil pump	1	
2	Oil pump drive gear	1	
3	Lower crank case	1	
4	Crankshaft	1	
5	Stopper ring	1	
6	Oil seal	1	
7	Oil seal	1	
8	Upper crankcase	1	
			For installation, reverse the removal procedure.



ESS00168

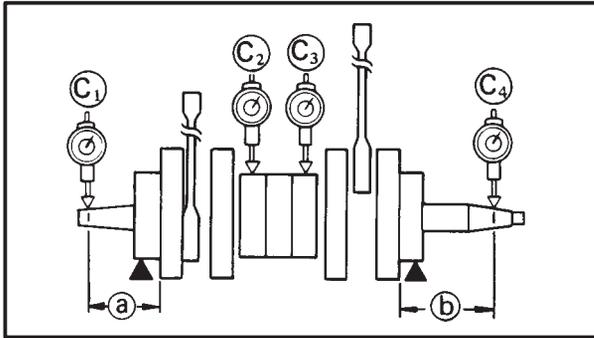
INSPECTION

1. Measure:

●Runout

Use the V-blocks and a dial gauge.

Out of specification → Replace or repair the crankshaft.



Dial gauge:

90890-03097, YU-03097



Runout limit:

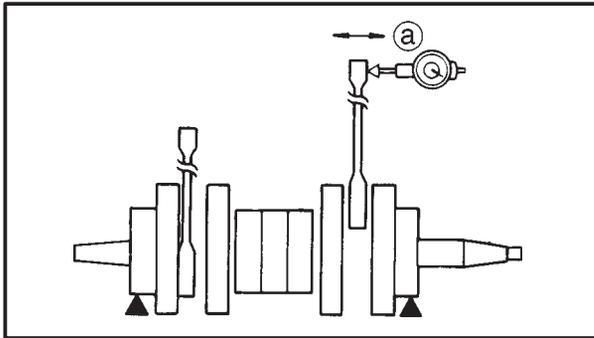
C₁ : 0.03 mm (0.0012 in)

C₂, C₃ : 0.04 mm (0.0016 in)

C₄ : 0.05 mm (0.0020 in)

(a) 97 mm (3.82 in)

(b) 93 mm (3.66 in)



2. Measure:

●Small end freeplay (a)

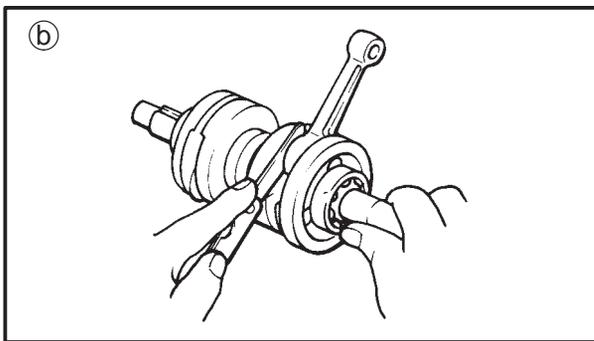
Use the dial gauge.

Out of specification → Replace the defective parts.



Small end freeplay (a) :

0.8 ~ 1.0 mm (0.03 ~ 0.04 in)



●Big end side clearance (b)

Use the feeler gauge.

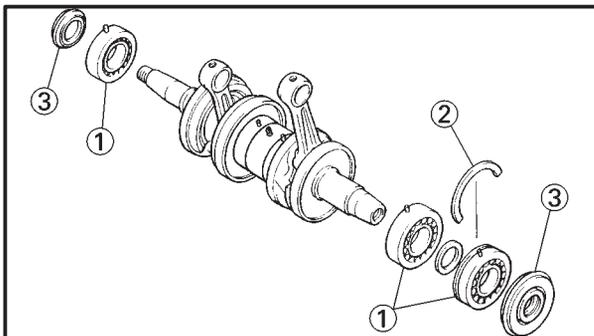
Out of specification → Replace the defective parts.



Big end side clearance (b) :

0.25 ~ 0.75 mm

(0.01 ~ 0.03 in)



3. Inspect:

●Crankshaft bearings (1)

Pitting/damage → Replace.

●Stopper ring (2)

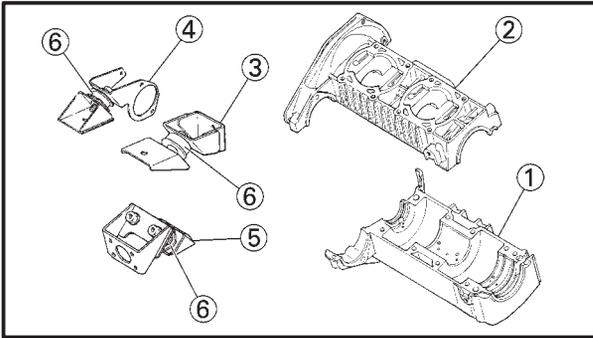
Bends/damage → Replace.

●Crankshaft oil seals (3)

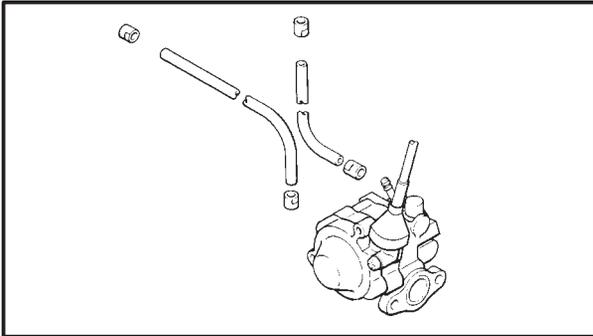
Wear/damage → Replace.

CAUTION:

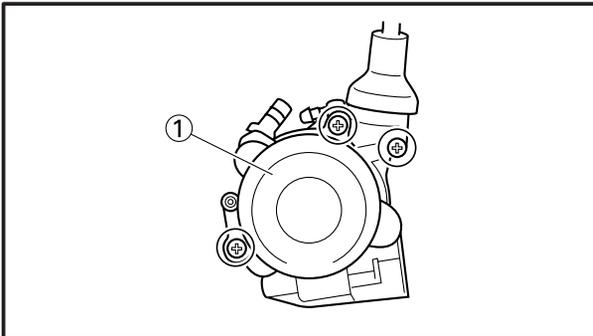
Lubricate the bearings immediately after examining them in order to prevent rust.



4. Inspect:
- Lower crankcase ①
 - Upper crankcase ②
 - Front left brackets ③
 - Front right brackets ④
 - Rear bracket ⑤
 - Dampers ⑥
- Cracks/damage → Replace.

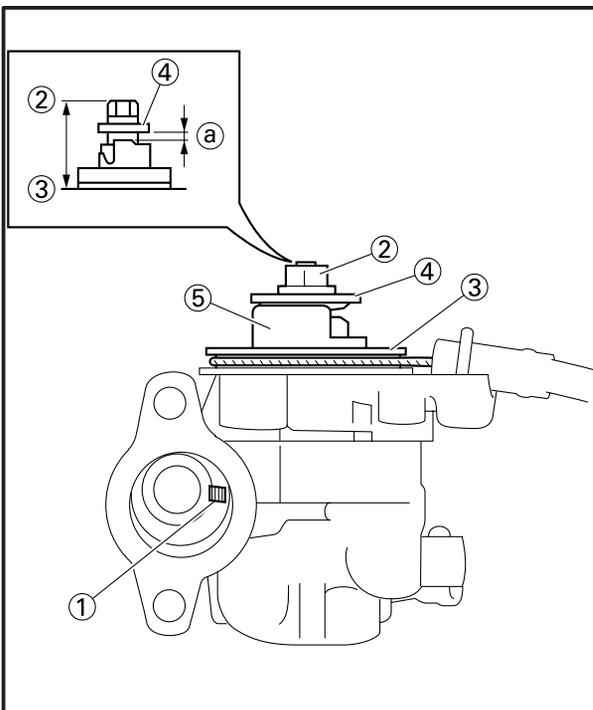


5. Inspect:
- Oil pump
 - Oil hoses
- Cracks/damage → Replace.
Clogs/damage → Replace.



OIL PUMP STROKE ADJUSTMENT

1. Remove:
 - Oil pump cover ①
2. Wipe off the grease from the plunger top.



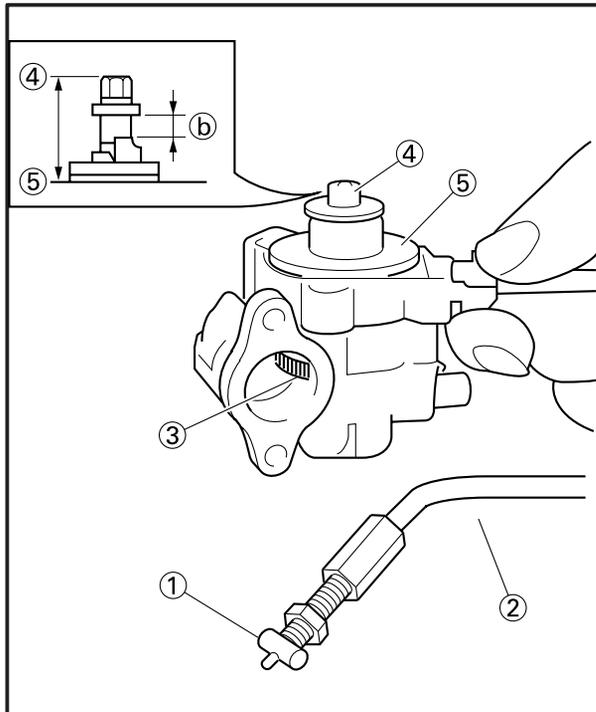
3. Measure:
 - Minimum pump stroke ①

Out of specification → Adjust.

	Minimum pump stroke ① :
	0.20 ~ 0.25 mm
	(0.008 ~ 0.010 in)

Minimum pump stroke measurement steps:

- Turn the pump worm gear ① with your fingers, until the plunger top ② is at its maximum distance from the pump body mating surface ③ of the pump cover.
- Using a feeler gauge, measure the minimum pump stroke ① between the adjusting plate ④ and the raised boss ⑤ on the adjusting pulley.
- If minimum pump stroke is not with in the specified limits, perform the adjustment steps.



4. Measure:

- Maximum pump stroke (b)
- Out of specification → Adjust.



Maximum pump stroke (b):
 1.65 ~ 1.87 mm
 (0.065 ~ 0.074 in)

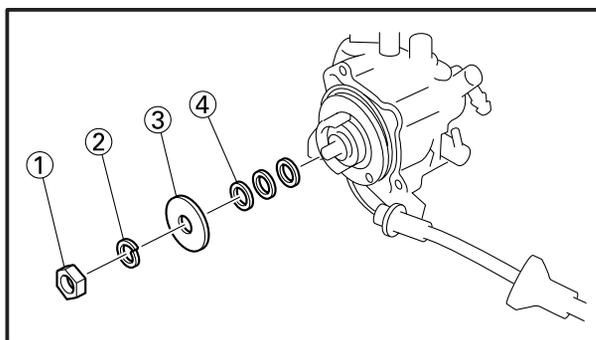
Maximum pump stroke measurement steps:

- Pull the oil pump cable (1) out of its sheath as far as it will go. The cable must be held in this taut position when measuring the maximum pump stroke.

NOTE:

It may be helpful to securely wrap duct tape (2) around the cable where it enters the sheath.

- Turn the pump worm gear (3) with your fingers, until the plunger top (4) is at its maximum distance from the pump body (5).
- Using a feeler gauge, measure the maximum pump stroke (b).
- If maximum pump stroke is not within the specified limits, perform the adjustment steps.



5. Adjust:

- Oil pump stroke

Adjustment steps:

- Remove the locknut (1), spring washer (2) and adjusting plate (3).
- Adjust the pump stroke by adding or removing a shim.

(4) Shims

Add shim → Pump stroke is increased.

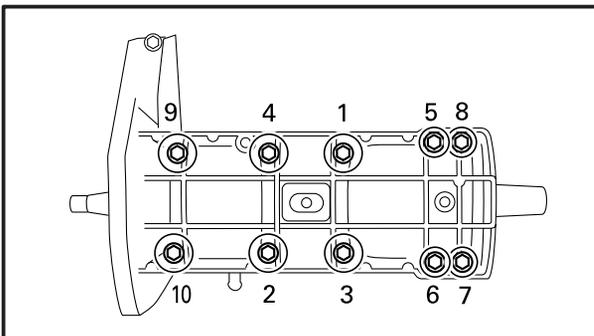
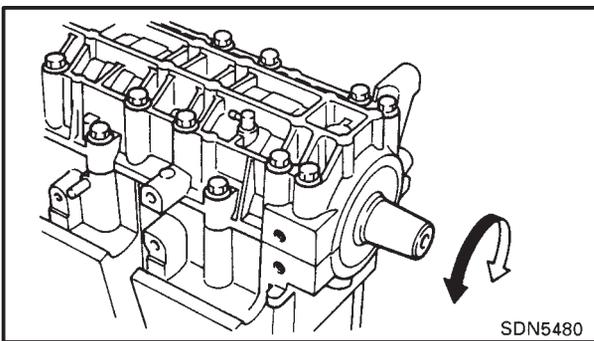
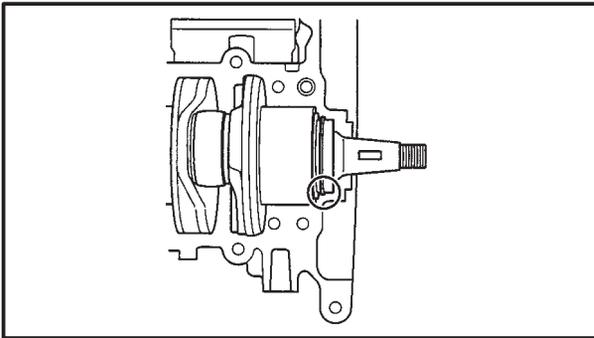
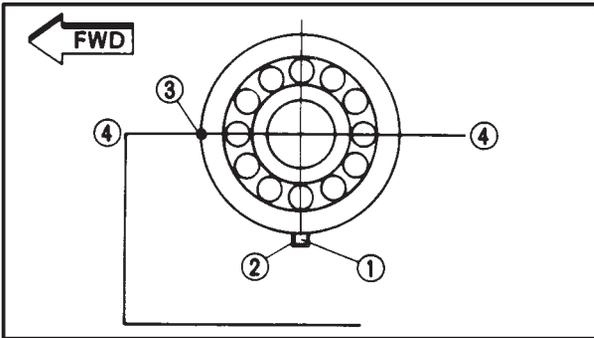
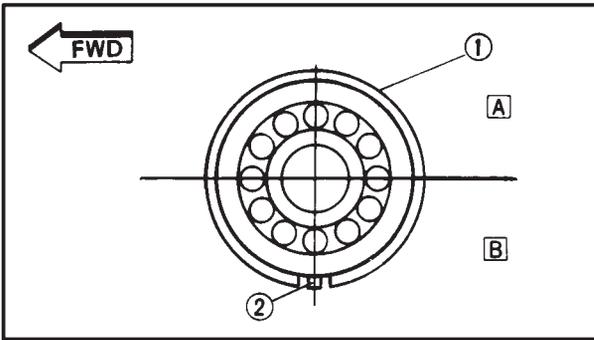
Remove shim → Pump stroke is decreased.

- Reinstall the adjusting plate, spring washer and locknut.



Locknut (1):
 7 Nm (0.7 m•kg, 5.1 ft•lb)

- Recheck the minimum and maximum pump stroke.
- If out of specification limits, perform the above steps again.



ESS00169

INSTALLATION

1. Install:
 - Stopper rings ①
(onto the lower crankcase bearing as shown)
 - ② Knock pin
 - Ⓐ Lower crankcase
 - Ⓑ Upper crankcase

2. Install:
 - Crankshaft assembly
(to upper crankcase)

NOTE: _____
 Set the knock pins ① on the upper crankcase and labyrinth seal into the pin holes ② of the bearings and upper crankcase by turning the bearings and labyrinth seal. At the same time, align the bearing punched marks ③ with the crankcase mating surface ④.

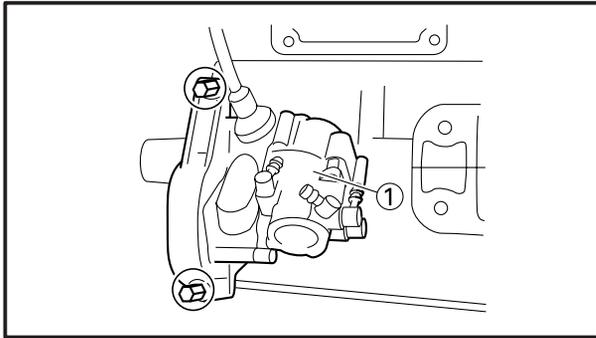
CAUTION: _____
 The oil seal lip must fit into the crankcase groove.

CAUTION: _____
 Before installing and torquing the crankcase bolts, be sure to check that the crankshaft turns smoothly.

3. Tighten:
 - Crankcase bolts ① ~ ⑩ (M8)

NOTE: _____
 Tighten the bolts in order, starting with the lowest number, and torque the bolts in two stages.

	Bolt (crankcase) ① ~ ⑩:
	First:
	13 Nm (1.3 m•kg, 9.4 ft•lb)
	Final:
	21 Nm (2.1 m•kg, 15 ft•lb)



OIL PUMP

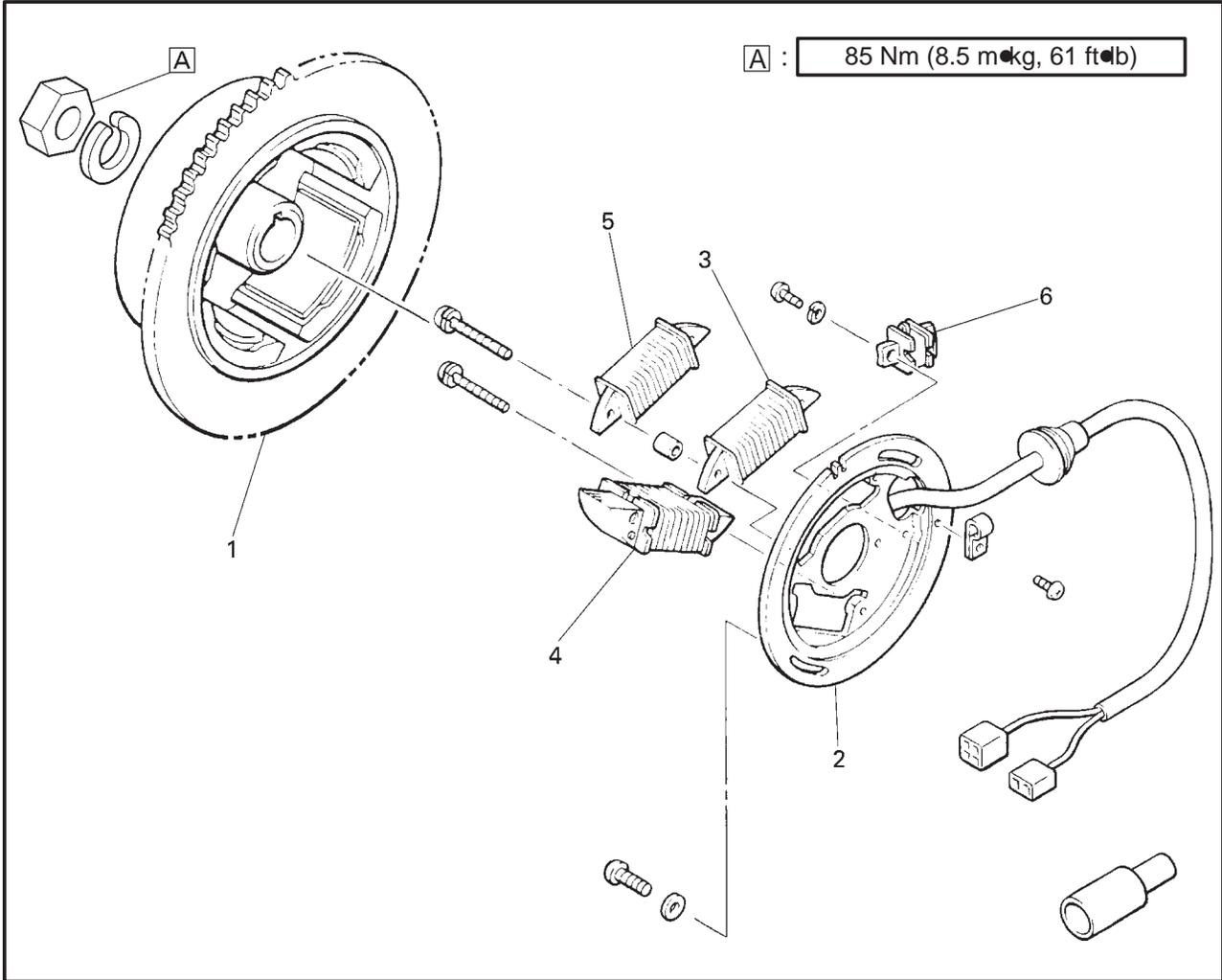
1. Install

- Dowel pins
- Oil pump ①

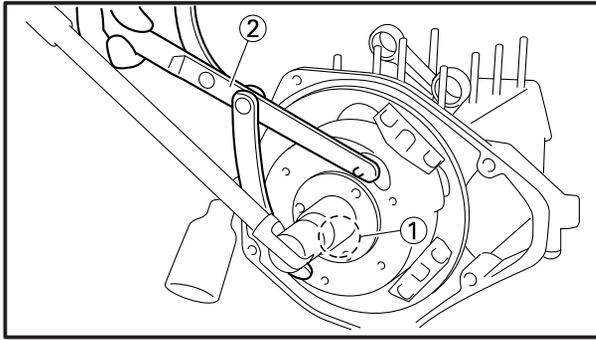


ESS00170

CDI MAGNETO



Order	Job name/Part name	Q'ty	Remarks
	CDI magneto removal		Remove the parts in the order listed below.
1	Rotor	1	
2	Stator assembly	1	
3	Charge coil	1	
4	Lighting coil 1	1	
5	Lighting coil 2	1	
6	Pulser coil	1	
			For installation, reverse the removal procedure.



ESS00171

REMOVAL

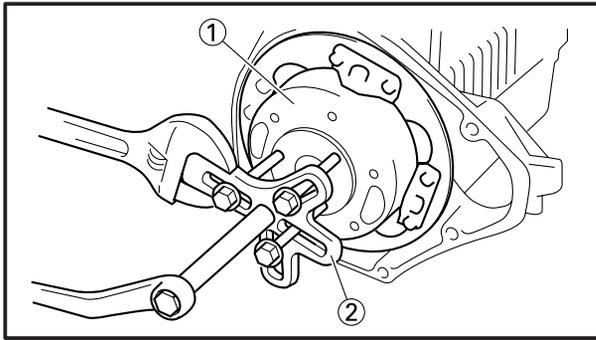
1. Remove:
 - Nut ① (CDI magneto)

NOTE: _____

Attach the universal rotor holder ② to hold the CDI magneto.



Universal rotor holder:
90890-01235, YU-01235



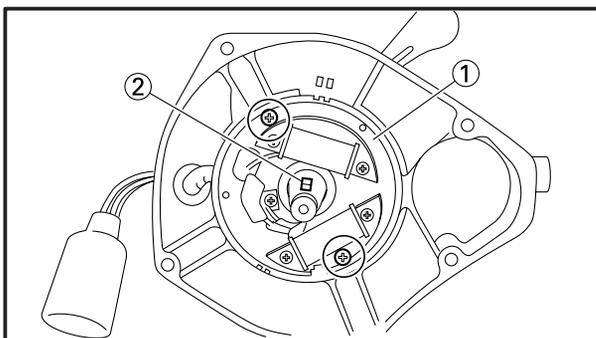
2. Remove:
 - Rotor ①

NOTE: _____

Attach the rotor holding puller ② to the CDI magneto and fully tighten the tool holding bolts, but make sure the tool body is parallel with the CDI magneto.



