YAMAHA

YFB250

Service Manual



LIT-11616-YB-27

YAMAHA

YFB250(G) '95

SUPPLEMENTARY SERVICE MANUAL

LIT-11616-09-51

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and data for the YFB250(G)'95. For complete service information procedures, it is necessary to use this Supplementary Service Manual together with the following manual.

YFB250(D) '92 SERVICE MANUAL: 4BD-28197-20
YFB250(E) '93 SUPPLEMENTARY SERVICE MANUAL: 4BD-28197-21
YFB250(F) '94 SUPPLEMENTARY SERVICE MANUAL: 4BD-28197-22

YFB250(G) '95
SUPPLEMENTARY
SERVICE MANUAL
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1st Edition, May 1994
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NOTICE

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

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.

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

⚠	The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
⚠ WARNING	Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.
CAUTION:	A CAUTION indicates special precautions that must be taken to avoid damage to the machine.
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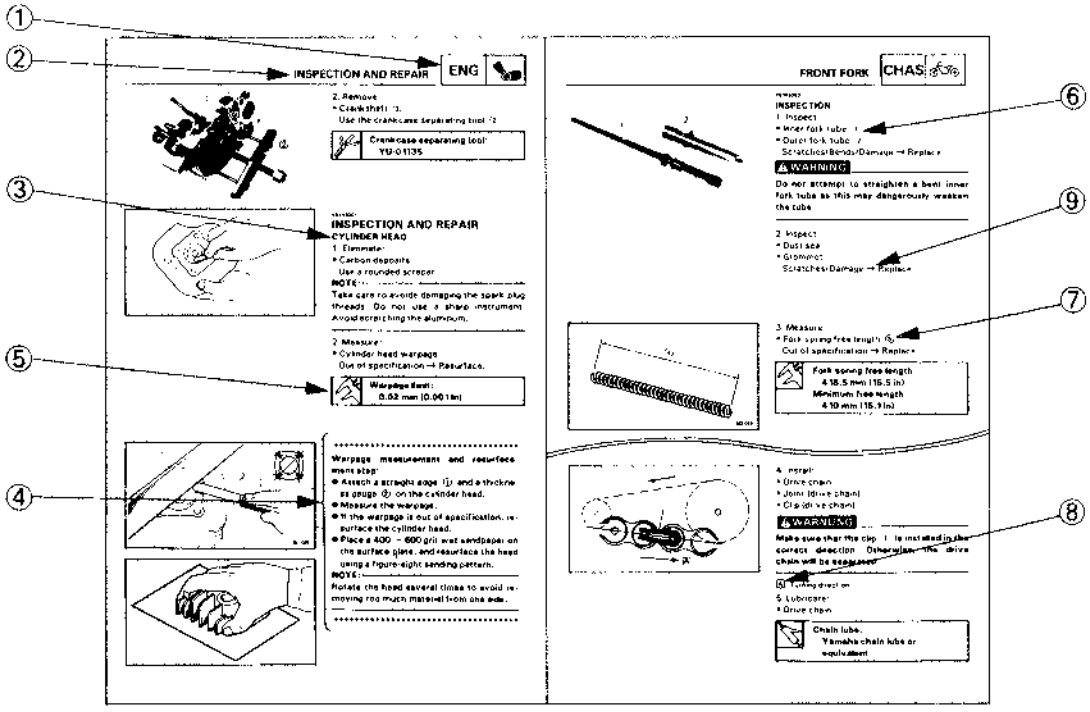
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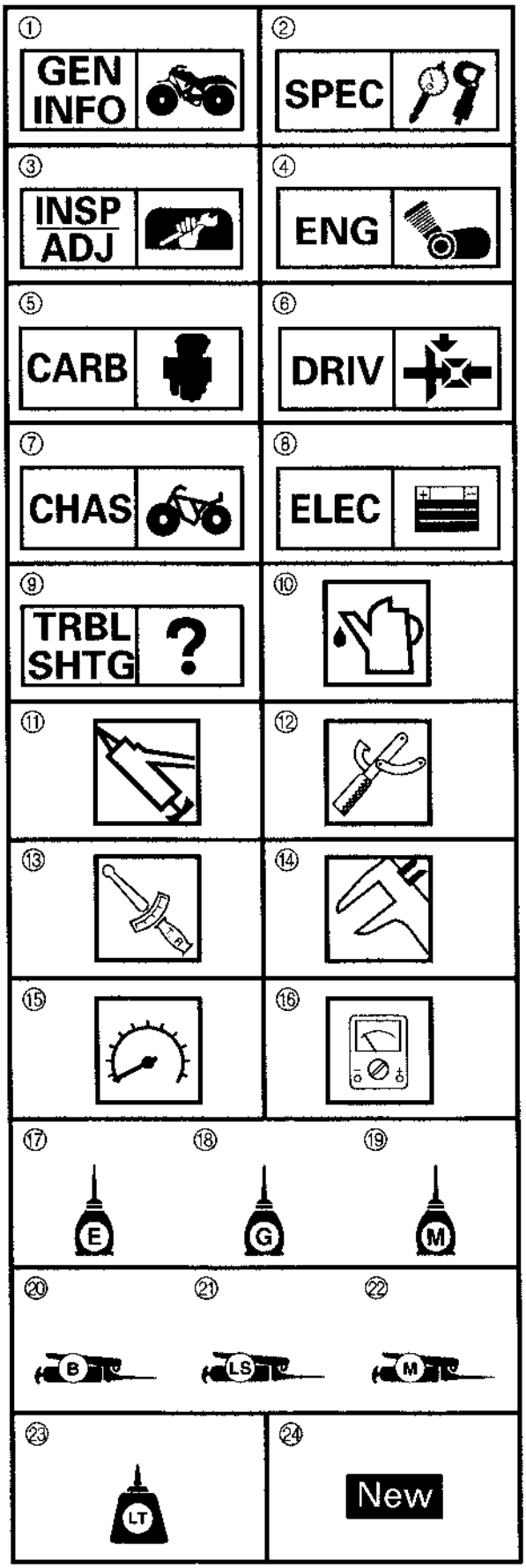
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- A condition of a faulty component will precede an arrow symbol and the course of action required ⑨.

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Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.





ILLUSTRATED SYMBOLS (Refer to the illustration)

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② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Carburetion
⑥ Drive train
⑦ Chassis
⑧ Electrical
⑨ Troubleshooting

Illustrated symbols ⑩ to ⑯ are used to identify the specifications appearing in the text.

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

Illustrated symbols ⑰ to ㉓ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑰ Apply engine oil
⑱ Apply gear oil
⑲ Apply molybdenum disulfide oil
⑳ Apply wheel bearing grease
㉑ Apply lightweight lithium-soap base grease
㉒ Apply molybdenum disulfide grease
㉓ Apply locking agent (LOCTITE®)
㉔ Use new one

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FRAME SERIAL NUMBER 1
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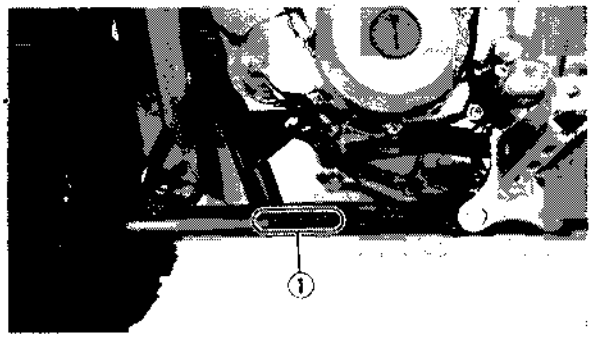
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GENERAL INFORMATION

MACHINE IDENTIFICATION



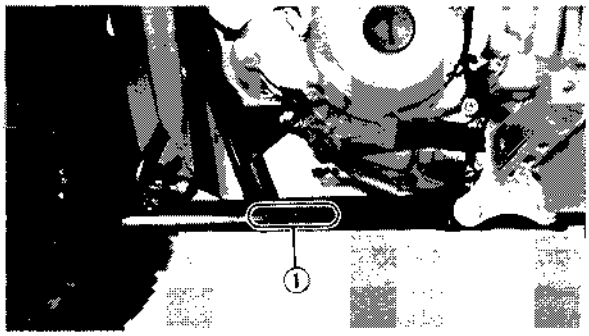
VEHICLE IDENTIFICATION NUMBER (FOR USA, CDN, AUS AND NZ)

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

NOTE:

The vehicle identification number is used to identify your machine and may be used to register your machine with the licensing authority in your state.

Starting Serial Number:
For USA
JY44BDA0 * SA148101
For CDN
JY44BDN0 * SA194101
For AUS and NZ
JY44BDT0 * SA197101



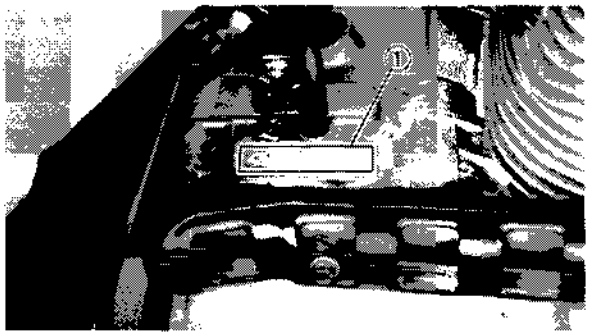
FRAME SERIAL NUMBER (EXCEPT FOR USA, CDN, AUS AND NZ)

The frame serial number ① is stamped into the left side of frame.

NOTE:

The first three digits of these numbers are for model identification; the remaining digits are the unit production number.

Starting Serial Number:
4BD-197101



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the right side of the engine.

NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

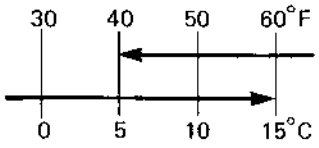
Starting Serial Number:
For USA
4BD-148101
For CDN
4BD-194101
Except for USA and CDN
4BD-197101

NOTE:

Designs and specifications are subject to change without notice.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	YFB250(G) '95
Model code number:	4BD B (USA) 4BD C (CDN) 4BD D (CH, F, GB, AUS, NZ, ZA)
Vehicle identification number: (for USA, CDN, AUS and NZ)	JY44BDA0 * SA148101 (USA) JY44BDN0 * SA194101 (CDN) JY44BDT0 * SA197101 (AUS and NZ)
Frame starting number: (except for USA, CDN, AUS and NZ)	4BD-197101
Engine starting number:	4BD-148101 (USA) 4BD-194101 (CDN) 4BD-197101 (CH, F, GB, AUS, NZ, ZA)
Basic weight: With oil and full fuel tank	199 kg (439 lb) (USA) 208.5 kg (460 lb) (Except for USA)
Oil type or grade: Engine oil 	Yamalube 4 (20W40) or SAE 20W40 type SE/SF motor oil Yamalube 4 (10W30) or SAE 10W30 type SE/SF motor oil
Final gear oil	SAE 80 API "GL-4" hypoid gear oil
Fuel: Type	Unleaded fuel recommended (USA) Regular unleaded gasoline (CDN) Regular unleaded gasoline with a research Octane number of 91 or higher (EUR) Unleaded fuel only (AUS) Regular gasoline (OCE)
Fuel tank capacity	9.2 L (2.02 Imp gal, 2.43 US gal)
Fuel reserve amount	1.6 L (0.35 Imp gal, 0.42 US gal)
Chassis: Frame type Caster angle Trail Tread (standard): Front Rear Toe-in	 Steel tube frame 4° 20 mm (0.79 in) 785 mm (30.9 in) 770 mm (30.3 in) 0 ~ 5 mm (0 ~ 0.20 in)
Brake: Front brake type Front brake operation Rear brake type Rear brake operation	 Drum brake (full seald) Right hand operation Drum brake (full seald) Left hand and right foot operation

MAINTENANCE SPECIFICATIONS

CHASSIS

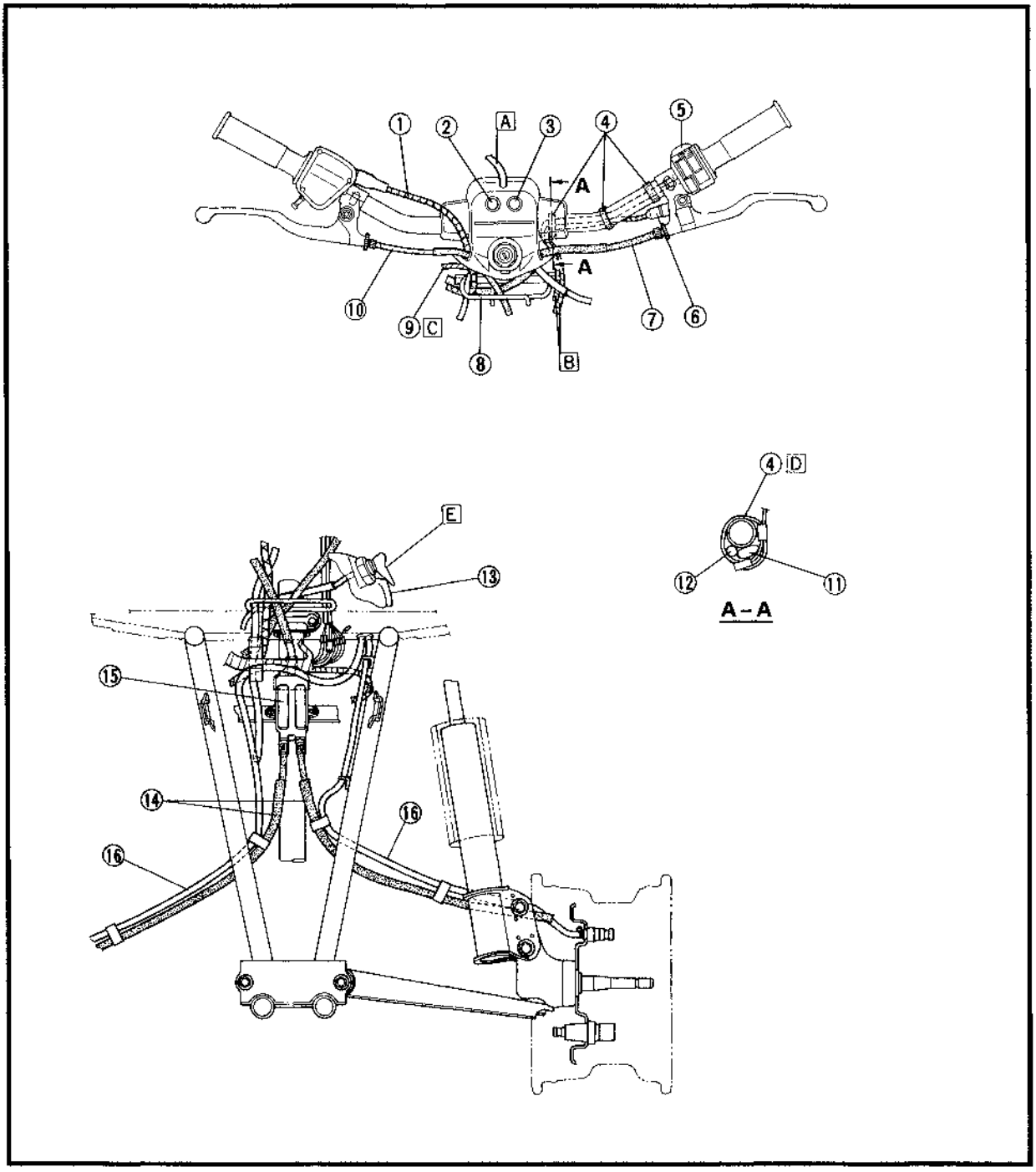
Model	YFB250(G) '95
Front suspension:	
Cushion stroke	117 mm (4.61 in)
Suspension spring free length	288 mm (11.34 in)
Spring rate/stroke	10 N/mm (1.0 kg/mm, 56 lb/in)/ 0 ~ 117 mm (0 ~ 4.61 in)
Optional spring	No
Wheel:	
Front wheel type	Panel wheel
Rear wheel type	Disc wheel
Front rim size/material	10 × 6.0 AT/Steel
Rear rim size/material	10 × 8.0 AT/Steel
< Rim runout limit> :	
Vertical	< 2.0 mm (0.08 in) >
Lateral	< 2.0 mm (0.08 in) >
Front drum brake:	
Type	Leading and trailing
Drum inside diameter	160 mm (6.3 in)
<Limit>	<161 mm (6.34 in)>
Lining thickness	4.0 mm (0.16 in)
<Limit>	<2.0 mm (0.08 in)>
Shoe spring free length	71 mm (2.8 in)

TIGHTENING TORQUE

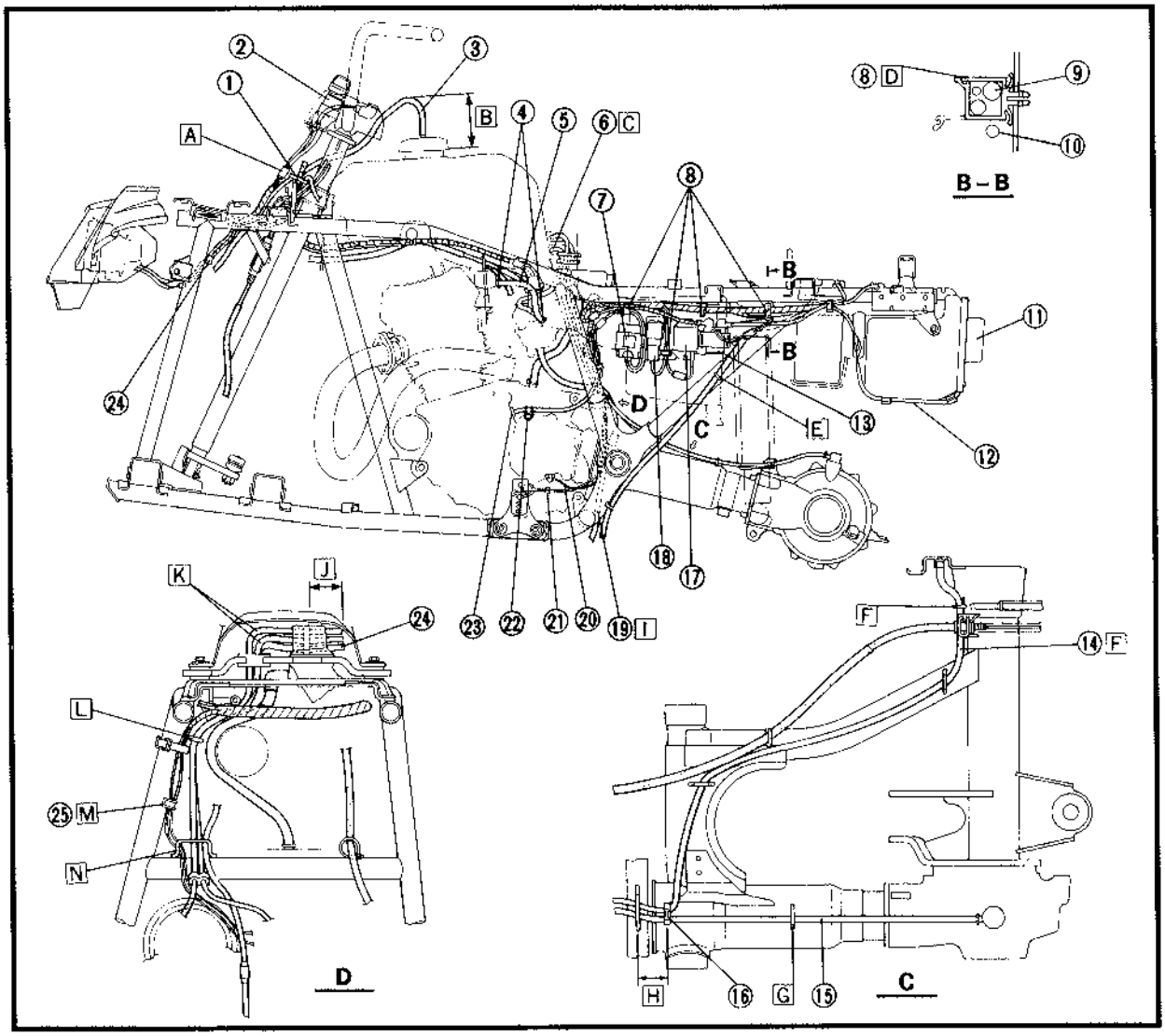
Parts to be tightened	Parts name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Front panel wheel and brake drum	Nut	M10 × 1.25	8	55	5.5	40	
Front backing plate and steering knuckle	Bolt	M8 × 1.25	8	30	3.0	22	
Footrest and frame	Bolt	M10 × 1.25	4	65	6.5	47	
Swingarm and final drive gear case (front)	Nut	M8 × 1.25	4	30	3.0	22	
Swingarm and final drive gear case (rear)	Bolt	M10 × 1.25	4	52	5.2	37	

CABLE ROUTING

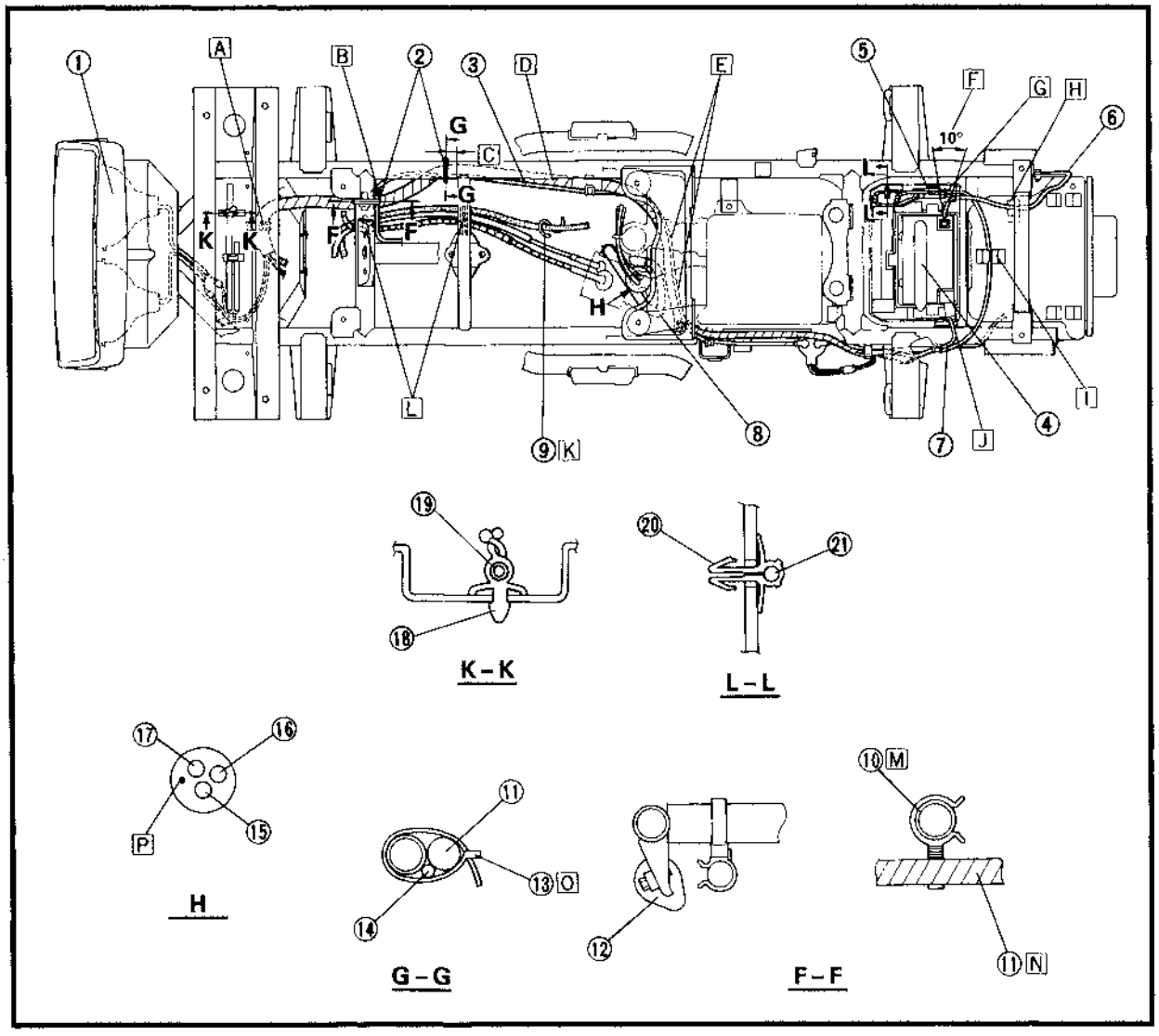
① Throttle cable
② "NEUTRAL" indicator light
③ "REVERSE" indicator light
④ Band
⑤ Handle switch 3
⑥ Front brake switch
⑦ Brake cable 1
⑧ Guide
⑨ Starter cable
⑩ Brake cable 4
⑪ Handle switch lead
⑫ Front brake switch lead
⑬ Front fender
⑭ Brake cable 3
⑮ Equalizer
⑯ Front brake drum breather hose
[A] Pass the fuel tank breather hose through the handlebar protector hole.
[B] Pass the handlebar switch lead behind the starter cable. Do not pass the lead in the guide.
[C] Pass the starter cable behind the throttle cable and the brake cable 1 and 4. Do not pass the starter cable through the guide.
[D] Bind the leads together, clamp them underneath the handlebar. The band should be located under the handlebar.
[E] Clamp the starter cable to the front fender.



① Guide
② Main switch
③ Fuel tank breather hose
④ Clip
⑤ Fuel hose
⑥ Air vent hose
⑦ Rectifier/regulator
⑧ Clamp
⑨ Wire harness
⑩ Battery positive (+) lead
⑪ Taillight unit assembly
⑫ Wire lead
⑬ Starter relay
⑭ Rear brake drum breather hose
⑮ Final gear case breather hose
⑯ Clip
⑰ CDI unit
⑱ Relay assembly
⑲ Overflow hose
⑳ Reverse switch lead
㉑ Neutral switch lead
㉒ Clamp
㉓ CDI magneto lead
㉔ Air vent hose
㉕ Clamp
[A] Pass the main switch lead and pilot light lead in front of the guide.
[B] 100 mm (3.94 in)
[C] Pass the air vent hose through the rubber grommet hole and connect the hose to the fuel tank. Be careful not to squeeze or twist the hose.
[D] Securely install the clamp.
[E] Pass the battery breather hose through the cable guide.
[F] Pass the rear brake drum breather hose through the cable guide.
[G] Pass the breather hose through the cable guide.
[H] 60 ~ 70 mm (2.36 ~ 2.76 in)
[I] Pass the overflow hose between the rear arm and the engine, then above the frame cross pipe and pull it downward. Make sure the hose is routed so that it will not get obstructed or damaged.
[J] 40 ~ 50 mm (1.57 ~ 1.97 in) both three hoses.
[K] The breather hoses (final gear case breather hose/rear brake drum breather hose) should be routed through the grommet hole, and connected to the fuel tank duct, as shown in the figure below. Make sure the hoses are routed so that they will not get obstructed or damaged.
[L] Pass the both breather hoses through the cable guide of frame.
[M] Clamp the CDI magneto lead, neutral and reverse switch leads.
[N] Pass both breather hoses the overflow hose, and the neutral and reverse switch leads through the cable guide of the frame.



① Headlight assembly
② Clamp
③ Wire harness
④ Battery
⑤ Fuse holder assembly
⑥ Battery negative (–) lead
⑦ Battery positive (+) lead
⑧ Crankcase breather hose
⑨ Cable guide
⑩ Clamp
⑪ Wire harness
⑫ Ignition coil
⑬ Clamp
⑭ Starter motor cable
⑮ Final gear case breather hose
⑯ Rear brake drum breather hose
⑰ Air vent hose (from carburetor)
⑱ Clip
⑲ Front brake drum breather hose
⑳ Clamp
㉑ Fuse holder lead
[A] Clamp the wire harness.
[B] Clamp the starter motor lead.
[C] 10 mm (0.39 in)
[D] Align the white tape on the wire harness with the clamp of the frame.
[E] Pass the starter motor lead over the duct.
[F] Refer to the figure when installing the battery negative (–) lead.
[G] Pass the battery negative (–) lead and fuse holder lead through the rear fender hole.
[H] Clamp the battery negative (–) lead.
[I] Clamp the fuse holder leads.
[J] Pass the battery positive (+) lead through the rear fender hole.
[K] Pass the brake cable 1 through the cable guide.
[L] Pass the throttle cable, starter cable and brake cable 1 through the cable guide.
[M] Securely install the clamp onto the frame as shown below.
[N] Insert the wire harness into the clamp.
[O] Bind the wire harness and the leads together, clamp them underneath the frame. The band should be located under the frame.
[P] When installing, make sure the make is facing forward.