Rotor holding puller:
90890-01362, YU-33270



3. Remove:
 - Stator assembly ①
 - Woodruff key ②

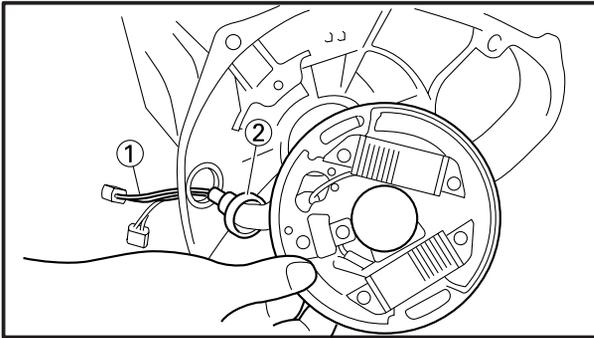


ESS00172

INSTALLATION

NOTE: _____

After installing all parts, refer to "CABLE ROUTING" in CHAPTER 8, to check the cable, lead and hose routings.

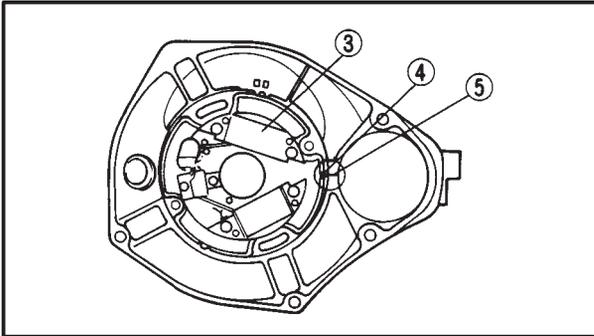


1. Pass the magneto leads (1) through the hole, and install the grommet (2) to the crankcase.

2. Install:
 - Stator assembly (3)

NOTE: _____

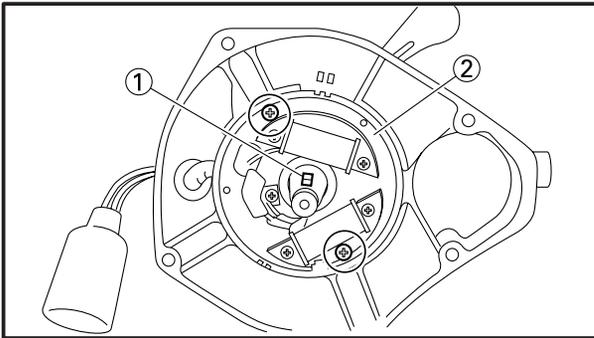
Align the timing mark (▶) (4) on the stator plate with the seam line (5) of the crankcase.



3. Install:
 - Woodruff key (1)
 - CDI magneto (2)

NOTE: _____

When installing the CDI magneto, make sure the woodruff key is properly seated in the key way of the crankshaft. Apply a light coating of lithium soap base grease to the tapered portion of the crankshaft end.



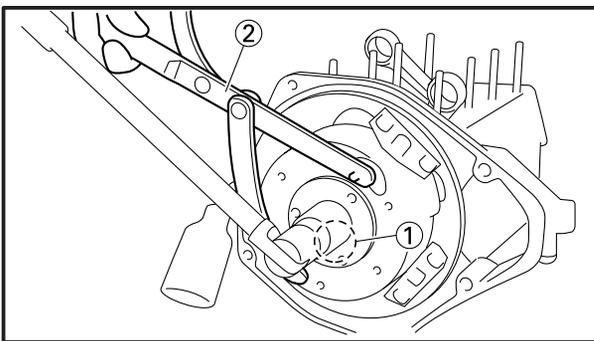
CAUTION: _____

Be sure to remove any oil or grease from the tapered portion of the crankshaft using a cloth dampened with thinner.

4. Tighten:
 - Nut (1) (CDI magneto)

NOTE: _____

Attach the universal rotor holder (2) to hold the CDI magneto.



Universal rotor holder:
90890-01235, YU-01235

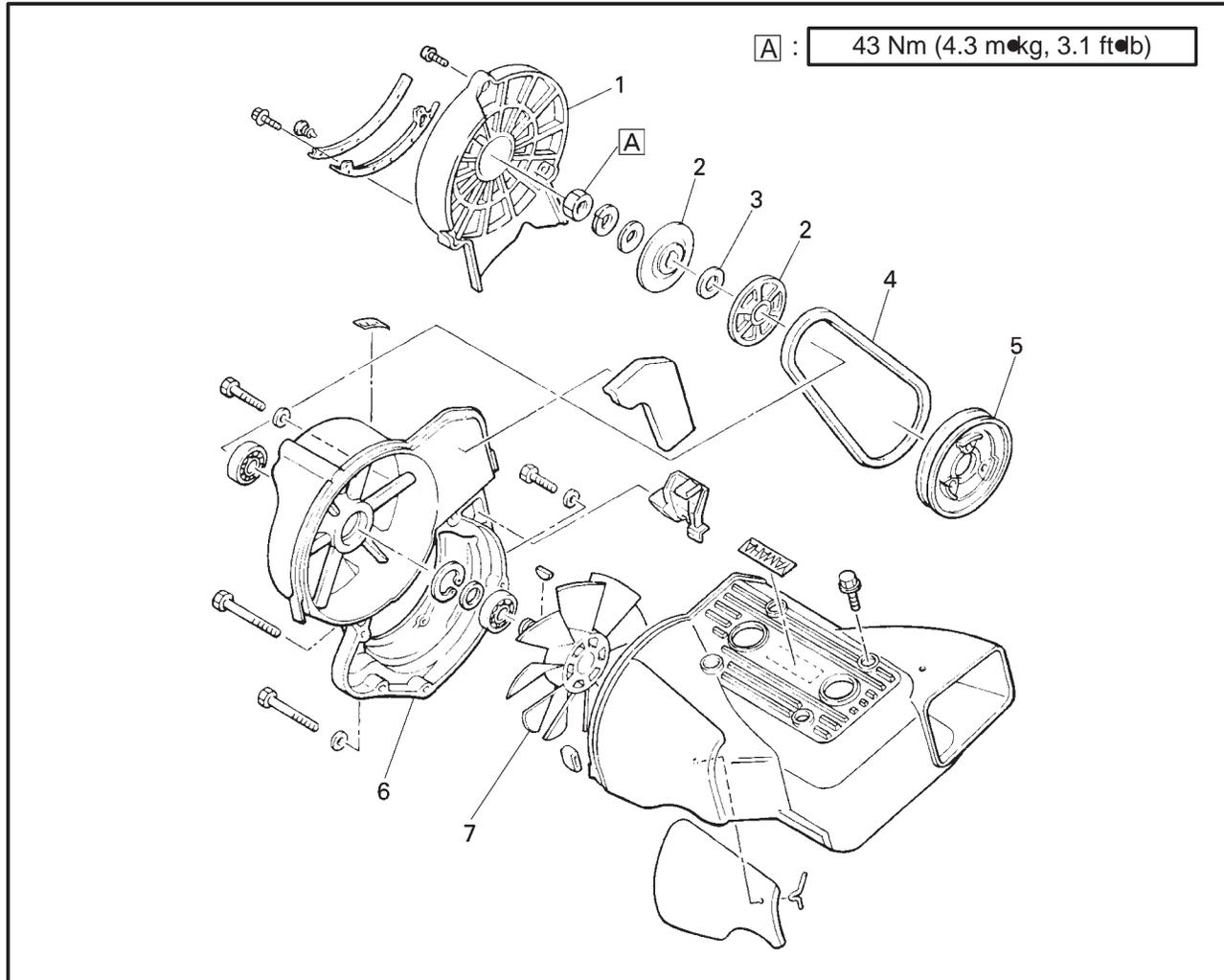


Nut (CDI magneto):
85 Nm (8.5 m•kg, 61 ft•lb)



ESS00173

ENGINE COOLING FAN



Order	Job name/Part name	Q'ty	Remarks
	Engine cooling fan removal		Removing the parts in the order listed below.
1	Cooling fan cover	1	
2	Fan belt driven pulley	2	
3	Shim	-	Refer to "COOLING FAN BELT TENSION ADJUSTMENT" in CHAPTER 2.
4	Fan belt	1	
5	Fan belt drive pulley	1	
6	Cooling fan housing	1	
7	Cooling fan	1	For installation, reverse the removal procedure.

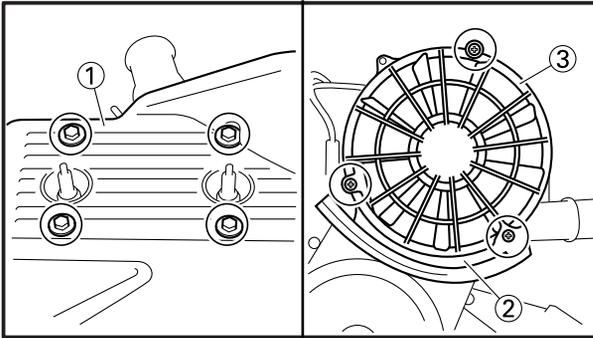


ESS00174

REMOVAL

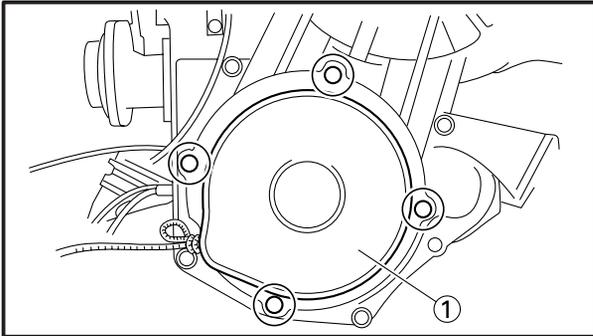
1. Remove:

- Cylinder air shroud ①
- Seal rubber stay ② (air duct)
- Cooling fan cover ③



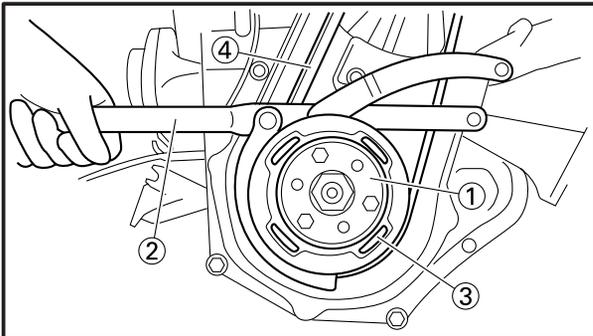
2. Remove:

- Recoil starter ①



3. Remove:

- Starter pulley ①
- Fan belt drive pulley ③
- Fan belt ④



NOTE:

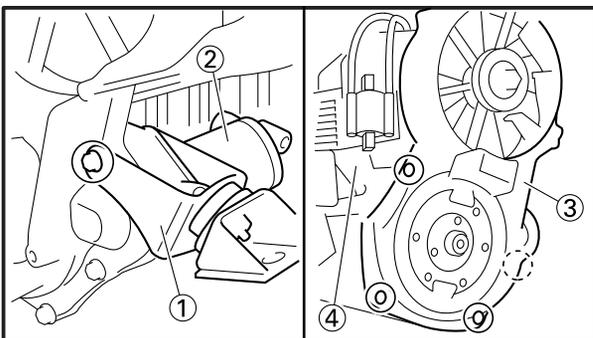
Attach the universal rotor holder ② to hold the starter pulley.

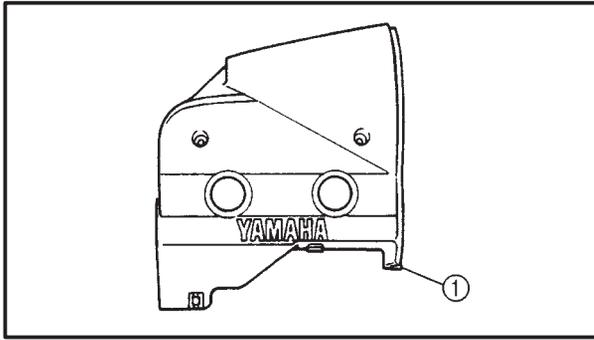


Universal rotor holder:
90890-01235, YU-01235

4. Remove:

- Engine mounting bracket ①
- Starter motor ②
- Cooling fan housing ③
- Seal rubber ④

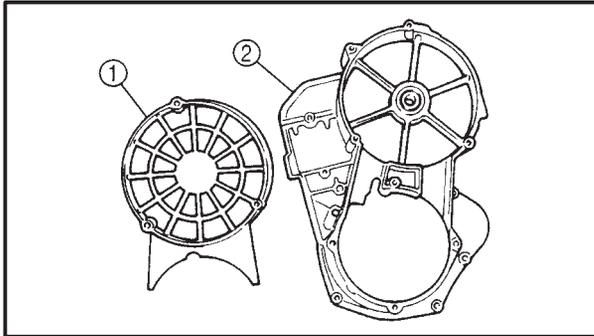




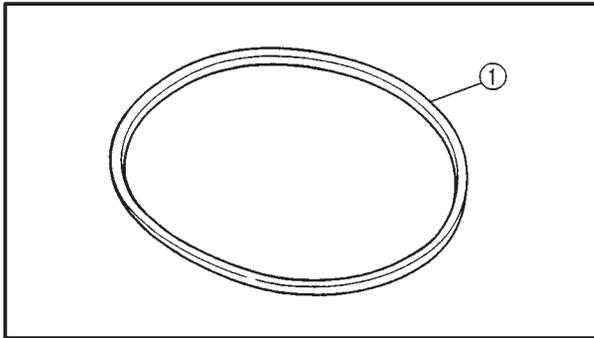
ESS00175

INSPECTION

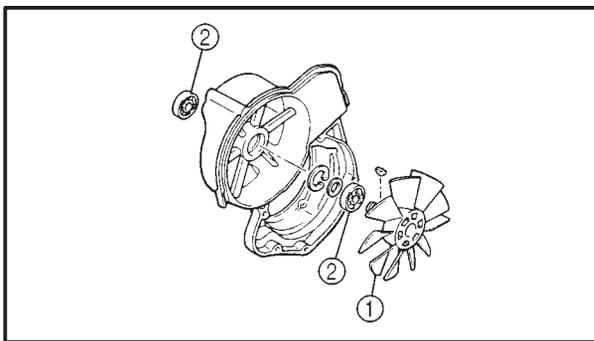
1. Inspect:
 - Upper air shroud ①
 - Cracks/damage → Replace.



2. Inspect:
 - Cooling fan grill ①
 - Cooling fan housing ②
 - Cracks/damage → Replace.



3. Inspect:
 - Cooling fan belt ①
 - Wear/cracks/damage → Replace.



4. Inspect:
 - Cooling fan ①
 - Cracks/damage → Replace.
 - Bearings (cooling fan housing) ②
 - Pitting/damage → Replace.

Replacement steps:

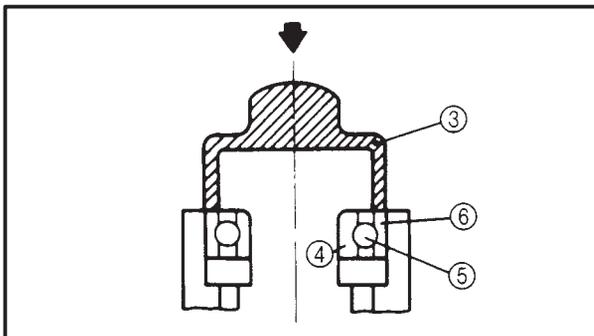
- Remove the bearing(s) ② using a general bearing puller.
- Install the new bearing(s).

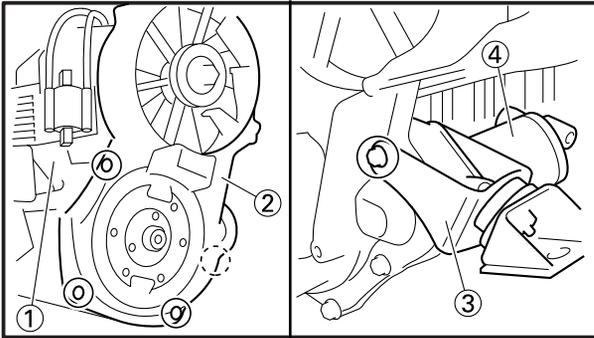
NOTE:

Use a socket ③ that is the same size as the outside diameter of the race of the bearing race.

CAUTION:

Do not strike the inner race ④ or ball bearings ⑤. Contact only the outer race ⑥.



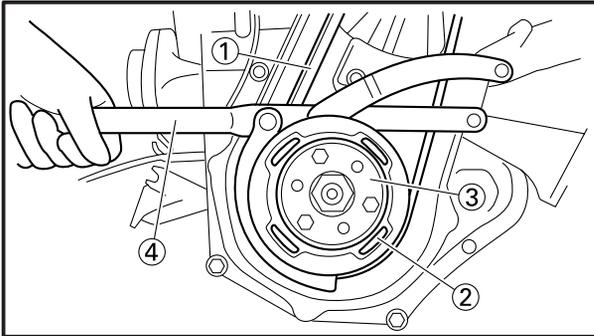


ESS00176

INSTALLATION

1. Install:

- Seal rubber ①
- Cooling fan housing ②
- Engine mounting bracket ③
- Starter motor ④



2. Install:

- Fan belt ①
- Fan belt drive pulley ②
- Starter pulley ③

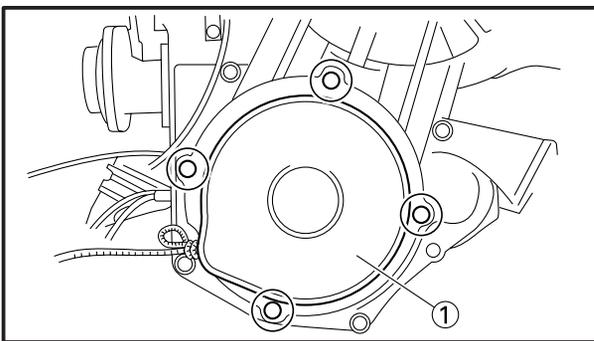
NOTE:

Attach the universal rotor holder ④ to hold the starter pulley.

**Universal rotor holder:****90890-01235, YU-01235**

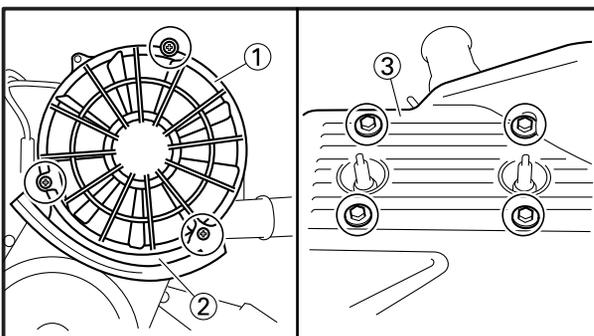
3. Measure:

- Cooling fan belt deflection.
Out of specification Adjust.
Refer to "COOLING FAN BELT INSPEC-
TION" in CHAPTER 2.

**Cooling fan belt deflection:****8 mm (0.31 in.)/4 ~ 6 kg
(8.8 ~ 13.2 lb)**

4. Install:

- Recoil starter ①



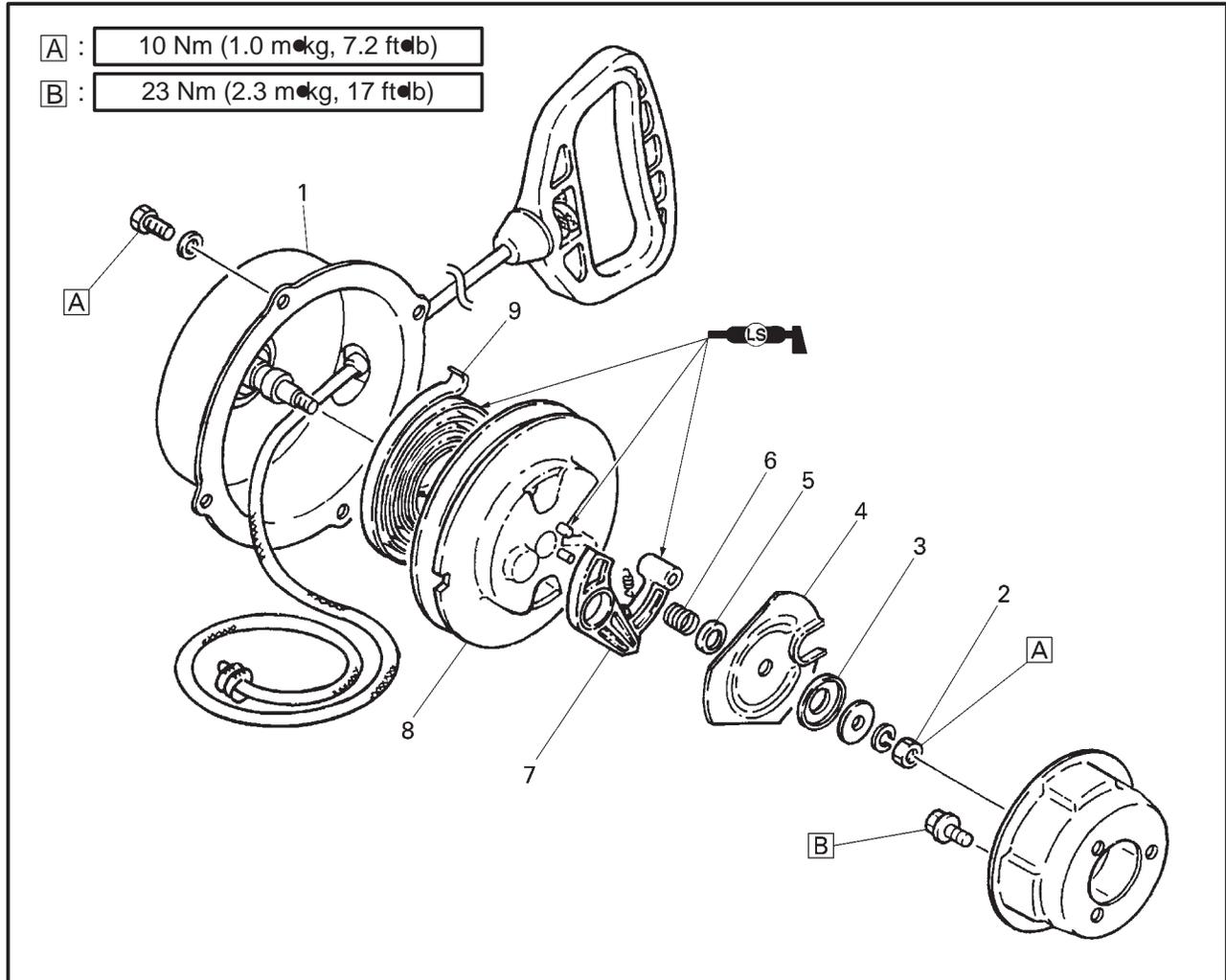
5. Install:

- Cooling fan cover ①
- Seal rubber stay (air duct) ②
- Cylinder air shroud ③

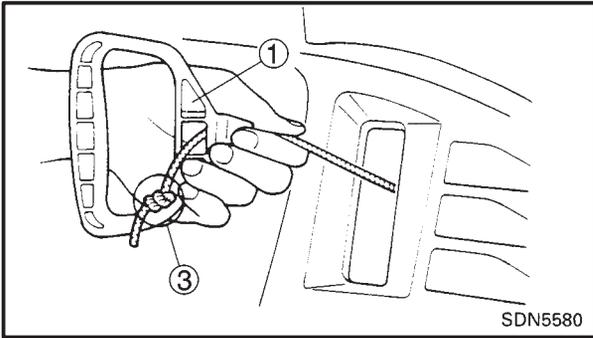


ESS00177

RECOIL STARTER



Order	Job name/Part name	Q'ty	Remarks
	Recoil starter removal		Remove the parts in the order listed below. Refer to "EXHAUST ASSEMBLY".
1	Recoil starter assembly	1	
2	Nut	1	
3	Special washer	1	
4	Drive plate	1	
5	Spring seat	1	
6	Spring	1	
7	Drive pawl	1	
8	Sheave drum	1	
9	Starter spring	1	
			For installation, reverse the removal procedure.