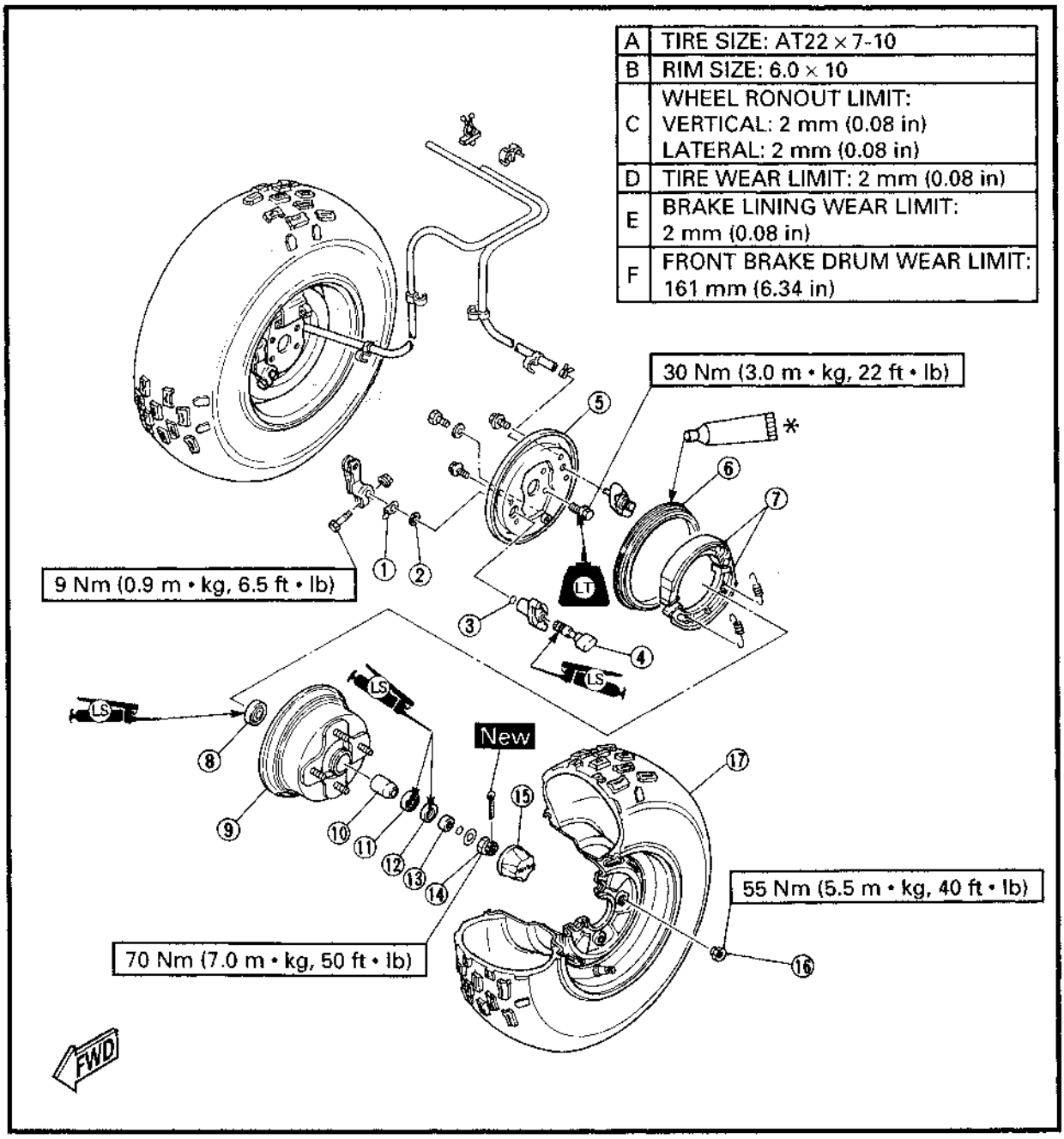


CHASSIS

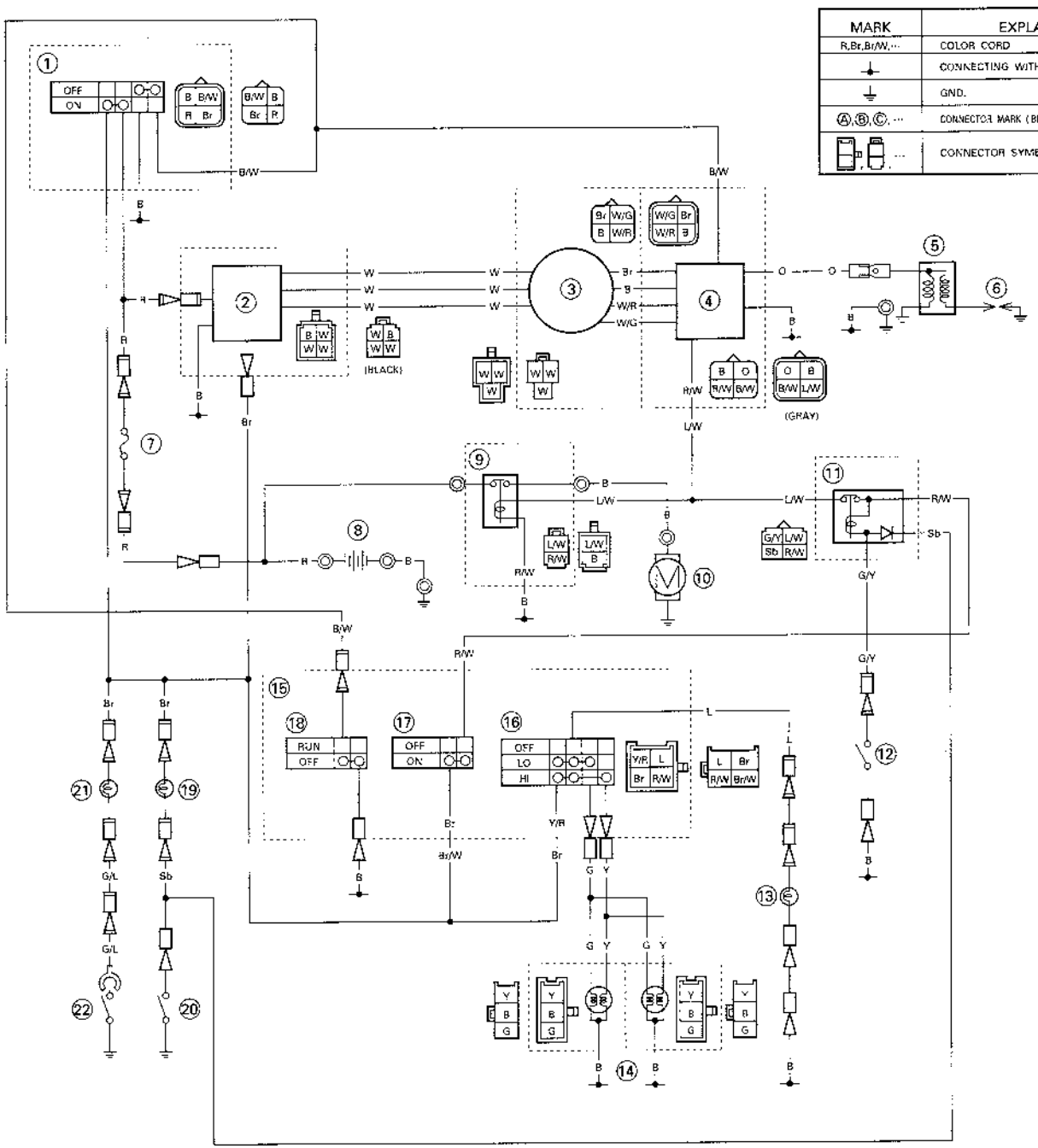
FRONT WHEELS AND FRONT BRAKE

① Cam lever
② Wear indicator plate
③ O-ring
④ Camshaft
⑤ Backing plate
⑥ Dust seal
⑦ Brake shoe complete
⑧ Bearing
⑨ Front brake drum
⑩ Bearing spacer
⑪ Bearing
⑫ Oil seal
⑬ Collar
⑭ Axle nut
⑮ Wheel cap
⑯ Wheel nut
⑰ Front wheel
* Apply Yamaha brake grease

TIRE AIR PRESSURE		
Cold tire pressure	Front	Rear
Standard	20 kPa (0.2 kg/cm², 2.8 psi)	25 kPa (0.25 kg/cm², 3.6 psi)
Minimum	17 kPa (0.17 kg/cm², 2.4 psi)	22 kPa (0.22 kg/cm², 3.1 psi)
Maximum	23 kPa (0.23 kg/cm², 3.2 psi)	28 kPa (0.28 kg/cm², 4.0 psi)



YFB250(G) '95 WIRING DIAGRAM



① Main switch
② Rectifier/regulator
③ CDI magneto
④ CDI unit
⑤ Ignition coil
⑥ Spark plug
⑦ Fuse
⑧ Battery
⑨ Starter relay
⑩ Starter motor
⑪ Relay assembly
⑫ Brake switch
⑬ Taillight
⑭ Headlight
⑮ Handlebar switch
⑯ "LIGHTS" switch
⑰ "START" switch
⑱ "ENGINE STOP" switch
⑲ "NEUTRAL" indicator light
⑳ Neutral switch
㉑ "REVERSE" indicator light
㉒ Reverse switch

COLOR CODE

B .....Black
G .....Green
L .....Blue
O .....Orange
R .....Red
Y .....Yellow
Br .....Brown
Sb .....Sky blue
W .....White
B/W .....Black/White
G/L .....Green/Blue
G/Y .....Green/Yellow
L/W .....Blue/White
R/W .....Red/White
Y/R .....Yellow/Red
W/G .....White/Green
W/R .....White/Red
Br/W .....Brown/White

YAMAHA

YFB250(F)'94

SUPPLEMENTARY SERVICE MANUAL

LIT-11616-09-06

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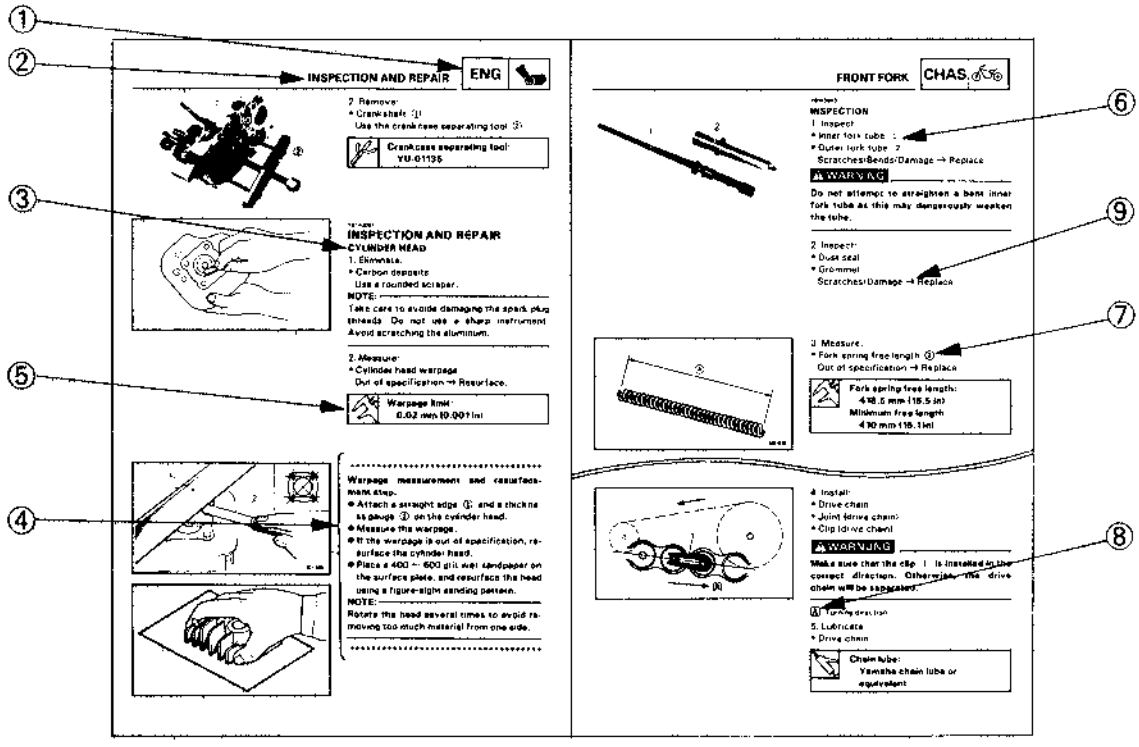
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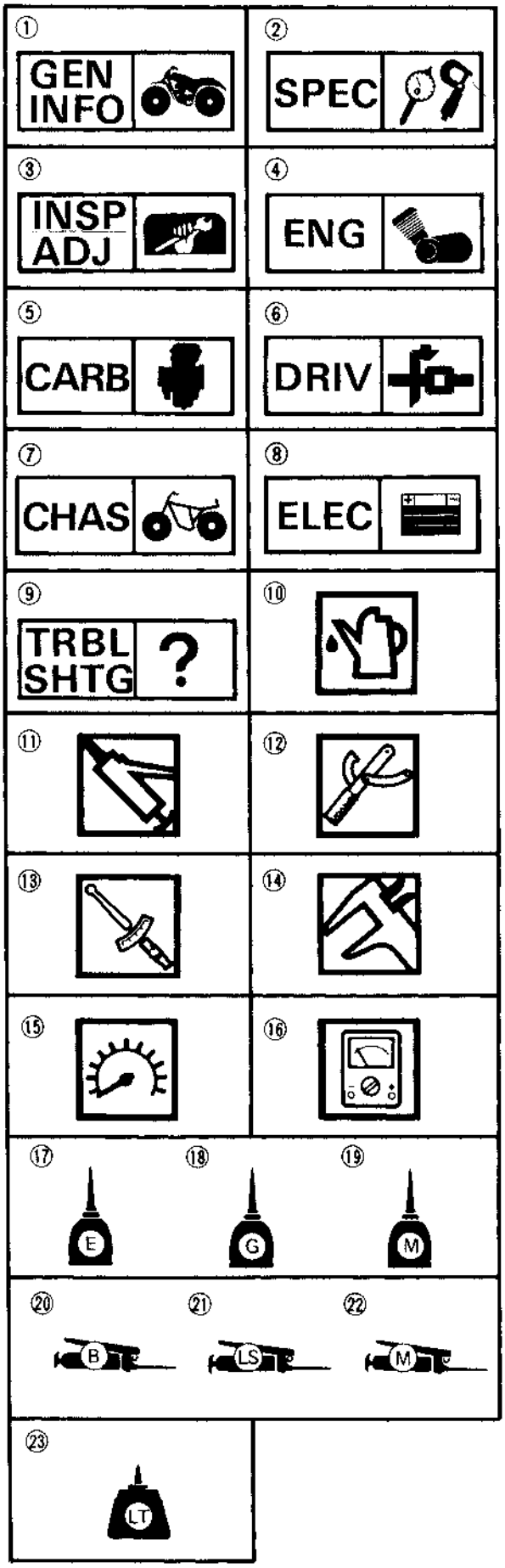
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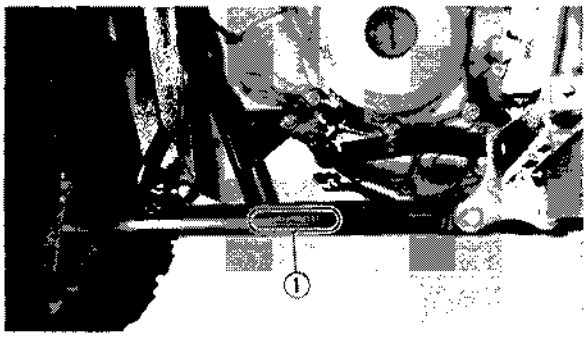
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  - VEHICLE IDENTIFICATION NUMBER 1
  - FRAME SERIAL NUMBER 1
  - ENGINE SERIAL NUMBER 1

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YFB250 (F) '94 WIRING DIAGRAM



GENERAL INFORMATION

MACHINE IDENTIFICATION

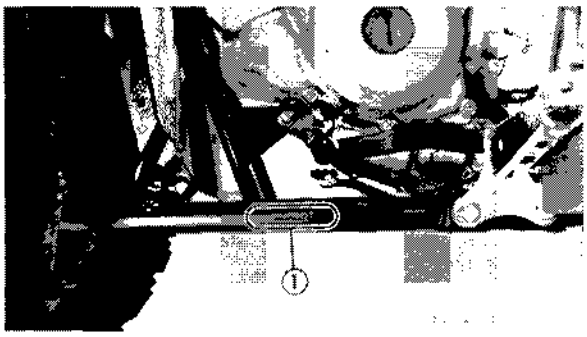
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For AUS and NZ
JY44BDT0 * RA143101



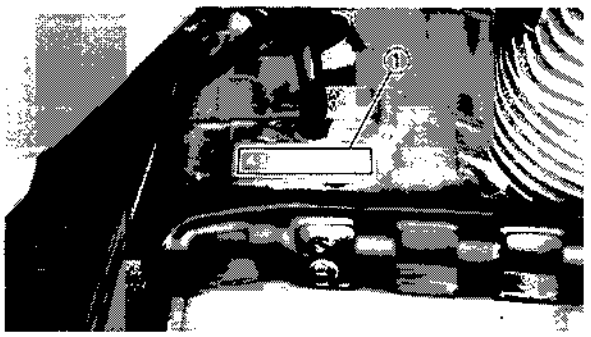
FRAME SERIAL NUMBER (EXCEPT FOR USA, CDN, AUS AND NZ)

The frame serial number ① is stamped into the left side of frame.

NOTE:

The first three digits of these numbers are for model identification; the remaining digits are the unit production number.

Starting Serial Number:
4BD-143101



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the right side of the engine.

NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:
For USA
4BD-113101
For CDN
4BD-141101
Except for USA and CDN
4BD-143101

NOTE:

Designs and specifications are subject to change without notice.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	YFB250(F) '94
Model code number:	4BD 8 (USA) 4BD 9 (CDN) 4BD A (CH, F, GB, AUS, NZ, ZA)
Vehicle identification number: (For USA, CDN, AUS and NZ)	JY44BDA0 * RA113101 (USA) JY44BDN0 * RA141101 (CDN) JY44BDT0 * RA143101 (AUS and NZ)
Frame starting number: (Except for USA, CDN, AUS and NZ)	4BD-143101
Engine starting number:	4BD-113101 (USA) 4BD-141101 (CDN) 4BD-143101 (CH, F, GB, AUS, NZ, ZA)
Dimensions: Overall length Overall width Overall height Seat height Wheelbase Minimum ground clearance	 1,742 mm (68.6 in) (USA) 1,826 mm (71.9 in) (Except for USA) 1,025 mm (40.4 in) 1,082 mm (42.6 in) 780 mm (30.7 in) 1,120 mm (44.1 in) 155 mm (6.1 in)
Basic weight: With oil and full fuel tank	 191 kg (421 lb) (USA) 200.5 kg (442 lb) (Except for USA)
Spark plug: Type/manufacture Spark plug gap	 For USA and Oceania: D7EA/NGK or X22ES-U/NIPPONDENSO For CDN, Europe and ZA: DR7EA/NGK 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Transmission: Primary reduction system Primary reduction ratio Secondary reduction system Secondary reduction ratio Transmission type Operation Gear ratio: 1st 2nd 3rd 4th 5th Reverse gear ratio	 Helical gear 73/22 (3.318) Shaft drive 19/18 × 46/11 (4.414) Constant mesh 5-speed Left foot operation 34/12 (2.833) 34/19 (1.789) 29/22 (1.318) 26/25 (1.040) 23/28 (0.821) 73/22 × 34/12 × 19/18 × 46/11 (41.500)
Electrical: Ignition system Generator system	 C.D.I A. C. Magneto generator

MAINTENANCE SPECIFICATIONS

CHASSIS

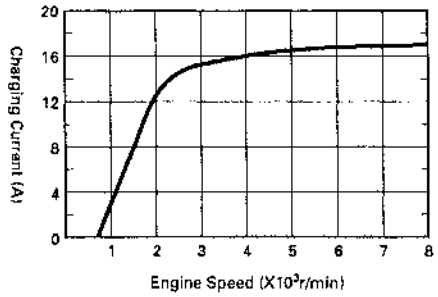
Model	YFB250(F) '94
Rear suspension:	
Cushion stroke	80 mm (3.15 in)
Suspension spring free length	221 mm (8.70 in)
Fitting length	200.5 mm (7.89 in)
Spring rate/stroke: K1	45 N/mm (4.5 kg/mm, 252 lb/in)/ 0 ~ 80 mm (0 ~ 3.15 in)
Optional spring	No
Wheel:	
Front wheel type	Panel Wheel
Rear wheel type	Disc Wheel
Front rim size/material	10 × 5.5 AT/Steel
Rear rim size/material	10 × 8.0 AT/Steel
< Rim runout limit> :	
Vertical	< 2.0 mm (0.08 in) >
Lateral	< 2.0 mm (0.08 in) >

TIGHTENING TORQUE

Parts to be tightened	Parts name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Front Fender and Fuel Tank Cover	Screw	M5	2	3	0.3	2.2	Use spring nut
Front Carrier and Frame	Bolt	M8 × 1.25	2	16	1.6	12	(Except for USA)
Rear Carrier and Frame	Bolt	M8 × 1.25	2	16	1.6	12	(Except for USA)

ELECTRICAL

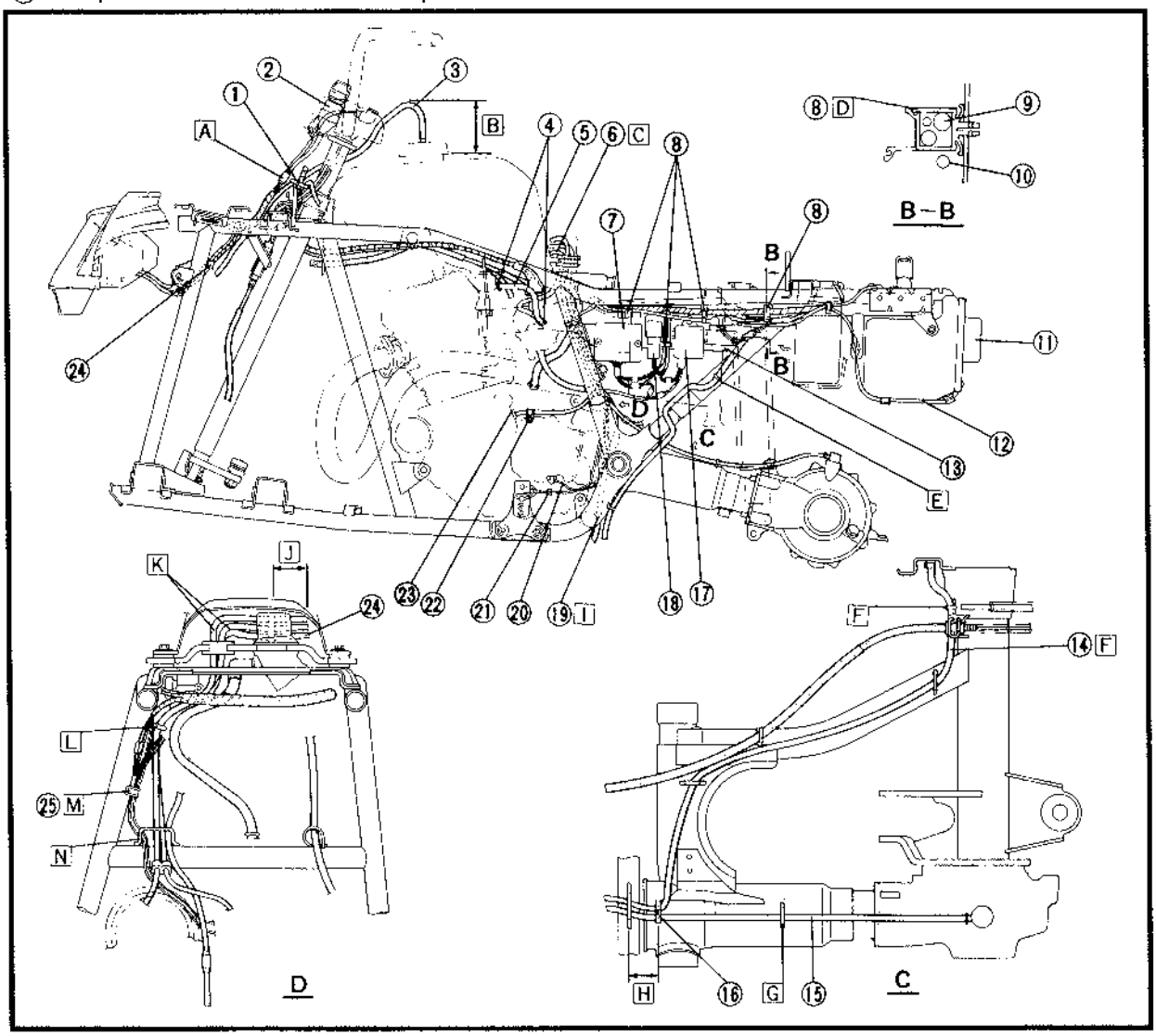
Model	YFB250(F) '94
CDI:	
Magneto-model/manufacturer	4BD/MITSUBISHI
Pickup coil resistance (Color)	189 ~ 231Ω at 20°C (68°F) (White/Green – White/Red)
Source coil resistance (Color)	270 ~ 330Ω at 20°C (68°F) (Brown – Black)
CDI unit-model/manufacturer	4BD/MITSUBISHI
Charging system:	
Type	A. C. Magneto generator
Standard output	14V 18A at 8,000 r/min
Stator coil resistance (Color)	0.45 ~ 0.55Ω at 20°C (68°F) (White – White)

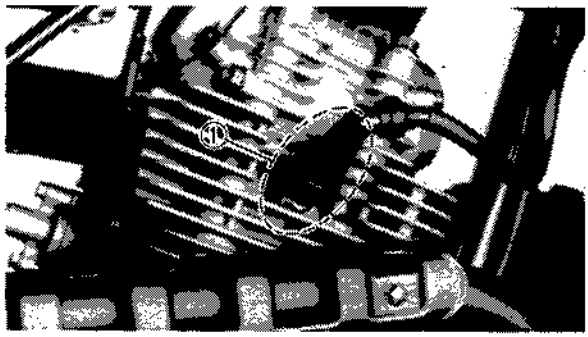


Model	YFB250(F) '94
Rectifier/regulator:	
Model/manufacturer	SH535-12/SHINDENGEN
Capacity	14A
Withstand voltage	240V
Circuit breaker:	
Type	Fuse
Amperage for individual circuit/quantity:	
Main	30A × 1 pc.
Reserve	30A × 1 pc.

CABLE ROUTING

① Guide
② Main switch
③ Fuel tank breather hose
④ Clip
⑤ Fuel hose
⑥ Air vent hose
⑦ Rectifier/regulator
⑧ Clamp
⑨ Wireharness
⑩ Battery positive (+) lead
⑪ Taillight unit assembly
⑫ Wire lead
⑬ Starter relay
⑭ Rear brake drum breather hose
⑮ Final gear case breather hose
⑯ Clip
⑰ CDI unit
⑱ Relay assembly
⑲ Over flow hose
⑳ Reverse switch lead
㉑ Neutral switch lead
㉒ Clamp
㉓ CDI magneto lead
㉔ Air vent hose
㉕ Clamp
[A] Pass the main switch lead and pilot light lead in front of the guide.
[B] 100 mm (3.94 in).
[C] Pass the air vent hose through the rubber grommet hole and connect the hose to the fuel tank. Be careful not to squeeze or twist the hose.
[D] Securely install the clamp.
[E] Pass the battery breather hose through the cable guide.
[F] Pass the rear brake drum breather hose through the cable guide.
[G] Pass the breather hose through the cable guide.
[H] 60 ~ 70 mm (2.36 ~ 2.76 in).
[I] Pass the over flow hose between the rear arm and the engine, then above the frame cross pipe and pull it downward. Make sure the hose is routed so that it will not get obstructed or damaged.
[J] 40 ~ 50 mm (1.57 ~ 1.97 in) both three hoses.
[K] The breather hoses (final gear case breather hose / rear brake drum breather hose) should be routed through the grommet hole, and connected to the fuel tank duct, as shown in the figure below. Make sure the hoses are routed so that they will not get obstructed or damaged.
[L] Pass the both breather hoses through the cable guide of frame.
[M] Clamp the CDI magneto lead, neutral and reverse switch leads.
[N] Pass the both breather hoses, over flow hose, neutral and reverse switch leads through the cable guide of frame.





PERIODIC INSPECTION AND ADJUSTMENT

ENGINE

SPARK PLUG INSPECTION

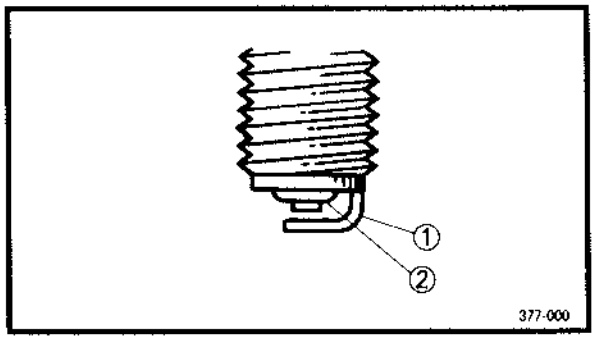
1. Place the machine on a level place.
2. Remove:
   - Spark plug ①

CAUTION:

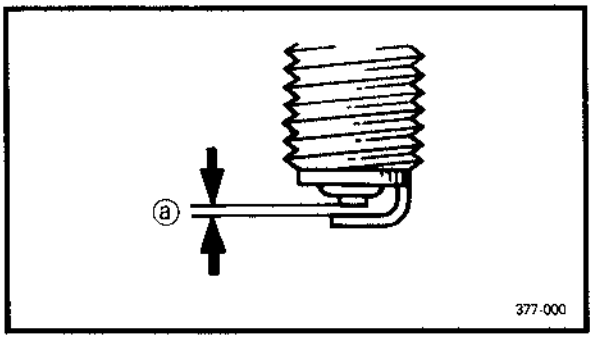
Before completely removing plug, use compressed air to clean the setting areas to prevent dirt particles from falling into the engine.

3. Inspect:
   - Spark plug type
     Incorrect → Replace.

Standard spark plug:
- **For USA, Oceania**
  D7EA (NGK) or X22ES-U (NIPPONDENSO)
- **For CDN, Europe, ZA**
  DR7EA (NGK)



4. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator color ②
     Normal condition is a medium to light tan color.
     Distinctly different color → Check the engine condition.

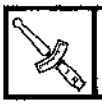


5. Clean:
   - Spark plug
     Clean the spark plug with a spark plug cleaner or wire brush.
6. Measure:
   - Spark plug gap ⓐ
     Out of specification → Regap.
     Use a wire gauge.

Spark plug gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

7. Tighten:
- Spark plug

NOTE:
- Before installing a spark plug, clean the gasket surface and plug surface.
- Finger-tighten the spark plug before torquing to specification.

	**Spark plug:** **17.5 Nm (1.75 m • kg, 12.5 ft • lb)**

ELECTRICAL

FUSE INSPECTION

CAUTION:

Don't forget to turn off the main switch when checking or replacing the fuse. Otherwise, it may cause accidental shortcircuiting.

⚠ WARNING

Do not use fuses of a higher amperage rating than those recommended. Substitution of a fuse of improper rating can cause extensive electrical system damage and possible fire.

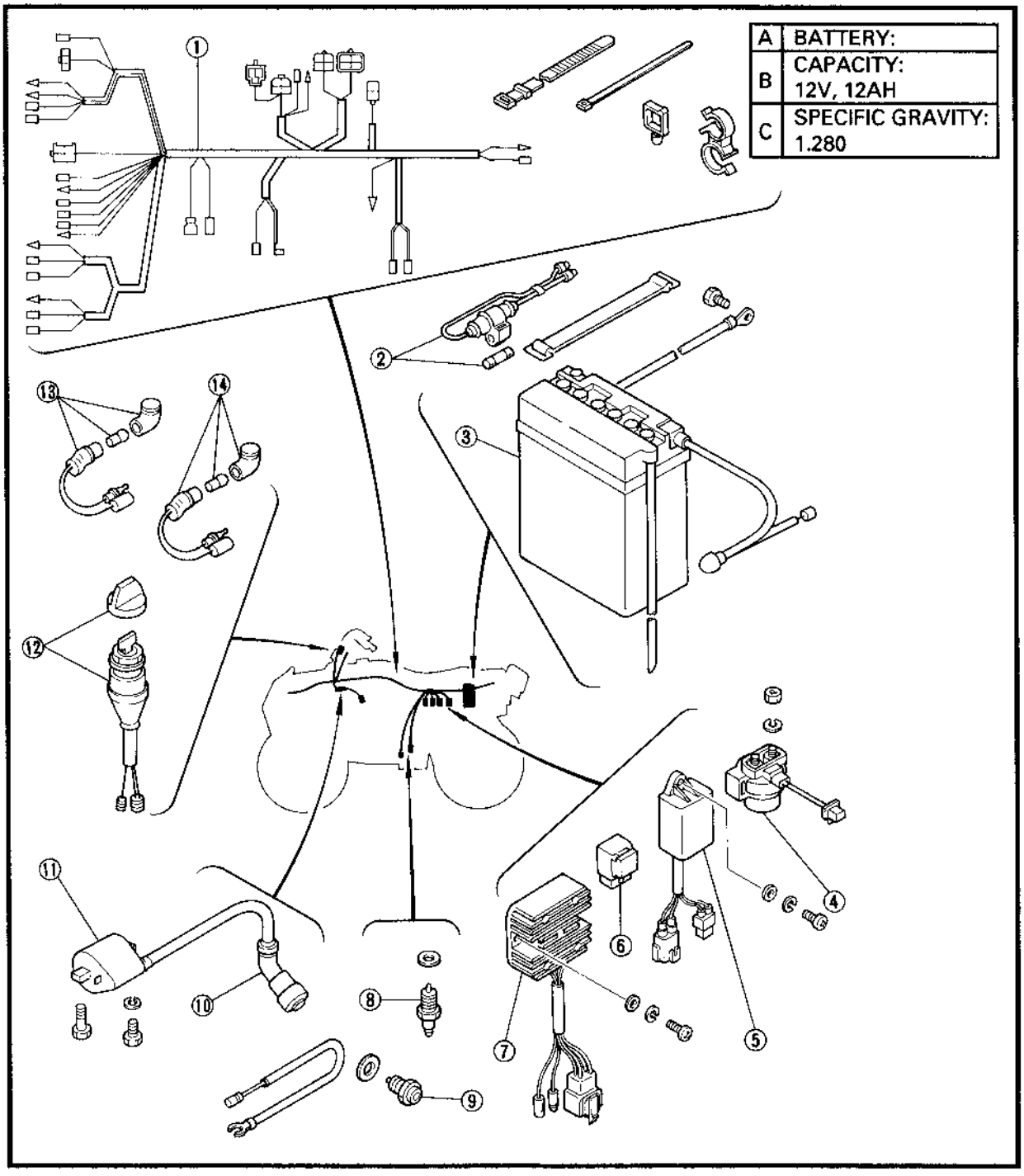
Description	Amperage	Quantity
Main	30A	1
Spare	30A	1

ELECTRICAL

ELECTRICAL COMPONENTS

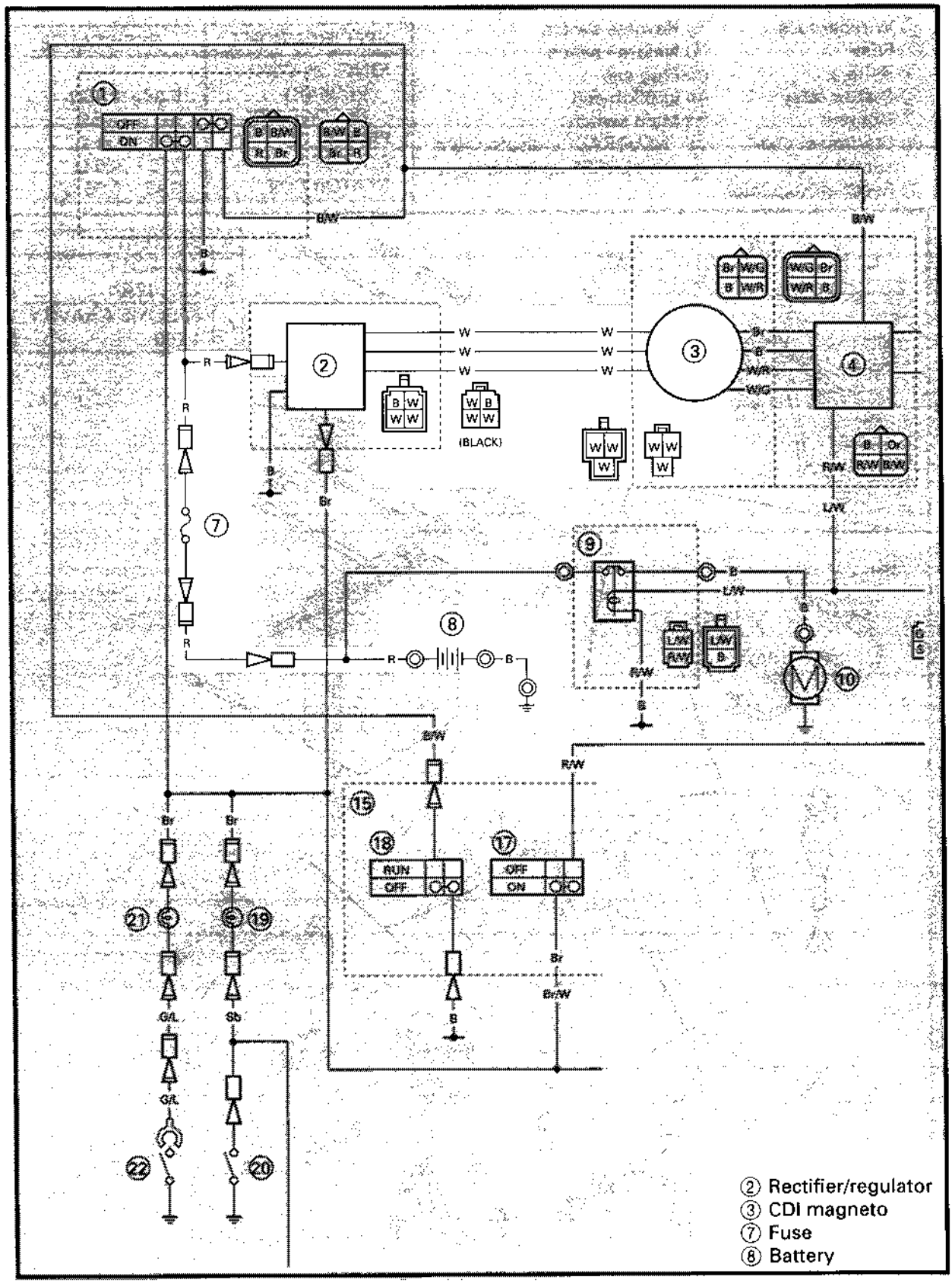
① Wireharness
② Fuse
③ Battery
④ Starter relay
⑤ CDI unit
⑥ Starting circuit cut-off relay
⑦ Rectifier/Regulator
⑧ Reverse switch
⑨ Neutral switch
⑩ Plug cap
⑪ Ignition coil
⑫ Main switch
⑬ "NEUTRAL" indicator light
⑭ "REVERSE" indicator light

SPECIFICATIONS	RESISTANCE
IGNITION COIL:	
PRIMARY	0.36 ~ 0.48Ω
SECONDARY	5.4 ~ 7.4 kΩ
PICK-UP COIL	189 ~ 231 Ω
SOURCE COIL	270 ~ 330 Ω
STATOR COIL	0.45 ~ 0.55 Ω



CHARGING SYSTEM

CIRCUIT DIAGRAM



TROUBLESHOOTING

THE BATTERY IS NOT CHARGED

Procedure

Check;

1. Fuse
2. Battery
3. Charging voltage
4. Stator coil resistance
5. Wiring connection (charging system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Rear carrier (except for USA)
  2) Seat
  3) Battery
  4) Fuse holder
  5) Rear fender
- Use the following special tools in this troubleshooting.

Pocket tester: P/N. YU-03112, 90890-03112	**Inductive tachometer: P/N. YU-08036, 90890-03113**

1. Fuse
   - Connect the Pocket Tester "Ω × 1" to the fuse.
   - Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY ↓

2. Battery
   - Check the battery condition.
   - Check the battery fluid level, battery terminals and specific gravity. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific gravity: 1.280 at 20°C (68°F)

INCORRECT →
- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓

*

*

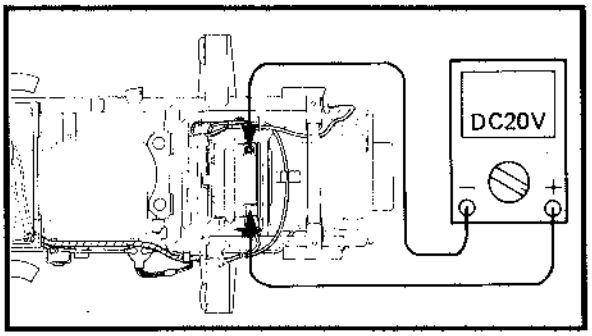
3. Charging voltage

- Securely connect the battery leads (positive and negative) to the battery.
- Connect the Inductive Tachometer to spark plug lead.
- Connect the Pocket Tester (DC20V) to the battery.

Tester (+) lead → Battery (+) terminal
Tester (–) lead → Battery (–) terminal

- Start the engine and accelerate to about 2,000 r/min.
- Measure the charging voltage.

Charging voltage:
14 ~ 15V at 2,000 r/min



MEETS SPECIFICATION

Replace battery.

OUT OF SPECIFICATION

4. Stator coil resistance

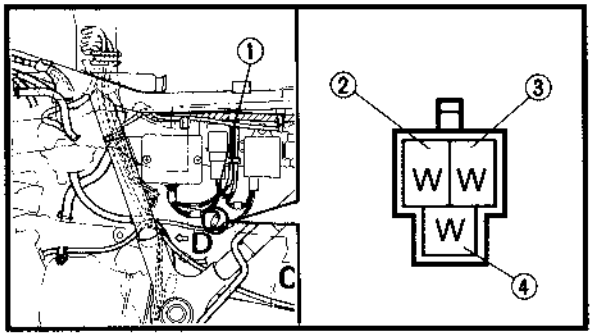
- Disconnect the CDI magneto White lead ① from the wireharness.
- Connect the Pocket Tester (Ω × 1) to the stator coil.

Tester (+) lead → White lead ②
Tester (–) lead → White lead ③

Tester (+) lead → White lead ②
Tester (–) lead → White lead ④

- Measure the stator coil resistance.

Stator coil resistance:
0.45 ~ 0.55Ω at 20°C (68°F)



OUT OF SPECIFICATION

Replace stator assembly.

MEETS SPECIFICATION

5. Wiring connection

- Check the entire charging system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

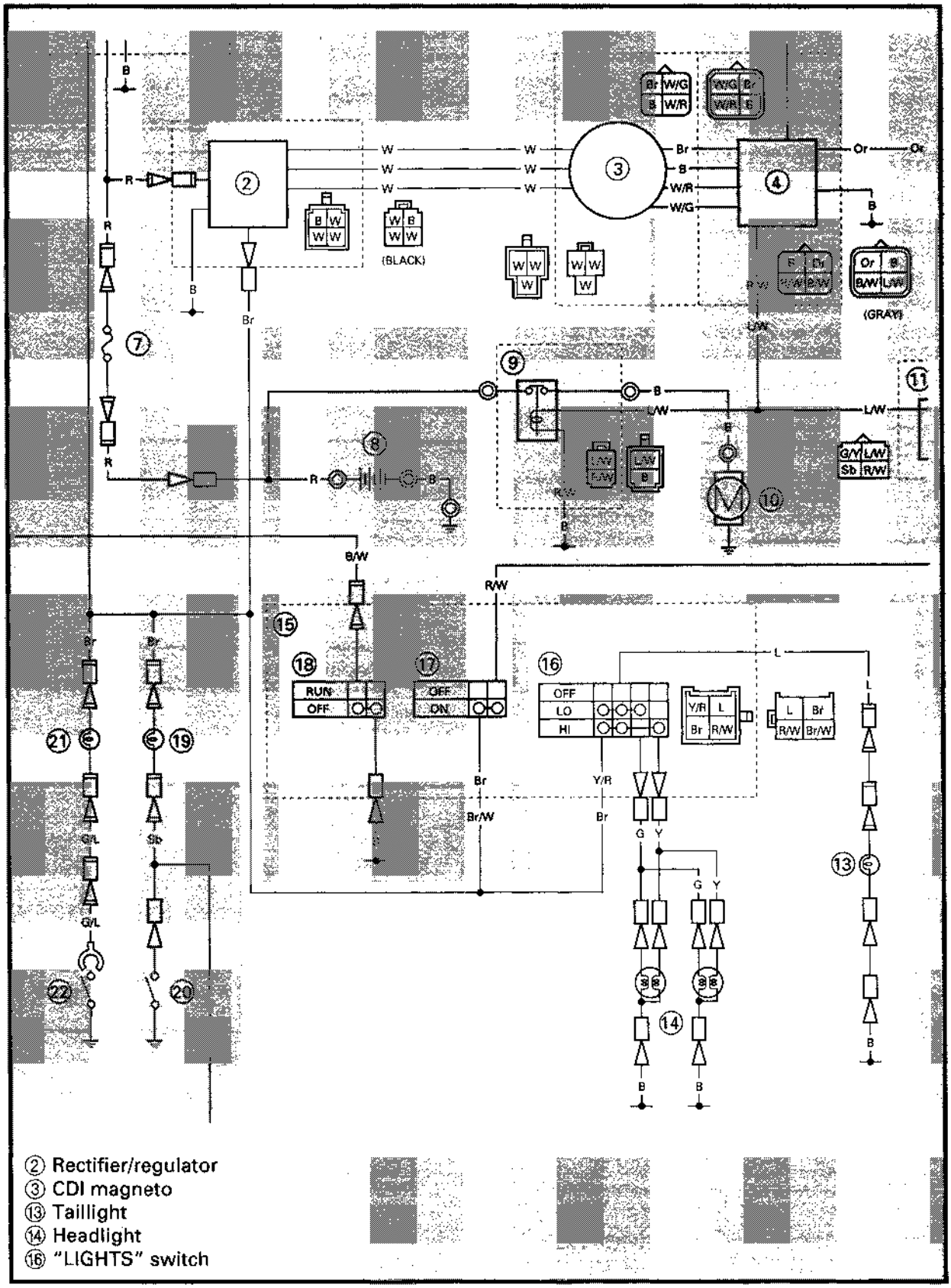
Correct.

CORRECT

Replace rectifier/regulator.

LIGHTING SYSTEM

CIRCUIT DIAGRAM



② Rectifier/regulator
③ CDI magneto
⑬ Taillight
⑭ Headlight
⑯ "LIGHTS" switch

TROUBLESHOOTING

HEADLIGHT, TAIL LIGHT DO NOT COME ON

Procedure

Check;

1. Bulb and bulb socket
2. Stator coil resistance
3. "LIGHTS" switch
4. Wiring connection (lighting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Fuel tank cover
  3) Fuel tank
  4) Rear carrier (except for USA)
  5) Battery
  6) Fuse holder
  7) Rear fender
- Use the following special tool in this troubleshooting.

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

1. Bulb and bulb socket

- Remove the bulb.
  Refer to "CHAPTER 3. HEADLIGHT BULB REPLACEMENT".
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Replace bulb.

CONTINUITY ⇩

4. Stator coil resistance

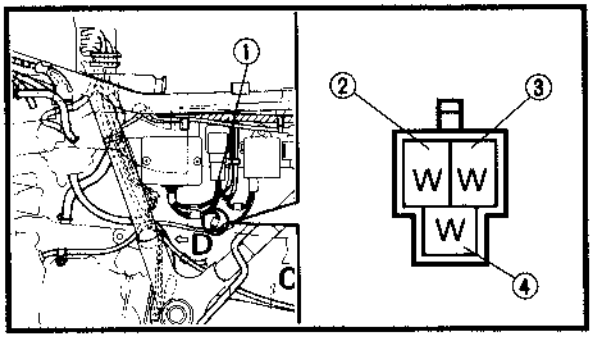
- Disconnect the CDI magneto White lead ① from the wireharness.
- Connect the Pocket Tester (Ω × 1) to the stator coil.

Tester (+) lead → White lead ②
Tester (–) lead → White lead ③

Tester (+) lead → White lead ②
Tester (–) lead → White lead ④

- Measure the stator coil resistance.

Stator coil resistance:
0.45 ~ 0.55Ω at 20°C (68°F)



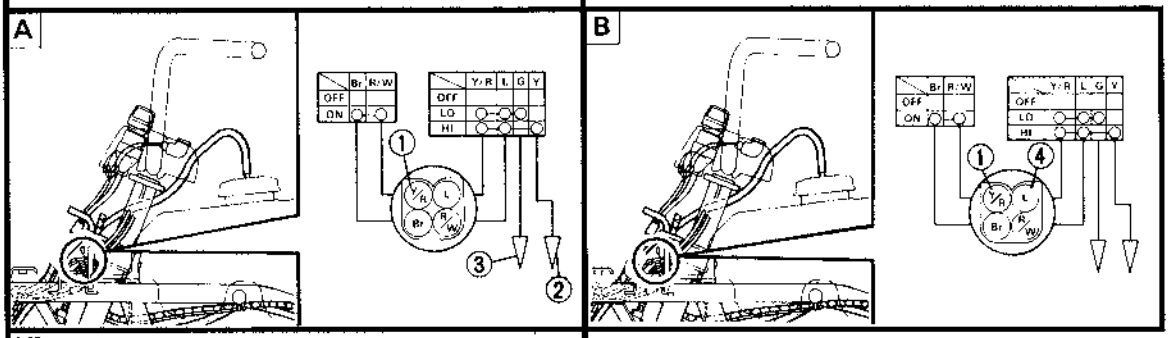
OUT OF SPECIFICATION → Replace stator assembly.

MEETS SPECIFICATION ⇩ *

*

3. "LIGHTS" switch

- Check the switch component for the continuity between "Yellow/Red ① and Yellow ② ", "Yellow/Red ① and Green ③ " and, "Yellow/Red ① and Blue ④ ". Refer to the "CHECKING OF SWITCHES" section.



A Headlight
B Tail light

INCORRECT → Replace handlebar switch.

CORRECT ↓

4. Wiring connection

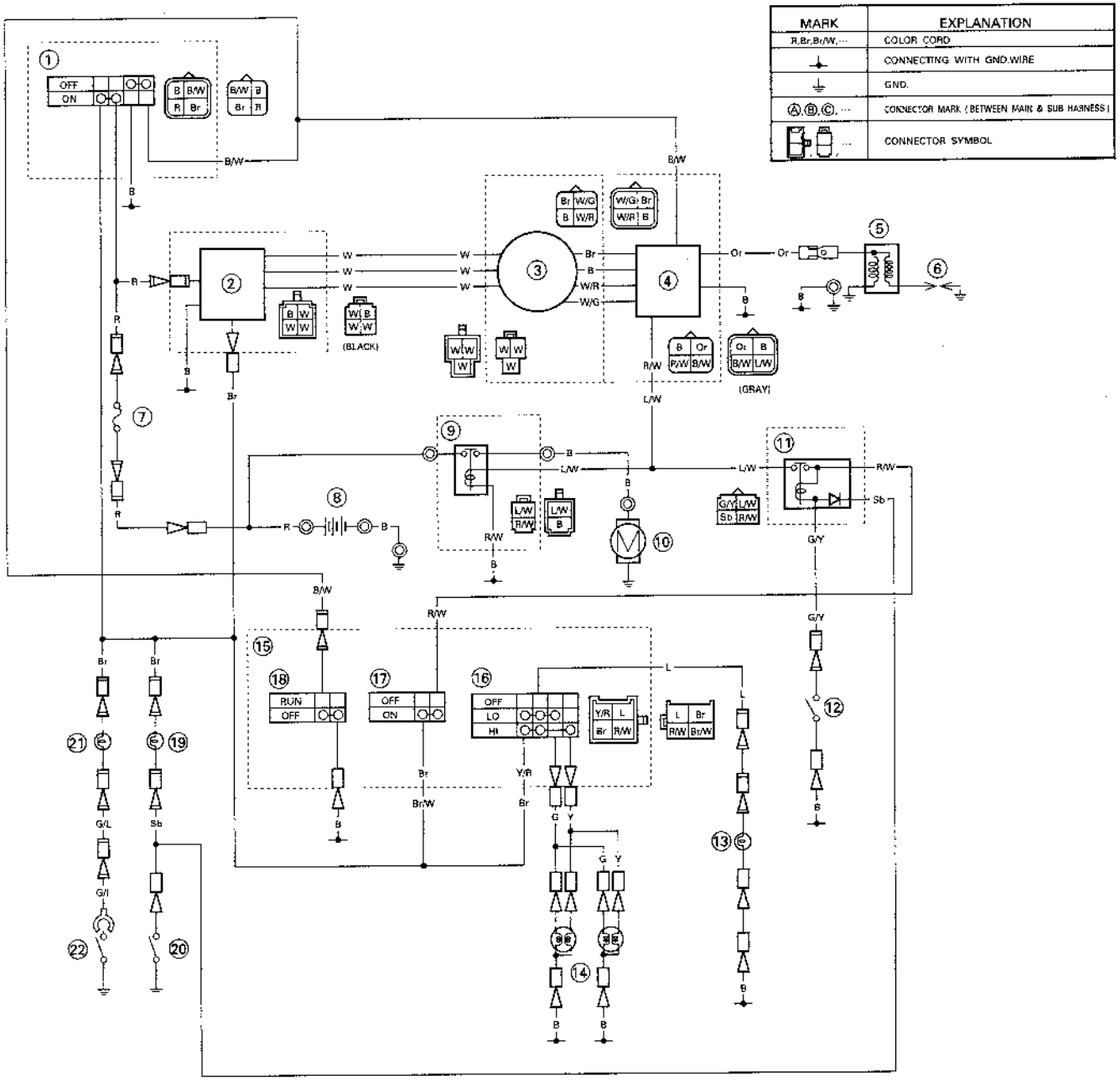
- Check entire lighting system for connections. Refer to "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

CORRECT ↓

Replace rectifier/regulator.

YFB250(F) '94 WIRING DIAGRAM



① Main switch
② Rectifier/regulator
③ CDI magneto
④ CDI unit
⑤ Ignition coil
⑥ Spark plug
⑦ Fuse
⑧ Battery
⑨ Starter relay
⑩ Starter motor
⑪ Relay assembly
⑫ Brake switch
⑬ Taillight
⑭ Headlight
⑮ Handlebar switch
⑯ "LIGHTS" switch
⑰ "START" switch
⑱ "ENGINE STOP" switch
⑲ "NEUTRAL" indicator light
⑳ Neutral switch
㉑ "REVERSE" indicator light
㉒ Reverse switch

COLOR CODE

B.....Black
G.....Green
L.....Blue
O.....Orange
R.....Red
Y.....Yellow
Br.....Brown
Sb.....Sky blue
W.....White
B/W.....Black/White
G/L.....Green/Blue
G/Y.....Green/Yellow
L/W.....Blue/White
R/W.....Red/White
Y/R.....Yellow/Red
W/G.....White/Green
W/R.....White/Red
Br/W.....Brown/White

YAMAHA MOTOR CO.,LTD.