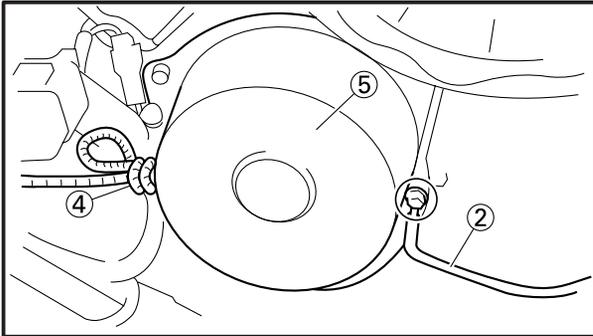
ESS00178

REMOVAL

1. Remove:
 - Starter handle ①
 - Ground lead ②

NOTE:

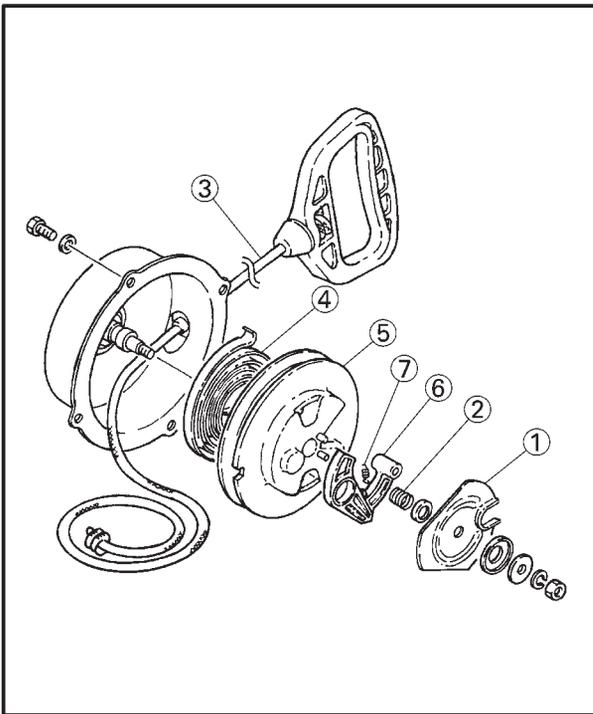
To remove the starter handle, untie the knot ③ in the starter rope and then re-tie a knot ④ in the rope end so that it is not pulled into the recoil starter case ⑤.



ESS00179

INSPECTION

1. Inspect:
 - Drive plate ①
Cracks/bends/damage → Replace.
 - Spring ② (drive plate)
Wear/damage → Replace.
 - Starter rope ③
Wear/breaks/damage → Replace.
 - Starter spring ④
Cracks/bends/damage → Replace.
 - Sheave drum ⑤
Cracks/damage → Replace.
 - Drive pawl ⑥
 - Return spring ⑦
Wear/cracks/damage → Replace.





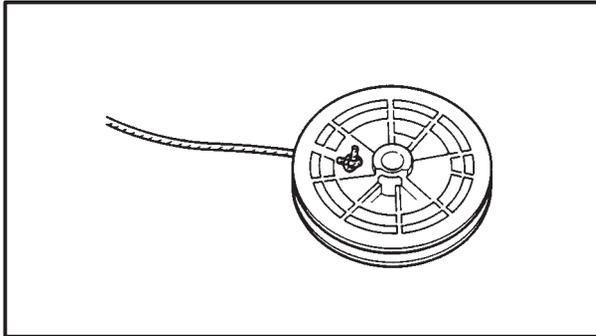
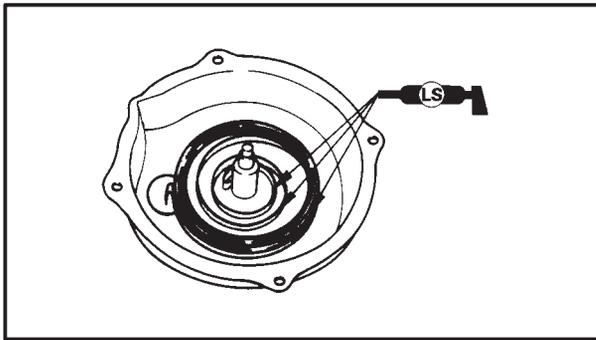
ESS00180

INSTALLATION

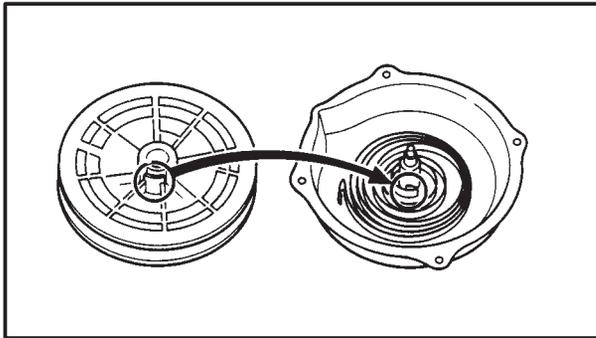
1. Hook the starter spring around the post in the starter case. Carefully wind the spring counterclockwise, and fit the spring into the case.

NOTE: _____

After installing the spring thoroughly apply low-temperature grease.



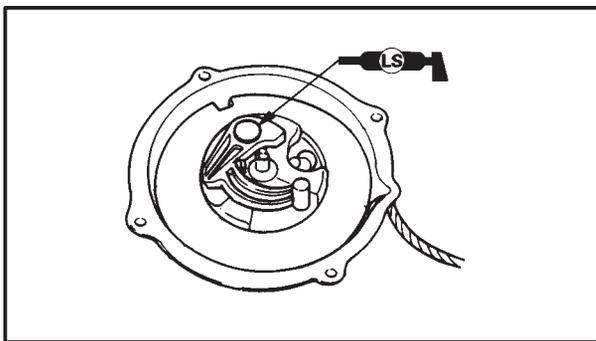
2. Pass the starter rope end into the sheave drum, and knot the rope end. Then fit the knot into the cutout in the sheave drum.



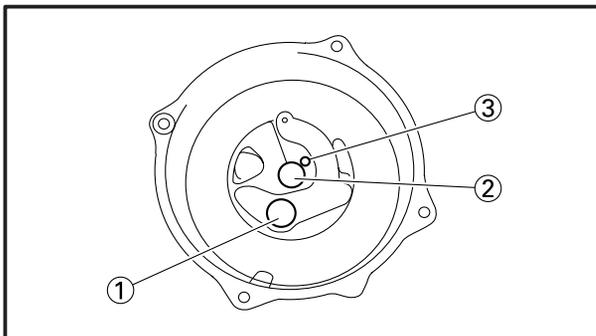
3. Wind:
 - Starter rope (2 turns counterclockwise) (to sheave drum)
4. Install:
 - Sheave drum (into starter case)

NOTE: _____

Be sure the inner hook on the starter spring hooks around the post on the sheave drum.



5. Apply:
 - Grease (lightly) (to pivot point of the drive pawl)



6. Install:
 - Drive pawl ①
 - Return spring ②

NOTE: _____

Hook the return spring end to the drive pawl ①. Then, hook other end of the return spring to the post ③ on the sheave drum.

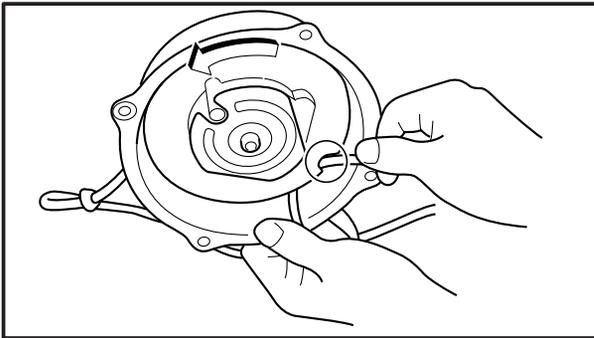


7. Install:
- Spring (drive plate)
 - Spring seat
 - Drive plate
 - Special washer
 - Washer
 - Spring washer
 - Nut

NOTE: _____
 Be sure the cutout portion in the drive plate fits over the post on the drive pawl.



Nut (drive plate):
10 Nm (1.0 m•kg, 7.2 ft•lb)
LOCTITE®



8. Pull about four inches of starter rope from out of the cutout portion in the sheave drum, and rotate the sheave drum five times counter-clockwise to preload the starter spring. Then knot the rope end so that it will not be pulled into the recoil starter case.

9. Install:
- Recoil starter
 - Starter handle



Bolt (recoil starter):
10 Nm (1.0 m•kg, 7.2 ft•lb)

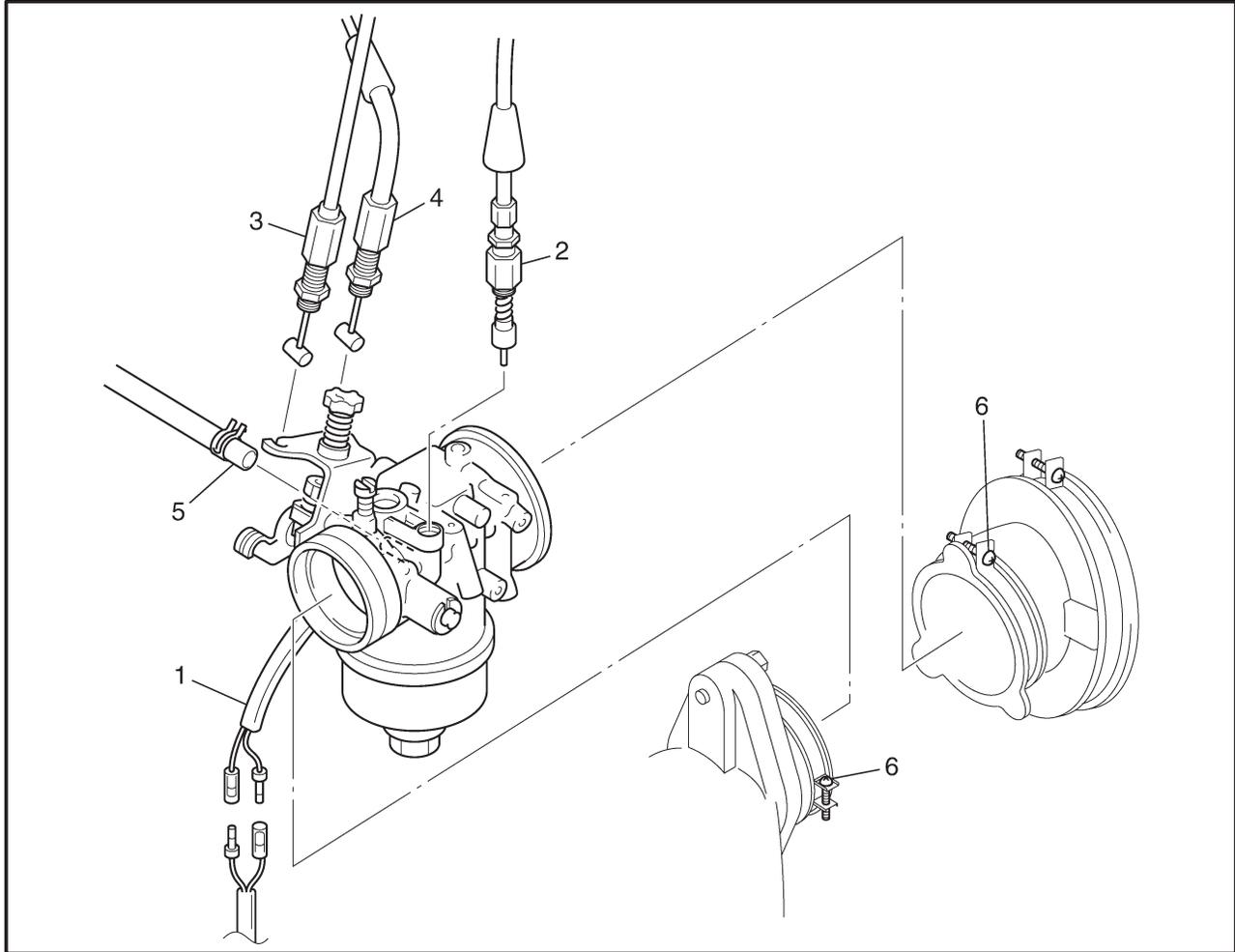
10. Check the starter for smooth operation. If it does not operate smoothly, repair it.

ESS00197

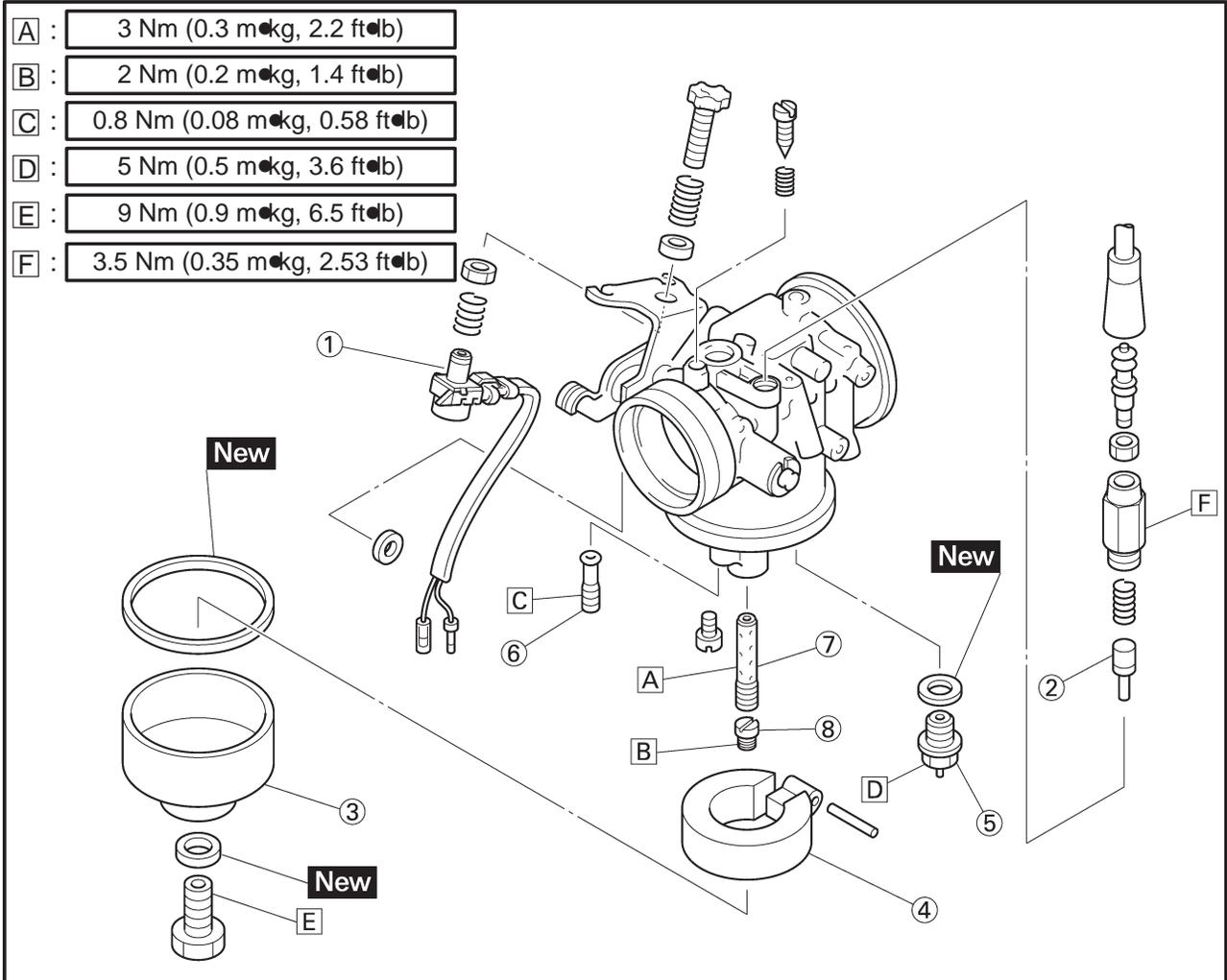
CARBURETION

ESS00198

CARBURETOR



Order	Job name/Part name	Q'ty	Remarks
	Carburetor removal		Remove the parts in the order listed below.
1	T.O.R.S. lead	1	
2	Starter cable	1	
3	Throttle cable	1	
4	Oil pump cable	1	
5	Fuel hose	1	
6	Clamp	2	
			For installation, reverse the removal procedure.



6

Order	Job name/Part name	Q'ty	Remarks
	Carburetor disassembly		Remove the parts in the order listed below.
①	Throttle switch	1	
②	Starter plunger	1	
③	Float chamber cover	1	
④	Float	1	
⑤	Valve seat assembly	1	
⑥	Pilot jet	1	
⑦	Main nozzle	1	
⑧	Main jet	1	
			For assembly, reverse the removal procedure.



ESS00201

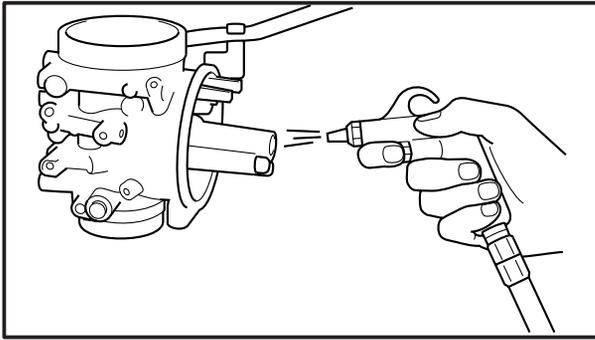
INSPECTION

1. Inspect:

- Carburetor body
 - Fuel passage
- Contamination → Clean.

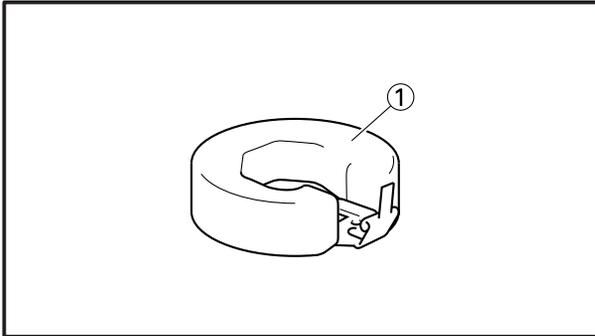
NOTE:

- Use a petroleum based solvent for cleaning.
- Blow out all passages and jets with compressed air.



2. Inspect:

- Float ①
- Damage → Replace.

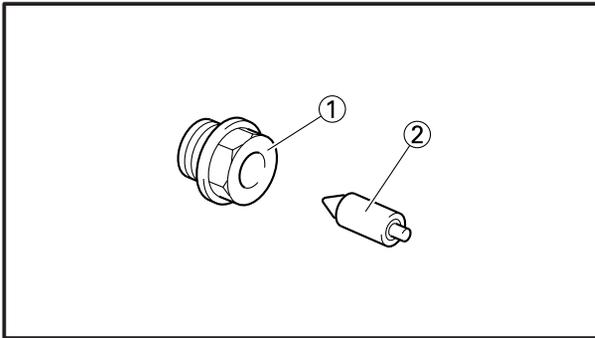


3. Inspect:

- Valve seat ①
 - Needle valve ②
- Wear/contamination → Replace.

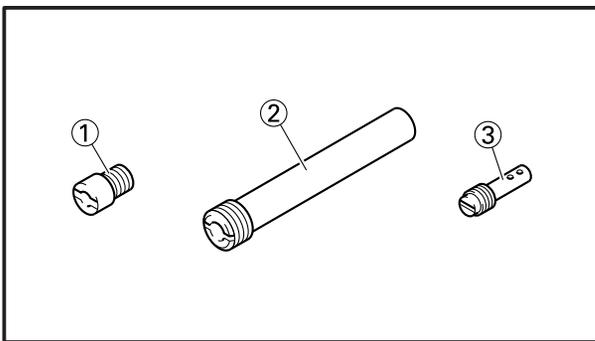
NOTE:

Always replace the needle valve and valve seat as a set.



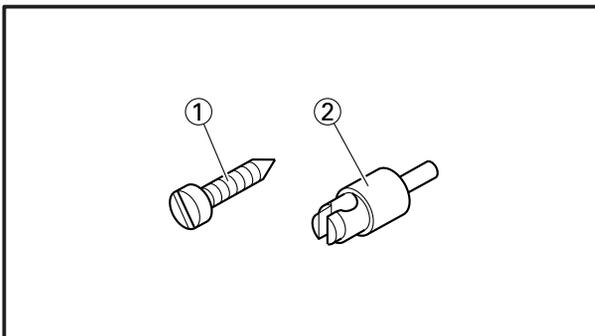
4. Inspect:

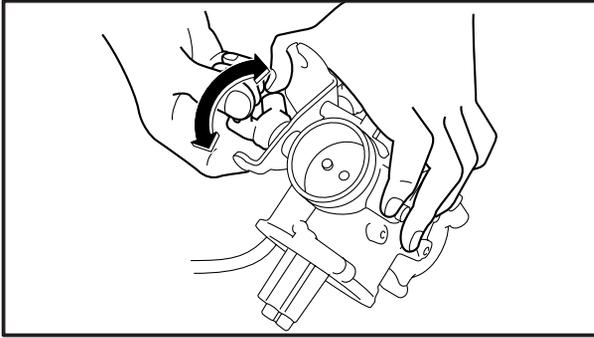
- Main jet ①
 - Main nozzle ②
 - Pilot jet ③
- Contamination → Clean or replace.



5. Inspect:

- Pilot screw ①
 - Starter plunger ②
- Wear/damage → Replace.





6. Check:
 - Throttle valve movement
Stick → Replace carburetor body.

ESS00202

ASSEMBLY

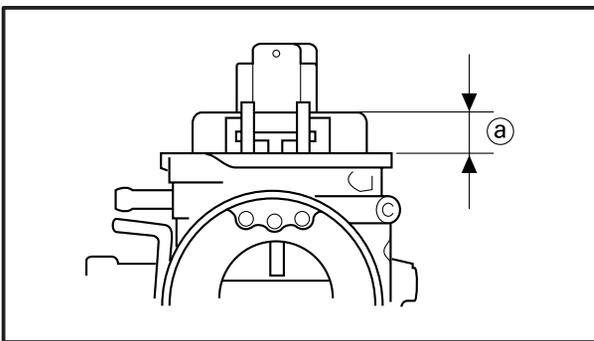
NOTE: _____

- Before reassembling, wash all parts in clean gasoline.
- Always use new gaskets and O-rings.

1. Tighten:

- Inner parts

	<p>Main nozzle: 3 Nm (0.3 m•kg, 2.2 ft•lb)</p> <p>Valve seat: 5 Nm (0.5 m•kg, 3.6 ft•lb)</p> <p>Main jet: 2 Nm (0.2 m•kg, 1.4 ft•lb)</p> <p>Pilot jet: 0.8 Nm (0.08 m•kg, 0.58 ft•lb)</p> <p>Starter plunger cap: 3.5 Nm (0.35 m•kg, 2.53 ft•lb)</p>
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



2. Measure:

- Float height (a)
Out of specification → Adjust.

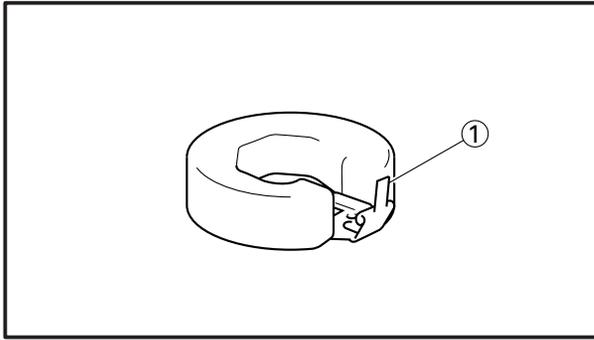
	<p>Float height (a): 12 ~ 16 mm (0.47 ~ 0.63 in)</p>
--	-----------------------------------------------------------------

Measurement and adjustment steps:

- Hold the carburetor upside down.
- Incline the carburetor at 60 ~ 70 (so that the end of the float valve does not hang down as a result of float weight).
- Measure the distance between the carburetor body and top of the floats.

NOTE: _____

The float arm should resting on the needle valve without exerting pressure on it.



- If the float height is not within specification, inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float arm tang ① on the float.
- Recheck the float height.

ESS00204

INSTALLATION**NOTE:** _____

After installing all parts, refer to "CABLE ROUTING" in CHAPTER 8, to check the cable, lead and hose routings.