PRINTED IN U.S.A

YAMAHA

YFB250(E) '93

SUPPLEMENTARY SERVICE MANUAL

LIT-11616-08-38

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service information and new data for the YFB250 (E) '93. For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with the following manuals:

YFB250 (D) '92 Service Manual: LIT-11616-08-17
4BD-ME1

YFB250 (E) '93
SUPPLEMENTARY
SERVICE MANUAL
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1st Edition, April 1992
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NOTICE

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

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

⚠	The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
⚠ WARNING	Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.
CAUTION:	A CAUTION indecates special precautions that must be taken to avoid damage to the machine.
NOTE:	A NOTE provides key information to make procedures easier or clearer.

HOW TO USE THIS MANUAL

CONSTRUCTION OF THIS MANUAL

This manual consists of chapters for the main categories of subjects. (See "Illustrated symbols")

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

2nd title ② : This title appears on the upper of each page on the left of the chapter symbol. (For the chapter "Periodic inspection and adjustment" the 3rd title appears.)

3rd title ③ : This is a final title.

MANUAL FORMAT

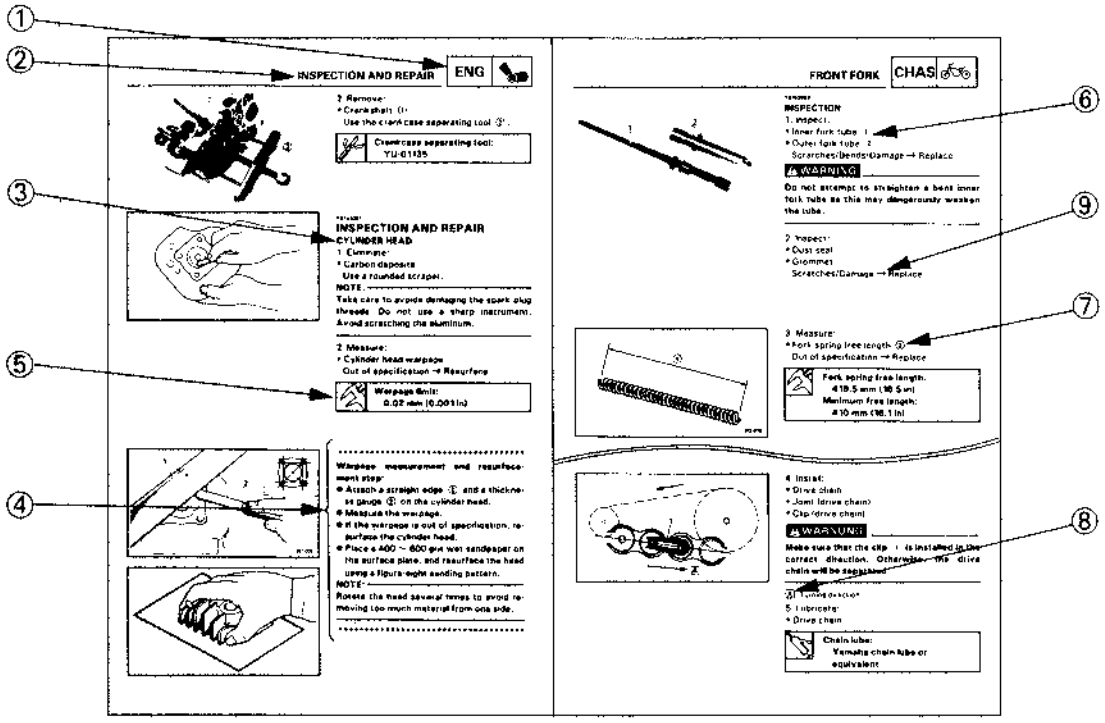
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections.
A set of particularly important procedure ④ is placed between a line of asterisks "*" with each procedure preceded by " ● ".

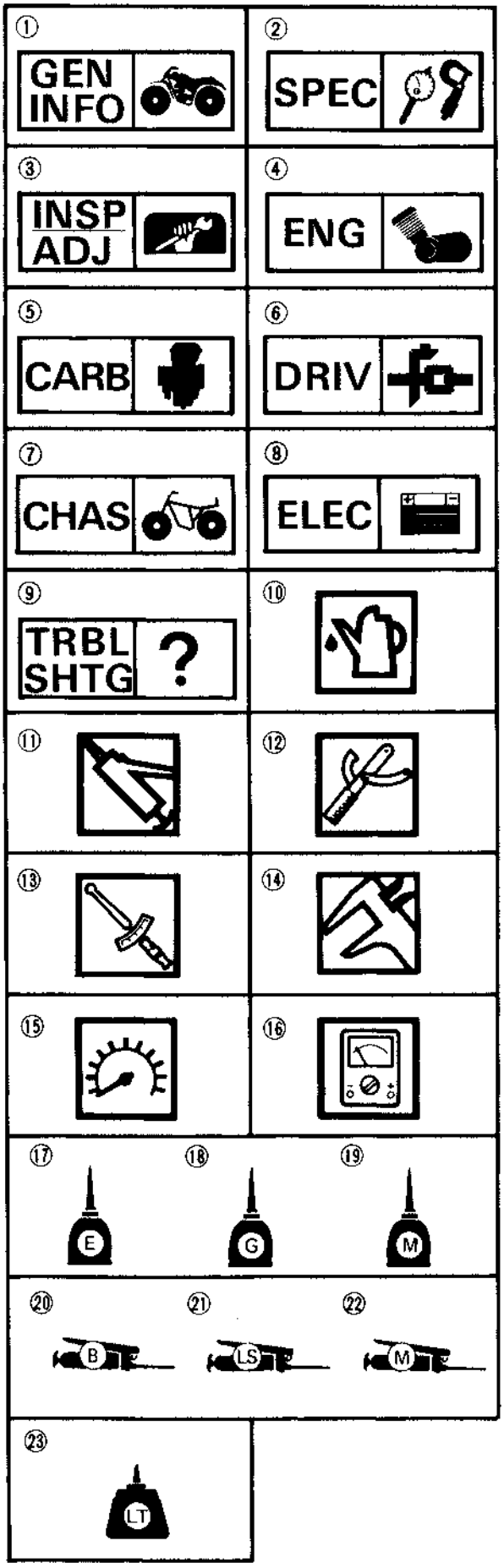
IMPORTANT FEATURES

- Data and a special tool are framed in a box preceded by a relevant symbol ⑤ .
- An encircled numeral ⑥ indicates a part name, and an encircled alphabetical letter data or an alignment mark ⑦ , the others being indicated by an alphabetical letter in a box ⑧ .
- A condition of a faulty component will precede an arrow symbol and the course of action required the symbol ⑨ .

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.





ILLUSTRATED SYMBOLS (Refer to the illustration)

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

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Carburetion
⑥ Drive train
⑦ Chassis
⑧ Electrical
⑨ Troubleshooting

Illustrated symbols ⑩ to ⑯ are used to identify the specifications appearing in the text.

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

Illustrated symbols ⑰ to ㉓ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑰ Apply engine oil
⑱ Apply gear oil
⑲ Apply molybdenum disulfide oil
⑳ Apply wheel bearing grease
㉑ Apply lightweight lithium-soap base grease
㉒ Apply molybdenum disulfide grease
㉓ Apply locking agent (LOCTITE®)

CONTENTS

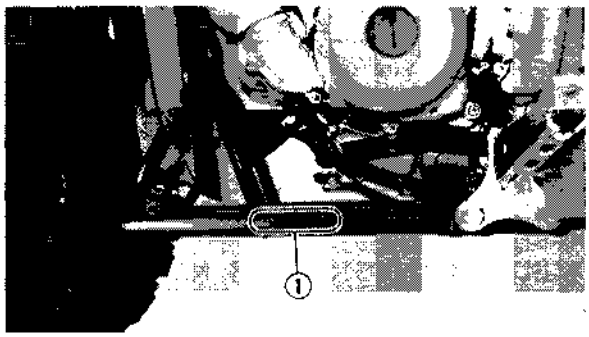
GENERAL INFORMATION 1
MACHINE IDENTIFICATION 1

SPECIFICATIONS 2
GENERAL SPECIFICATIONS 2
MAINTENANCE SPECIFICATIONS 3

PERIODIC INSPECTION AND ADJUSTMENT 4
REAR SHOCK ABSORBERS ADJUSTMENT 4

GENERAL INFORMATION

MACHINE IDENTIFICATION



VEHICLE IDENTIFICATION NUMBER (FOR USA, CDN AND AUS)

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

NOTE:

The vehicle identification number is used to identify your machine and may be used to register your machine with the licensing authority in your state.

Starting Serial Number:
For USA
JY44BDA0 * PA058101
For CDN
JY44BDN0 * PA089101
For AUS, NZ
JY44BDT0 * PA099101



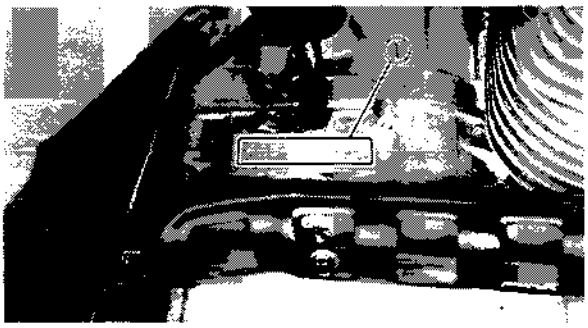
FRAME SERIAL NUMBER (EXCEPT FOR USA, CDN, AUS AND NZ)

The frame serial number ① is stamped into the left side of the frame.

NOTE:

The first three digits of these numbers are for model identification; the remaining digits are the unit production number.

Starting Serial Number:
4BD-099101



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the right side of the engine.

NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:
For USA
4BD-058101
For CDN
4BD-089101
Except for USA and CDN
4BD-099101

NOTE:

Designs and specifications are subject to change without notice.

SPECIFICATIONS

GENERAL SPECIFICATIONS

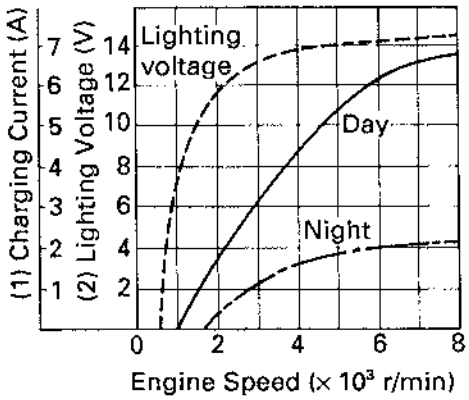
Model	YFB250(E) '93
Model Code Number:	4BD 4 (USA) 4BD 5 (CDN) 4BD 6 (CH, F, GB, AUS, NZ, ZA)
Vehicle Identification Number: (For USA, CDN and AUS)	JY44BDA0 * PA058101 (USA) JY44BDN0 * PA089101 (CDN) JY44BDT0 * PA099101 (AUS, NZ)
Frame Starting Number: (Except for USA, CDN, AUS and NZ)	4BD-099101
Engine Starting Number:	4BD-058101 (USA) 4BD-089101 (CDN) 4BD-099101 (Except for USA, CDN)
Dimensions: Overall Length Overall Width Overall Height Seat Height Wheelbase Minimum Ground Clearance	 1,742 mm (68.6 in) (USA) 1,826 mm (71.9 in) (Except for USA) 1,024 mm (40.3 in) 1,082 mm (42.6 in) 780 mm (30.7 in) 1,120 mm (44.1 in) 155 mm (6.1 in)

MAINTENANCE SPECIFICATIONS

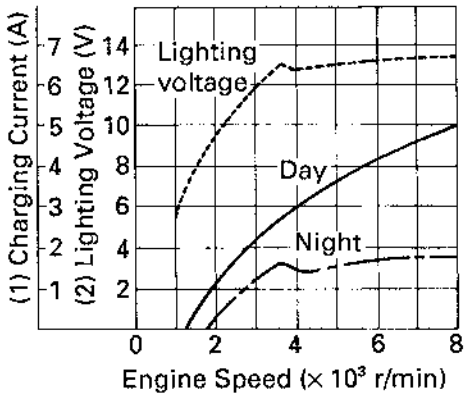
ELECTRICAL

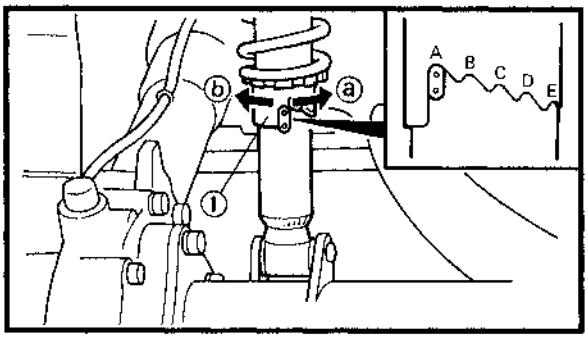
Model		YFB250(E) '93
CDI:		
Magneto-Model/Manufacturer		For USA: 4BD/MITSUBISHI Except for USA: 29U/MITSUBISHI
Pickup Coil Resistance (Color)		For USA: 189 ~ 231Ω at 20°C (68°F) (White/Green – White/Red) Except for USA: 176 ~ 216 Ω at 20°C (68°F) (White/Green – White/Red)
Source Coil Resistance (Color)		For USA: 428 ~ 523Ω at 20°C (68°F) (Brown – Black) Except for USA: 343 ~ 419 Ω at 20°C (68°F) (Brown – Black)
CDI Unit-Model/Manufacturer		4BD1/MITSUBISHI
Flywheel Magneto:		
Charging Current	Day:	1.8A or more at 3,000 r/min 4.5A or more at 8,000 r/min
	Night:	0.7A or more at 3,000 r/min 1.7A or more at 8,000 r/min
Charging Coil Resistance (Color)		For USA: 0.72 ~ 0.88Ω at 20°C (68°F) (White – Black) Except for USA: 0.36 ~ 0.44 Ω at 20°C (68°F) (White – Black)
Lighting Voltage		11.3V or more at 3,000 r/min For USA: 13.8 ~ 14.8V at 8,000 r/min Except for USA: 13.0 ~ 14.0 V at 8,000 r/min
Lighting Coil Resistance (Color)		For USA: 0.48 ~ 0.58Ω at 20°C (68°F) (Yellow – Black) Except for USA: 0.31 ~ 0.37 Ω at 20°C (68°F) (Yellow – Black)

For USA



Except for USA





PERIODIC INSPECTION AND ADJUSTMENT

REAR SHOCK ABSORBERS ADJUSTMENT

1. Adjust:
- Spring preload
  Turn the adjuster ① to direction ⓐ or ⓑ.

Turning toward ⓐ → Spring preload is softer.
Turning toward ⓑ → Spring preload is harder.

Adjuster position:
Standard A
Minimum A
Maximum E

YAMAHA MOTOR CO.,LTD.

PRINTED IN U.S.A.

YAMAHA

YFB250(D)'92

SERVICE MANUAL

LIT-11616-08-17

YFB250(D) '92
SERVICE MANUAL
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1st Edition, September 1991
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permission of Yamaha Motor Co., Ltd.
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NOTICE

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

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.

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

⚠	The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
⚠ WARNING	Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.
CAUTION:	A CAUTION indecates special precautions that must be taken to avoid damage to the machine.
NOTE:	A NOTE provides key information to make procedures easier or clearer.

HOW TO USE THIS MANUAL

CONSTRUCTION OF THIS MANUAL

This manual consists of chapters for the main categories of subjects. (See "Illustrated symbols")

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

2nd title ② : This title appears on the upper of each page on the left of the chapter symbol. (For the chapter "Periodic inspection and adjustment" the 3rd title appears.)

3rd title ③ : This is a final title.

MANUAL FORMAT

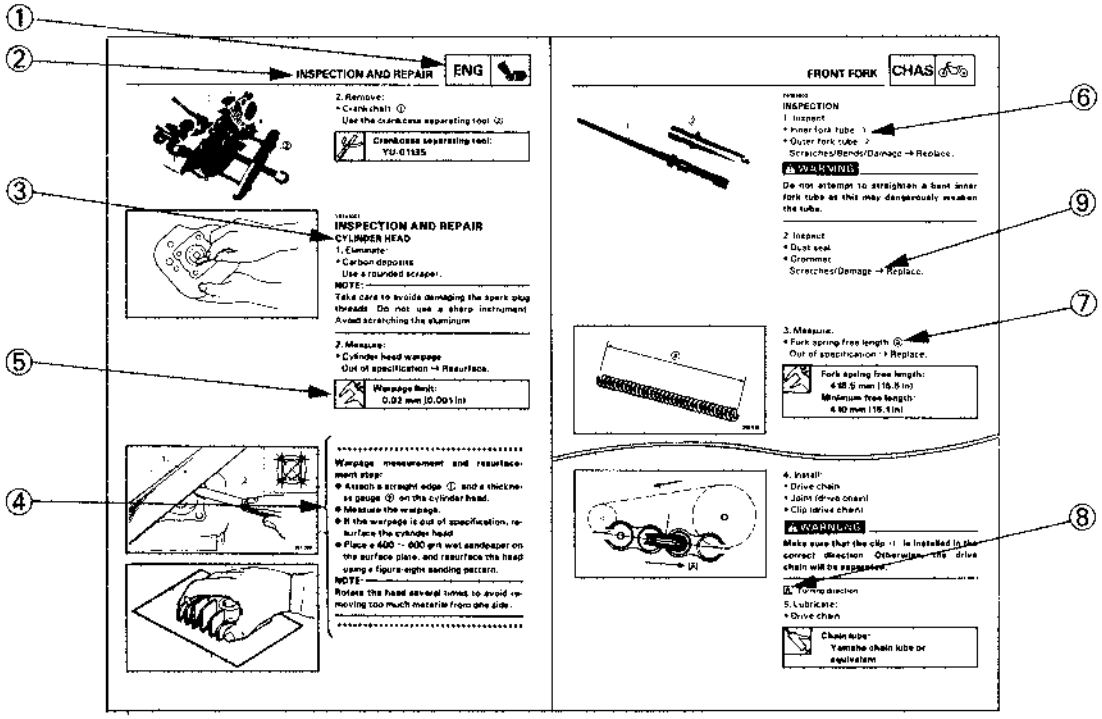
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections.
A set of particularly important procedure ④ is placed between a line of asterisks "*" with each procedure preceded by " ● ".

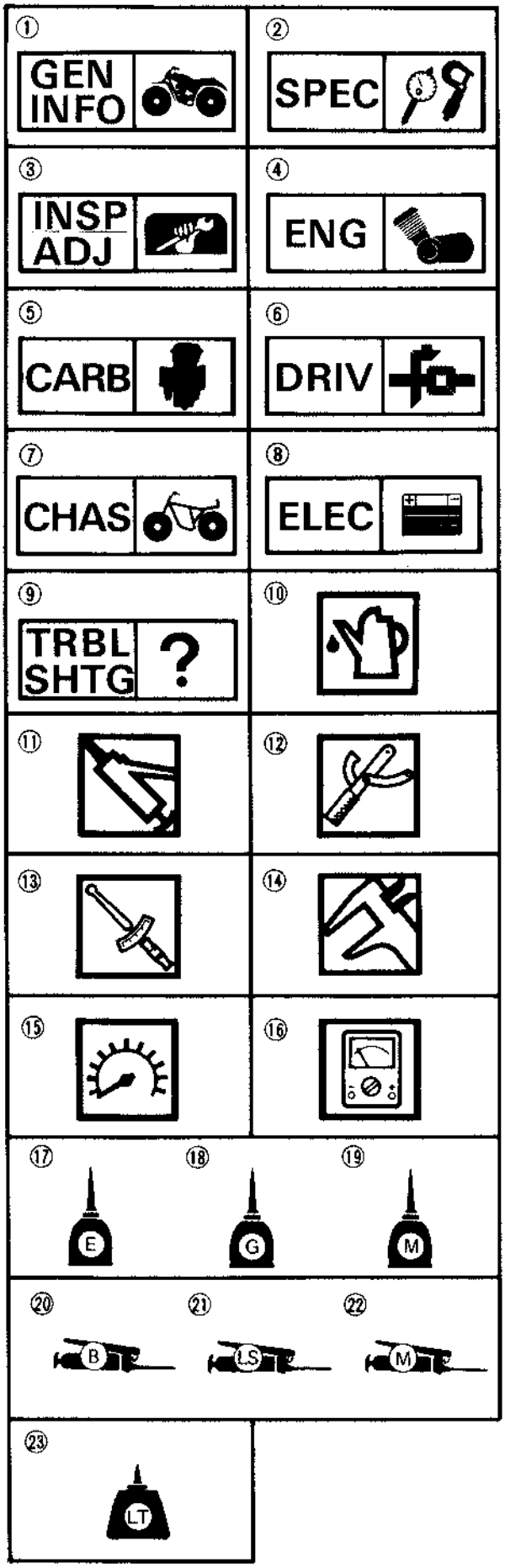
IMPORTANT FEATURES

- Data and a special tool are framed in a box preceded by a relevant symbol ⑤ .
- An encircled numeral ⑥ indicates a part name, and an encircled alphabetical letter data or an alignment mark ⑦ , the others being indicated by an alphabetical letter in a box ⑧ .
- A condition of a faulty component will precede an arrow symbol and the course of action required the symbol ⑨ .

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.





ILLUSTRATED SYMBOLS (Refer to the illustration)

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

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Carburetion
⑥ Drive train
⑦ Chassis
⑧ Electrical
⑨ Troubleshooting

Illustrated symbols ⑩ to ⑯ are used to identify the specifications appearing in the text.

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

Illustrated symbols ⑰ to ㉓ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑰ Apply engine oil
⑱ Apply gear oil
⑲ Apply molybdenum disulfide oil
⑳ Apply wheel bearing grease
㉑ Apply lightweight lithium-soap base grease
㉒ Apply molybdenum disulfide grease
㉓ Apply locking agent (LOCTITE®)

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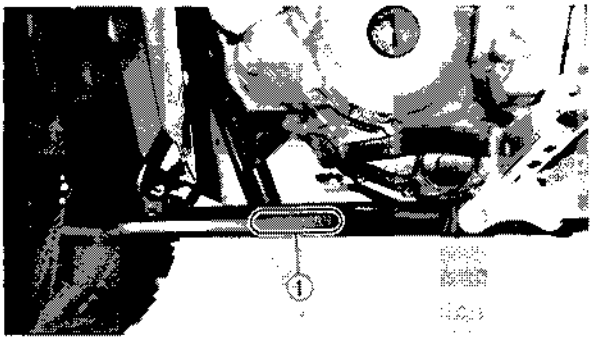
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GENERAL INFORMATION

MACHINE IDENTIFICATION



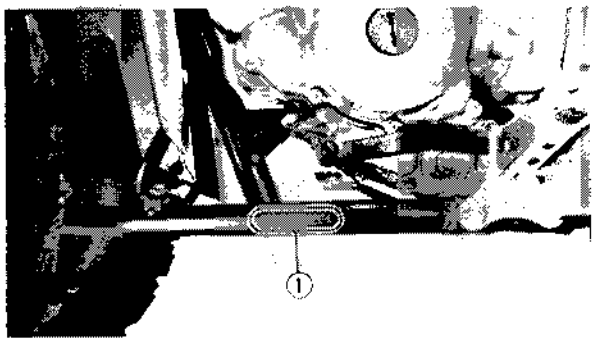
VEHICLE IDENTIFICATION NUMBER (FOR USA, CDN AND AUS)

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

NOTE:

The vehicle identification number is used to identify your machine and may be used to register your machine with the licensing authority in your state.

Starting Serial Number:
For USA
JY44BDA0*NA000101
For CDN
JY44BDN0*NA031101
For AUS
JY44BDT0*NA050101



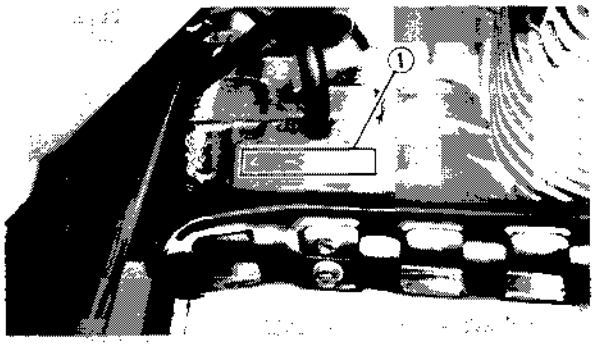
FRAME SERIAL NUMBER (EXCEPT FOR USA, CDN AND AUS)

The frame serial number ① is stamped into the left side of frame.

NOTE:

The first three digits of these numbers are for model identification; the remaining digits are the unit production number.

Starting Serial Number:
4BD-050101



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the right side of the engine.

NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

Starting Serial Number:
For USA
4BD-000101
For CDN
4BD-031101
Except for USA and CDN
4BD-050101

NOTE:

Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to the "CHAPTER 1. GENERAL INFORMATION-SPECIAL TOOLS" section.
3. When disassembling the machine, keep mated parts together. This includes gears, cylinder, piston and other parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.
4. During the machine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled.
5. Keep away from fire.

ALL REPLACEMENT PARTS

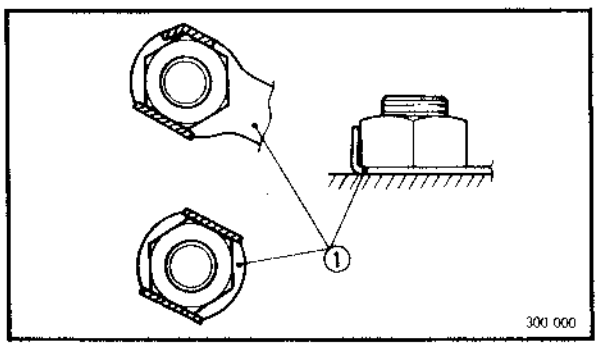
1. We recommend to use Yamaha genuine parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment.

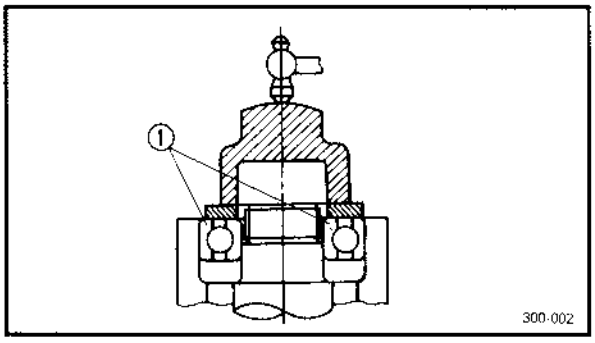
GASKETS, OIL SEALS, AND O-RINGS

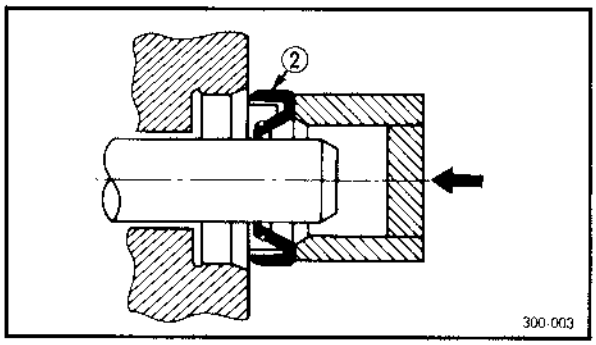
1. All gaskets, seal, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips, and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.

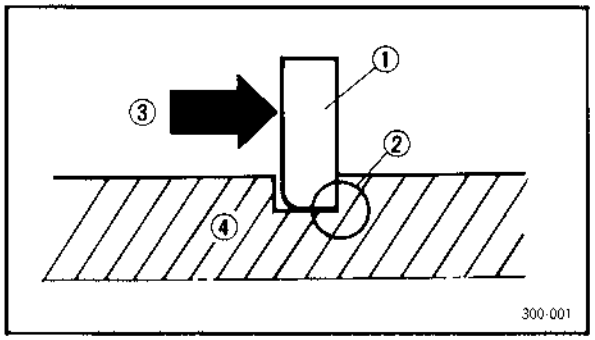
LOCK WASHERS/PLATES AND COTTER PINS

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









BEARINGS AND OIL SEALS

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

⚠ WARNING

Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces and may cause the bearing to explode.

CIRCLIPS

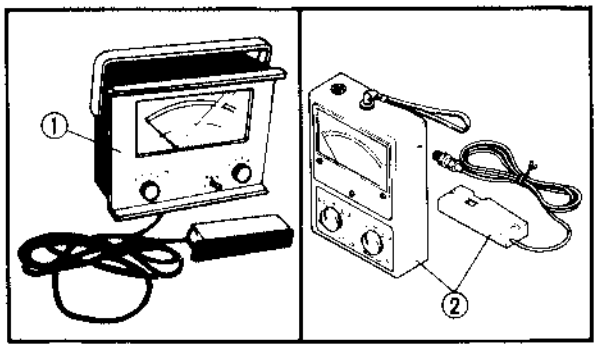
1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlip ①, make sure that the sharp-edged corner ② is positioned opposite to the thrust ③ it receives. See the sectional view.

④ Shaft

SPECIAL TOOLS

The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques. The shape and part number used for the special tool differ by country, so two types are prouided. Refer to the list prouided to avoid errors when placing an order.

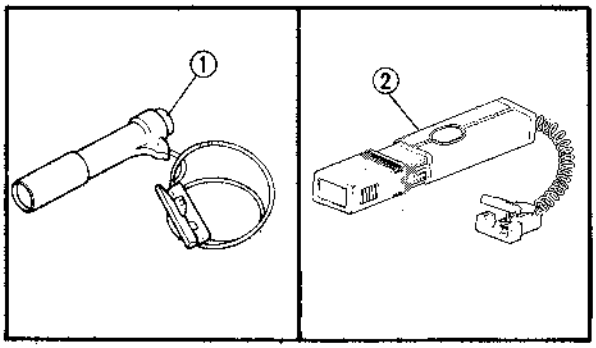
P/N. YM- □□□□□ , YU- □□□□□ } For US, CDN
YS- □□□□□ , YK- □□□□□ } For US, CDN
ACC- □□□□□ } For US, CDN
P/N. 90890- □□□□□ } Except for US, CDN



FOR TUNE UP

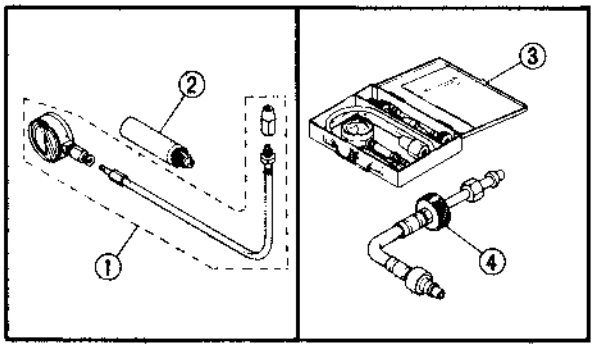
1. Inductive tachometer
   P/N. YU-08036-A- ①
   P/N. 90890-03113- ②

This tool is needed for detecting engine rpm.



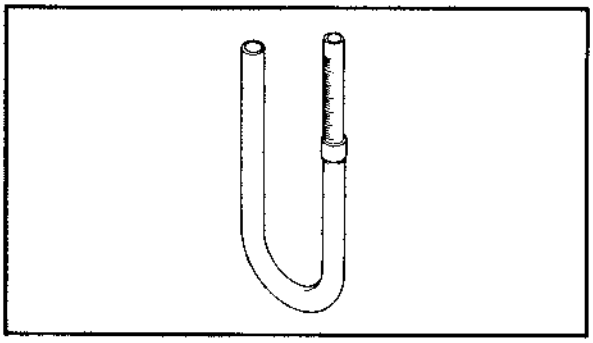
2. Inductive timing light
   P/N. YM-33277-A- ①
   P/N. 90890-03141- ②

This tool is necessary for checking ignition timing.



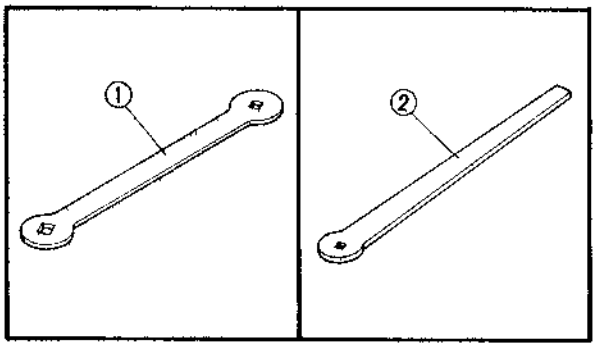
3. Compression gauge
   P/N. YU-33223- ①
   P/N.90890-03081- ③
   Adapter (M12)
   P/N. YU-33223-3- ②
   Extension
   P/N. 90890-04082- ④

These gauges are used to measure the engine compression.



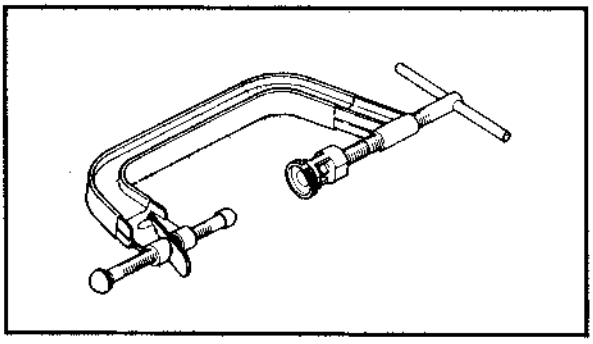
4. Fuel level gauge
   P/N. YM-01312-A
   P/N. 90890-01312

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



5. Valve adjusting tool 3 mm (0.12 in)
   P/N. YM-08035- ①
   P/N. 90890-01311- ②

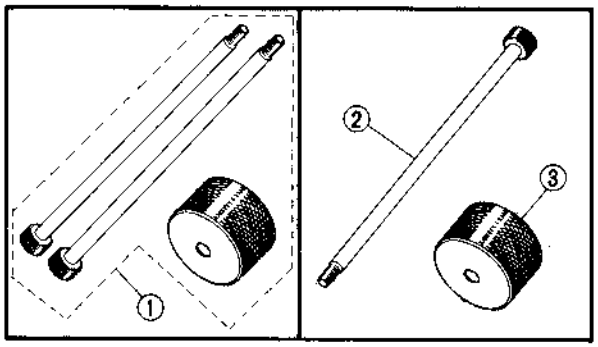
This tool is necessary for adjusting the valve clearance.



FOR ENGINE SERVICE

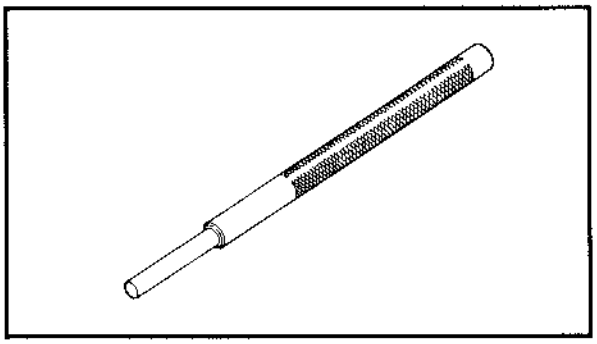
1. Valve spring compressor
   P/N. YM-04019
   P/N.90890-04019

This tool is needed to remove and install the valve assemblies.



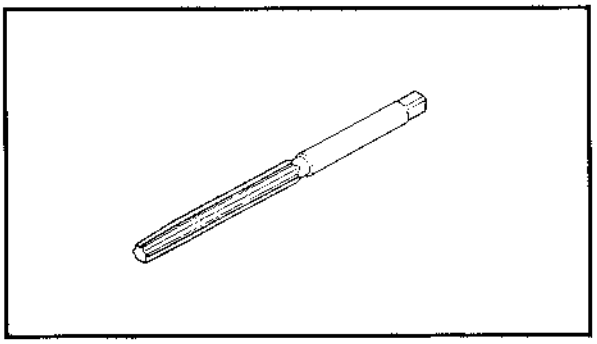
2. Slide hammer set
   P/N. YU-01083-A- ①
   Slide hammer bolt
   P/N. 90890-01083- ②
   Weight
   P/N.90890-01084- ③

These tools are used when removing the rocker arm shaft.



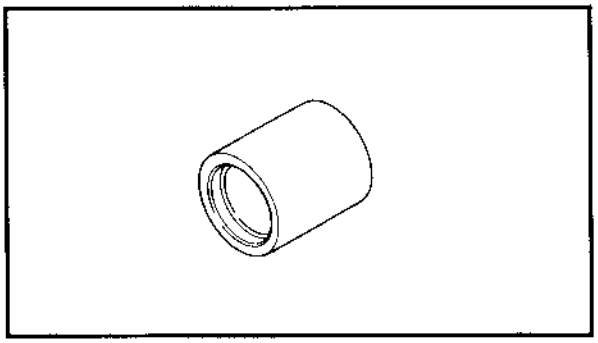
3. Valve guide remover 6 mm (0.24 in)
   P/N. YM-04064-A
   P/N. 90890-04064

This tool is used to remove the valve guides.



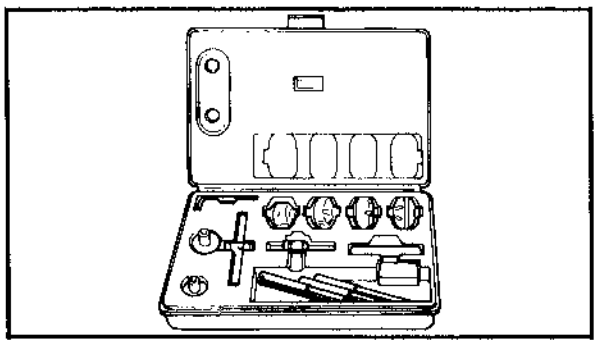
4. Valve guide reamer 6 mm (0.24 in)
   P/N. YM-04066
   P/N. 90890-04066

This tool is used rebore the new valve guide.



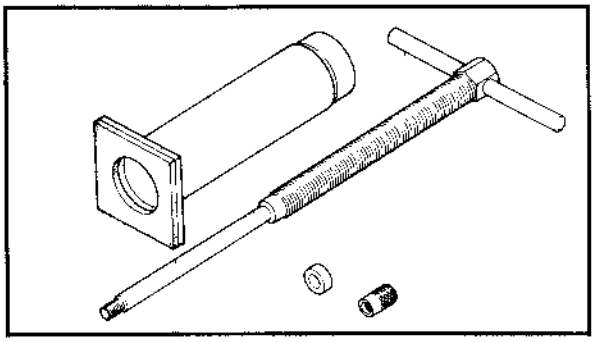
5. Valve guide installer 6 mm (0.24 in)
   P/N. YM-4065-A
   P/N. 90890-04065

This tool is needed to install the valve guides properly.



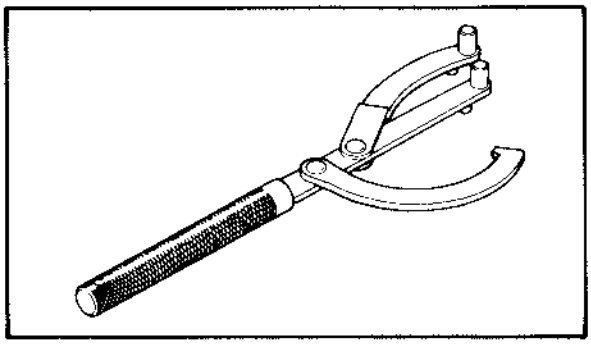
6. Valve seat cutter set
   P/N. YM-91043-B

This tool is needed to resurface the valve seat.



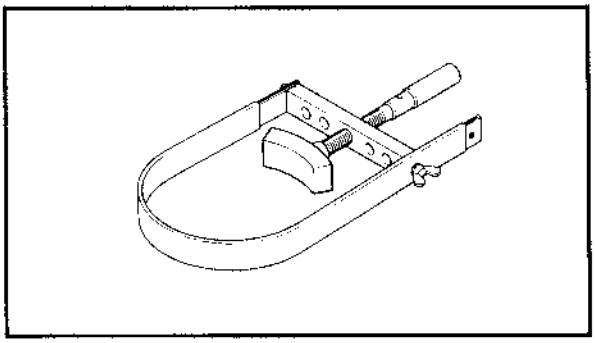
7. Piston pin puller
   P/N. YU-01304
   P/N. 90890-01304

This tool is used to remove the piston pin.



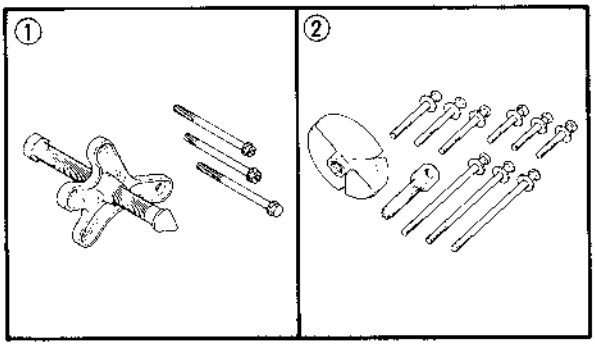
8. Rotor Holder
   P/N. YU-01235
   P/N. 90890-01235

This tool is used to hold the starter pulley and clutch when removing or installing the starter pulley and clutch boss securing nut.



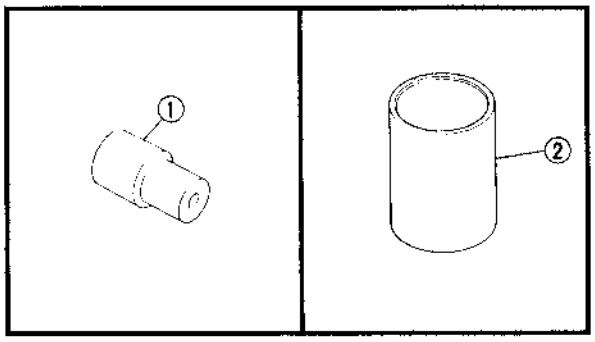
9. Rotor holder
   P/N. YS-01880
   P/N. 90890-01701

This tool is used to hold the flywheel magnet rotor when removing or installing the rotor securing nut.



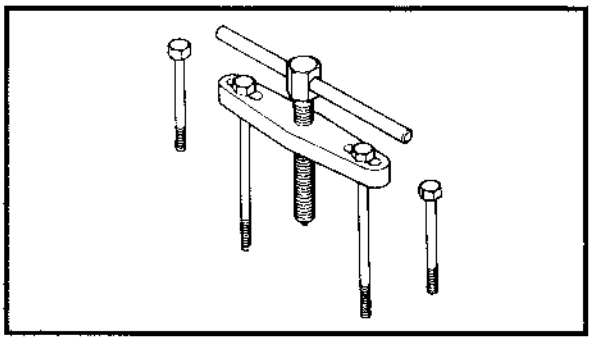
10. Rotor puller
    P/N. YU033270- ①
    P/N. 90890-01362- ②

This tool is used to remove the flywheel magnet rotor.



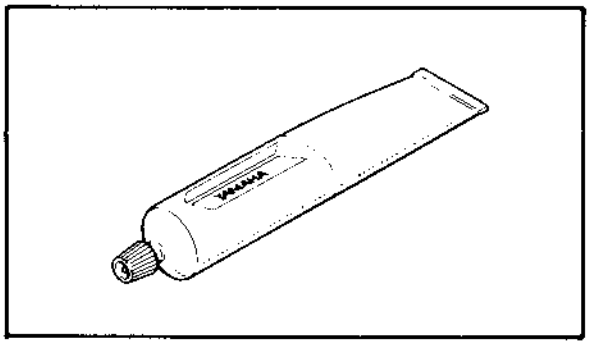
11. Flywheel puller attachment
    P/N. YU-33282- ①(for USA)
    P/N. 90890-04089
    Fly wheel puller attachment
    P/N. YM-33278- ②(except for USA)
    P/N. 90890-04087

These tools are used to remove the flywheel magnet rotor and crankcase.



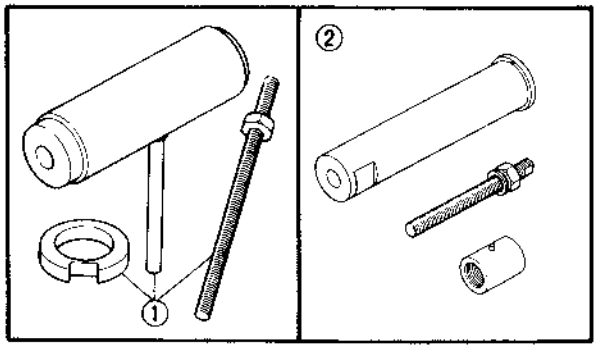
12. Crankcase Separating Tool
    P/N. YU-01135-A
    P/N. 90890-01135

These tools are used when separating the crankcase.



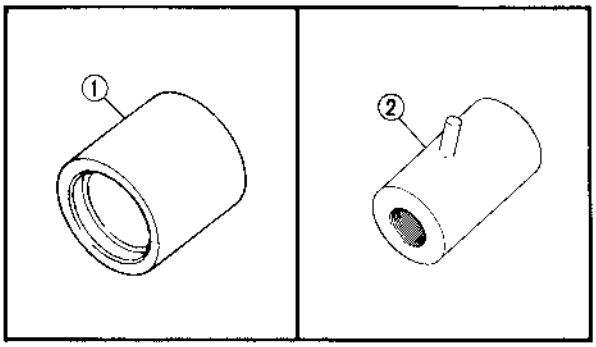
13. Apply
    Sealant (Quick gasket®)
    P/N. ACC-11001-01
    Yamaha Bond No. 1215
    P/N. 90890-85505

This sealant (bond) is used for crankcase mating surfaces, etc.



14. Crankshaft installer set
    P/N. YU-90050- ①
    Buffer boss installer set
    P/N. 90890-04088- ②

These tools are used to install the crankshaft, and balancer drive gear.

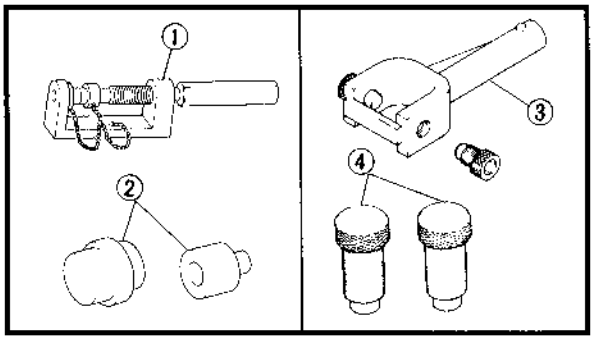


15. Pot extension
    P/N. YM-90070-A- ①
    P/N. 90890-04060

This tool is used to install the crankshaft, and balancer drive gear.

    Adapter #11
    P/N. YM-33279- ②

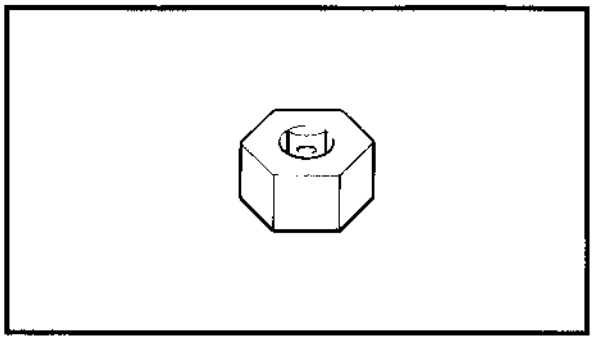
This tool is used to install the crankshaft, and balancer drive gear.



FOR MIDDLE GEAR SERVICE

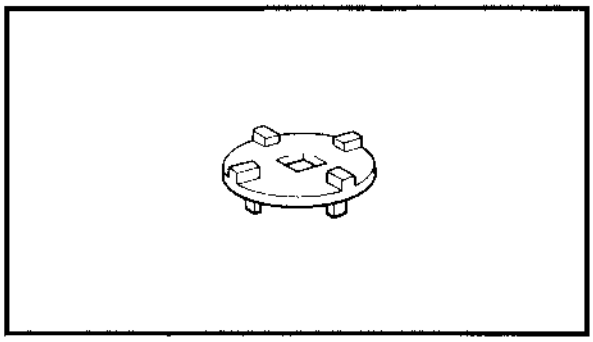
1. Universal Joint Holder
    P/N. YM-04062- ①
    P/N. 90890-04062- ③
    Attachment
    P/N.YM-33291- ②
    P/N. 90890-04096- ④

These tools are used to remove and install the universal joint.



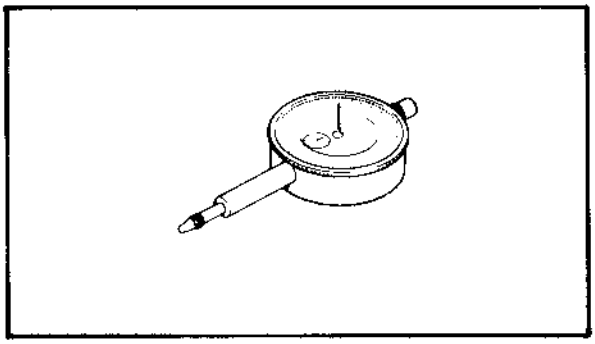
2. Bearing retainer wrench
   P/N. YM-33289
   P/N. 90890-04104

This tool is used to disassemble and reassemble the bearing.



3. Ring nut wrench
   P/N. YM-1391
   P/N. 90890-01391

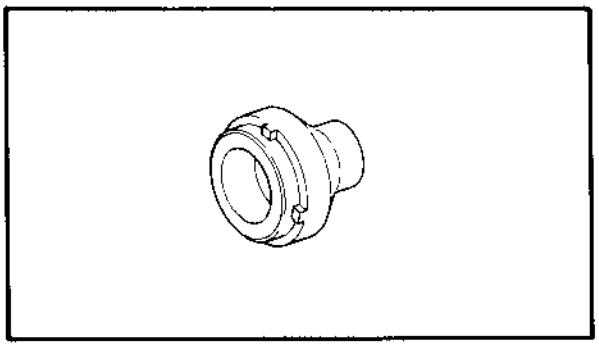
This tool is used to remove and install the reverse gear.



4. Dial Gauge
   P/N. YM-03097
   P/N. 90890-03097

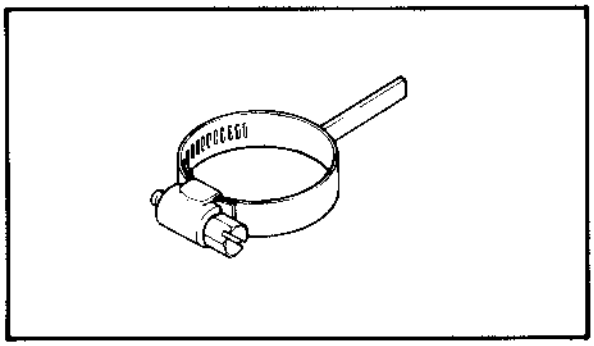
This tool is used to measure the gear lash for the middle gear and final gear.

FOR FINAL GEAR SERVICE



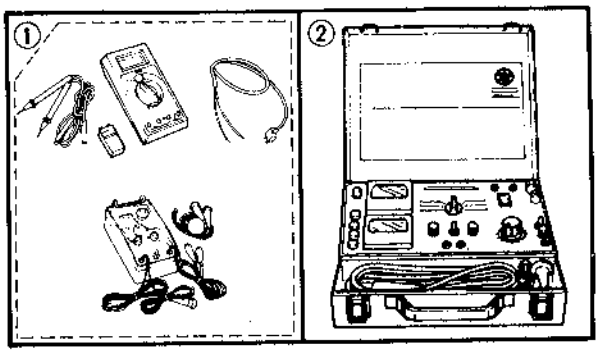
1. Final Drive Shaft Bearing Retainer Wrench
   P/N.YM-04050
   P/N. 90890-04050

This tool is used to remove and install the final gear bearing retainer.



2. Gear Lash Measurement Tool
   P/N. YM-01231
   P/N. 90890-01231

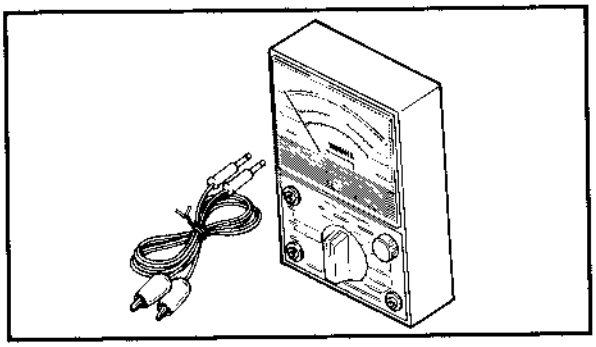
This tool is used to measure the gear lash.



FOR ELECTRICAL COMPONENTS

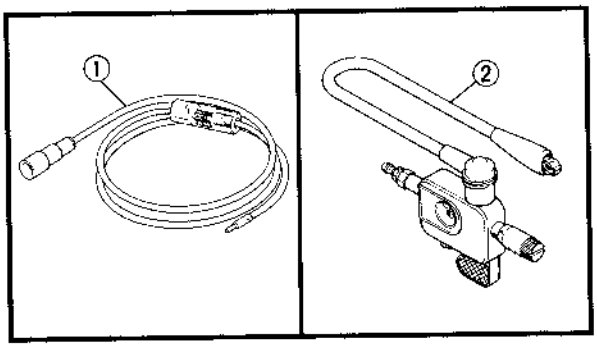
1. Elector tester
   P/N. YU-33260-A- ①
   P/N. 90890-03021- ②

This instrument is necessary for checking the ignition system components.



2. Pocket tester
   P/N. YU-03112
   P/N. 90890-03112

This instrument is available for checking the electrical system.

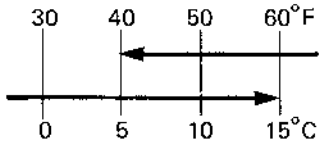


3. Dynamic spark tester
   P/N. YM-34487 – ①
   Ignition checker
   P/N. 90890-06754 – ②

This instrument is necessary for checking the ignition system components.