1. Adjust:

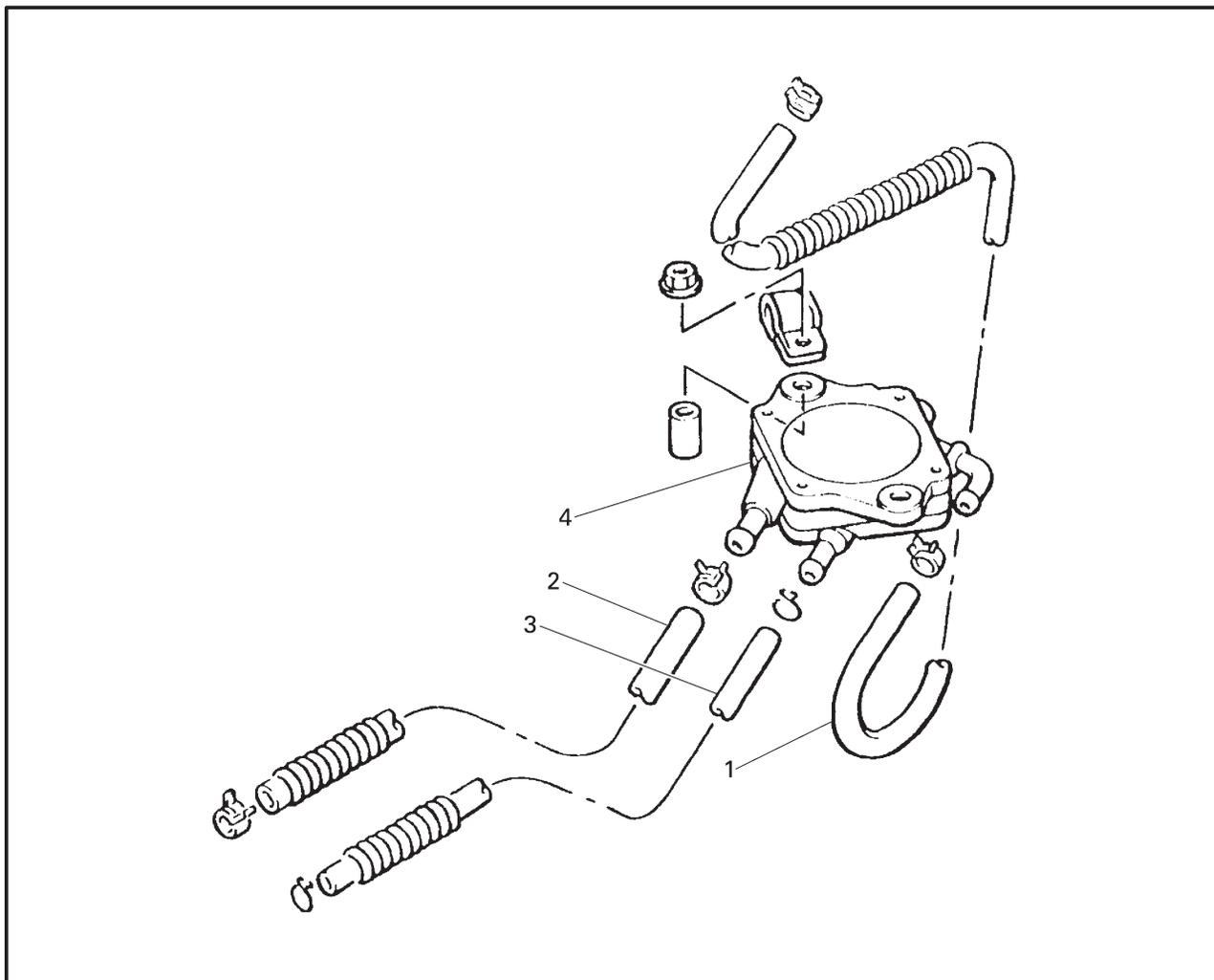
- Starter cable freeplay

Refer to "STARTER (CHOKE) CABLE ADJUSTMENT" in CHAPTER 2.

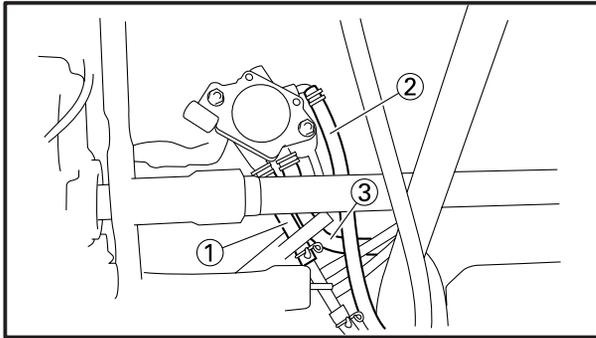


ESS00206

FUEL PUMP



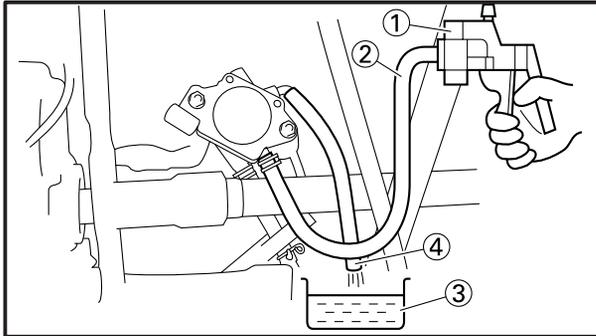
Order	Job name/Part name	Q'ty	Remarks
	Fuel pump removal		Remove the parts in the order listed below.
1	Fuel hose	1	
2	Fuel delivery hose	1	
3	Vacuum hose	1	
4	Fuel pump assembly	1	
			For installation, reverse the removal procedure.



ESS00207

INSPECTION

1. Inspect:
 - Fuel hose ①
 - Fuel delivery hoses ②
 - Vacuum hose ③
 Clogs/damage → Replace.



2. Check:
 - Fuel pump operation

Checking steps:

- Connect the Mity vac ① to the pulser hose ②.



Mity vac:

90890-06756, YB-35956

- Place a container ③ under the end of the fuel delivery hoses ④.
- Operate the Mity vac ① while checking that fuel flows from the fuel delivery hoses ④.
- If fuel does not flow out, replace the fuel pump.

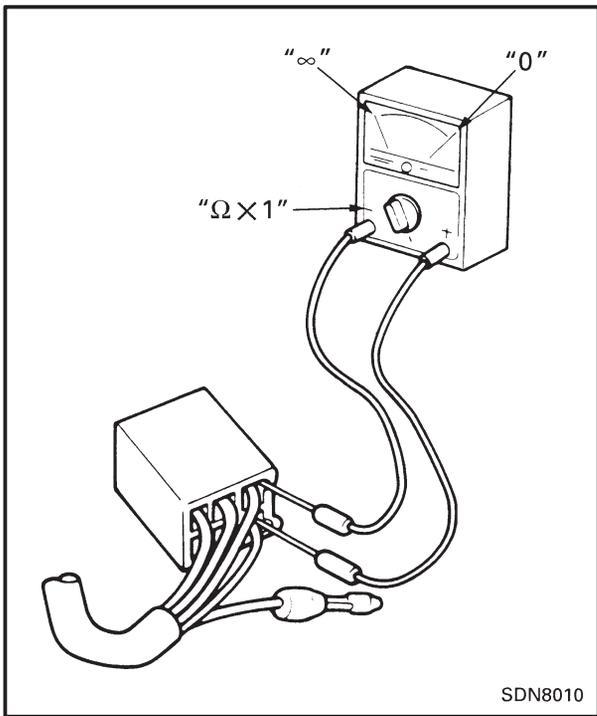
ESS00208

INSTALLATION

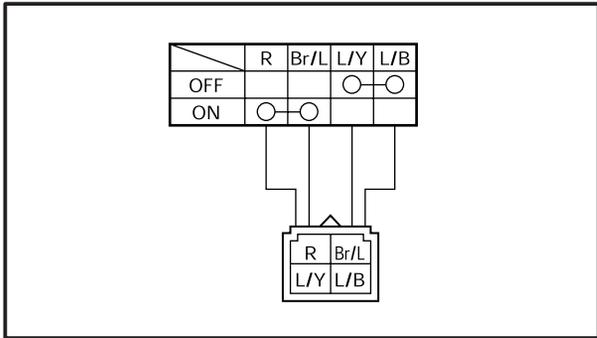
NOTE: _____

After installing all parts, refer to “CABLE ROUTING” in CHAPTER 8, to check the cable, lead and hose routings.

1. Bleed:
 - Oil system
 Refer to “OIL PUMP” in CHAPTER 2.



SDN8010



ELECTRICAL

SWITCH INSPECTION

Use a pocket tester to check the terminals for continuity. If the continuity is faulty at any point, replace the switch.



Pocket tester:
90890-03112, YU-03112

NOTE:

- Set the pocket tester to “0” before starting a test.
- When testing the switch for continuity the pocket tester should be set to the “~ 1” Ω range.
- When checking the switch turn it on and off a few times.

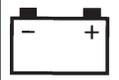
INSPECTING A SWITCH SHOWN IN THE MANUAL

The terminal connections for switches (main switch, handlebar switch, engine stop switch, light switch, etc.) are shown in a chart similar to the one on the left.

This chart shows the switch positions in the column and the switch lead colors in the top row. For each switch position, “○—○” indicates the terminals with continuity.

The example chart shows that:

- ① There is continuity between the “Blue/Yellow and Blue/Black” leads when the switch is set to “OFF”.
- ② There is continuity between the “Red and Brown/Blue” leads when the switch is set to “ON”.



TROUBLESHOOTING

NO SPARK OR WEAK SPARK.

Check the spark plug gap.

↓ OK OUT OF SPECIFICATION → Repair or replace the spark plug.

Check the spark plug cap resistance.

↓ OK OUT OF SPECIFICATION → Replace the spark plug cap.

Check the ignition coil resistance.

↓ OK OUT OF SPECIFICATION → Replace the ignition coil.

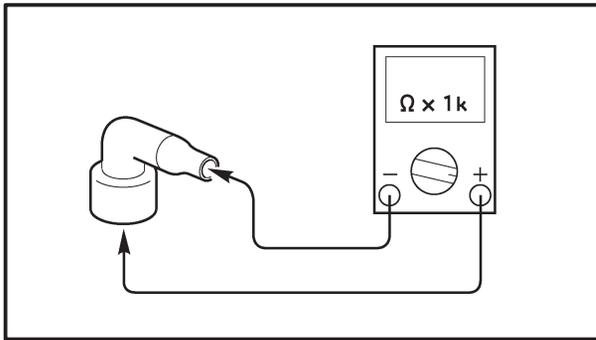
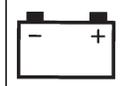
Check the source coil.

↓ OK FAULTY → Replace the source coil.

Check the engine stop switch,
throttle switch, carburetor switch
and main switch.

↓ OK FAULTY → Replace the handlebar switch (right), carburetor
switch, and/or main switch.

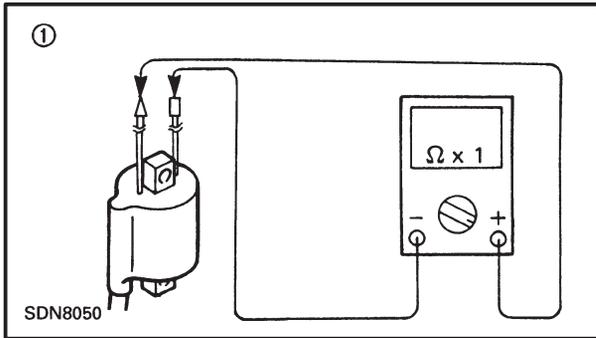
Correct connection and/or replace
CDI unit and/or Rectifier/regulator.



SPARK PLUG CAP

1. Remove:
 - Spark plug cap
2. Connect:
 - Pocket tester (to the spark plug cap)
3. Measure:
 - Spark plug cap resistance
 - Out of specification → Replace.

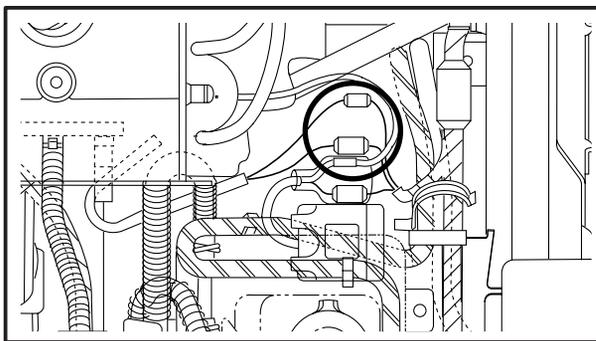
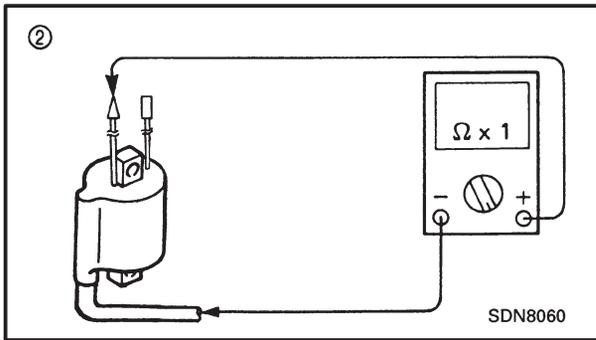
Spark plug cap resistance:
5 kΩ at 20°C (68°F)



IGNITION COIL

1. Disconnect:
 - Ignition coil lead
 - Spark plug lead
2. Connect:
 - Pocket tester (to the ignition coil and spark plug lead)
3. Measure:
 - Primary coil resistance ①
 - Secondary coil resistance ②
 - Out of specification → Replace.

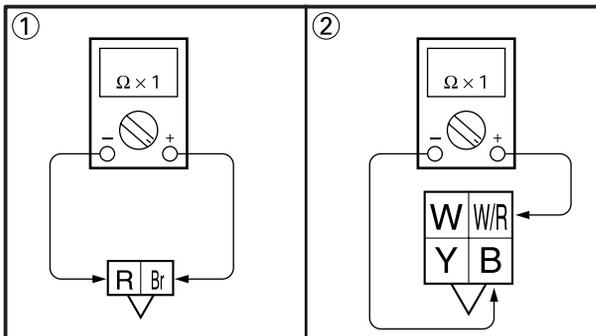
Primary coil resistance ① :
0.2 Ω ± 20% at 20°C (68°F)
Secondary coil resistance ② :
4.9 kΩ ± 20% at 20°C (68°F)

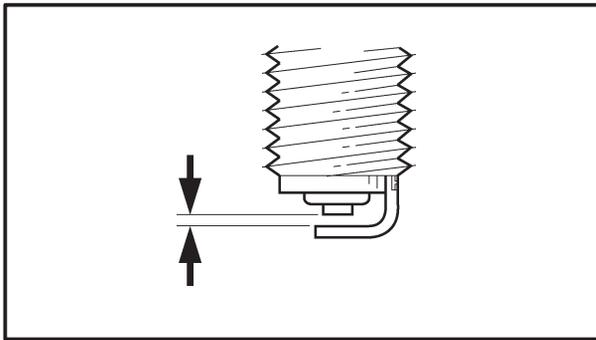
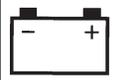


SOURCE COIL/PULSER COIL

1. Disconnect:
 - CDI magneto coupler
2. Connect:
 - Pocket tester (to CDI magneto coupler)
3. Measure:
 - Source coil/pulser coil resistance
 - Out of specification → Replace.

Source coil resistance: ① (Br-R)
275 Ω ± 20% at 20°C (68°F)
Pulser coil resistance: ② (W/R-B)
20 Ω ± 20% at 20°C (68°F)





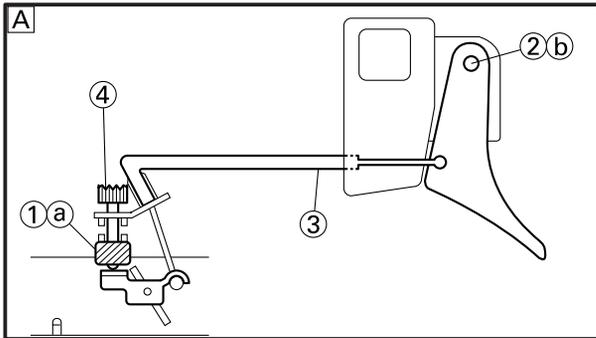
SPARK PLUG

1. Remove:
 - Spark plugs
2. Measure:
 - Spark plug gap

Standard spark plug:
BR9ES (NGK)



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



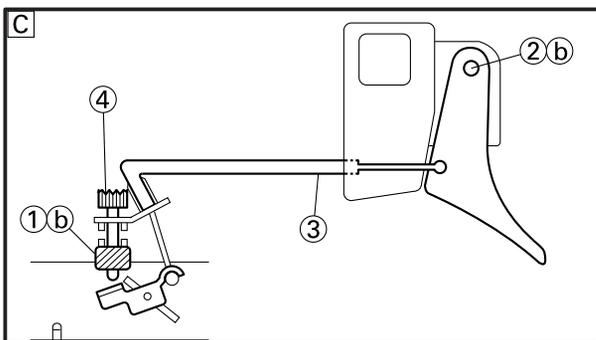
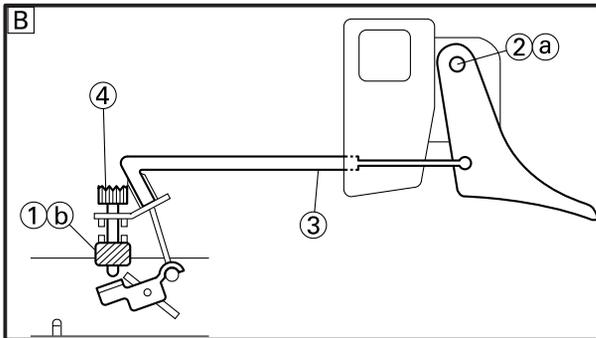
THROTTLE OVERRIDE SYSTEM (T.O.R.S.)

If the carburetor or throttle cable should malfunction during operation, T.O.R.S. will operate when the throttle lever is released.

T.O.R.S. is designed to interrupt the ignition and keep the engine revolutions between 2,800 and 3,000 r/min if the carburetor fails to return to idle when the lever is released.

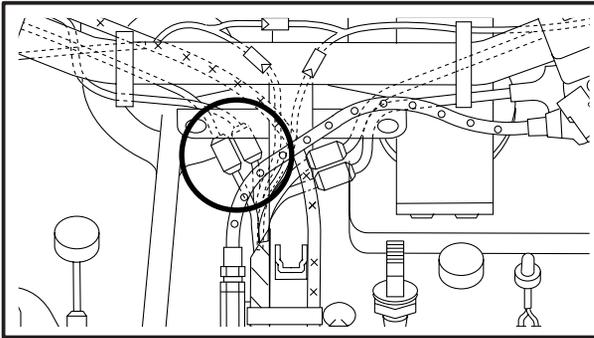
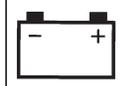
⚠ WARNING

- If T.O.R.S. operates, make sure that the cause of the malfunction is corrected and that the engine can be operated without a problem before restarting the engine.
- Be sure to use the standard resistance-type spark plug and spark plug cap. Otherwise, T.O.R.S. will not work properly.



Status \ Switch	A Idling or starting	B Running	C Trouble
Throttle switch	OFF	ON	OFF
Carburetor switch	ON	OFF	OFF
Engine	Running	Running	T.O.R.S. operating

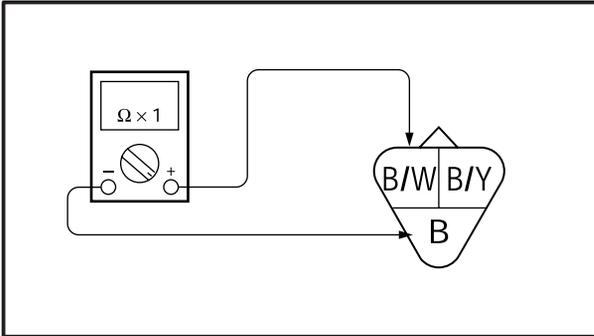
- ① Carburetor switch
- ② Throttle switch
- ③ Throttle cable
- ④ Throttle stop screw
- ⓐ ON
- ⓑ OFF



HANDLEBAR SWITCH (RIGHT)

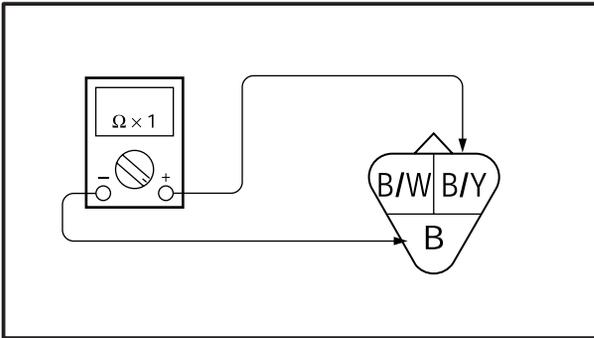
Engine stop switch and throttle switch

1. Disconnect:
 - Handlebar switch (right) coupler
2. Connect:
 - Pocket tester



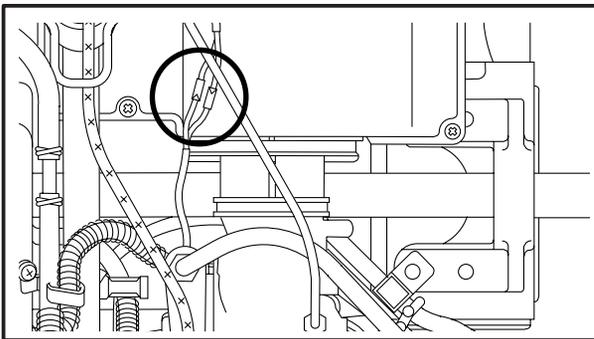
3. Check:
 - Engine stop switch continuity
 Faulty → Replace the handlebar switch (right).

Switch position	Continuity
RUN (pulled out)	Yes
OFF (pushed in)	No



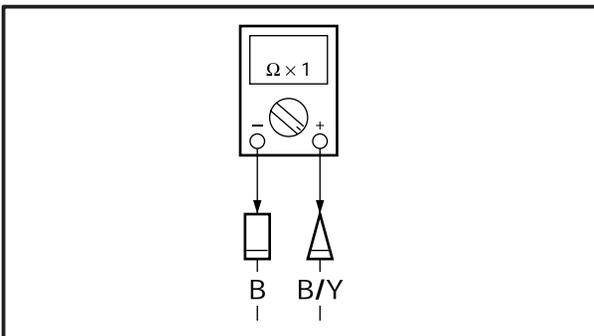
4. Check:
 - Throttle switch continuity
 Faulty → Replace the handlebar switch (right).

Throttle switch position	Continuity
Throttle lever is operated.	Yes
Throttle lever is not operated.	No

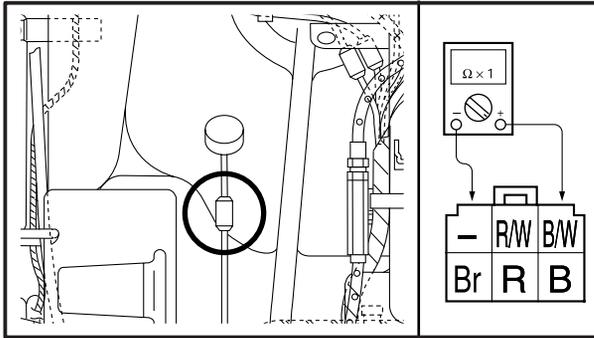
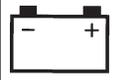


CARBURETOR SWITCH

1. Disconnect:
 - Carburetor switch lead
2. Connect:
 - Pocket tester
3. Check:
 - Carburetor switch continuity
 Faulty → Replace.



Carburetor switch position	Continuity
Throttle lever is operated.	No
Throttle lever is not operated.	Yes



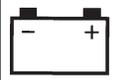
MAIN SWITCH

1. Disconnect:
 - Main switch coupler
2. Connect:
 - Pocket tester
3. Check:
 - Main switch continuity
 Faulty → Replace.

Switch position	Continuity
OFF	Yes
ON	No

Switch position	Color code				
	Br	B	B/W	R/W	R
OFF		○—○			
ON	○—				○—
START	○—			○—	○—

○—○ Continuity



TROUBLESHOOTING

HEADLIGHT, TAIL LIGHT AND/OR METER LIGHT DO NOT COME ON.

Check the bulb(s).



OK

NO CONTINUITY



Replace the bulb(s).

Check the headlight beam switch and lighting coil.