SPECIFICATIONS

GENERAL SPECIFICATIONS

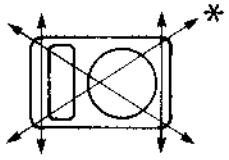
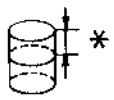
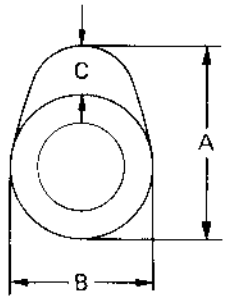
Model	YFB250(D) '92
Model Code Number:	4BD 1 (USA) 4BD 2 (CDN) 4BD 3 (CH, F, GB, AUS, NZ, ZA)
Vehicle Identification Number: (For USA, CDN and AUS)	JY44BDA0*NA000101 (USA) JY44BDN0*NA031101 (CDN) JY44BDT0*NA050101 (AUS)
Frame Starting Number: (Except for USA, CDN and AUS)	4BD-050101
Engine Starting Number:	4BD-000101 (USA) 4BD-031101 (CDN) 4BD-050101 (CH, F, GB, AUS, NZ, ZA)
Dimensions: Overall Length Overall Width Overall Height Seat Height Wheelbase Minimum Ground Clearance	 1,742 mm (68.6 in) (USA) 1,826 mm (71.9 in) (Except for USA) 1,024 mm (40.3 in) 1,082 mm (42.6 in) 778 mm (30.6 in) 1,120 mm (44.1 in) 155 mm (6.1 in)
Basic Weight: With Oil and Full Fuel Tank	 188 kg (414 lb) (USA) 195 kg (430 lb) (CDN) 197.5 kg (435 lb) (Except for USA and CDN)
Minimum Turning Radius:	2,900 mm (114 in)
Engine: Engine Type Cylinder Arrangement Displacement Bore × Stroke Compression Ratio Compression Pressure Starting System	 Air cooled 4-stroke gasoline, SOHC Forward inclined single cylinder 229.6 cm^3 71 × 58 mm (2.795 × 2.283 in) 8.7 : 1 900 kPa (9.0 kg/cm^2, 128 psi) Electric starter (For USA) Electric and Recoil starter (Except for USA)
Lubrication System:	Wet sump
Oil Type or Grade: Engine Oil  Final Gear Oil	 Yamalube 4 (20W40) or SAE 20W40 type SE motor oil (If temperature does not go below 5°C (40°F)) Yamalube 4 (10W30) or SAE 10W30 type SE motor oil (If temperature does not go above 15°C (60°F)) SAE 80 API "GL-4" Hypoid Gear Oil

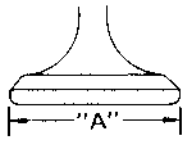
Model	YFB250(D) '92
Oil Capacity:	
Engine Oil:	
Periodic Oil Change	1.5 L (1.3 Imp qt, 1.6 US qt)
With Oil Filter Replacement	1.6 L (1.4 Imp qt, 1.7 US qt)
Total Amount	1.8 L (1.6 Imp qt, 1.9 US qt)
Final Gear Case:	
Total Amount	0.13 L (0.11 Imp qt, 0.14 US qt)
Periodic Oil Change	0.12 L (0.10 Imp qt, 0.13 US qt)
Air Filter:	Wet type element
Fuel:	
Type	Unleaded Fuel Recommended (USA) Regular Unleaded Gasoline (CDN) Regular Unleaded Gasoline with a Research Octane Number of 91 or Higher (EUR) Unleaded Fuel Only (AUS) Regular Gasoline (OCE)
Fuel Tank Capacity	9.7 L (2.13 Imp gal, 2.56 US gal)
Fuel Reserve Amount	2.0 L (0.44 Imp gal, 0.53 US gal)
Carburetor:	
Type/Quantity	VM24SH/1 pc.
Manufacturer	MIKUNI
Spark Plug:	
Type/Manufacture	For USA and Oceania: D7EA/NGK or X22ES-U/NIPPONDENSO For CDN, Europe and ZA: DR7ES/NGK
Spark Plug Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Clutch Type:	Wet, Centrifugal Automatic
Transmission:	
Primary Reduction System	Spur Gear
Primary Reduction Ratio	73/22 (3.318)
Secondary Reduction System	Shaft Drive
Secondary Reduction Ratio	19/18 × 46/11 (4.414)
Transmission Type	Constant Mesh 5-Speed
Operation	Left Foot Operation
Gear Ratio: 1st	34/12 (2.833)
2nd	34/19 (1.789)
3rd	29/22 (1.318)
4th	26/25 (1.040)
5th	23/28 (0.821)
Reverse Gear Ratio	73/22 × 34/12 × 19/18 × 46/11 (41.500)
Chassis:	
Frame Type	Steel Tube Frame
Caster Angle	4°
Trail	20 mm (0.79 in)
Tread (Standard): Front	785 mm (30.9 in)
Rear	770 mm (30.3 in)
Toe-in	0 ~ 10 mm (0 ~ 0.39 in)

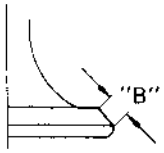
Model	YFB250(D) '92	
Tire:	Front	Rear
Type	Tubeless	Tubeless
Size	AT22 × 7-10	AT22 × 10-10
Manufacture (type)	DUNLOP (KT701)	DUNLOP (KT705)
< Wear limit >	< 2.0 mm (0.8 in) >	< 2.0 mm (0.08 in) >
Tire Pressure (Cold Tire):	Front	Rear
Recommended	20 kPa (0.20 kg/cm², 2.8 psi)	25 kPa (0.25 kg/cm², 3.6 psi)
Minimum	17 kPa (0.17 kg/cm², 2.4 psi)	22 kPa (0.22 kg/cm², 3.1 psi)
Maximum	23 kPa (0.23 kg/cm², 3.2 psi)	28 kPa (0.28 kg/cm², 4.0 psi)
Brake:		
Front Brake Type	Drum Brake	
Front Brake Operation	Right Hand Operation	
Rear Brake Type	Drum Brake (Full Seald)	
Rear Brake Operation	Left Hand and Right Foot Operation	
Suspension:		
Front	Strut - Type	
Rear	Swingarm (Monocross)	
Shock Absorber:		
Front	Coil Spring/Oil Damper	
Rear	Coil Spring/Oil Damper	
Wheel Travel:		
Front	125 mm (4.92 in)	
Rear	125 mm (4.92 in)	
Electrical:		
Ignition System	C.D.I	
Generator System	Flywheel Magneto	
Headlight Type	Bulb type	
Bulb Wattage × Quantity:		
Headlight	12V,25W/25W × 2pcs.	
Tail Light	12V, 7.5W × 1pc.	
Indicator Light:		
"NEUTRAL"	12V, 3.4W × 1pc.	
"REVERSE"	12V, 3.4W × 1pc.	

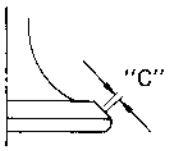
MAINTENANCE SPECIFICATIONS

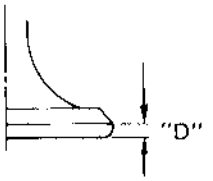
ENGINE

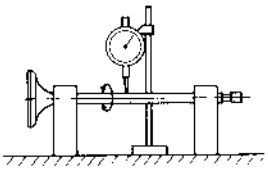
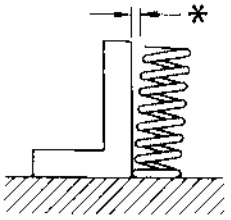
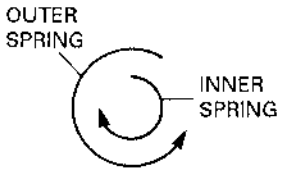
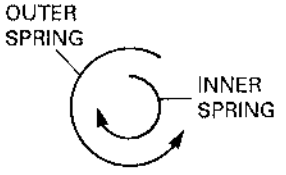
Model	YFB250(D) '92
Cylinder Head: < Warp Limit >* 	< 0.03 mm (0.0012 in) > *Lines indicate straight edge measurement.
Cylinder: Bore Size/Measuring Point*  < Wear Limit >	70.97 ~ 71.02 mm (2,794 ~ 2,796 in) 45 mm (1.77 in) < 71.10 mm (2.799 in) >
Camshaft: Drive Method Cam Dimensions: Intake: "A" < Limit > "B" < Limit > "C" Exhaust: "A" < Limit > "B" < Limit > "C" < Camshaft runout Limit > 	Chain drive (Left) 36.587 mm (1.4404 in) < 36.487 mm (1.4365 in) > 30.181 mm (1.1882 in) < 30.081 mm (1.1843 in) > 6.587 mm (0.2593 in) 36.632 mm (1.4422 in) < 36.532 mm (1.4383 in) > 30.302 mm (1.1930 in) > < 30.202 mm (1.1891 in) > 6.632 mm (0.2611 in) < 0.03 mm (0.0012 in) >
Rocker Arm and Rocker Arm Shaft: Rocker Arm Inside Diameter Shaft Outside Diameter Arm-to-Shaft Clearance < Limit >	 12.000 ~ 12.018 mm (0.4724 ~ 0.4731 in) 11.985 ~ 11.991 mm (0.4718 ~ 0.4721 in) 0.009 mm (0.0004 in) < 0.037 mm (0.0015 in) >
Cma Chain: Cam Chain Type/No. of Links Cam Chain Adjustment Method	 DID25SH/104 Automatic
Valve, Valve Seat, Valve Guide: Valve Clearance (Cold): IN. EX.	 0.05 ~ 0.09 mm (0.002 ~ 0.004 in) 0.11 ~ 0.15 mm (0.004 ~ 0,006 in)









Model		YFB250(D) '92
"A" Head Diameter	IN.	33.9 ~ 34.1 mm (1.335 ~ 1.343 in)
	EX.	28.4 ~ 28.6 mm (1.118 ~ 1.126 in)
"B" Face Width	IN.	2.26 mm (0.089 in)
	EX.	2.26 mm (0.089 in)
"C" Seat Width	IN.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
	EX.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
< Limit>	IN.	< 1.6 mm (0.063 in) >
	EX.	< 1.6 mm (0.063 in) >
"D" Margin Thickness	IN.	0.8 ~ 1.2 mm (0.032 ~ 0.047 in)
	EX.	0.8 ~ 1.2 mm (0.032 ~ 0.047 in)
Stem Outside Diameter	IN.	5.975 ~ 5.990 mm (0.235 ~ 0.236 in)
	EX.	5.960 ~ 5.975 mm (0.234 ~ 0.235 in)
Guide Inside Diameter	IN.	6.000 ~ 6.012 mm (0.236 ~ 0.237 in)
	EX.	6.000 ~ 6.012 mm (0.236 ~ 0.237 in)
Stem-to-Guide Clearance	IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
	EX.	0.025 ~ 0.052 mm (0.001 ~ 0.002 in)
< Limit >	IN.	< 0.08 mm (0.0031 in) >
	EX.	< 0.10 mm (0.0039 in) >
< Stem Runout Limit >		< 0.03 mm (0.0012 in) >
		
Valve Spring:		
Free Length:		
Inner Spring	IN.	35.5 mm (1.4 in)
	EX.	35.5 mm (1.4 in)
Outer Spring	IN.	37.2 mm (1.46 in)
	EX.	37.2 mm (1.46 in)
Compressed Length (Valve Closed):		
Inner Spring	IN.	30.5 mm (1.2 in)
	EX.	30.5 mm (1.2 in)
Outer Spring	IN.	32.0 mm (1.26 in)
	EX.	32.0 mm (1.26 in)
< Tilt Limit > * :	IN. & EX.	< 2.5° or 1.6 mm (0.06 in) >
		
Direction of Winding (Top view):	IN	EX
		

Model	YFB250(D) '92
Piston:	
Piston size "D"	70.92 ~ 70.97 mm (2,792 ~ 2,794 in)
Measuring Point "H"	4.0 mm (0.16 in)
	(From bottom line of piston skirt)
Piston Over Size: 2nd	71.50 mm (2,815 in)
4th	72.00 mm (2,846 in)
Piston off-set	0.5 mm (0.02 in)
Piston off-set Dirrection	IN Side
Piston-to-cylinder Clearance	0.04 ~ 0.06 mm (0.0016 ~ 0.0024 in)
< Limit >	< 0.10 mm (0.004 in) >
Piston Pin Bore Inside Diameter	16.002 ~ 16.013 mm (0.63 ~ 0.6304 in)
Piston Pin Outside Diameter	15.991 ~ 16.000 mm (0.6296 ~ 0.6299 in)
Piston Ring:	
Top Ring	
Type	Barrel
Dimensions (B × T)	1.2 × 2.8 mm (0.047 × 0.110 in)
End Gap (Installed)	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
< Limit >	< 0.4 mm (0.016 in) >
Side Clearance (Installed)	0.03 ~ 0.07 mm (0.001 ~ 0.003 in)
< Limit >	< 0.12 mm (0,005 in) >
2nd Ring:	
Type	Taper
Dimensions (B × T)	1.2 × 2.8 mm (0.047 × 0.110 in)
End Gap (Installed)	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
< Limit >	< 0.4 mm (0.016 in) >
Side Clearance	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
< Limit >	< 0.12 mm (0.005 in) >
Oil Ring:	
Dimensions (B × T)	2.5 × 2.8 mm (0.098 × 0.110 in)
End Gap (Installed)	0.3 ~ 0.9 mm (0.012 ~ 0.035 in)
Crankshaft:	
Crank Width "A"	55.95 ~ 56.00 mm (2.203 ~ 2.205 in)
< Runout Limit "C1" >	< 0.03 mm (0.0012 in) >
< Runout Limit "C2" >	< 0.06 mm (0.0024 in) >
Big End Side Clearance "D"	0.35 ~ 0.65 mm (0.014 ~ 0.026 in)
Big End Side Clearance "E"	0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in)
Small End Free Play "F"	0.8 ~ 1.0 mm (0.032 ~ 0.040 in)
< Limit >	< 2.0 mm (0.08 in) >
Ballancer Drive Method:	Gear

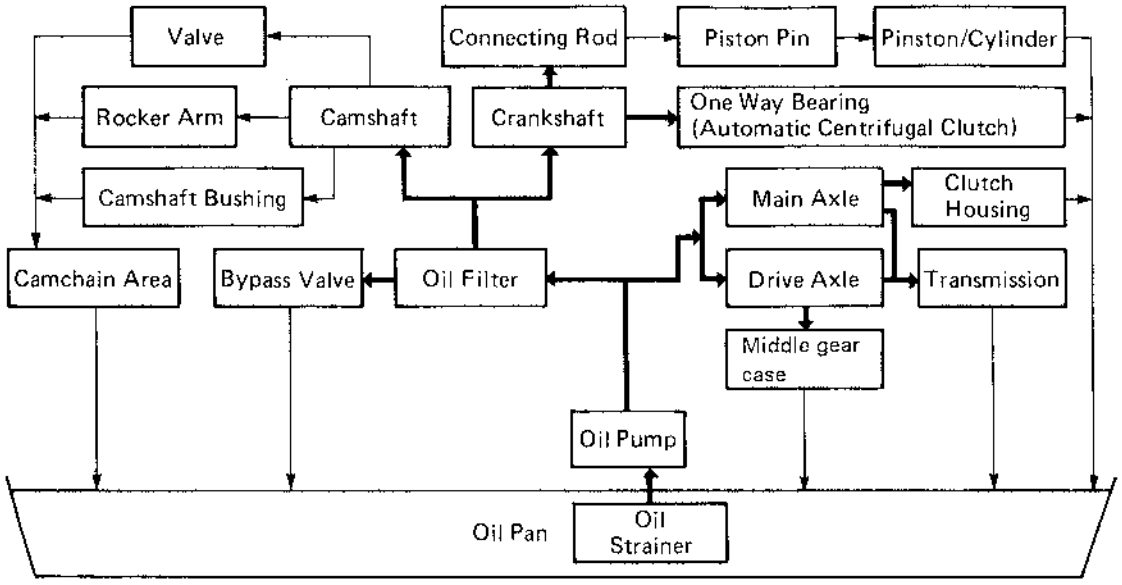
Model		YFB250(D) '92
Clutch:		
Friction Plate:	Thickness	2.92 ~ 3.08 mm (0.115 ~ 0.121 in)
	Quantity	5 pcs.
	< Wear Limit >	< 2.8 mm (0.110 in) >
Clutch Plate:	Thickness	1.45 ~ 1.75 mm (0.057 ~ 0.069 in)
	Quantity	4 pcs.
	< Warp Limit >	< 0.2 mm (0.008 in) >
Clutch Spring:	Free Length	34.9 mm (1.37 in)
	Quantity	4 pcs.
	< Minimum Length >	< 32.9 mm (1.30 in) >
Clutch Release Method		Outer Push, Cam Push
Automatic Centrifugal Clutch:		
Clutch Shoe:	Thickness	2.0 mm (0.08 in)
	Quantity	3 pcs.
	< Wear Limit >	<1.5 mm (0.06 in)>
Clutch Shoe Spring Free Length		32.47 mm (1.278 in)
Clutch-In Revolution		1,800 ~ 2,100 r/min
Clutch-Stall Revolution		3,200 ~ 3,600 r/min
Transmission:		
< Main Axle Deflection Limit >		< 0.08 mm (0.0031 in) >
< Drive Axle Deflection Limit >		< 0.08 mm (0.0031 in) >
Shifter:		
Shifter Type		Cam Drum and Guide Bar
< Guide Bar Bending Limit >		<0.8 mm (0.032 in)>
Carburetor:		
I.D. Mark		4BD00
Main Jet	(M.J.)	#85
Main Air Jet	(M.A.J.)	ø1.6
Jet Needle	(J.N.)	5L10-4
Needle Jet	(N.J.)	O-4 (#390)
Cutaway	(C.A.)	3.5
Pilot Jet	(P.J.)	#20
Pilot Air Jet	(P.A.J.)	#120
Pilot Screw	(P.S.)	1 and 1/4 turns out
Pilot Outlet	(P.O.)	ø0.7
Bypass	(B.P. 1)	ø0.9
Valve Seat Size	(V.S.)	ø1.8
Starter Jet	(G.S. 1)	#70
Fuel Level		2.0 ~ 4.0 mm (0.08 ~ 0.16 in)
Float Height	(F.H.)	21.0 ~ 22.0 mm (0.83 ~ 0.87 in)
Engine Idling Speed		1,350 ~ 1,450 r/min
Vacuum Pressure at Idling Speed		Above 30.6 kPa (230 mmHg, 9.06 inHg)
Lubrication System:		
Oil Filter Type		Wire Mesh
Oil Pump Type:		Trochoid type
Tip Clearance		0 ~ 0.15 mm (0 ~ 0.006 in)
< Limit >		< 0.20 mm (0.008 in) >
Side Clearance		0.04 ~ 0.09 mm (0.002 ~ 0.004 in)
< Limit >		< 0.09 mm (0.004 in) >
Bypass Valve Operating Pressure		80 ~ 120 kPa (0.8 ~ 1.2 kg/cm², 11 ~ 17 psi)

Model	YFB250(D) '92
Shaft Drive:	
Middle Gear Backlash (Forward)	0.1 ~ 0.2 mm (0.004 ~ 0.008 in)
Middle Gear Backlash (Reverse)	0.1 ~ 0.2 mm (0.004 ~ 0.008 in)
< Limit >	<0.05 mm (0.002 in)>
Final Gear Backlash	0.1 ~ 0.2 mm (0.004 ~ 0.008 in)
< Limit >	<0.05 mm (0.002 in)>

Model	YFB250(D) '92

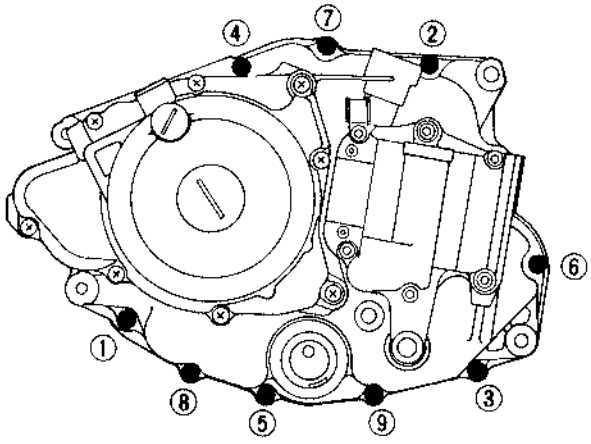
Lubrication Chart:

➡ : Pressured feed
⇢ : Splashed

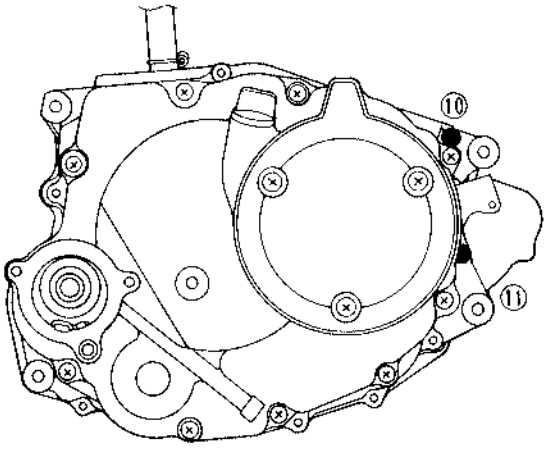


Crankcase Tightening Sequence:

LEFT-CASE SIDE



RIGHT-CASE SIDE



TIGHTENING TORQUE

Parts to be tightened	Parts name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Cylinder head (Oil Gallery Plug)	Bolt	M6	1	7	0.7	5.1	
Cylinder Head and Cylinder	Flange bolt	M8	4	22	2.2	16	Apply oil to the washer
Cylinder Head	Bolt	M8	2	22	2.2	16	
Cam Sprocket Cover	Screw	M6	2	7	0.7	5.1	
Tappet Cover	Bolt	M6	5	10	1.0	7.2	
Camshaft Bushing Retainer	Bolt	M6	2	8	0.8	5.8	Use lock washer
Spark Plug	–	M12	1	17.5	1.75	12.5	
Cylinder	Bolt	M6	2	10	1.0	7.2	
Balancer Shaft	Nut	M14 × 1.0	1	75	7.5	54	Use lock washer
Rotor	Bolt	M10 × 1.25	1	50	5.0	36	
Valve Adjusting Nut	Nut	M6	2	14	1.4	10	
Cam Sprocket	Bolt	M10	1	60	6.0	43	
Chain Tensioner	Bolt	M6	2	10	1.0	7.2	
Chain Tensioner Cap	Bolt	M6	1	7	0.7	5.1	
Chain Guide (intake)	Bolt	M6	2	8	0.8	5.8	
Oil Pump	Screw	M6	3	7	0.7	5.1	
Drain Plug	Plug	M35	1	43	4.3	31	
Oil Filter Cover (Drain)	Bolt	M6	1	10	1.0	7.2	
Oil Filter Cover	Bolt	M6	2	10	1.0	7.2	
Carburetor Joint and Cylinder Head	Bolt	M6	2	12	1.2	8.7	Tighten cable guide together
Carburetor and Carburetor Joint	Flange Nut	M6	2	8	0.8	5.8	
Carburetor and Joint Hose	Hose clamp	M4	1	2	0.2	1.4	
Air Filter Case and Joint Hose	Hose clamp	M5	2	2	0.2	1.4	
Air Filter Case and Air Duct	Hose clamp	M5	2	2	0.2	1.4	
Muffler	Bolt	M8	2	27	2.7	19	
Muffler and Exhaust Pipe	Bolt	M8	1	20	2.0	14	
Exhaust Pipe	Bolt	M6	2	10	1.0	7.2	
Crankcase	Screw	M6	11	7	0.7	5.1	
Recoil Starter	Screw	M6	6	7	0.7	5.1	(Except for USA)
Crankcase Spacer (Right)	Screw	M6	8	7	0.7	5.1	
Crankcase cover Bearing Retainer (Right)	Screw	M6	3	7	0.7	5.1	LT
(Left)	Screw	M5	3	4	0.4	2.9	LT (Except for USA)
Clutch Cover Protector	Screw	M6	3	7	0.7	5.1	
Crankcase Cover (Right)	Screw	M6	9	7	0.7	5.1	
Crankcase Cover (Left)	Screw	M6	8	7	0.7	5.1	
Clutch Carrier Assembly	Nut	M22	1	78	7.8	56	Use lock washer
Clutch Spring	Screw	M5	4	6	0.6	4.3	
Clutch Boss	Nut	M14	1	50	5.0	36	Use lock washer
Shift Cam Segment	Screw	M6	1	12	1.2	8.7	LT
Lock nut (Clutch Release Adjuster)	Nut	M8	1	15	1.5	11	
Starter Clutch	Bolt	M8	3	30	3.0	22	LT Stake
Starter Motor	Screw	M6	2	7	0.7	5.1	
Pinion Gear (Drive Axle)	Nut	M16	1	60	6.0	43	Stake
Bearing Retainer (Drive Axle)	Screw	M8	3	25	2.5	18	LT

Parts to be tightened	Parts name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Bearing Retainer (Bearing Housing)	Nut	–	1	60	6.0	43	
	Nut	–	1	60	6.0	43	
	Nut	–	1	60	6.0	43	
Bearing Housing	Bolt	M8	4	23	2.3	17	
Middle Driven Axle and U-Joint	Nut	M12	1	60	6.0	43	
Drive Select Lever Component:							
Drive Select Lever Assembly	Bolt	M6	2	7	0.7	5.1	
	Straight Screw Plug	M14	1	15	1.5	11	
Locknut	Nut	M6	1	8	0.8	5.8	
(Joint Rod Adjuster)	Nut	M6	1	8	0.8	5.8	
Lever Complete	Flange Bolt	M6	1	10	1.0	7.2	
Final Drive Gear Component:							
Final Drive Gear Case and Swingarm	Flange Nut	M8	4	23	2.3	17	
Oil Filler Bolt	Bolt	M14	1	23	2.3	17	
Drain Plug	Bolt	M14	1	23	2.3	17	
Bearing Housing (Ring Gear)	Bolt	M10	2	40	4.0	29	
	Bolt	M8	6	23	2.3	17	
Bearing Retainer (Drive)	–	–	1	100	10.0	72	
Shift Pedal	Bolt	M6	1	10	1.0	7.2	
Magneto Base	Screw	M6	3	7	0.7	5.1	(Except for USA)
Neutral Switch	–	M10	2	20	2.0	14	
Reverse Switch	–	M12	1	20	2.0	14	

CHASSIS

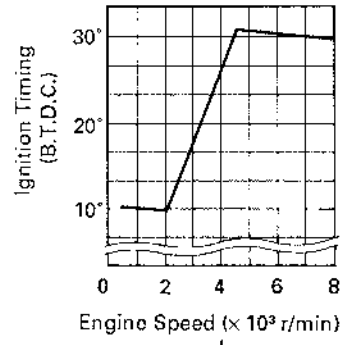
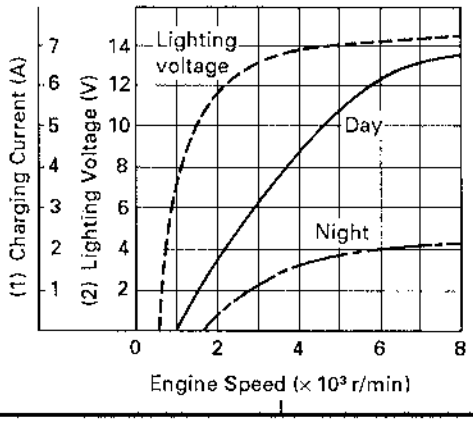
Model	YFB250(D) '92
Front Suspension:	
Cushion Stroke	117 mm (4.61 in)
Suspension Spring Free Length	278 mm (10.94 in)
Spring Rate/Stroke	10 N/mm (1.0 kg/mm, 56 lb/in)/ 0 ~ 117 mm (0 ~ 4.61 in)
Optional Spring	No
Rear Suspension:	
Cushion Stroke	80 mm (3.15 in)
Suspension Spring Free Length	203.5 mm (8.01 in)
Fitting Length	190 mm (7.48 in)
Spring Rate/Stroke: K1	45 N/mm (4.5 kg/mm, 252 lb/in)/ 0 ~ 80 mm (0 ~ 3.15 in)
Optional Spring	No
Swingarm:	
< Free Play Limit >: End	< 1.0 mm (0.04 in) >
Side	< 1.0 mm (0.04 in) >
Wheel:	
Front Wheel Type	Disc Wheel
Rear Wheel Type	Disc Wheel
Front Rim Size/Material	10 × 5.5 AT/Steel
Rear Rim Size/Material	10 × 8.0 AT/Steel
< Rim Runout Limit> :	
Vertical	< 2.0 mm (0.08 in) >
Lateral	< 2.0 mm (0.08 in) >
Front Drum Brake:	
Type	Leading and Trailing
Drum Inside Diameter	110 mm (4,3 in)
< Limit >	< 111 mm (4.,37 in) >
Lining Thickness	4.0 mm (0.16 in)
< Limit >	< 2.0 mm (0.08 in) >
Shoe Spring Free Length	50.5 mm (1.99 in)
Rear Drum Brake:	
Type	Leading Trailing
Drum Inside Diameter	160 mm (6.3 in)
< Limit >	< 161 mm (6.34 in) >
Lining Thickness:	4.0 mm (0.16 in)
< Limit >	< 2.0 mm (0.08 in) >
Brake Lever & Brake Pedal:	
Brake Lever Free Play	5.0 ~ 8.0 mm (0.20 ~ 0.31 in) at lever pivot
Brake Pedal Free Play	20 ~ 30 mm (0.78 ~ 1.18 in)

TIGHTENING TORQUE

Parts to be tightened	Parts name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Front Panel Wheel and Brake Dram	Nut	M10 × 1.25	8	45	4.5	32	
Front Brake Dram and Steering knuckle	Nut	M14 × 1.5	2	70	7.0	50	
Front Brake Cam Lever and Cam Shaft	Bolt	M6 × 1.0	2	9	0.9	6.5	
Steering Knucle and Front Shock Absorber	Nut	M12 × 1.25	4	70	7.0	50	
Front Shock Absorber and Frame	Nut	M35 × 1.5	2	55	5.5	40	
Steering Knucle and Tie-rod End	Nut	M10 × 1.25	2	25	2.5	18	
Tie-rod and Locknut	Nut	M10 × 1.25	4	30	3.0	22	
Steering Shaft and Tie-rod End	Nut	M10 × 1.25	2	25	2.5	18	
Steering Shaft (lower) and Frame	Nut	M10 × 1.25	1	30	3.2	22	
Steering Shaft Holder and Frame	Bolt	M8 × 1.25	2	23	2.3	17	Use lock washer
Steering Shaft and Upper Handlebar Holder	Bolt	M8 × 1.25	4	20	2.0	14	
Front Lower Arm and Frame	Nut	M10 × 1.25	4	45	4.5	32	
Front Lower Arm and Steering Knuckle	Nut	M10 × 1.25	2	25	2.5	18	
Engine Stay and Frame (Upper)	Bolt	M8 × 1.25	2	33	3.3	24	
Engine Mounting (Upper)	Nut	M8 × 1.25	1	33	3.3	24	
Engine Mounting (Front)	Nut	M8 × 1.25	1	33	3.3	24	
Engine Mounting (Rear-Upper)	Nut	M8 × 1.25	1	33	3.3	24	
Engine Mounting (Rear-Lower)	Nut	M8 × 1.25	1	33	3.3	24	
Front Fender and Frame	Bolt	M8 × 1.25	4	15	1.5	11	
Front Fender and Fender Stay	Nut	M6 × 1.0	2	7	0.7	5.1	
Front Fender and Fuel Tank Cover	Screw	M5	2	2	0.2	1.4	Use spring nut
Front Bumper and Frame	Bolt	M8 × 1.25	4	15	1.5	11	
Front Carrier and Front Bumper	Nut	M6 × 1.0	2	10	1.0	7.2	(Except for USA)
Front Carrier and Frame	Bolt	M8 × 1.25	2	33	3.3	24	(Except for USA)
Rear Fender and Frame	Bolt	M6 × 1.0	2	7	0.7	5.1	
Rear Fender and Fender Stay	Bolt	M6 × 1.0	4	7	0.7	5.1	(For USA)
Rear Fender and Plate (Footrest)	Bolt	M6 × 1.0	4	7	0.7	5.1	
Rear Fender Stay and Frame	Bolt	M8 × 1.25	4	15	1.5	11	(For USA)
Rear Bumper and Frame	Bolt	M8 × 1.25	3	15	1.5	11	
	Bolt	M8 × 1.25	1	27	2.7	19	Tighten muffler together
Rear Carrier and Rear Bumper	Bolt	M6 × 1.0	2	8	0.8	5.8	(Except for USA)
Rear Carrier and Frame	Bolt	M8 × 1.25	2	33	3.3	24	(Except for USA)
Rear Fender and Rear Bumper	Nut	M6 × 1.0	2	7	0.7	5.1	(Except for USA)
Footrest and Frame	Bolt	M10 × 1.25	4	55	5.5	40	
Rear Panel Wheel and Wheel hub	Nut	M10 × 1.25	8	55	5.5	40	
Rear Axle and Nut	Nut	M16 × 1.5	2	150	15	110	
Rear Brake Cam Lever and Cam Shaft	Bolt	M6 × 1.0	1	9	0.9	6.5	LT
Rear Backing Plate and Swingarm	Bolt	M8 × 1.25	4	28	2.8	20	

Parts to be tightened	Parts name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Pivot Shaft and Frame	–	M22 × 1.5	2	6	0.6	4.3	
Pivot Shaft and Nut	Nut	M22 × 1.5	2	130	13	94	
Swingarm and Final Drive Gear Case (Front)	Nut	M8 × 1.25	4	23	2.3	17	
Swingarm and Final Drive Gear Case (Rear)	Bolt	M10 × 1.25	4	45	4.5	32	
Rear Shock Absorber (Upper) and Frame	Nut	M12 × 1.25	1	50	5.0	36	
Fuel Tank and Fuel Cock	Screw	M6 × 1.0	2	5	0.5	3.6	

ELECTRICAL

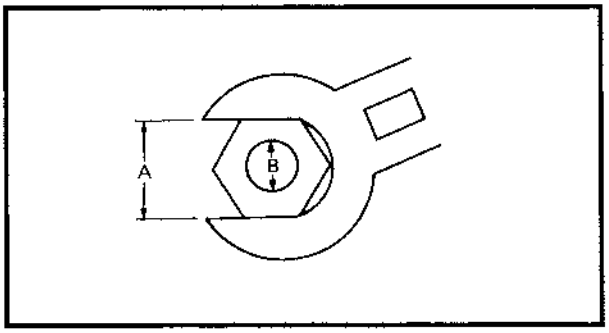
Model	YFB250(D) '92
Voltage:	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	10° at 1,000 r/min
Advanced Timing (B.T.D.C.)	30° at 6,000 r/min
Advancer Type	Electrical
	
CDI:	
Magneto-Model/Manufacturer	4BD-0/MITSUBISHI
Pickup Coil Resistance (Color)	189 ~ 231Ω at 20°C (68°F) (White/Green – White/Red)
Source Coil Resistance (Color)	428 ~ 523Ω at 20°C (68°F) (Brown – Black)
CDI Unit-Model/Manufacturer	4BD1-0/MITSUBISHI
Ignition Coil:	
Model/Manufacturer	F6T535/MITSUBISHI
Minimum Spark Gap	6 mm (0.24 in)
Primary Winding Resistance	0.36 ~ 0.48Ω at 20°C (68°F)
Secondary Winding Resistance	5.4 ~ 7.4Ω at 20°C (68°F)
Charging System/Type	Flywheel Magneto
Flywheel Magneto:	
Charging Current Day:	1.8A or more at 3,000 r/min
	4.5A or more at 8,000 r/min
Night:	0.7A or more at 3,000 r/min
	1.7A or more at 8,000 r/min
Charging Coil Resistance (Color)	0.72 ~ 0.88Ω at 20°C (68°F) (White – Black)
Lighting Voltage	11.3V or more at 3,000 r/min
	13.8 ~ 14.8V at 8,000 r/min
Lighting Coil Resistance (Color)	0.48 ~ 0.58Ω at 20°C (68°F) (Yellow – Black)
	

Model	YFB250(D) '92
Rectifier/Regulator:	
Model/Manufacturer	TR-30/MATSUSHITA
Capacity	5,5A
Withstand Voltage	240V
Battery:	
Capacity	12V, 12AH
Specific Gravity	1.280
Electrical Starter System:	
Amperage Rating	Constant mesh type
Starter Motor:	
Model/Manufacturer	4BD/MITSUBA
Output	0.4kW
Armature Coil Resistance	0.023Ω at 20°C (68°F)
Brush:	
Overall Length	11 mm (0.41 in)
< Limit >	< 5 mm (0.2 in) >
Spring Pressure	400 ~ 660 g (14.1 ~ 23.3 oz)
Commutator:	
Diameter	23 mm (0.91 in)
< Wear Limit >	< 22 mm (0.87 in) >
Mica Undercut	1.8 mm (0.07 in)
Starter Relay:	
Model/Manufacturer	A104-132/HITACHI
Amperage Rating	100A
Coil Winding Resistance/Color	3.9 ~ 4.7Ω at 20°C (68°F)/(Red/White – Blue/White)
Starting Circuit Cut-off Relay:	
Model/Manufacturer	ACA1211-8
Coil Winding Resistance	72 ~ 88Ω at 20°C (68°F)
Diode	Yes
Circuit Breaker:	
Type	Fuse
Amperage for Individual Circuit/Quantity:	
Main	10A × 1 pc.
Reserve	10A × 1 pc.

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 multifastener 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
10mm	6mm	6	0.6	4.3
12mm	8mm	15	1.5	11
14mm	10mm	30	3.0	22
17mm	12mm	55	5.5	40
19mm	14mm	85	8.5	61
22mm	16mm	130	13.0	94



A: Distance across flats
B: Outside thread diameter

DEFINITION OF UNITS

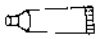
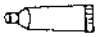
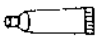
Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1kg × m/sec^2	Force
Nm m•kg	Newton meter Meter kilogram	N × m m × kg	Torque Torque
Pa N/mm	Pascal Newton per millimeter	N/m^2 N/mm	Pressure Spring rate
L cm^3	Liter Cubic centimeter	–	Volume or Capacity
r/min	Revolution per minute	–	Engine Speed

LUBRICATION POINTS AND LUBRICANT TYPE

ENGINE

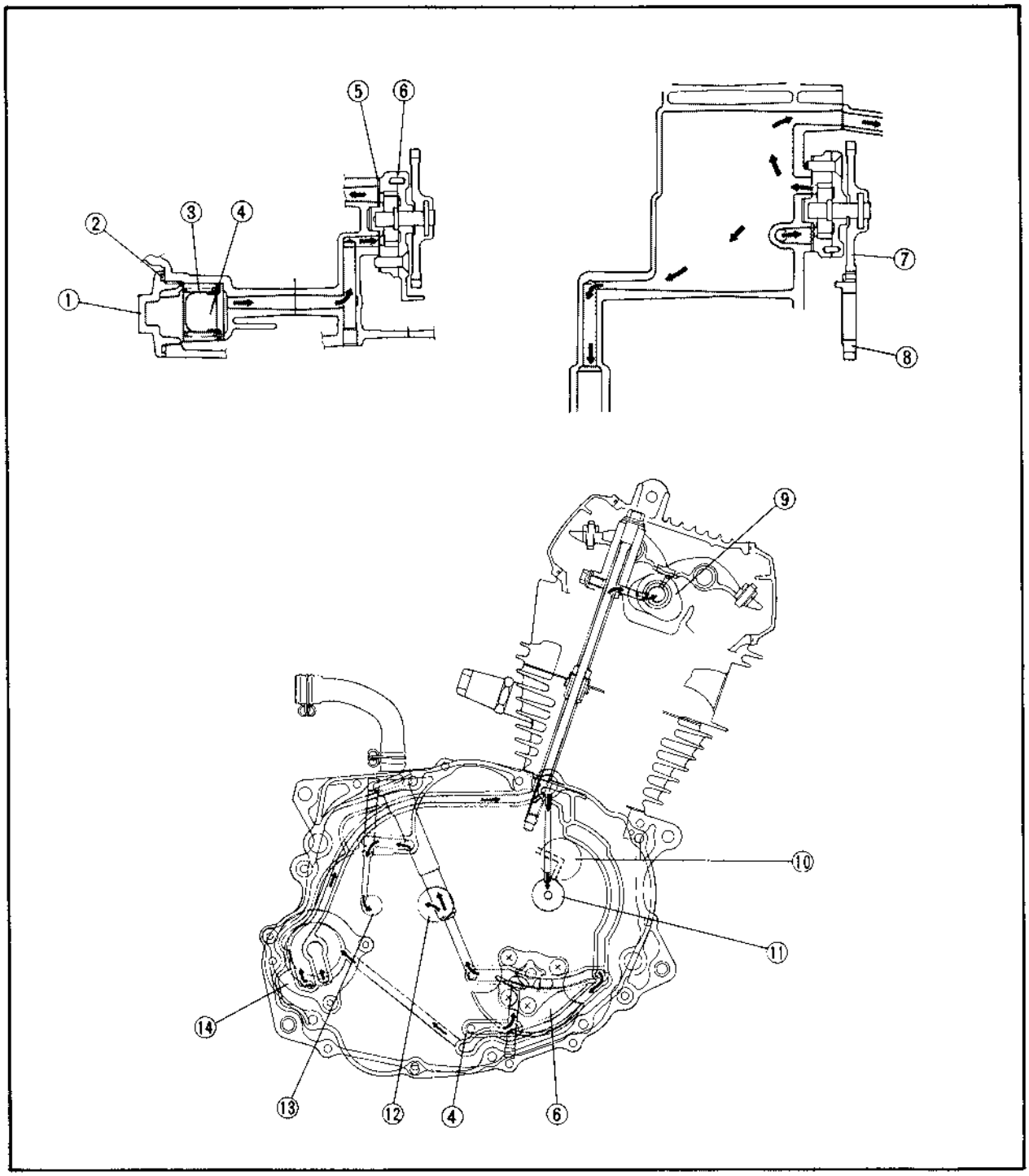
Lubrication points (part name)	Lubricant type
Oil seal lips (all)	LS
O-rings (All)	LS
Bearings (all)	E
Washer (cylinder head bolt)	E
Crank pin	E
Connecting rod (big end)	E
Piston and piston pin	E
Piston and piston ring	E
Buffer boss	E
Valve stem and valve guide	M
Oil seal (valve stem end)	M
Rocker arm shaft and rocker arm	M
Cam and bearing (camshaft)	E
O-ring (drain plug)	LS
Push rod	E
Primary driven gear and main axle	E
Sliding gear (transmission)	M
Free movement gear (transmission)	M
Shift fork and guide bar	E
Shift cam and bearing (shift cam)	E
Shift shaft	E
Shift ball holder and guide	M
Shift shaft and shift pedal	LS
Crankcase mating surfaces	Sealant (Quick Gasket®) Yamaha Bond No. 1215
Adaptor (crankcase cover 1) and grommet	Sealant (Quick Gasket®) Yamaha Bond No. 1215

CHASSIS

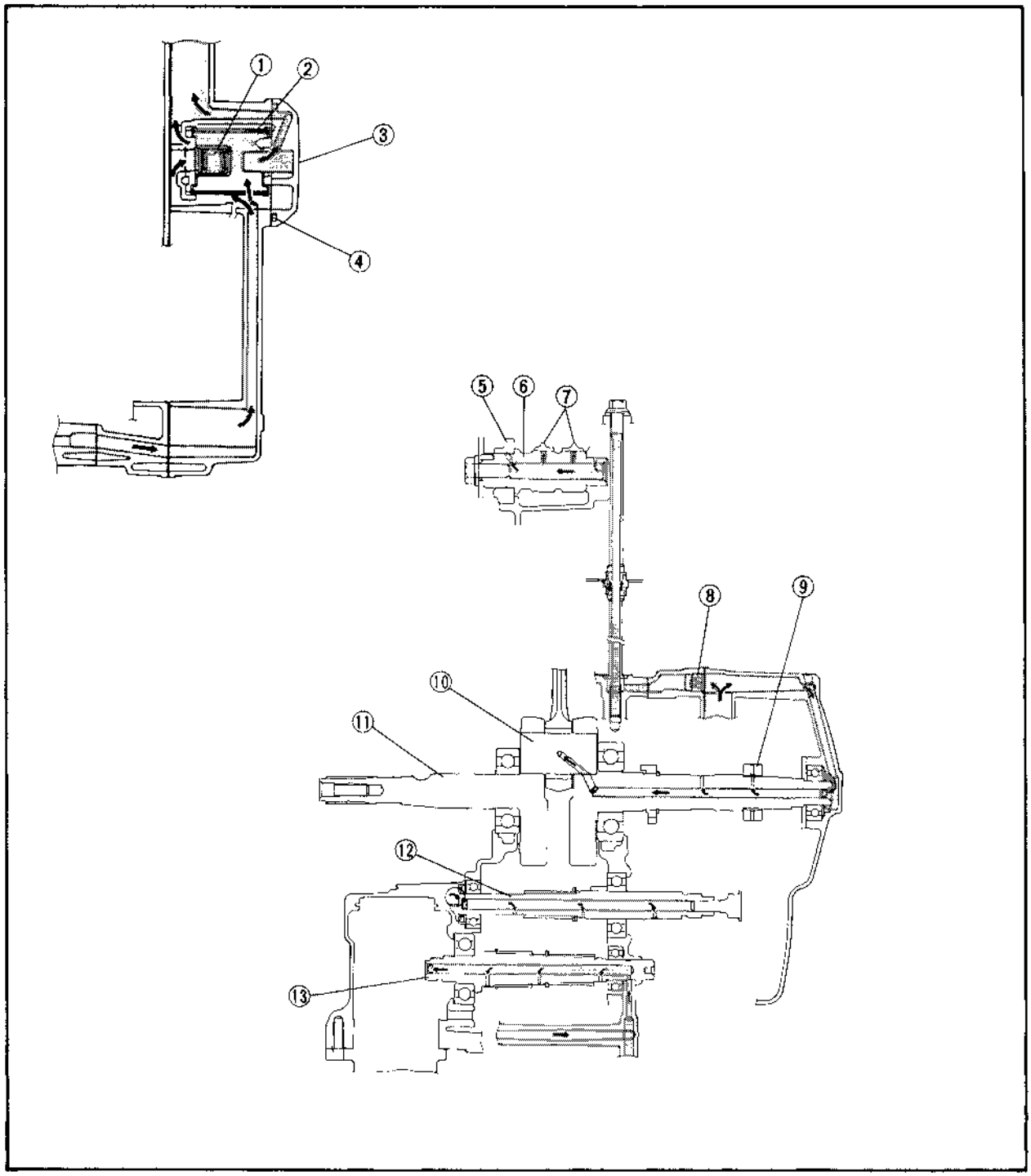
Lubrication Points	Symbol	Lubricant Type
Oil Seal Lips (All)/O-Rings (All)		Lithium-soap base grease
Steering Shaft (Upper and Lower with Nipple Bushes)		Lithium-soap base grease
Steering Knuckle Pivot		Lithium-soap base grease
Front Lower Arm (Ball joint)		Lithium-soap base grease
Front Wheel Bearings		Wheel bearing grease
Front Drum Brake: Brake Cam Shaft Pivot Pin Oil Seal Lips		Lithium-soap base grease
Rear Drum Brake: Brake Cam Shaft Pivot Pin		Lithium-soap base grease
Dust Seal (Rear Backing Plate)		Yamaha Brake Grease
Rear Backing Plate and Brake Cam Bracket		Sealant (Quick Gasket®) Yamaha Bond No. 1215
Front Brake Cable Joint		Lithium-soap base grease
Front and Rear Brake Lever Pivot		Lithium-soap base grease
Front Brake Cable Adjuster and Pin		Lithium-soap base grease
Rear Brake Cable Adjuster and Pin		Lithium-soap base grease
Rear Brake Pedal Pivot		Lithium-soap base grease
Throttle Lever Holder Cable End		Lithium-soap base grease
Drive Select Lever Pivots		Lithium-soap base grease
Swingarm (Pivot Shaft, Bearing)		Lithium-soap base grease
Final Drive Gear Case and Swingarm		Sealant (Quick Gasket®) Yamaha Bond No. 1215
Rear Backing Plate and Swingarm		Sealant (Quick Gasket®) Yamaha Bond No. 1215
Rear Shock Absorber Bushes		Lithium-soap base grease

LUBRICATION DIAGRAMS

① Drain plug
② O-ring
③ Compression spring
④ Oil strainer
⑤ Oil pump gasket
⑥ Oil pump assembly
⑦ Oil pump driven gear
⑧ Oil pump drive gear
⑨ Camshaft
⑩ Crank pin
⑪ Crankshaft
⑫ Main axle
⑬ Drive axle
⑭ Oil filter

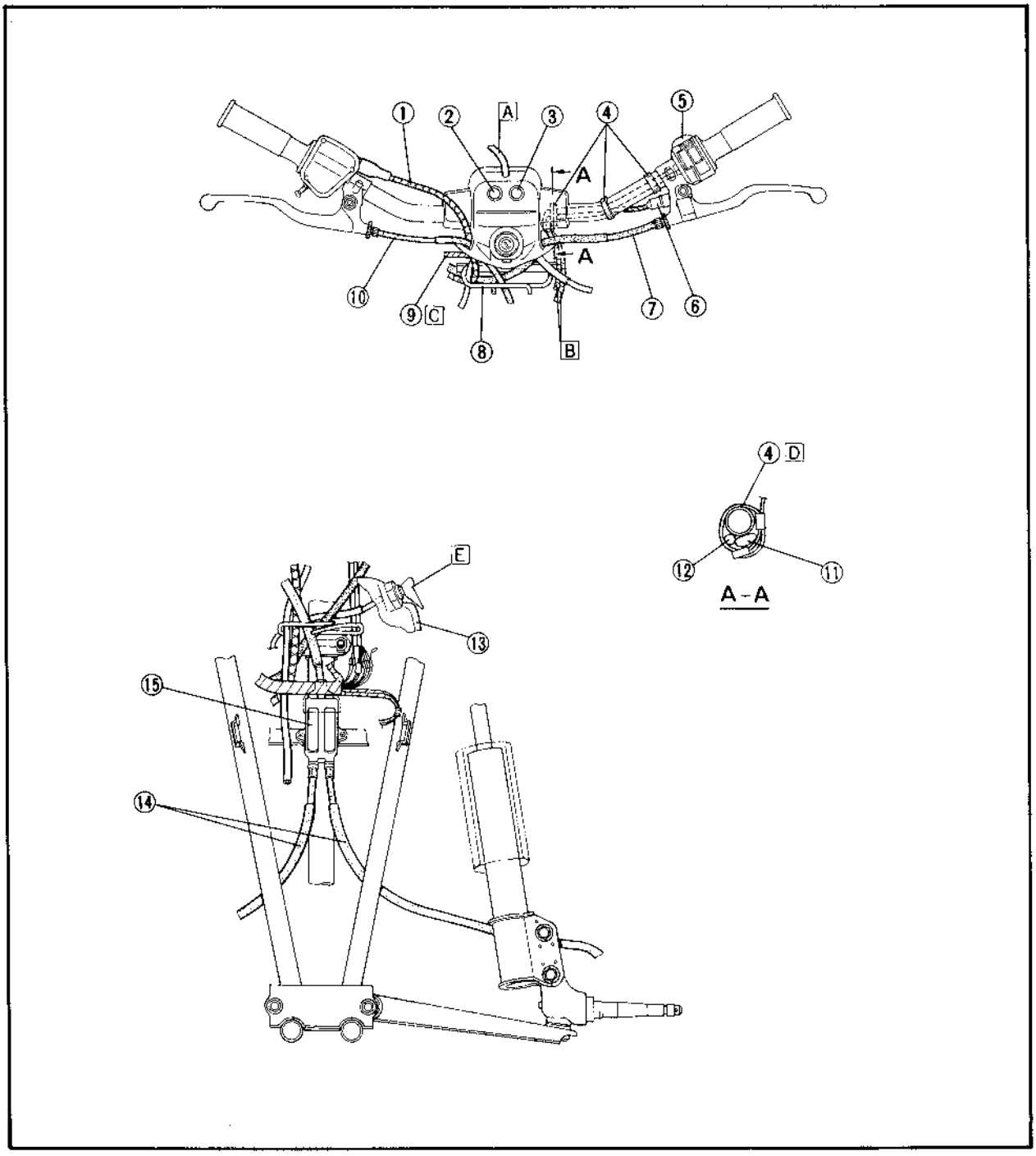


① Bypass valve
② Oil filter
③ Oil filter cover
④ O-ring
⑤ Collar
⑥ Camshaft
⑦ Rocker arm
⑧ Check valve assembly
⑨ One way bearing
(Automatic centrifugal clutch)
⑩ Crank pin
⑪ Crankshaft
⑫ Main axle
⑬ Drive axle

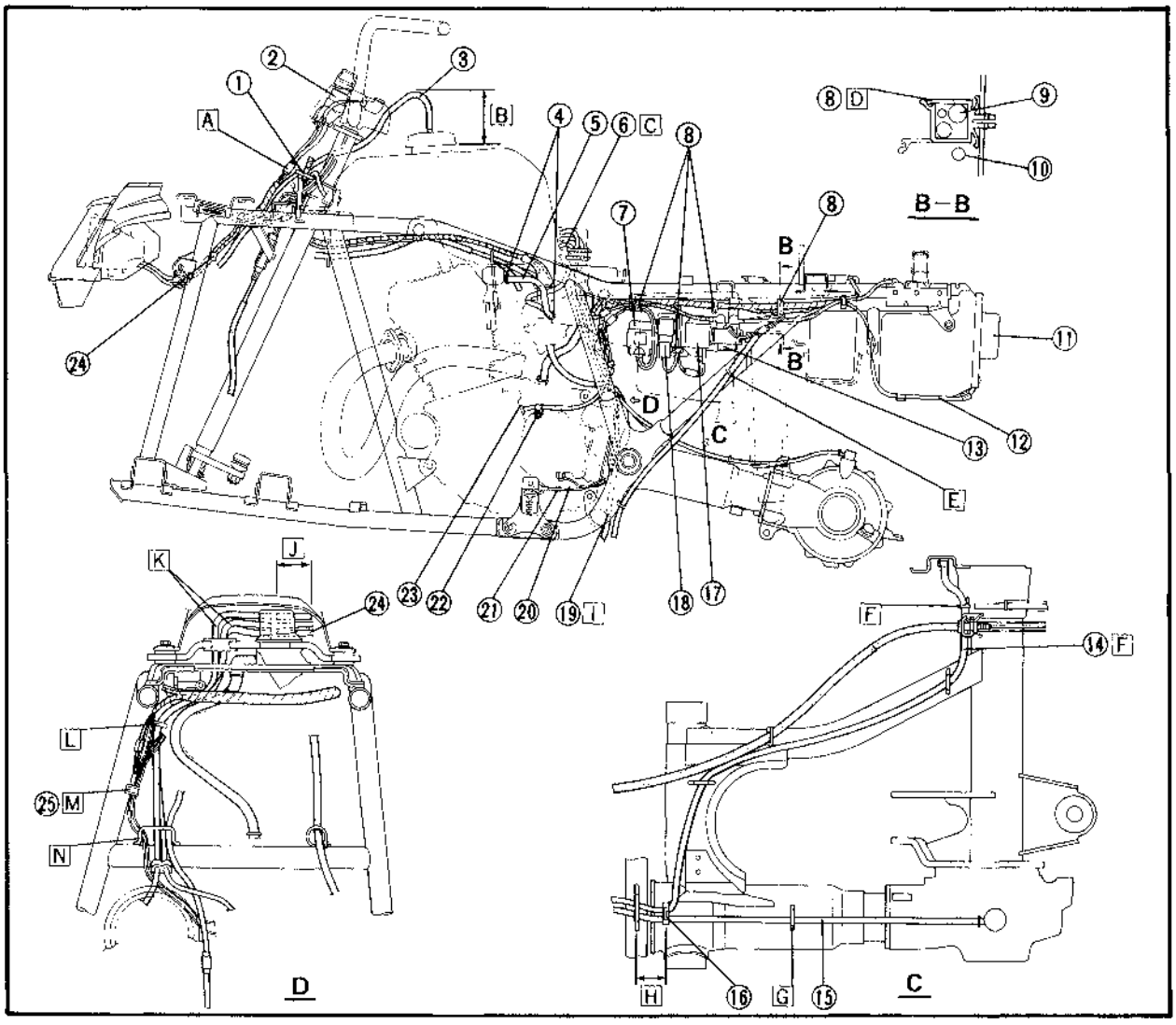


CABLE ROUTING

① Throttle cable
② "NEUTRAL" indicator light
③ "REVERSE" indicator light
④ Band
⑤ Handle switch 3
⑥ Front brake switch
⑦ Brake cable 1
⑧ Guide
⑨ Starter cable
⑩ Brake cable 4
⑪ Handle switch lead
⑫ Front brake switch lead
⑬ Front fender
⑭ Brake cable 3
⑮ Equalizer
[A] Pass the fuel tank breather hose through the handlebar protector hole.
[B] Pass the handlebar switch lead behind the starter cable (Do not pass the lead in the guide).
[C] Pass the starter cable behind the throttle cable and the brake cable 1 and 4. Do not pass the starter cable through the guide.
[D] Bind the leads together, clamp them underneath the handlebar. The band should be located under the handlebar.
[E] Clamp the starter cable to the front fender.