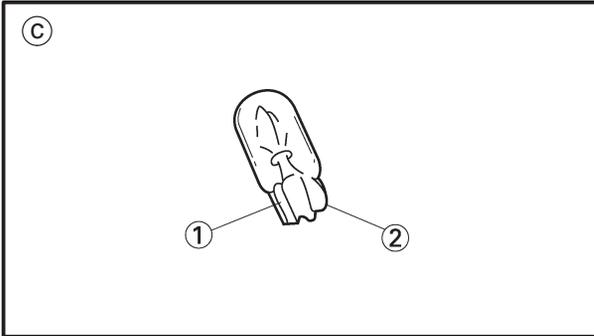
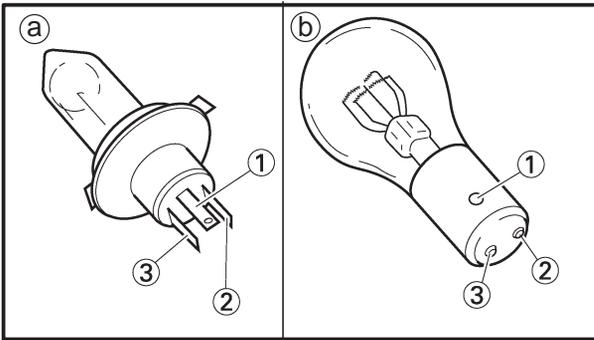
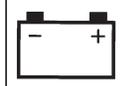
OK

FAULTY



Replace the headlight beam switch and/or lighting coil.

Correct the connection and/or replace the rectifier/regulator.



BULB(S)

1. Remove:
 - Headlight bulb (a)
 - Tail/brake light bulb (b)
 - Meter light bulb (c)
2. Connect:
 - Pocket tester (to the bulb terminals)

⚠ WARNING

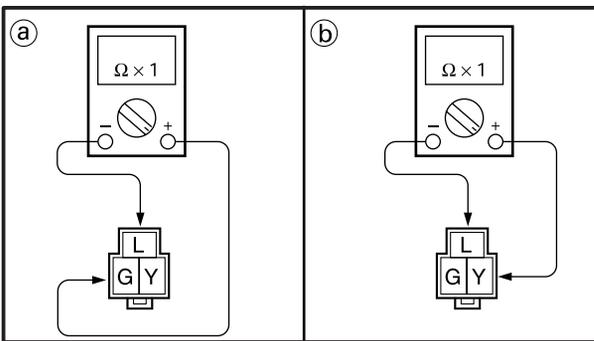
Keep flammable products and your hands away from the bulb while it is on; it will be hot. Do not touch the bulb until it cools down.

3. Check:
 - Bulb(s)

Terminal	Continuity
① - ②	Yes
① - ③	Yes

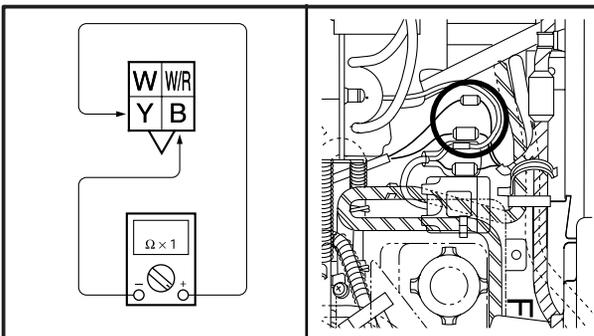
HEADLIGHT BEAM SWITCH

1. Disconnect:
 - Headlight beam switch coupler
2. Connect:
 - Pocket tester (to the headlight beam switch coupler)



3. Check:
 - Headlight beam switch continuity
 Faulty → Replace.

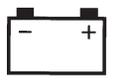
Switch position	(a) Continuity	(b) Continuity
HI	No	Yes
LO	Yes	No



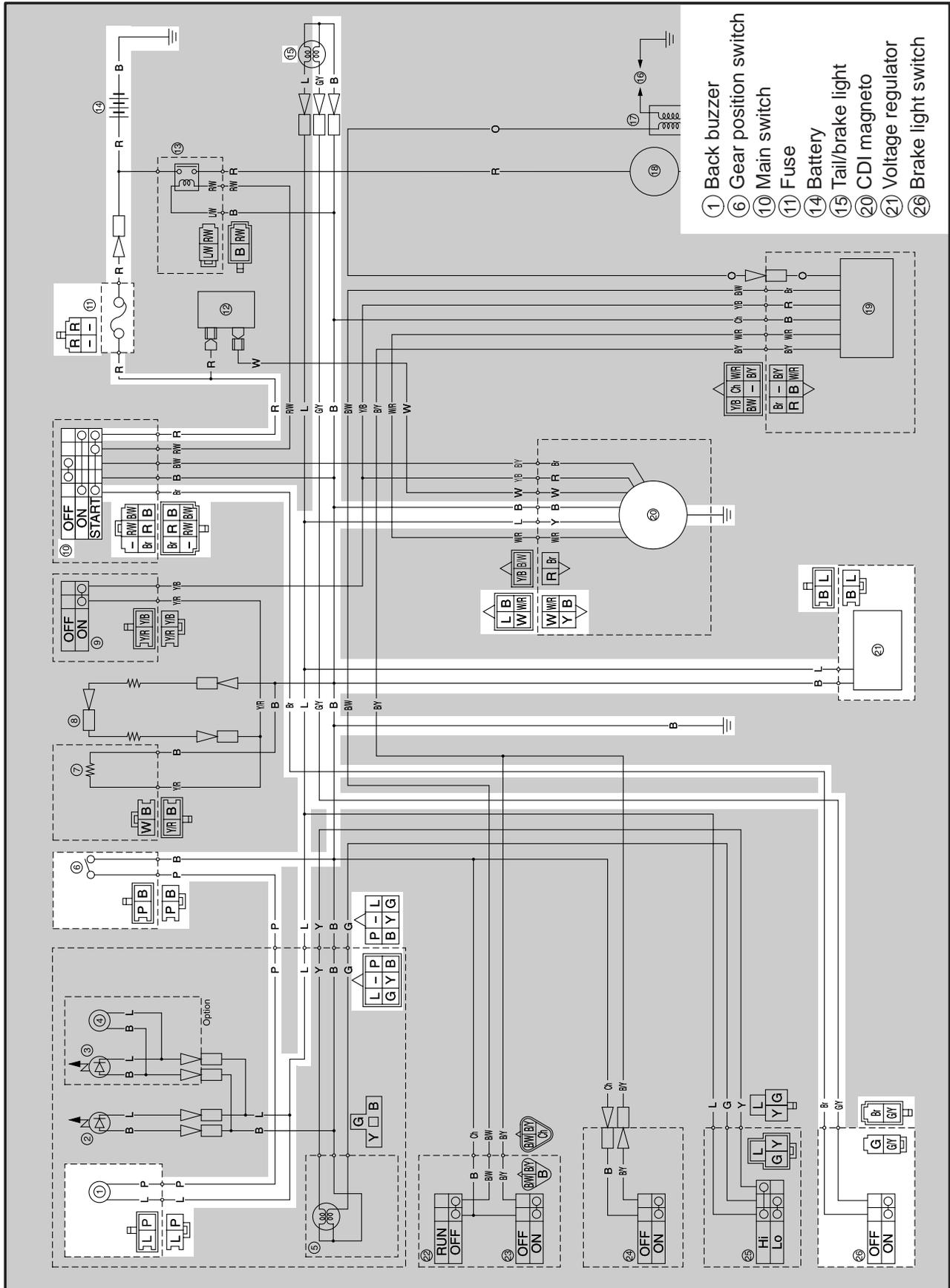
LIGHTING COIL

1. Measure:
 - Lighting coil resistance
 Out of specification → Replace.

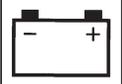
Lighting coil resistance:
 (Yellow – Black)
 $0.3 \Omega \pm 20\%$ at 20° (68° F)



SIGNAL SYSTEM
CIRCUIT DIAGRAM



- ① Back buzzer
- ⑥ Gear position switch
- ⑩ Main switch
- ⑪ Fuse
- ⑭ Battery
- ⑮ Tail/brake light
- ⑲ CDI magneto
- ⑳ Voltage regulator
- ㉔ Brake light switch



TROUBLESHOOTING

BRAKE LIGHT DOES NOT COME ON.

Check the tail/brake light bulb.



OK

NO CONTINUITY



Replace the bulb.

Check the brake light switch.



OK

FAULTY



Replace the brake light switch.

Check the main switch and fuse.



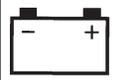
OK

FAULTY



Replace the main switch and/or fuse.

Replace and/or charge battery
and/or correct connection.



8E181

TROUBLESHOOTING

BACK BUZZER DOES NOT SOUND.

Check the gear position switch.



OK

FAULTY



Replace the gear position switch.

Check the lighting coil.



OK

OUT OF SPECIFICATION



Replace the lighting coil.

Check the back buzzer.



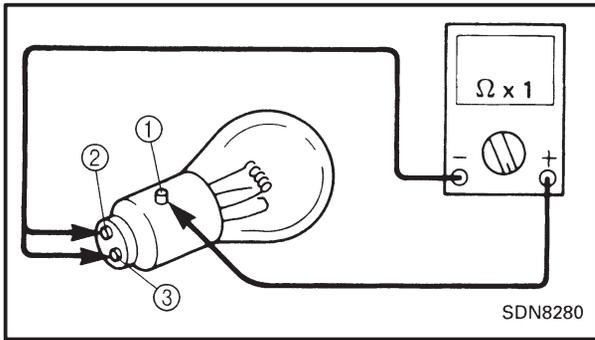
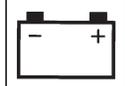
OK

DOES NOT SOUND



Adjust and/or replace the back buzzer.

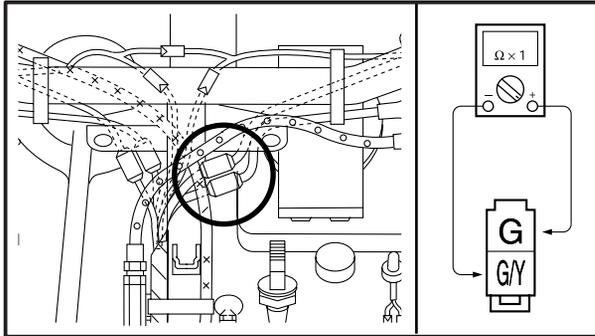
Correct connection and/or
replace the rectifier/regulator.



TAIL/BRAKE LIGHT BULB

1. Remove:
 - Tail/brake light bulb

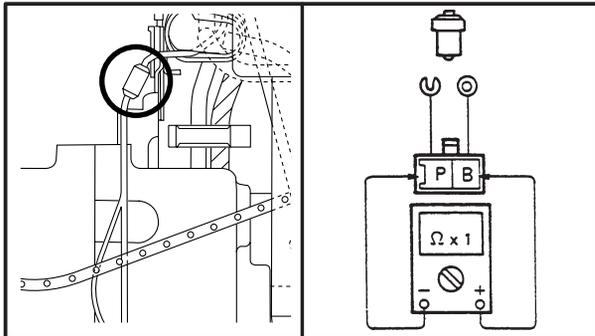
Terminal	Continuity
① - ②	Yes
① - ③	Yes



BRAKE LIGHT SWITCH

1. Check:
 - Brake light switch continuity
 Faulty → Replace.

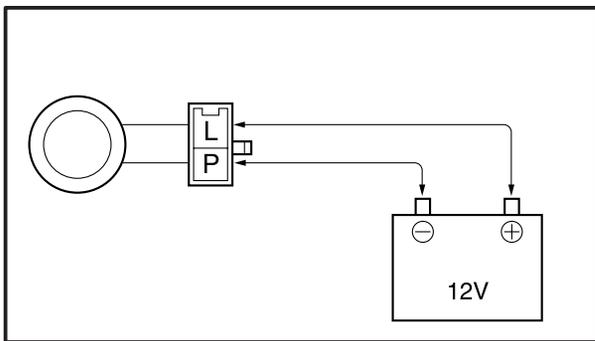
Switch position	Continuity
Brake lever operates	Yes
Brake lever does not operate	No



GEAR POSITION SWITCH

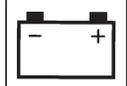
1. Check:
 - Gear position switch continuity
 Faulty → Replace.

Shift lever position	Continuity
FORWARD	No
REVERSE	Yes



BACK BUZZER

1. Disconnect:
 - Back buzzer coupler
2. Connect:
 - Battery
3. Check:
 - Back buzzer
 Does not sound → Replace.



8E281

TROUBLESHOOTING

GRIP WARMER DOES NOT OPERATE.

Check the resistor.



OK

NO CONTINUITY



Replace the resistor.

Check the grip and thumb warmer.



OK

NO CONTINUITY



Replace the grip warmer and/or thumb warmer.

Check the grip warmer switch.



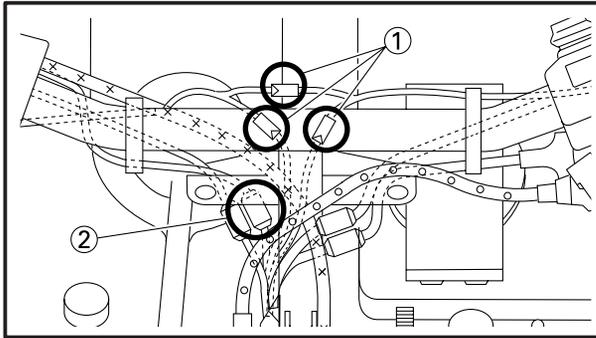
CORRECT

INCORRECT



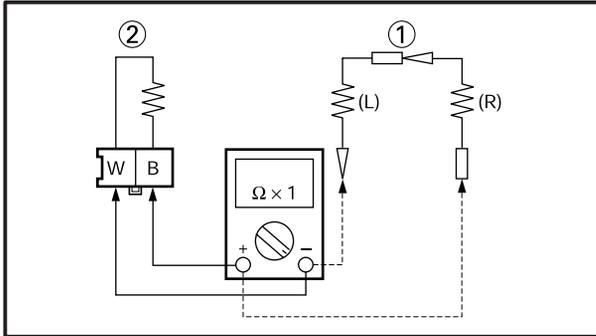
Replace the grip warmer switch.

Replace the grip warmer coil and/or correct connection.

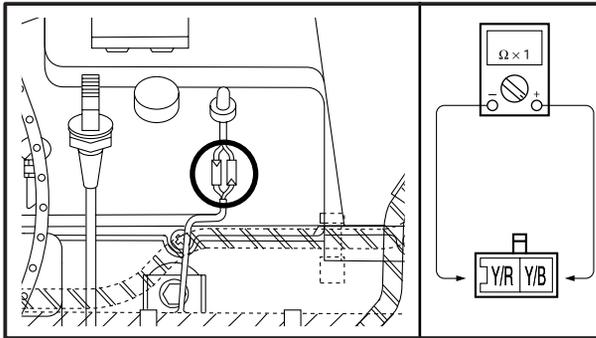


GRIP AND THUMB WARMER COIL

1. Disconnect:
 - Grip warmer leads ①
 - Thumb warmer coupler ②
2. Connect:
 - Pocket tester
(to the grip warmer coil leads and/or thumb warmer coil leads)



3. Check:
 - Grip warmer ① continuity
 - Thumb warmer ② continuity
 No continuity → Replace both grips together or separately and/or the handlebar switch.



GRIP WARMER SWITCH

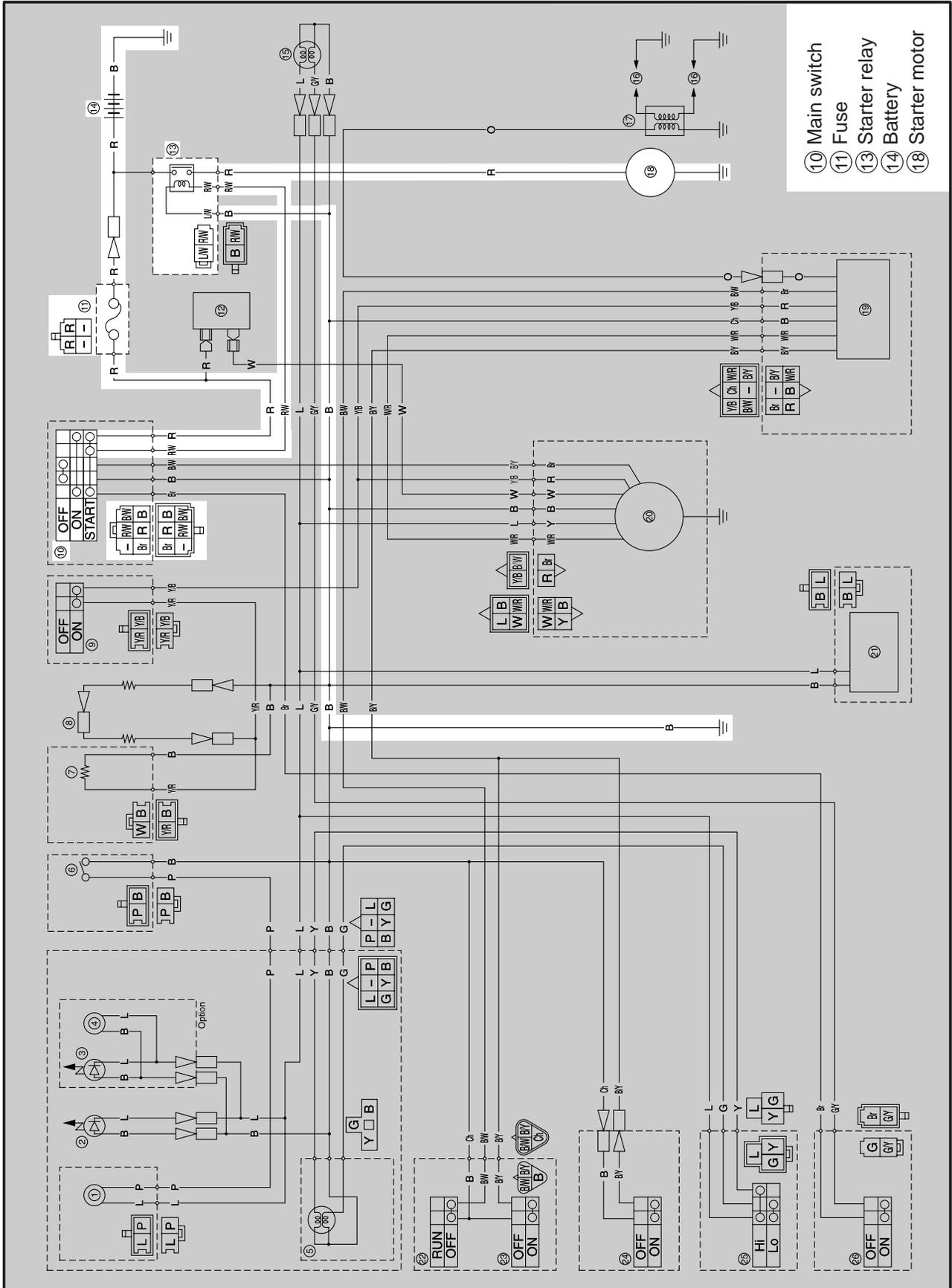
1. Check:
 - Grip warmer switch continuity
 Faulty → Replace.

Switch position	Color code	
	Y/R	Y/B
OFF		
ON	○ — ○	○ — ○

○ — ○ Continuity



**ELECTRICAL STARTING SYSTEM
CIRCUIT DIAGRAM**

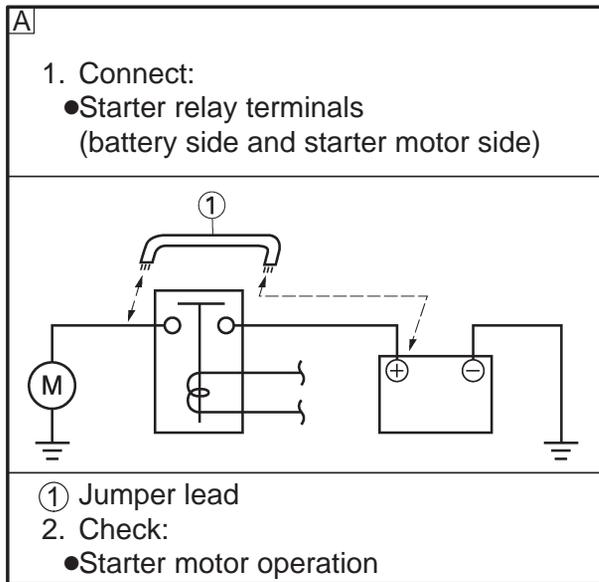


TROUBLESHOOTING

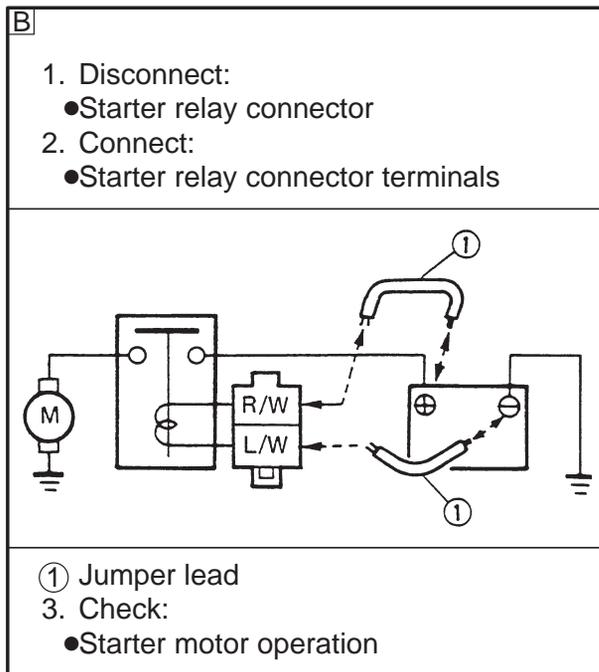
STARTER MOTOR DOES NOT OPERATE.

⚠ WARNING

Before starter motor operation, push the “ENGINE STOP” switch to “OFF”.



OK



OK

NO

Check the battery and connectors.

OK

NO

Replace and/or charge the battery.

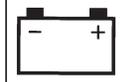
Repair and/or replace the starter motor.

⚠ WARNING

A wire for the jumper lead ① must have the equivalent capacity as that of the battery lead or more, otherwise it may cause the jumper lead to be burned. This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.

NO

Replace the starter relay.



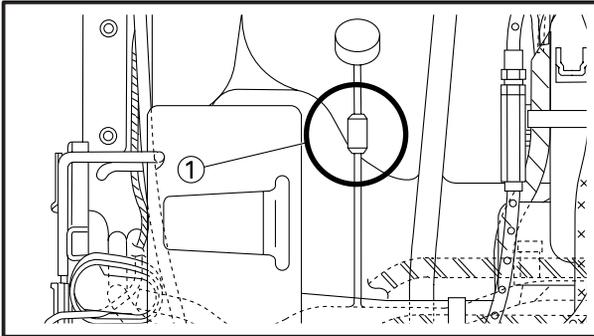
FAULTY

Check the main switch, fuse and rectifier.

↓ OK

Correct connection.

Replace the main switch, fuse and/or rectifier.



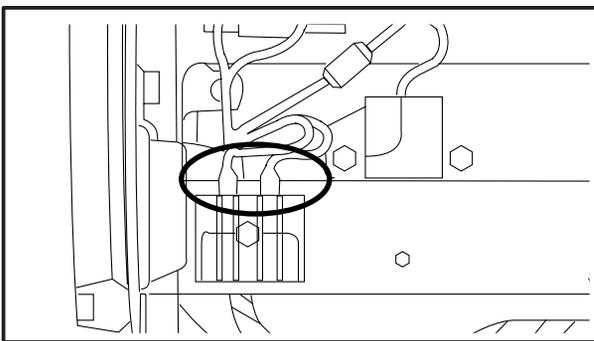
MAIN SWITCH

1. Disconnect:
 - Main switch coupler ①
2. Connect:
 - Pocket Tester (to main switch coupler)

3. Check:
 - Main switch continuity
 - Faulty → Replace.

Switch position	Color code				
	Br	B	B/W	R/W	R
OFF		○—○			
ON	○				○
START	○			○	○

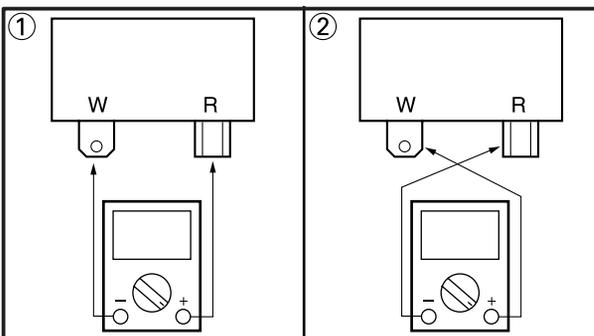
○—○ Continuity



RECTIFIER

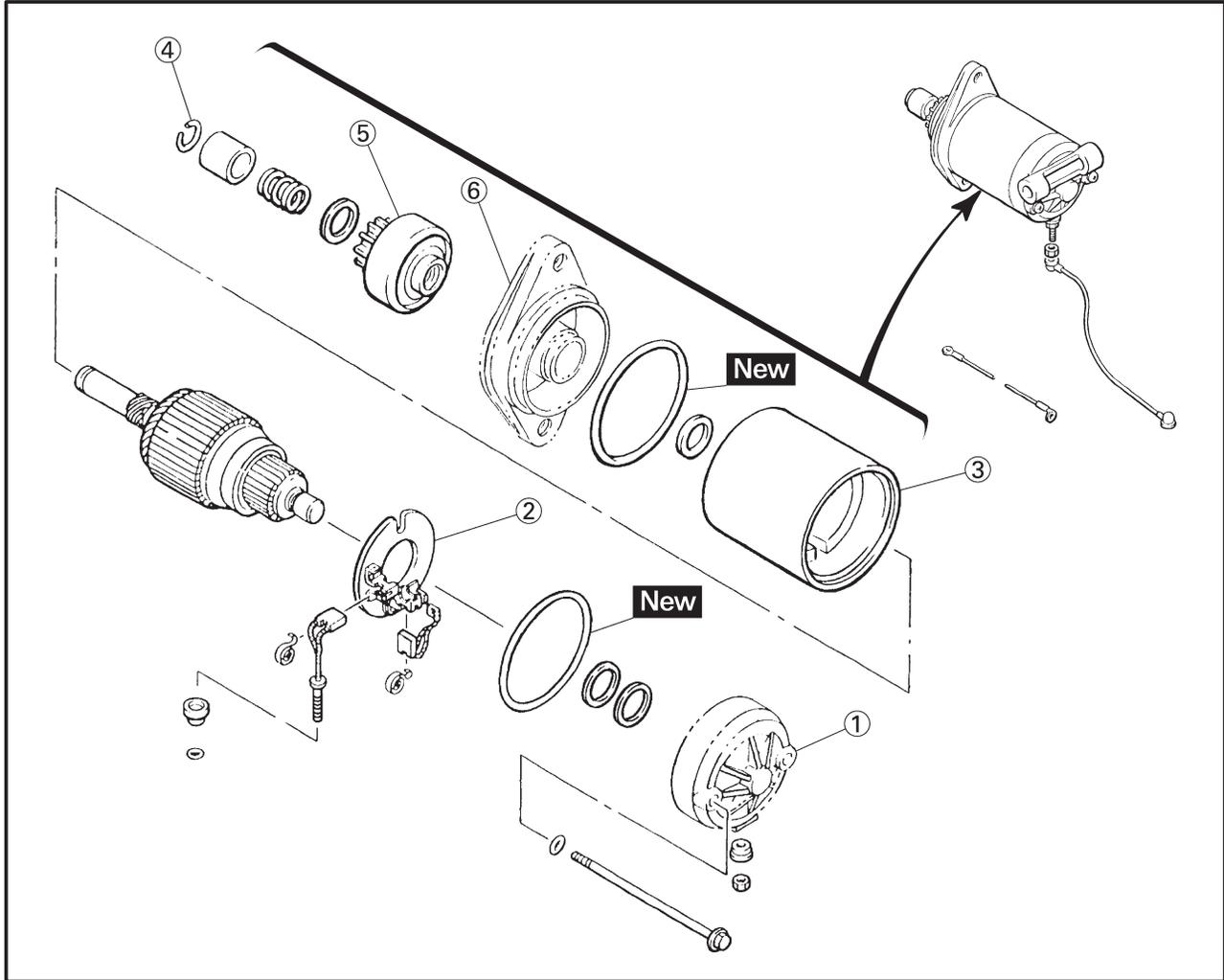
1. Disconnect:
 - Rectifier lead
2. Connect:
 - Rocket tester (to rectifier terminal)

3. Check:
 - Rectifier
 - Incorrect → Replace.

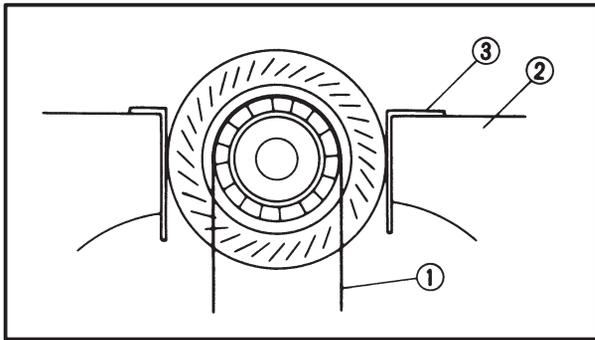
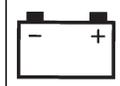


Tester connection	Continuity
①	Yes
②	No

STARTER MOTOR



Order	Job name/Part name	Q'ty	Remarks
	Starter motor disassembly		Remove the parts in the order listed below.
①	Rear cover	1	
②	Brush plate	1	
③	Starter yoke	1	
④	Clip	1	
⑤	Pinion gear	1	
⑥	Front cover	1	
			For assembly, reverse the removal procedure.

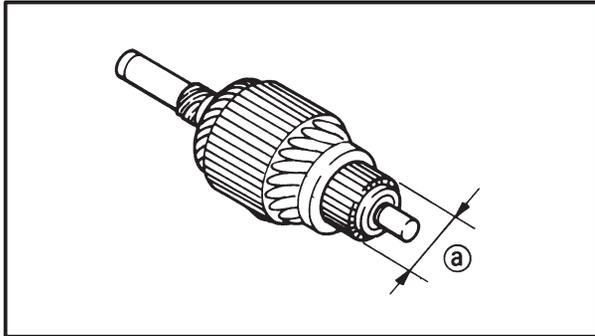
**STARTER MOTOR****Inspection**

1. Inspect:

- Commutator (outer surface)
Dirty → Clean with #600 grit sandpaper ①.
Hold the armature in a vise ② and copper or aluminium plate ③.

CAUTION:

Lightly grip the armature with a vise.

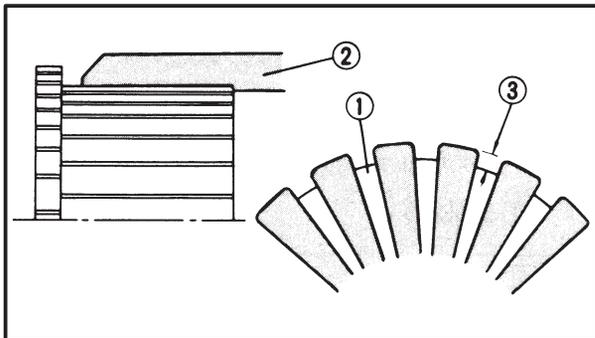


2. Measure:

- Commutator (diameter)
Measure the diameter ① of the commutator at points where the brush comes in contact.
Out of specification → Replace.



Commutator wear limit ①:
27.0 mm (1.06 in)

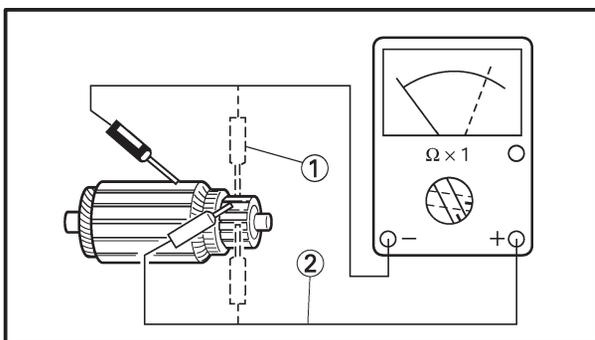


3. Measure:

- Mica ① (insulation depth)
(between commutator segments)
Out of specification → Scrape mica to proper limits.
Use a hacksaw blade ② that is ground to fit.



Mica undercut limit ③:
0.6 mm (0.024 in)



4. Measure:

- Armature coil resistance
(insulation/continuity)
Defect(s) → Replace starter motor.

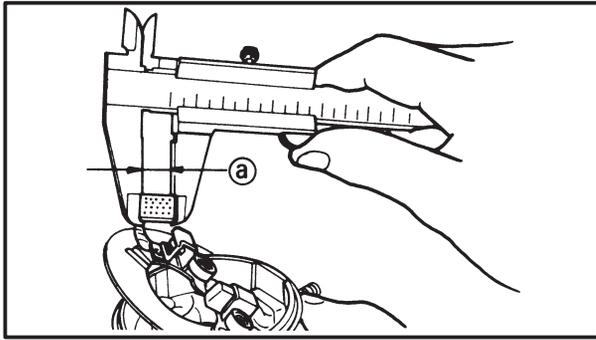
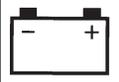
Inspecting steps:

- Connect the pocket tester for the continuity check ① and the insulation check ②.
- Measure the armature coil resistances.



Armature coil resistance:
Continuity check ①:
0.016 Ω \pm 10% at 20 C (68 F)
Insulation check ②:
More than 100 k Ω at 20 C (68 F)

- If the resistance is incorrect, replace the starter motor.



5. Measure:
- Brush length (a)
- Out of specification → Replace.

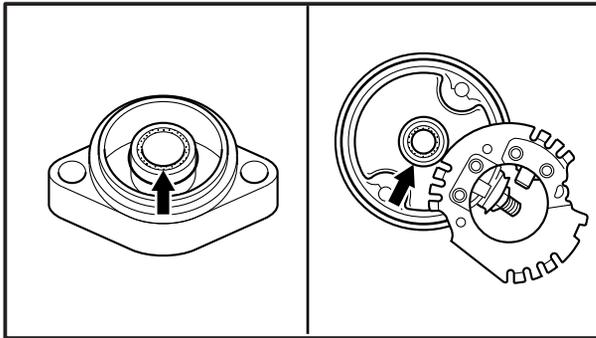


Brush length limit (a):
8.5 mm (0.33 in)

6. Measure:
- Brush spring pressure
- Fatigue/Out of specification → Replace as a set.

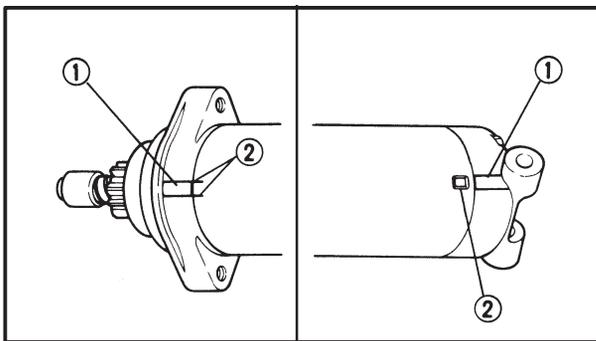


Brush spring pressure:
800 ± 150 g (28.22 ± 5.30 oz)



Assembly

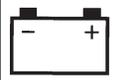
1. Before installing the front and rear covers, apply bearing grease to the bearings of the front and rear covers.
2. Make sure the rear cover and front cover are fitted with O-rings.



3. When installing the rear cover assembly, take care not to scratch the brushes.
4. Install:
 - Securing bolts (starter motor)

NOTE:

Align the match marks (1) on the bracket with the match marks (2) on the yoke.



8E011

TROUBLESHOOTING

BATTERY IS NOT CHARGED.

A

1. Connect:
 - Pocket tester (to battery terminals)
2. Measure:
 - Battery voltage
 - Fluid gravity

 **Battery voltage:**
more than 12 V at 20 C (68 F)

↓ OK

OUT OF SPECIFICATIONS

●Check the battery.
●Replace and/or charge battery.

B

1. Start the engine and accelerate to 3,000 rpm.
2. Measure:
 - Charging voltage

 **Charging voltage:**
13.3 ~ 14.3 V/3,000 rpm.

OUT OF SPECIFICATION

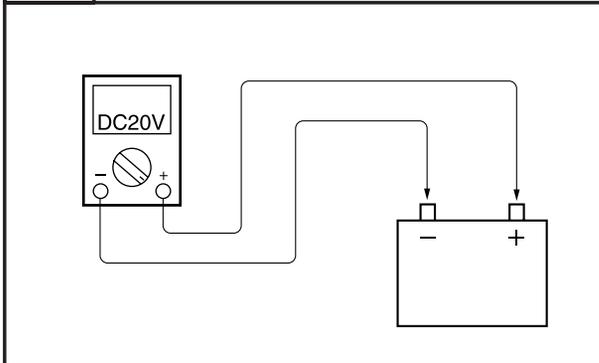
Check the fuse and charging coil.

OK

↓ FAULTY

Replace the fuse, rectifier and/or charging coil.

Replace voltage regulator.

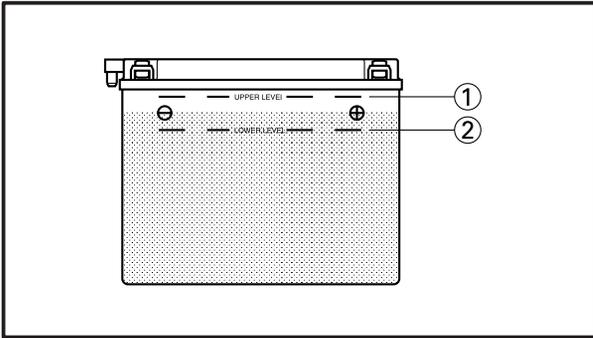
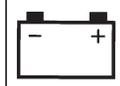


CAUTION:

Never disconnect battery cables while generator is operating or rectifier and regulator will be damaged.

↓ OK

Correct connector.



BATTERY

Inspection

1. Inspect:
 - Battery fluid level
 - Below lower level → Refill.

- ① Upper level
- ② Lower level

2. Check:

- Specific gravity
- Less than 1.280 → Recharge battery.

Battery Storage

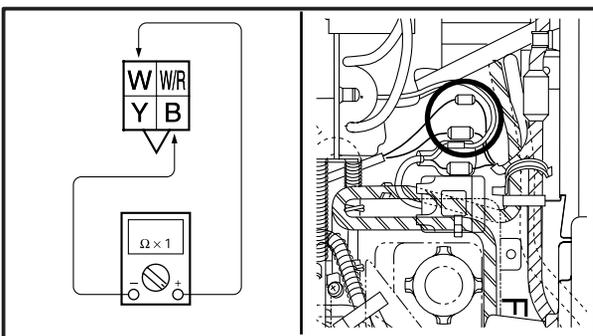
The battery should be stored if the vehicle is not to be used for a long period.

1. Remove:
 - Battery

Battery storage and maintenance tips:

- Recharge the battery periodically.
- Store the battery in a cool, dry place.
- Recharge the battery before reinstalling.

Battery	
Electrolyte	Specific gravity: 1.280 at 20°C (68°F)
Initial charging rate	1.6 Amp for 10 hours (new battery)
Recharging rate	10 hours (or until specific gravity reaches 1.280)
Refill fluid	Distilled water (to maximum level line)
Refill period	Check once per month (or more often as required)



CHARGING COIL

1. Measure:
 - Charging coil resistance
 - Out of specification → Replace.



Charging coil resistance:
(White – Black)
 0.4 Ω ± 20% at 20° (68°F)



9E001

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	VK540E
Model code number:	8AC
Dimensions:	
Overall length	3,120 mm (122.8 in)
Overall width	1,130 mm (44.5 in)
Overall height	1,350 mm (53.1 in)
Weight:	
Dry weight (Without fuel and oil)	291 kg (642 lb)
Minimum turning radius:	
Clockwise	3.9 mm (12.8 ft)
Counterclockwise	4.1 mm (13.4 ft)
Engine:	
Engine type	Axial fan cooled 2-stroke
Induction system	Piston reed valve
Cylinder arrangement	Forward inclined parallel 2-cylinder
Displacement	535 cm ³
Bore ~ stroke	73 ~ 64 mm (2.87 ~ 2.52 in)
Compression ratio	6.1 : 1
Maximum horse power r/min	6,500 r/min
Maximum torque r/min	6,000 r/min
Starting system	Electric and recoil hand starter
Lubrication system:	Separate lubrication (YAMAHA AUTOLUBE)
Engine Oil:	
Type	YAMALUBE 2-cycle oil or Equivalent
Tank capacity	2.5 L (2.2 Imp qt, 2.6 US qt)
Drive chain housing oil:	
Type	Gear oil API "GL-3" SAE #75 or #85
Capacity	0.35 L (0.08 Imp qt, 0.09 US gal)
Fuel:	
Type	Regular gasoline {Pump Octane (R + M)/2; 88} (for U.S.A./Canada) Research Octane; 93 (for Europe)
Tank capacity	31.0 L (6.8 Imp gal, 8.2 US gal)
Carburetor:	
Type/quantity	B38-34/1
Manufacturer	MIKUNI
Spark plug:	
Type	BR9ES
Manufacturer	NGK
Gap	0.7 0.8 mm (0.028 0.031 in)

GENERAL SPECIFICATIONS

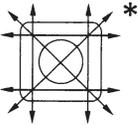
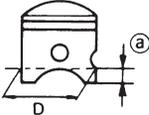
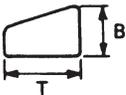
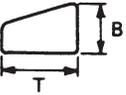
SPEC



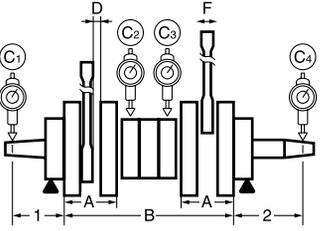
Model	VK540E
Transmission: Primary reduction system Primary reduction ratio Clutch type Secondary reduction system Secondary reduction ratio Reverse system	V-Belt 3.8 0.95 : 1 Automatic centrifugal engagement Chain Low: Gear, chain 39/17 (2.29) Low: 28/22 ~ 28/22 ~ 39/17 (3.71) Yes
Chassis: Frame type Caster Ski stance (center to center)	Monocock 22.5● 960 mm (37.8 in)
Suspension: Front suspension type Rear suspension type	Telescopic strut suspension Slide rail suspension
Track: Track type Track width Length on ground Track deflection	Internal drive type 500 mm (19.7 in) 1,204 mm (47.4 in) 35 45 mm (1.4 1.8 in)/10 kg (22 lb)
Brake: Brake type Operation method	Caliper type disc brake Handle lever, left hand operated
Electrical: Ignition system/manufacturer Generator system	CDI/YAMAHA Flywheel magneto
Bulb wattage ~ quantity: Headlight Tail/brake light Speedometer light	12 V, 60 W/55 W ~ 1 12 V, 8 W/23 W ~ 1 12 V, 3.4 W ~ 1

9E011

**MAINTENANCE SPECIFICATIONS
ENGINE**

Model	VK540E
Cylinder head: Volume (With spark plug) <Warp limit>	 30.2 ~ 30.8 cm ³ <0.03 mm (0.0012 in)> * Lines indicate straightedge measurement.
Cylinder: Material Bore size <Taper limit> <Out-of-round limit>	Aluminum alloy with cast iron sleeve 73.00 ~ 73.02 mm (2.874 ~ 2.875 in) <0.05 mm (0.0019 in)> <0.01 mm (0.0004 in)>
Piston: Piston size "D" Measuring point (a)	 72.942 ~ 72.950 mm (2.871 ~ 2.872 in) 19.0 mm (0.75 in)
Piston to-cylinder clearance <Limit> Piston offset Piston offset direction Piston pin bore inside diameter	0.055 ~ 0.060 mm (0.0022 ~ 0.0024 in) <0.1 mm (0.004 in)> 1.0 mm (0.039 in) EX side 21.40 ~ 21.55 mm (0.843 ~ 0.848 in)
Piston pin: Piston pin outside diameter Piston pin length	19.995 ~ 20.000 mm (0.7872 ~ 0.7874 in) 55.7 ~ 56.0 mm (2.193 ~ 2.205 in)
Piston ring: Sectional sketch Top ring	 Keystone B = 1.2 mm (0.047 in) T = 2.7 mm (0.106 in)
Sectional sketch 2nd ring	 Keystone B = 1.2 mm (0.047 in) T = 2.7 mm (0.106 in)
End gap (installed): Top ring	0.20 ~ 0.40 mm (0.008 ~ 0.016 in)
End gap (installed): 2nd ring	0.20 ~ 0.40 mm (0.008 ~ 0.016 in)
Side clearance Top ring	0.02 ~ 0.06 mm (0.00079 ~ 0.0024 in)
Side clearance 2nd ring	0.02 ~ 0.06 mm (0.00079 ~ 0.0024 in)
Coating Top ring	Chrome Plated/parkerizing
Coating 2nd ring	Chrome Plated/parkerizing



Model	VK540E
<p>Crankshaft: Crank width "A" Crank width "B" Crankshaft deflection "C": C₁ C₂, C₃ C₄ Measuring points: 1 2 Connecting rod big end side clearance "D" Connecting rod small end free play "F"</p> 	<p>59.95 ~ 60.00 mm (2.360 ~ 2.362 in) 199.75 ~ 200.25 mm (7.86 ~ 7.88 in) Below 0.03 mm (0.0012 in) Below 0.04 mm (0.0016 in) Below 0.05 mm (0.0020 in) 97.0 mm (3.82 in) 93.0 mm (3.66 in) 0.25 ~ 0.75 mm (0.01 ~ 0.03 in) 0.8 ~ 1.0 mm (0.03 ~ 0.04 in)</p>
<p>Big end bearing: Type</p>	<p>Needle bearing</p>
<p>Small end bearing: Type</p>	<p>Needle bearing</p>
<p>Crank pin: Crank pin outside diameter</p>	<p>23.987 ~ 24.000 mm (0.9444 ~ 0.9449 in)</p>
<p>Connecting rod: Small end diameter Big end diameter</p>	<p>24.995 ~ 25.008 mm (0.9841 ~ 0.9846 in) 31.010 ~ 31.023 mm (1.2209 ~ 1.2214 in)</p>
<p>Reed valve: Material Thickness <Bending limit> Stopper height</p>	<p>Steel 0.19 ~ 0.21 mm (0.007 ~ 0.008 in) <0.6 mm (0.024 in)> 9.4 ~ 10.0 mm (0.37 ~ 0.39 in)</p>
<p>Carburetor: Type/quantity Manufacturer I.D. Mark</p> <p>Main jet (M.J) Pilot jet (P.J) Pilot air jet (P.A.J) Pilot outlet (P.O) Bypass 1 (B.P. 1) Bypass 2 (B.P. 2) Pilot screw (P.S) Throttle valve (Th.V) Valve seat size (V.S) Starter jet (G.S) Float height (F.H) Fuel level (from the bore center) (F.L) Engine idle speed</p>	<p>B38-34/1 pcs. MIKUNI 84R01 (for U.S.A./Canada) 86R01 (for Europe)</p> <p>#141.3 #90 ø0.8 ø1.2 ø0.7 ø0.8 1-1/4 turns out #130 ø1.5 ø1.4 12 ~ 16 mm (0.47 ~ 0.63 in) 49 ~ 51 mm (1.93 ~ 2.01 in) 1,200 ± 100 r/min</p>

MAINTENANCE SPECIFICATIONS

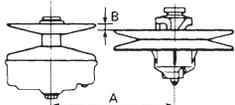
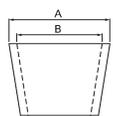
SPEC

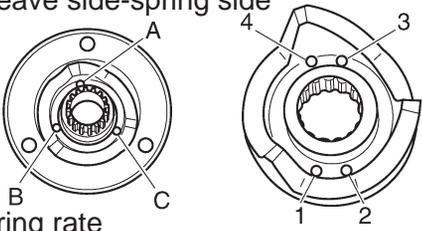
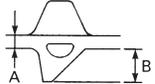
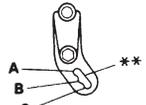


Model	VK540E
Fuel pump: Type Manufacturer	DIAPHRAM MIKUNI
Oil pump: Color code Plunger diameter Worm gear ratio Minimum stroke Maximum stroke Pump cable free play	White 5.5 mm (0.22 in) 1/44 (0.023) 0.20 ~ 0.25 mm (0.008 ~ 0.010 in) 1.65 ~ 1.87 mm (0.065 ~ 0.074 in) 25 ± 1 mm (0.98 ± 0.039 in)
Cooling system: Cooling fan belt tension	8 mm/4 ~ 6 kg (0.3 in/8.8 ~ 13.0 lb)



POWER TRAIN

Model	VK540E
<p>Transmission:</p> <p>Type</p> <p>Range of ratio</p> <p>Engagement r/min</p> <p>Shift r/min</p> <p>Sheave center distance "A"</p> <p>Sheave offset "B"</p> 	<p>V-belt automatic</p> <p>3.8 ~ 0.95 : 1</p> <p>2,600 ± 300 r/min</p> <p>6,700 ± 300 r/min</p> <p>267 ~ 270 mm (10.5 ~ 10.6 in)</p> <p>14.5 ~ 17.5 mm (0.57 ~ 0.69 in)</p>
<p>V-belt:</p> <p>Part number/manufacturer</p> <p>Outside circumference</p> <p>Width "A"</p> <p><Wear limit "B"></p> 	<p>87X-17641-00/DAYCO</p> <p>1,118 ~ 1,128 mm (44.0 ~ 44.4 in)</p> <p>35.0 mm (1.38 in)</p> <p>32.0 mm (1.26 in)</p>
<p>Primary sheave spring:</p> <p>Part number</p> <p>Color code</p> <p>Diameter</p> <p>Wire diameter</p> <p>Pre-load</p> <p>Spring rate</p> <p>Number of coils</p> <p>Free length</p>	<p>90501-481J1</p> <p>Silver – Blue – Silver</p> <p>60 mm (2.36 in)</p> <p>4.8 mm (0.19 in)</p> <p>20 kg/mm (44 lb/in)</p> <p>9.8 N/mm (1.0 kg/mm, 5.5 lb/in)</p> <p>5.16</p> <p>85.4 mm (33.6 in)</p>
<p>Primary sheave weight arm:</p> <p>Part number</p> <p>Weight</p> <p>Quantity</p>	<p>8AT-17605-00</p> <p>44.0 g (1.55 oz)</p> <p>3 pcs.</p>
<p>Rivet:</p> <p>Part number</p> <p>Material</p> <p>Size</p> <p>Quantity</p> <p>Hole quantity</p>	<p>90261-06019</p> <p>Steel</p> <p>13.3 mm (0.52 in)</p> <p>3 pcs.</p> <p>3 pcs.</p>

Model	VK540E
<p>Secondary sheave spring:</p> <p>Part number Color code Outside diameter Wire diameter Twist angle Hole position Sheave side-spring side</p>  <p>Spring rate Number of coils Free length Torque cam angle</p>	<p>90508-50746 White 65 mm (2.6 in) 5 mm (0.20 in) 40● C-2</p> <p>8.7 Nmm/rad (0.89 kg/mm, 48.7 lb/in) 4.74 93.5 mm (3.68 in) 37●</p>
<p>Drive chain:</p> <p>Type Number of links</p>	<p>DID 35 P-3 70</p>
<p>Track:</p> <p>Part number Width Length Pitch Number of links Thickness "A" Height "B" Deflection</p> 	<p>8AC-47110-00 500 mm (19.7 in) 3,968 mm (156.2 in) 64 mm (2.52 in) 62 5.5 mm (0.22 in) 16 mm (0.63 in) 35 ~ 45 mm (1.4 ~ 1.8 in)/10 kg (22 lb)</p>
<p>Slide rail suspension:</p> <p>Front travel Rear travel Suspension spring rate Front Rear Spring wire diameter Front Rear</p>	<p>212 mm (8.35 in) 262 mm (10.3 in)</p> <p>14.85 N/mm (1.5 kg/mm, 84 lb/in) 44.1 N/mm (4.5 kg/mm, 252 lb/in)</p> <p>7 mm (0.28 in) 12 mm (0.47 in)</p>
<p>Suspension setting position:</p> <p>Hook setting length*</p>  <p>Full rate adjusting position**</p> 	<p>25 ± 0.5 mm (0.98 ± 0.02 in)</p> <p>A</p>

MAINTENANCE SPECIFICATIONS

SPEC



Model	VK540E
Shock absorber: Damping force (Extension) Front Rear Damping force (Compression) Front Rear	510 N/0.3 m/s (52 kg/0.3 m/s, 115 lb/0.3 m/s) 2650 N/0.3 m/s (270.4 kg/0.3 m/s, 596 lb/0.3 m/s) 1780 N/0.3 m/s (181.6 kg/0.3 m/s, 400 lb/0.3 m/s) 780 N/0.3 m/s (79.6 kg/0.3 m/s, 176 lb/0.3 m/s)
Slide runner: Thickness <Wear limit>	17.8 mm (0.70 in) <10 mm (0.40 in)>
Track sprocket wheel: Material Number of teeth	Polyethylene 9T
Rear guide wheel: Material Outside diameter	Aluminum with rubber 178 mm (7.0 in)
Brake: Pad thickness <Pad wear limit> Pad to disc clearance Disc outside diameter Disc thickness Brake lever free play	13.5 mm (0.53 in) <10 mm (0.39 in)> 0.25 ~ 0.65 mm (0.01 ~ 0.025 in) 167 mm (6.57 in) 4 mm (0.16 in) 3.0 ~ 8.0 mm (0.12 ~ 0.31 in)



CHASSIS

Model..	VK540E
Frame: Frame material Seat height Luggage box location	Steel 713 mm (28.1 in) Under seat
Steering: Lock-to-lock angle (Left) (Right) Ski alignment Toe-out size Ski stance (center to center)	24.9● (R ski) 26.6● (L ski) 28.4● (R ski) 25.9● (L ski) Toe-out 0 ~ 15 mm (0 ~ 0.6 in) 960 mm (37.8 in)
Ski: Ski material Length Width Thickness Ski ground length	Steel 1,094 mm (43 in) 145 mm (5.71 in) 1.6 mm (0.06 in) 514 mm (20.2 in)
Ski suspension: Type Travel Spring type Spring rate Wire diameter	TSS 150 mm (5.9 in) Coil spring 15.68 N/mm (1.6 kg/mm, 90 lb/in) 7.5 mm
Shock absorber: Damping force (Extension) (Compression)	402 N/0.3 m/s (41 kg/0.3 m/s, 90 lb/0.3 m/s) 637 N/0.3 m/s (65 kg/0.3 m/s, 143 lb/0.3 m/s)



ELECTRICAL

Model	VK540E
Voltage:	12 V
Ignition system: Ignition timing (B.T.D.C.)	17● (1.55 mm) at 7,000 r/min
CDI: Magneto model/manufacturer Pulser coil resistance (Color code) Source coil resistance (Color code) CDI unit model/manufacturer	F8AT/YAMAHA 16.0 ~ 24.0 Ω at 20●C (68●F) (White/Red – Black) 220 ~ 330 Ω at 20●C (68●F) (Brown – Red) 8AU/YAMAHA
Ignition coil: Model/manufacturer Minimum spark gap Primary coil resistance Secondary coil resistance	88T/YAMAHA 6 mm (0.24 in) 0.16 ~ 0.24 Ω at 20●C (68●F) 3.9 ~ 5.9 Ω at 20●C (68●F)
Spark plug cap: Type Model/manufacturer Resistance	Resin type L.05E/NGK 3.7 ~ 6.3 kΩ at 20●C (68●F)
Charging system: Type	Flywheel magneto

MAINTENANCE SPECIFICATIONS

SPEC



Model	VK540E
Flywheel magneto: Model/manufacture Lighting voltage (minimum) Lighting coil resistance: (Color code) Charging coil resistance: (Color code) Coil resistance for grip warmer (Color code)	F8AT/YAMAHA 11.8 V at 3,000 r/min 0.24 ~ 0.36 Ω at 20°C (68°F) (Yellow – Black) 0.32 ~ 0.48 Ω at 20°C (68°F) (White – Black) 0.64 ~ 0.96 Ω at 20°C (68°F) (Red – Black)
Voltage Regulator: Type Model/manufacture No load regulated voltage	Short circuit type SH588/SHINDENGEN 13.6 ~ 14.1 V
Rectifier: Model/manufacture Capacity	1Y8060/STANLEY 6.0 A
Battery: Specific gravity Type	1.280 YB16AL-A2
Electric starter system: Type	Bendix type
Starter motor: Model/manufacture Output Armature coil resistance Brush: Overall length Wear limit Spring pressure Commutator diameter Wear limit Mica undercut	DB5XM/NIPPONDENSO 0.6 kW 0.013 ~ 0.015 Ω at 20°C (68°F) 12 mm (0.48 in) 8.5 mm (0.33 in) 638 ~ 932 g (22.5 ~ 32.9 oz) 28 mm (1.10 in) 27 mm (1.06 in) 0.4 ~ 0.8 mm (0.016 ~ 0.031 in)
Grip warmer: Heater resistance	2.7 ~ 3.3 Ω at 20°C (68°F)



HIGH ALTITUDE SETTINGS

VK540E

Temperature Altitude	-30°C (-22°F)	-20°C (-4°F)	-10°C (14°F)	0°C (32°F)	10°C (50°F)	20°C (68°F)
0 ~ 100 m (300 ft)	#142.5	#141.3 (STD)	#141.3 (STD)	#141.3 (STD)	#140	#140
100 ~ 600 m (2000 ft)	#141.3 (STD)	#141.3 (STD)	#141.3 (STD)	#141.3 (STD)	#140	#140
600 ~ 1200 m (4000 ft)	#141.3 (STD)	#141.3 (STD)	#141.3 (STD)	#141.3 (STD)	#140	#140
1200 ~ 1800 m (6000 ft)	#140	#140	#137.5	#137.5	#135	#135
1800 ~ 2400 m (8000 ft)	#137.5 PJ: #100, PS: 1-3/4	#135 PJ: #100, PS: 1-3/4	#135 PJ: #100, PS: 1-3/4			
2400 ~ 3000 m (10000 ft)	#135 PJ: #100, PS: 1-3/4	#132.5 PJ: #100, PS: 1-3/4	#132.5 PJ: #100, PS: 1-3/4			

#: Main jet number PS: Pilot screw turns out PJ: Pilot jet number



TIGHTENING TORQUE

Part to be tightened	Tightening torque			Remarks	
	Nm	m•kg	ft•lb		
Crankcase (First)	13	1.3	9.4	Tighten the bolts in two stages.	
(Final)	21	2.1	15		
Front engine mount bolt (left)	103	10.3	74		
Front engine mount bolt (right)	53	5.3	38		
Rear engine mount bolt	53	5.3	38		
Cylinder head (First)	13	1.3	9.4		Tighten the bolts in two stages.
(Final)	25	2.5	18		
Cylinder	25	2.5	18	Apply LOCTITE®	
Exhaust pipe and cylinder	30	3.0	22		
Carburetor joint and cylinder	14	1.4	10		
Reed valve	1	0.1	0.7		
Spark plug	20	2.0	14		
Cooling fan driven pulley nut	43	4.3	31		
CDI magneto and crankshaft	85	8.5	61		
Recoil starter case	10	1.0	7.2		
Recoil starter drive plate	10	1.0	7.2		
Recoil starter pulley	23	2.3	17		
Throttle cable locknut	0.8	0.08	0.58		
Carburetor					
Main nozzle	3	0.3	2.2		
Main jet	2	0.2	1.4		
Pilot jet	0.8	0.08	0.58		
Valve seat	5	0.5	3.6		
Float chamber cover	9	0.9	6.5		
Starter plunger cap	3.5	0.35	2.53		
Primary sheave (First)	120	12.0	85		Tighten the bolts in two stages. See NOTE.
(Final)	60	6.0	43		
Roller (primary sheave)	6	0.6	4.3	Left-hand thread	
Weight (primary sheave)	6	0.6	4.3		
Primary sheave cap	14	1.4	10		
Spider	200	20	145		
Secondary sheave	60	6.0	43		
Secondary shaft (jackshaft) bearing housing	21	2.1	15		
Shift rod and shift link lever	10	1.0	7.2		
Drive chain housing and frame	21	2.1	15		
Drive chain housing	10	1.0	7.2		
Drive chain housing oil drain bolt	10	1.0	7.2		
Driven sprocket	100	10	72		
Brake caliper and drive chain housing	48	4.8	34.7		
Brake caliper end cover	2	0.2	1.4		
Brake caliper stationary cover	9	0.9	6.5		
Speedometer gear and frame	21	2.1	15		
Front axle	85	8.5	61		
Steering bearing holder (nut)	19	1.9	14		



Part to be tightened	Tightening torque			Remarks
	Nm	m•kg	ft•lb	
Steering bearing holder (bolt)	27	2.7	20	
Handlebar holder	15	1.5	11	
Relay-rod and steering colum	43	4.3	31	
Relay-rod and suspension arm	43	4.3	31	
Relay-rod end locknut	25	2.5	18	Apply LOCTITE®
Tie-rod and suspension arm	43	4.3	31	
Tie-rod end locknut	25	2.5	18	Apply LOCTITE®
Ski and suspension bracket	43	4.3	31	
Ski runner and ski	21	2.1	15	
Front arm and suspension arm	43	4.3	31	
Front arm and suspension bracket	43	4.3	31	
Suspension bracket nut	21	2.1	15	
Suspension bracket set screw	2	0.2	1.4	Apply LOCTITE®
Front shock absorber holder	10	1.0	7.2	
Front shock absorber	5	0.5	3.6	
Front shock absorber locknut	16	1.6	11	
Slide rail suspension and frame	72	7.2	52	Apply LOCTITE®
Slide rail suspension shock absorber	49	4.9	35	
Full rate adjuster nut	49	4.9	35	
Stopper band tensioner locknut	16	1.6	11	
Stopper band	4	0.4	2.9	
Front pivot arm and sliding frame	72	7.2	52	Apply LOCTITE®
Front pivot arm bracket and sliding frame	72	7.2	52	Apply LOCTITE®
Rear pivot arm and bracket	24	24	17	
Rear pivot arm bracket and sliding frame	72	7.2	52	Apply LOCTITE®
Control rod and sliding frame	72	7.2	52	
Rear axle nut	80	8.0	58	

NOTE:

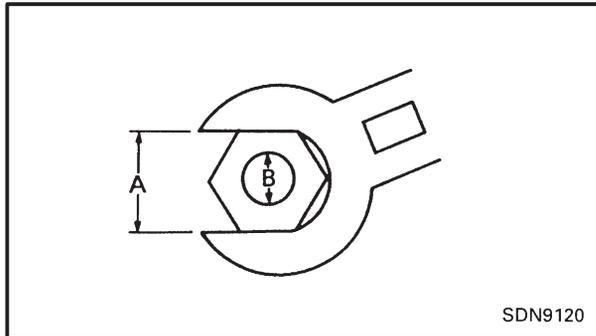
Tightening steps:

1. Tighten the bolt. 120 Nm (12 m•kg, 85 ft•lb)
2. Loosen it completely.
3. Retighten it. 60 Nm (6.0 m•kg, 43 ft•lb)

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (nut)	B (bolt)	General torque specifications		
		Nm	m•kg	ft•lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

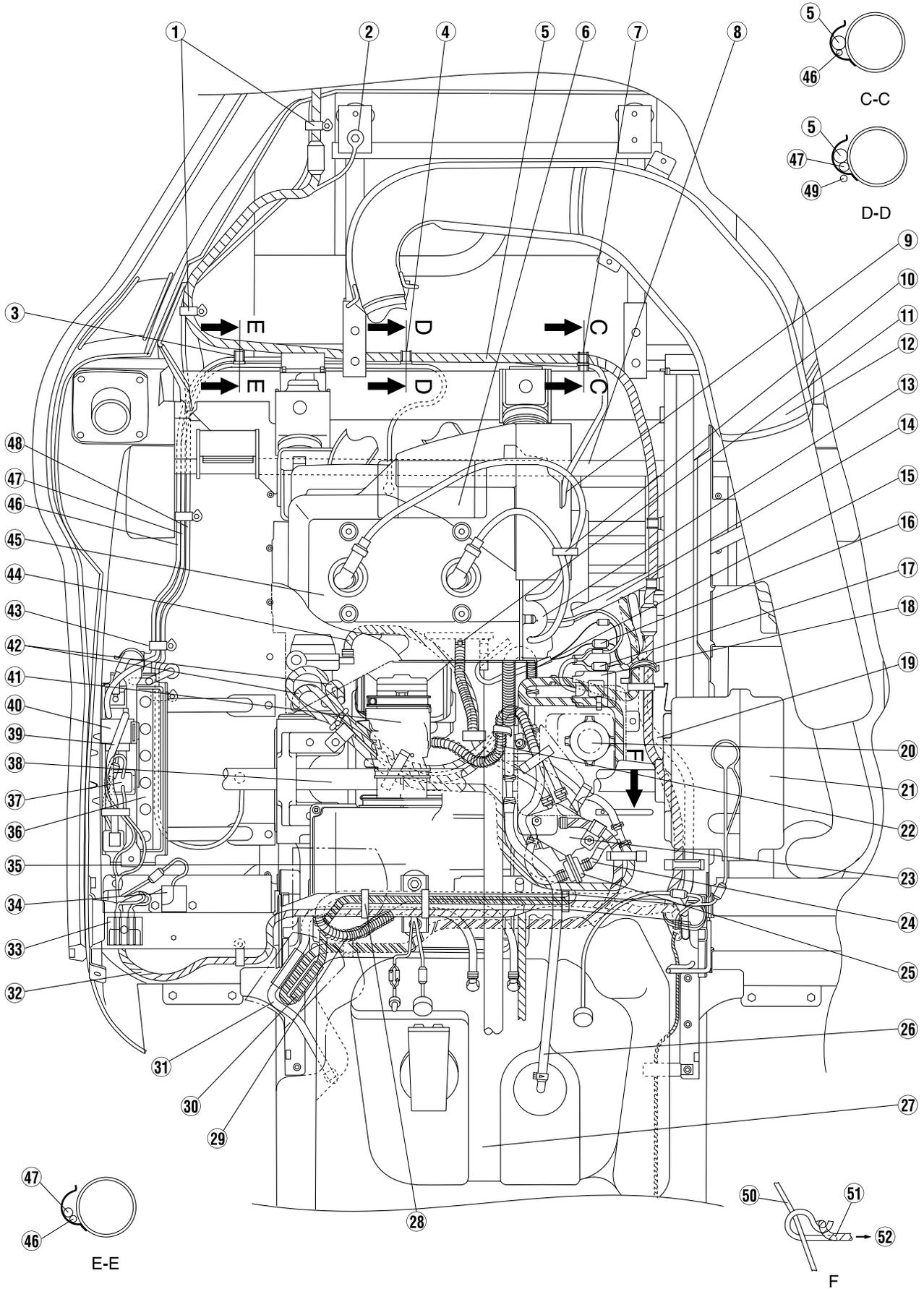


A: Distance across flats

B: Outside thread diameter

DEFINITION OF UNITS

Unit	Read	Definition	Measurement
mm	Millimeter	10^{-3} meter	Length
cm	Centimeter	10^{-2} meter	Length
kg	Kilogram	10^3 gram	Weight
N	Newton	$1 \text{ kg} \sim \text{m}/\text{sec}^2$	Force
Nm	Newton meter	$\text{N} \sim \text{m}$	Torque
m•kg	Meter kilogram	$\text{m} \sim \text{kg}$	Torque
Pa	Pascal	N/m^2	Pressure
N/mm	Newtons per millimeter	N/mm	Spring rate
L	Liter	—	Volume or capacity
cm^3	Cubic centimeter	—	
r/min	Rotations per minute	—	Engine speed



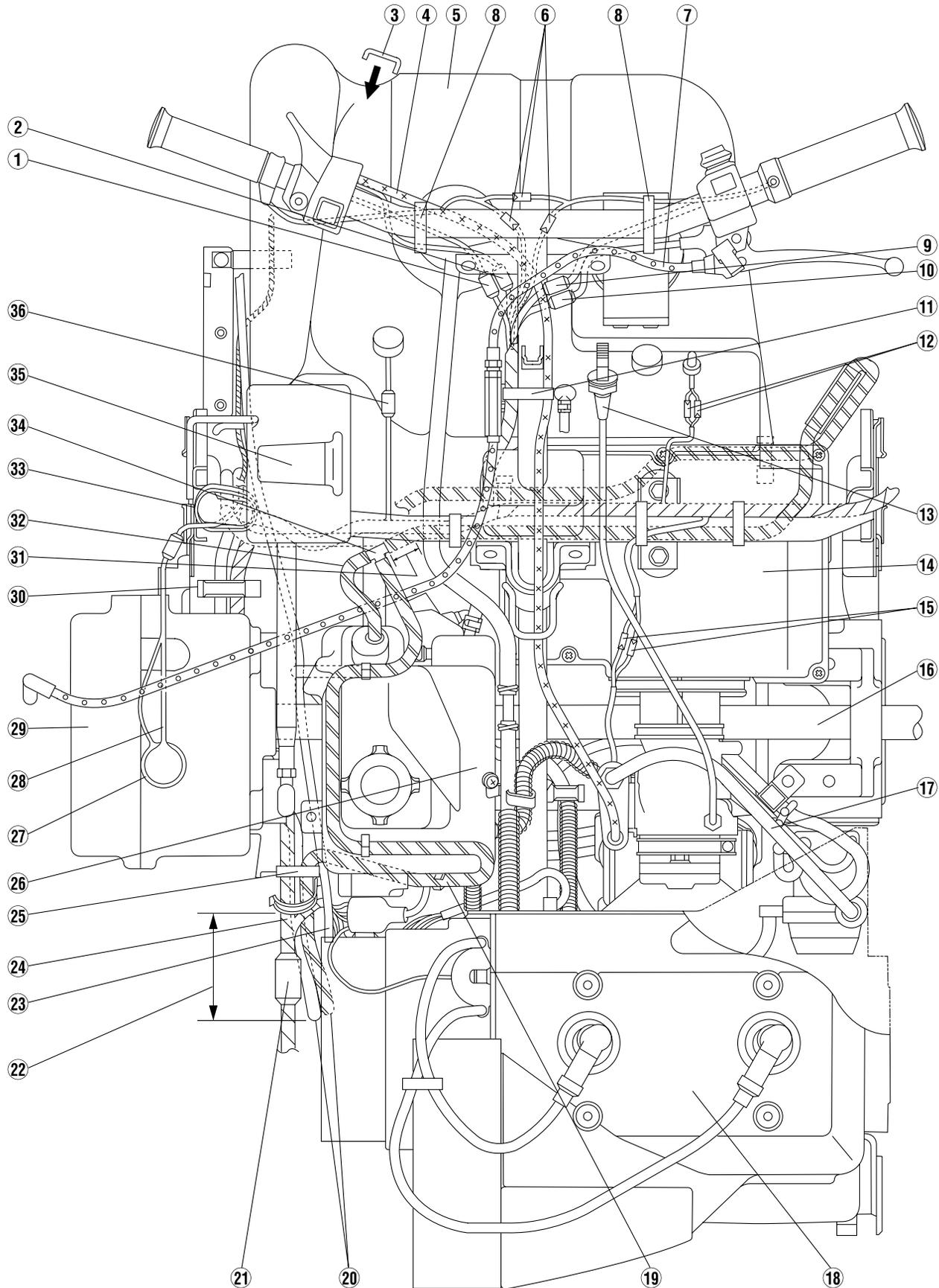


CABLE ROUTING

- ① Fasten the wire harness and speedometer cable with a steel clamp.
- ② Ground lead
- ③ Fasten the wire lead and wire negative lead with a steel clamp.
- ④ Fasten the wire harness and wire lead with a steel clamp.
- ⑤ Wire harness
- ⑥ Starting motor
- ⑦ Fasten the wire harness and wire negative lead with a steel clamp.
- ⑧ Tie-rod
- ⑨ Fasten the wire negative lead downward to the front bolt along the recoil starter case.
- ⑩ Clamp
Do not cross the high tension cable.
- ⑪ Pulser hose
- ⑫ Muffler
- ⑬ Ignition coil
- ⑭ Relay rod
- ⑮ Fuel hose
- ⑯ CDI magneto coupler
- ⑰ CDI unit coupler
- ⑱ CDI unit
- ⑲ Fuel tank breather hose
Float the open part than the floor panel.
- ⑳ Oil tank
- ㉑ Chain case
- ㉒ Fuel delivery hose
- ㉓ Fuel pump
- ㉔ Oil hose
- ㉕ Oil strainer
- ㉖ Fuel hose
- ㉗ Fuel tank
- ㉘ Set the all wires to back side of gate, and clamp. Do not put the wires between panel and gate.
- ㉙ Fuel tank breather hose
- ㉚ Oil level hose
- ㉛ Fuel level hose
- ㉜ Wire harness
- ㉝ Rectifier regulator
- ㉞ Voltage regulator
- ㉟ Intake silencer

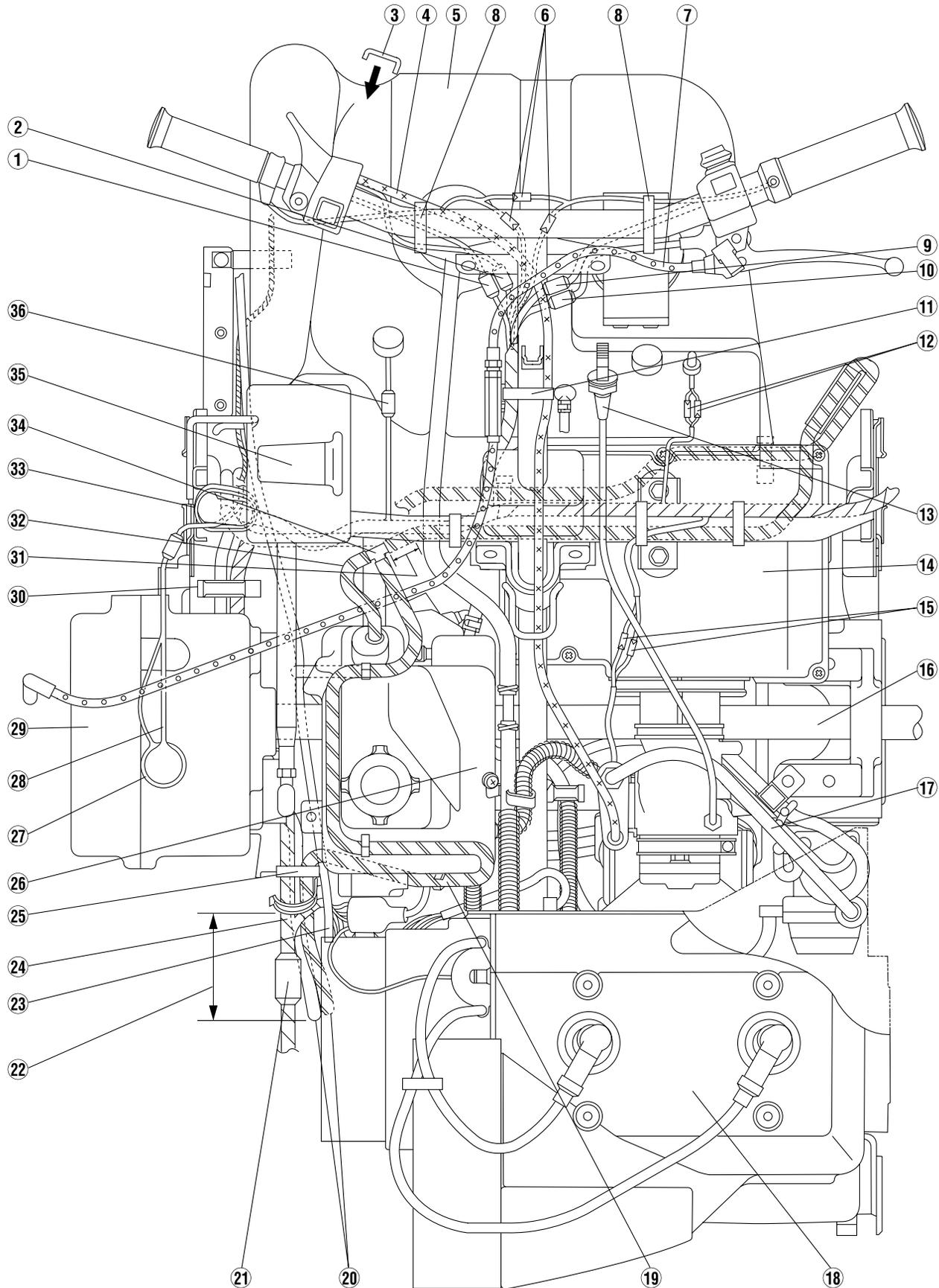


- ③⑥ Battery
- ③⑦ Fuse box
- ③⑧ Secondary shaft (jackshaft)
- ③⑨ Battery positive lead
- ④⑩ Starter switch
- ④⑪ Carburetor
- ④⑫ Delivery hose
- ④⑬ Fasten the wire lead, wire negative lead and speedometer cable with a plastic clamp.
- ④⑭ Route the oil hose under the engine mount bracket.
- ④⑮ Engine
- ④⑯ Wire negative lead
- ④⑰ Wire lead
- ④⑱ Speedometer cable
Do not be loosen.
- ④⑲ Wire negative lead
Do not fasten in this position.
- ⑤⑩ Recoil starter cable
- ⑤⑪ Oil hose
- ⑤⑫ To the oil pump.



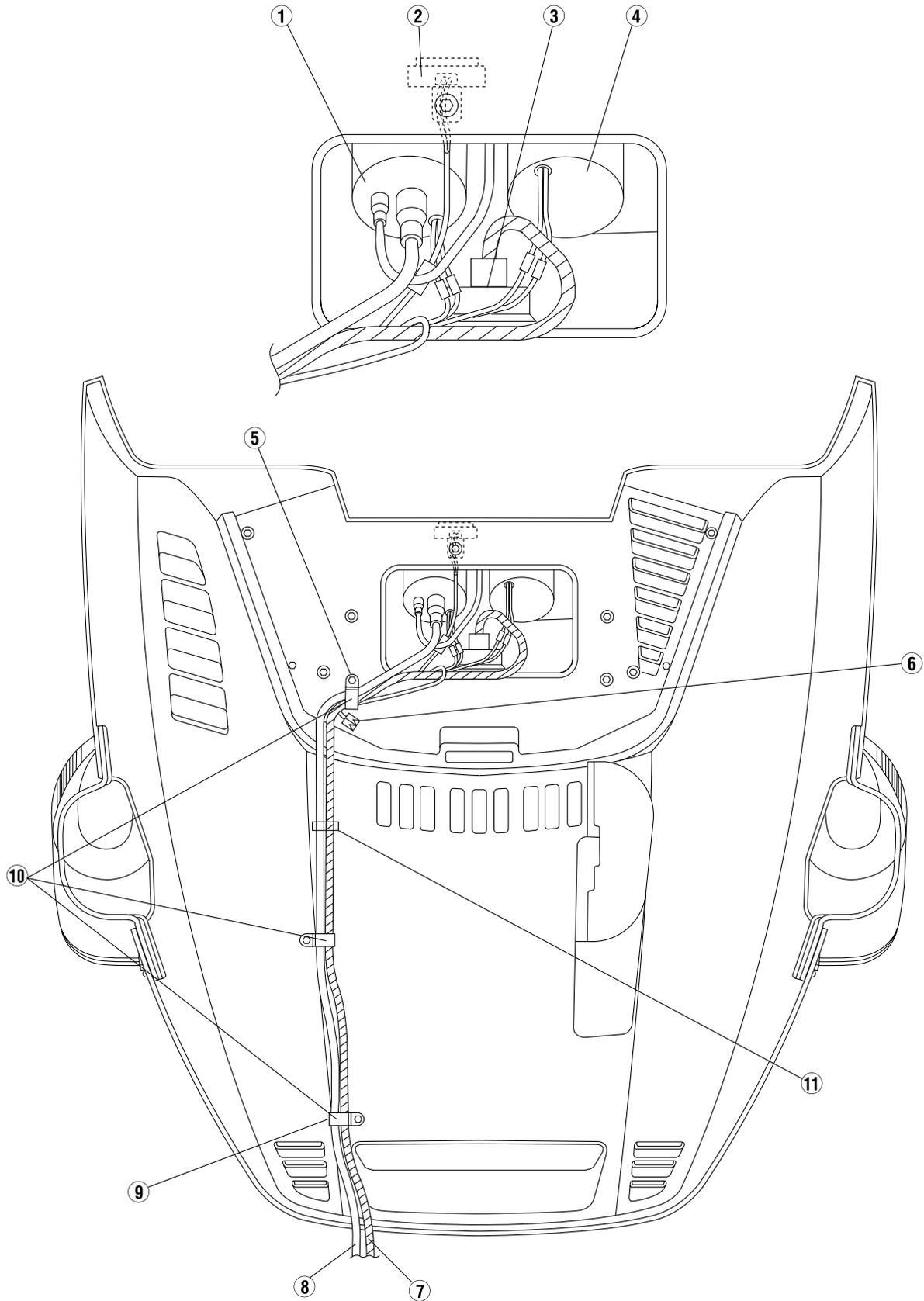


- ① Engine stop switch coupler
Route the engine stop switch lead backward the handlebar.
- ② Thumb warmer coupler
- ③ Clamp
- ④ Route the throttle cable forward the handlebar.
- ⑤ Fuel tank
- ⑥ Grip warmer connector
- ⑦ Brake cable
- ⑧ Clamp
Do not fasten the throttle cable and brake cable.
- ⑨ Headlight switch coupler
Route the headlight switch lead backward the handlebar.
- ⑩ Tail/brake light switch coupler
Route the tail/brake light switch lead backward the handlebar.
- ⑪ Fasten the wire harness and throttle cable with a clamp under the handlebar cover bracket. Do not fasten the brake cable.
- ⑫ Grip warmer switch lead
- ⑬ Starter cable
- ⑭ Intake silencer
- ⑮ T.O.R.S. lead
- ⑯ Secondary shaft (jackshaft)
- ⑰ Oil pump cable
- ⑱ Engine
- ⑲ Oil tank breather hose
Route the oil tank breather hose over left and right side of the oil tank.
- ⑳ Face the open part under than the wire harness coupler.
- ㉑ Wire harness coupler
- ㉒ Clamp to open part.
80 ~ 100 mm (3.15 ~ 3.94 in)
- ㉓ Recoil starter cable
- ㉔ Fasten the wire wariness, fuel tank breather hose and oil tank breather hose with a clamp.



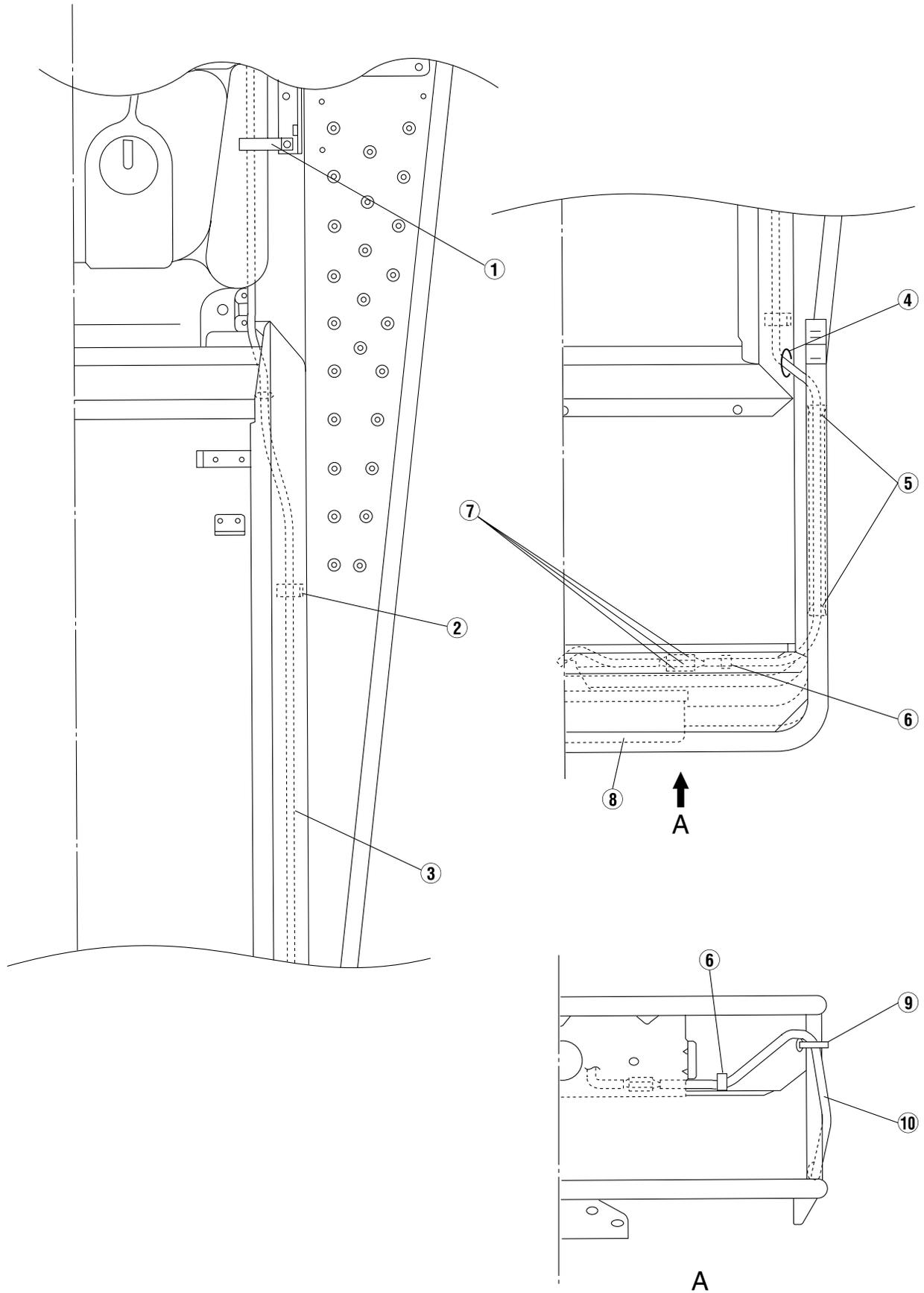


- ②5 Fasten the wire harness, fuel tank breather hose and oil tank breather hose with a plastic band.
- ②6 Oil tank
- ②7 Gear position switch
- ②8 Wire harness sub lead
- ②9 Drive chain case
- ③0 Fasten the wire harness and fuel tank breather hose at the white tape mark, with a clamp. Route the fuel tank breather hose outside the wire harness.
- ③1 40 mm (1.57 in)
- ③2 Oil tank breather hose
- ③3 Band
- ③4 Joint
- ③5 Shift lever
- ③6 Main switch coupler



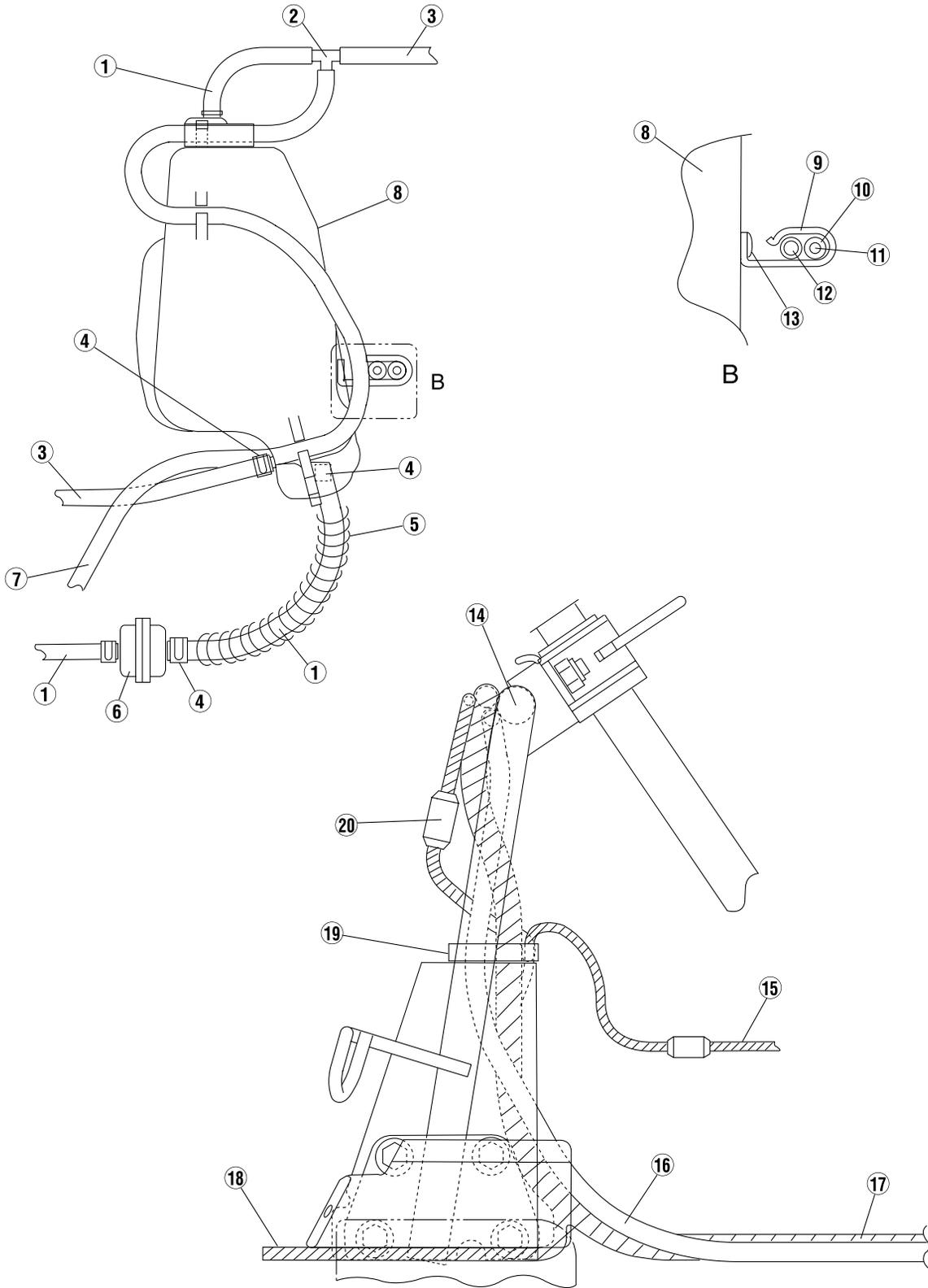


- ① Speedometer
- ② Back buzzer
- ③ Headlight
- ④ Tachometer (option)
- ⑤ Set the clamp at the illustrated.
- ⑥ Clamp the tachometer lead for a model without tachometer.
- ⑦ Headlight lead
- ⑧ Speedometer cable
- ⑨ Fasten the headlight lead and speedometer cable at white tape mark, with a plastic clamp.
- ⑩ Clamp
- ⑪ Fasten the headlight lead and speedometer cable with a plastic band.





- ① Clamp on the frame
- ② Clamp in the cargo space
- ③ Do not be loosen.
- ④ Grommet
- ⑤ Grommet
Route the tail/stop light lead into the pipe.
- ⑥ Clamp on the rear bumper
- ⑦ Tail/brake light lead connector
- ⑧ Taillight unit
- ⑨ Plastic band
- ⑩ Tail/brake light lead





- ① Oil hose
- ② Joint
- ③ Oil level hose
- ④ Clip
- ⑤ Hose protector
- ⑥ Oil strainer
- ⑦ Oil tank breather hose
- ⑧ Oil tank
- ⑨ Clamp on the oil tank
After routing the fuel hoses, push the clamp to broken, and hold the hoses.
- ⑩ Protector
- ⑪ Fuel delivery hose
- ⑫ Fuel hose
- ⑬ Screw
- ⑭ Steering gate
- ⑮ Wire harness sub lead
- ⑯ Fuel tank breather hose
- ⑰ Wire harness
- ⑱ To the tail/brake light
- ⑲ Band
Band along the bracket of under the steering gate.
- ⑳ Main switch coupler

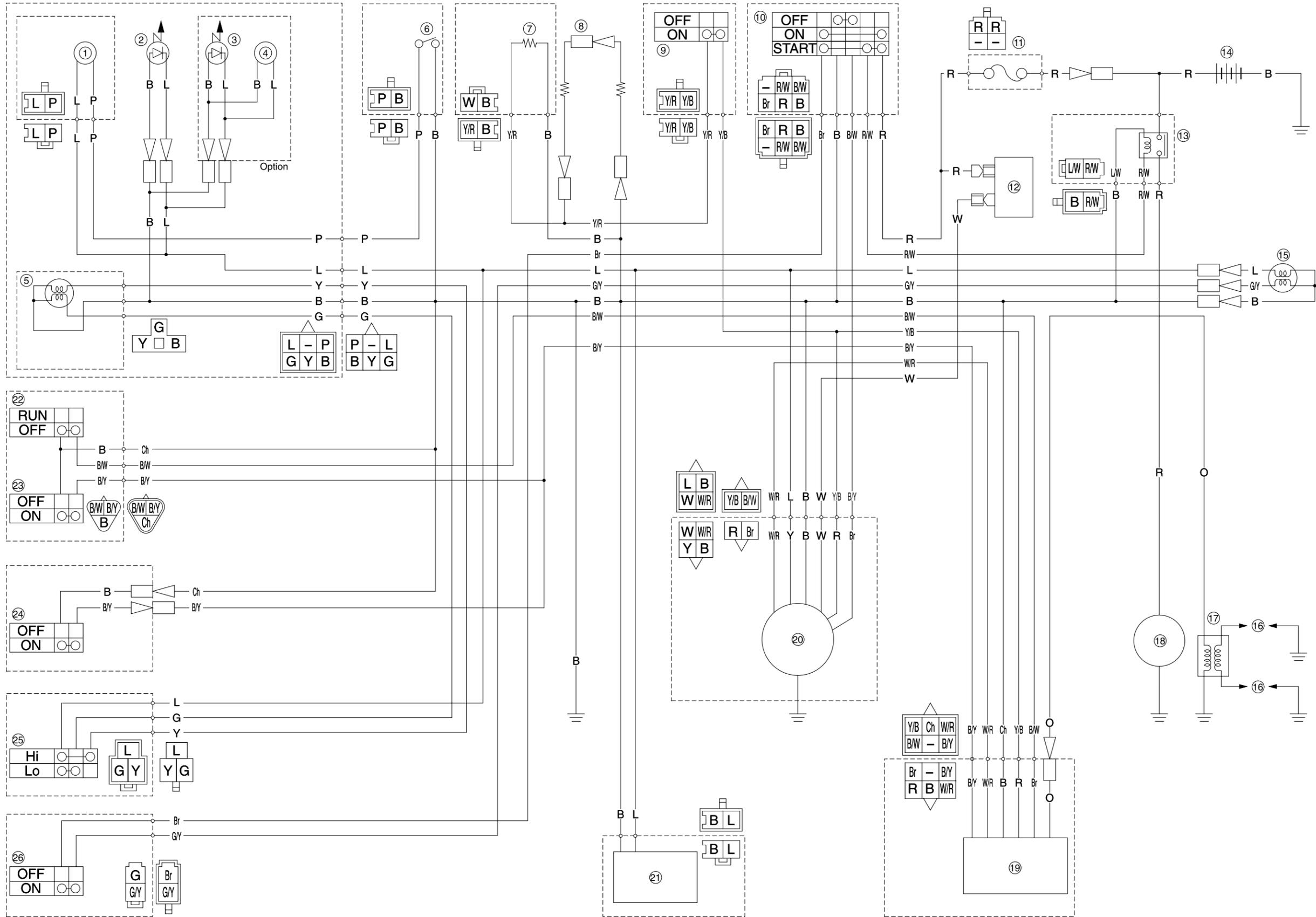
- ① Back buzzer
- ② Speedometer light
- ③ Tachometer light
- ④ Tachometer
- ⑤ Headlight
- ⑥ Gear position switch
- ⑦ Thumb warmer
- ⑧ Grip warmer
- ⑨ Grip warmer switch
- ⑩ Main switch
- ⑪ Fuse
- ⑫ Rectifier regulator
- ⑬ Starter relay
- ⑭ Battery
- ⑮ Tail/brake light
- ⑯ Spark plug
- ⑰ Ignition coil
- ⑱ Starter motor
- ⑲ CDI unit
- ⑳ CDI magneto
- ㉑ Voltage regulator
- ㉒ Engine stop switch
- ㉓ Throttle switch
- ㉔ Carburetor switch
- ㉕ Dimmer switch
- ㉖ Brake light switch

COLOR CODE

B	Black
Br	Brown
Ch	Chocolate
G	Green
L	Blue
O	Orange
P	Pink
R	Red
W	White
Y	Yellow
B/W	Black/White
B/Y	Black/Yellow
G/Y	Green/Yellow
L/W	Blue/White
R/W	Red/White
Y/B	Yellow/Black
Y/R	Yellow/Red

WIRING DIAGRAM

VK540E





PRINTED ON RECYCLED PAPER

2000. 05 ~ 1. E. ITP
PRINTED IN U.S.A.