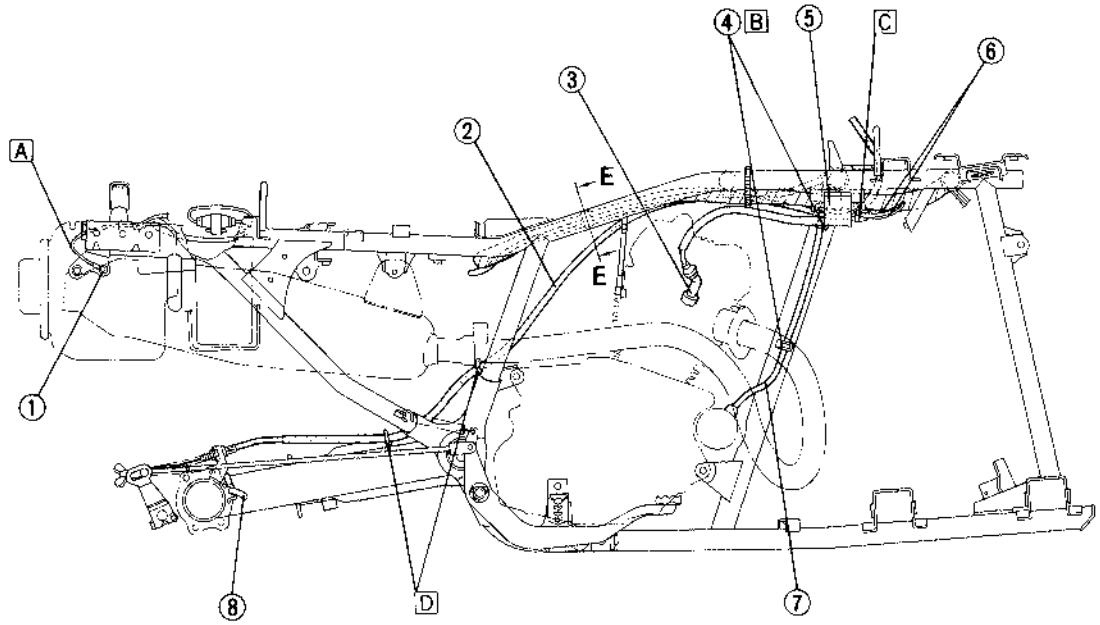


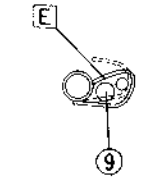
① Guide
② Main switch
③ Fuel tank breather hose
④ Clip
⑤ Fuel hose
⑥ Air vent hose
⑦ CDI unit
⑧ Clamp
⑨ Wireharness
⑩ Battery positive (+) lead
⑪ Taillight unit assembly
⑫ Wire lead
⑬ Starter relay
⑭ Rear brake drum breather hose
⑮ Final gear case breather hose
⑯ Clip
⑰ Rectifier/regulator
⑱ Relay assembly
⑲ Over flow hose
⑳ Reverse switch lead
㉑ Neutral switch lead
㉒ Clamp
㉓ CDI magneto lead
㉔ Air vent hose
㉕ Clamp
[A] Pass the main switch lead and pilot light lead in front of the guide.
[B] 100 mm (3.94 in).
[C] Pass the air vent hose through the rubber grommet hole and connect the hose to the fuel tank. Be careful not to squeeze or twist the hose.
[D] Securely install the clamp.
[E] Pass the battery breather hose through the cable guide.
[F] Pass the rear brake drum breather hose through the cable guide.
[G] Pass the breather hose through the cable guide.
[H] 60 ~ 70 mm (2.36 ~ 2.76 in).
[I] Pass the over flow hose between the rear arm and the engine, then above the frame cross pipe and pull it downward. Make sure the hose is routed so that it will not get obstructed or damaged.
[J] 40 ~ 50 mm (1.57 ~ 1.97 in) both three hoses.
[K] The breather hoses (final gear case breather hose / rear brake drum breather hose) should be routed through the grommet hole, and connected to the fuel tank duct, as shown in the figure below. Make sure the hoses are routed so that they will not get obstructed or damaged.
[L] Pass the both breather hoses through the cable guide of frame.
[M] Clamp the CDI magneto lead, neutral and reverse switch leads.
[N] Pass the both breather hoses, over flow hose, neutral and reverse switch leads through the cable guide of frame.



① Earth bolt
② Brake cable 1
③ Plug cap assembly
④ Clamp
⑤ Ignition coil assembly
⑥ Ignition coil lead
⑦ Starter motor cable
⑧ Rear brake drum breather hose
⑨ Wire harness

[A] Do not pinch the battery negative (–) lead with the box mounting bolt.
[B] Clamp the starter motor cable.
[C] Tighten the wire harness ground lead and ignition coil together.
[D] Pass the brake cable 1 through the cable guide.
[E] Close the clamp towards the centerline of the pipe as shown in the illustration.

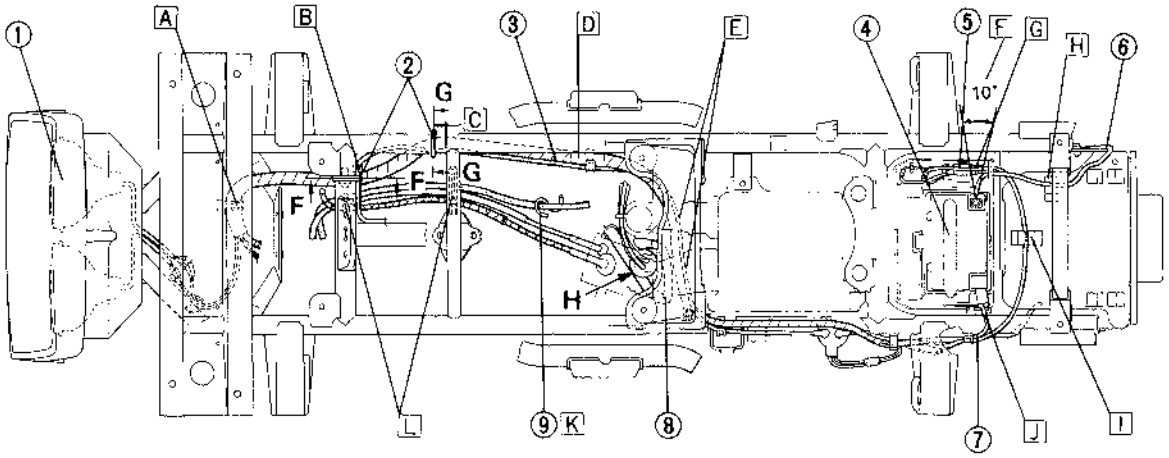


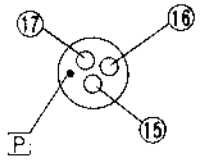


E – E

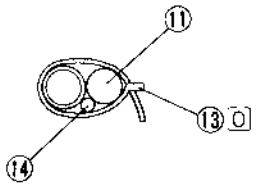
① Headlight assembly
② Clamp
③ Wire harness
④ Battery
⑤ Fuse holder assembly
⑥ Battery negative (–) lead
⑦ Battery positive (+) lead
⑧ Crankcase breather hose
⑨ Cable guide
⑩ Clamp
⑪ Wire harness
⑫ Ignition coil
⑬ Clamp
⑭ Starter motor cable
⑮ Final gear case breather hose
⑯ Rear brake drum breather hose
⑰ Air vent hose (from carburetor)

[A] Clamp the wire harness.
[B] Clamp the starter motor lead.
[C] 10 mm (0.39 in).
[D] Align the white tape on the wire harness with the clamp of the frame.
[E] Pass the starter motor lead over the duct.
[F] Refer to the figure when installing the battery negative (–) lead.
[G] Pass the battery negative (–) lead and fuse holder lead through the rear fender hole.
[H] Clamp the battery negative (–) lead.
[I] Clamp the fuse holder leads.
[J] Pass the battery positive (+) lead through the rear fender hole.
[K] Pass the brake cable 1 through the cable guide.
[L] Pass the throttle cable, starter cable and brake cable 1 through the cable guide.
[M] Securely install the clamp onto the frame as shown below.
[N] Insert the wire harness into the clamp.
[O] Bind the wire harness and the leads together, clamp them underneath the frame. The band should be located under the frame.
[P] When installing, make sure the mark is facing forward.

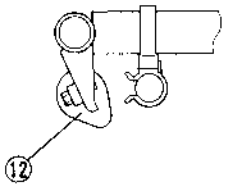




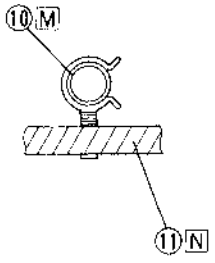
H



G–G

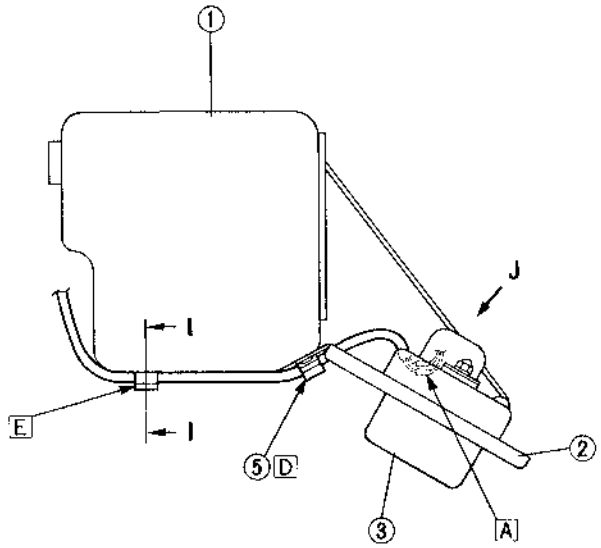


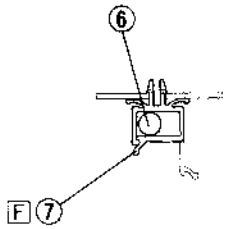
F–F



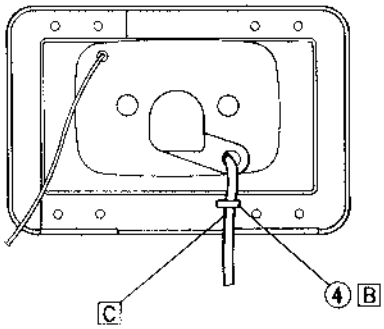
① Box complete
② Lid
③ Taillight unit assembly
④ Clamp
⑤ Clamp
⑥ Wire sub lead
⑦ Clamp

[A] Connect the tail light lead and the wire sub lead on the inside of the box lid.
[B] Pass the wire sub lead through the clamp.
[C] Pass the wire sub lead through the lid slit.
[D] Clamp the wire sub lead.
[E] Pass the wire sub lead through the clamp.
[F] Securely install the clamp.





I – I



J

PERIODIC INSPECTION AND ADJUSTMENT

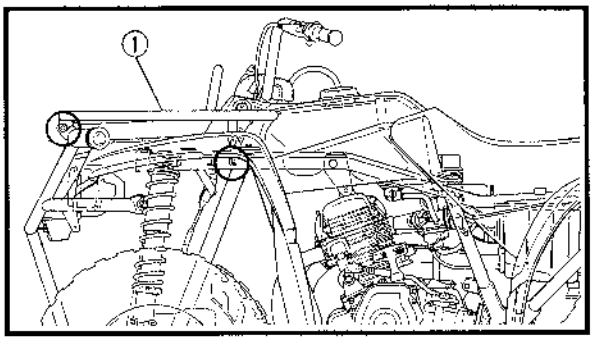
INTRODUCTION

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

PERIODIC MAINTENANCE/LUBRICATION

Item	Remarks	Initial			Every	
		1 month	3 months	6 months	6 months	1 year
Valve(s)*	Check valve clearance. Adjust if necessary.	O		O	O	O
Spark plug	Check condition. Clean or replace if necessary.	O	O	O	O	O
Air filter	Clean. Replace if necessary.	Every 20 ~ 40 hours (More often in wet or dusty area)				
Carburetor*	Check idle speed/starter operation. Adjust if necessary.		O	O	O	O
Fuel line*	Check fuel hose for cracks or damage. Replace if necessary.			O	O	O
Engine oil	Replace (Warm engine before draining).	O		O	O	O
Engine oil filter	Clean.	O		O		O
Engine oil strainer	Clean.	O		O		O
Final gear oil	Check oil level/oil leakage. Replace every 12 months.	O				O
Brake*	Check operation. Adjust if necessary.	O	O	O	O	O
Clutch*	Check operation. Adjust if necessary.	O		O	O	O
Wheels*	Check balance/damage/runout. Repair if necessary.	O		O	O	O
Wheel bearings*	Check bearings assembly for looseness/damage. Replace if damage.	O		O	O	O
Steering system*	Check operation/replace if damaged. Check toe-in/adjust if necessary.	O	O	O	O	O
Steering shaft*	Lubricate every 6 months. **			O	O	O
Fittings/Fasteners*	Check all chassis fittings and fasteners. Correct if necessary.	O	O	O	O	O
Battery*	Check specific gravity. Check breather pipe for proper operation. Correct if necessary.	O	O	O	O	O

* : It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic. (For USA)
* : It is recommended that these items be serviced by a Yamaha dealer. (Except for USA)
**: Lithium soap base grease.

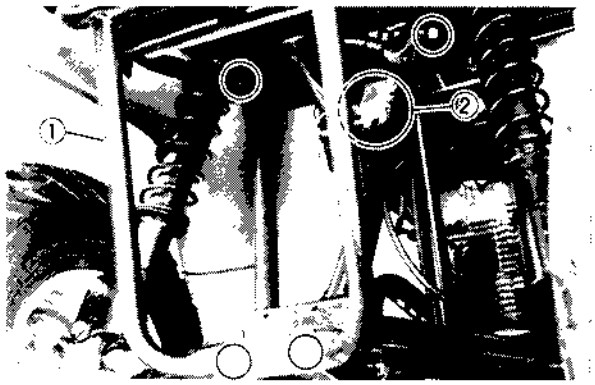


FENDERS AND FUEL TANK

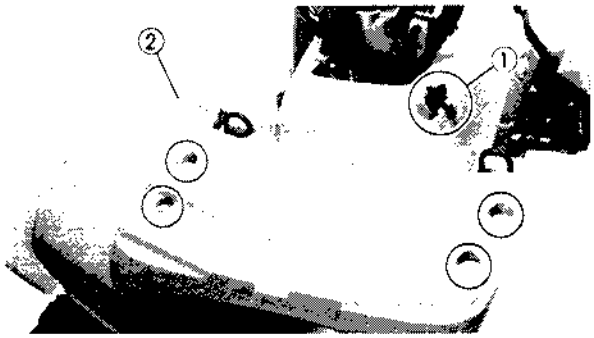
FRONT FENDER

Removal

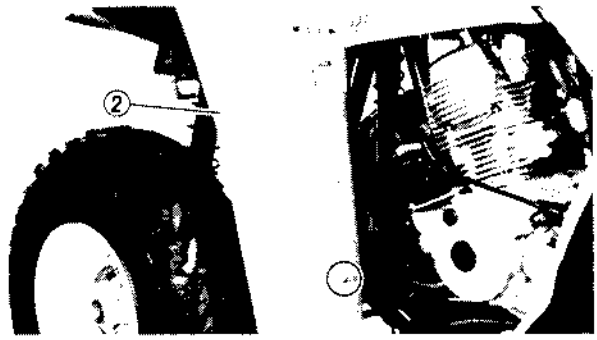
1. Place the machine on a level place.
2. Remove:
   - Front carrier ① (except for USA)

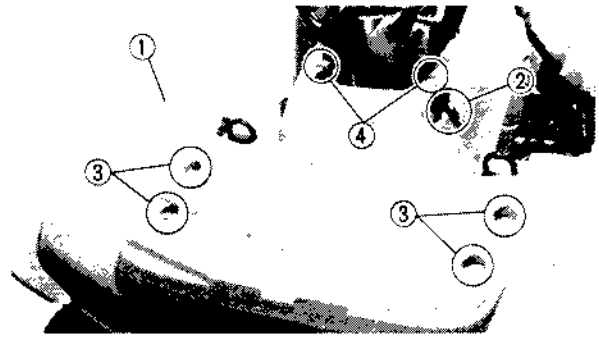


3. Remove:
   - Front bumper ①
4. Disconnect:
   - Dual headlight leads ②



5. Remove:
   - Starter lever ①
   - Front fender ②

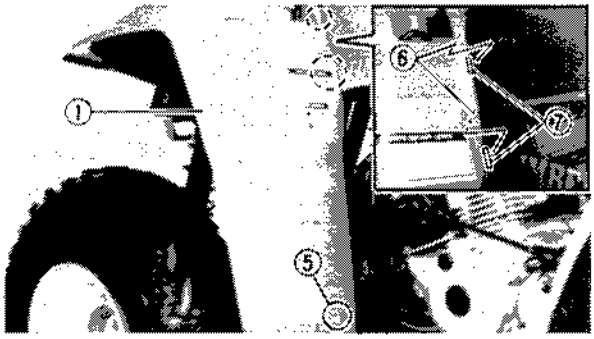


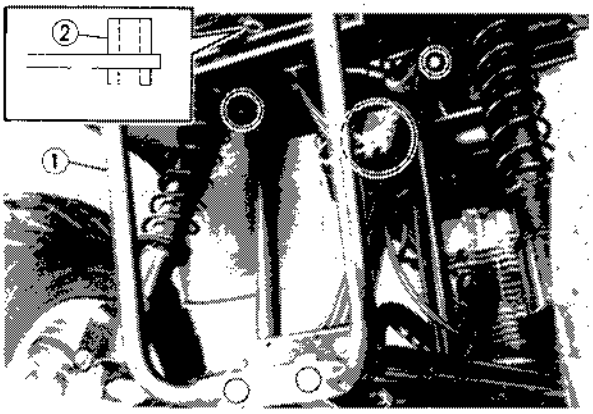


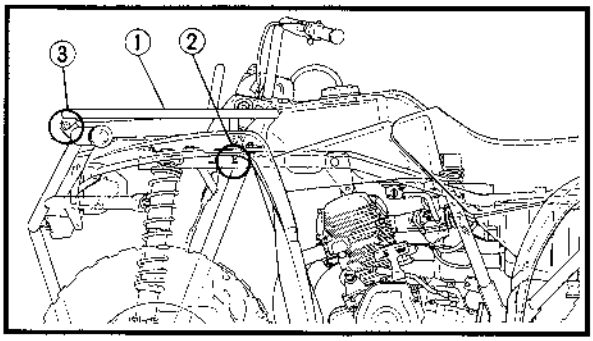
Installation

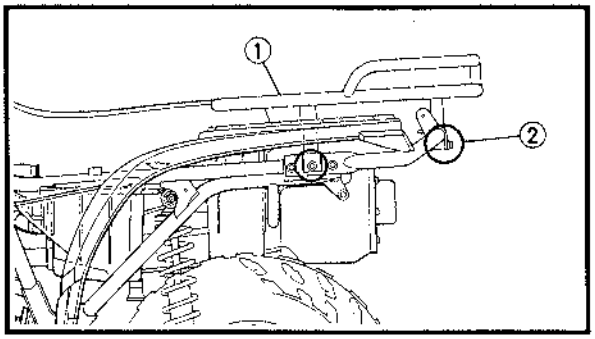
Reverse the "Removal" procedures.
Note the following points.

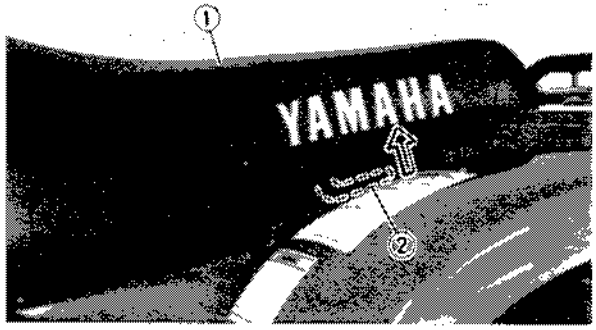
1. Install:
   - Front fender ①
   - Starter lever ②











Bolt ③ (front fender and frame):
15 Nm (1.5 m • kg, 11 ft • lb)
Screw ④ (front fender and fuel tank cover):
2 Nm (0.2 m • kg, 1.4 ft • lb)
Nut ⑤ (front fender and fender stay):
7 Nm (0.7 m • kg, 5.1 ft • lb)

NOTE:
Securely insert the lobes ⑥ on the front fender into the receptacles ⑦ on the fuel tank cover.

2. Install:
   - Front bumper ①

Bolt (front bumper and frame):
15 Nm (1.5 m • kg,11 ft • lb)

NOTE :
Install the grommet ② with it's wide end positioned upward.

3. Install:
   - Front carrier ① (except for USA)

Bolt ② (front carrier and frame):
33 Nm (3.3 m • kg, 24 ft • lb)
Nut ③ (front carrier and front bumper):
10 Nm (1.0 m • kg, 7.2 ft • lb)

REAR FENDER

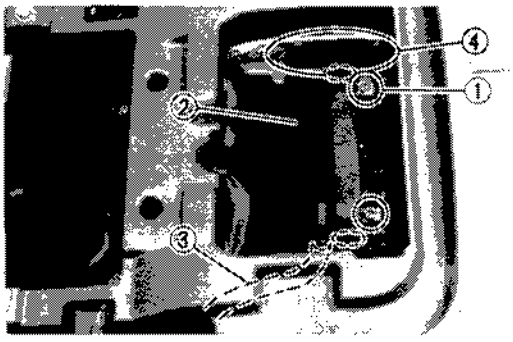
Removal

1. Place the machine on a level place.
2. Remove:
   - Rear carrier ① (except for USA)

② with speacer collar

3. Remove:
   - Seat ①

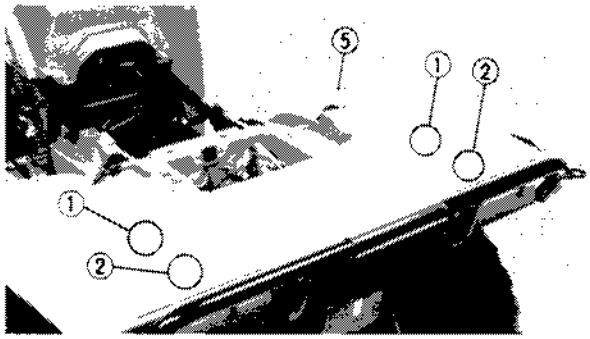
   Pull up the seat lock lever ② , then pull up the seat at the rear.



4. Disconnect:
   - Battery leads (positive and negative)
   - Battery band

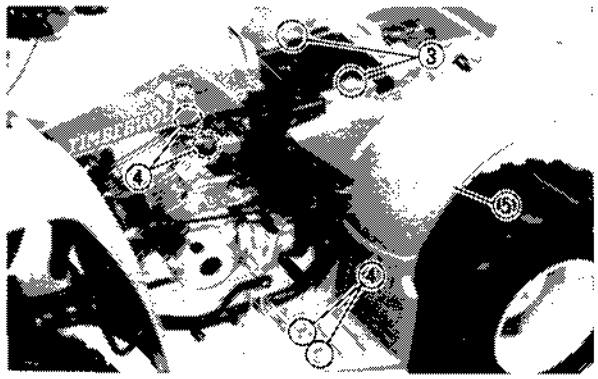
⚠ WARNING

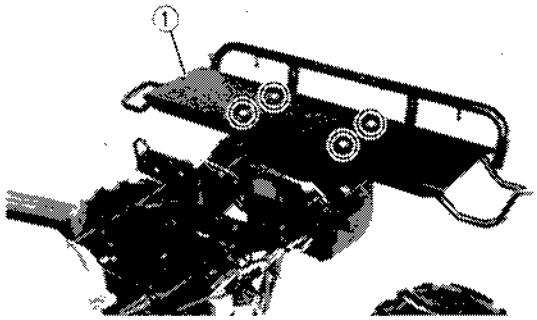
Disconnect the negative lead ① first.



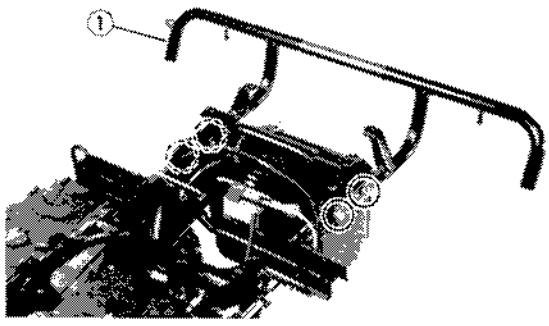
5. Remove:
   - Battery ②
   - Breather hose ③ (battery side)
   - Fuse holder ④ (from rear fender)

6. Remove:
   - Bolt ①, ② (for USA)
   - Bolt ② (except for USA)
   - Bolt ③ (rear fender and frame)
   - Bolt ④ (rear fender and footrest plate)
   - Rear fender ⑤

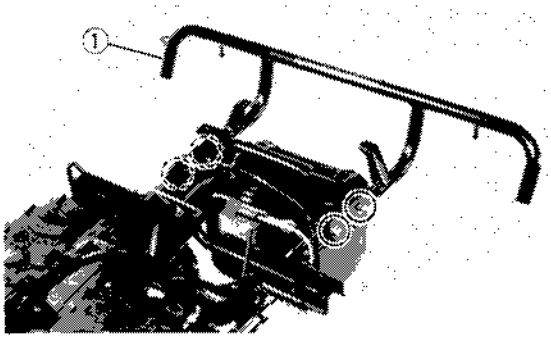




7. Remove:
   - Rear fender stay ① (for USA)



8. Remove:
   - Rear bumper ①



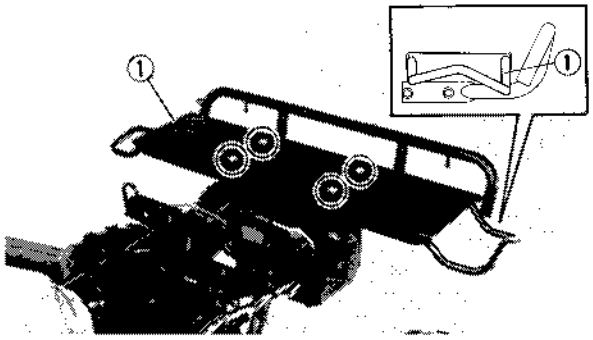
Installation

Reverse the removal procedures.

Note the following points.

1. Install:
   - Rear bumper ①

	Bolt (rear bumper and frame): 15 Nm (1.5 m • kg, 11 ft • lb)

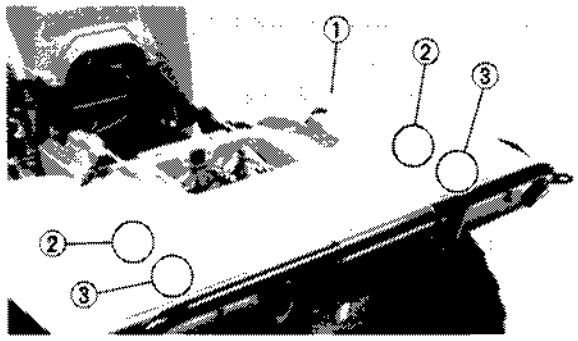


2. Install :
   - Rear fender stay ① (for USA)

	Bolt (rear fender stay): 15 Nm (1.5 m • kg, 11 ft • lb)

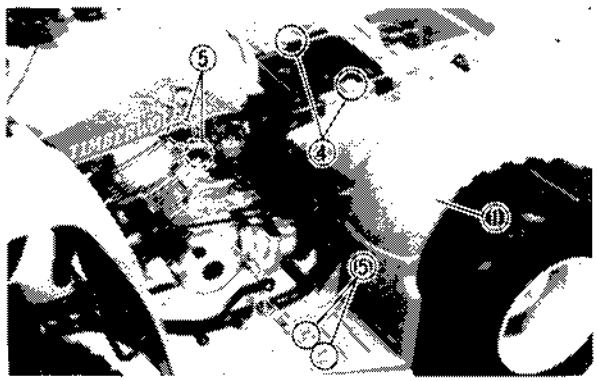
NOTE:

Install the rear fender stay as shown.



3. Install:
   - Rear fender ①

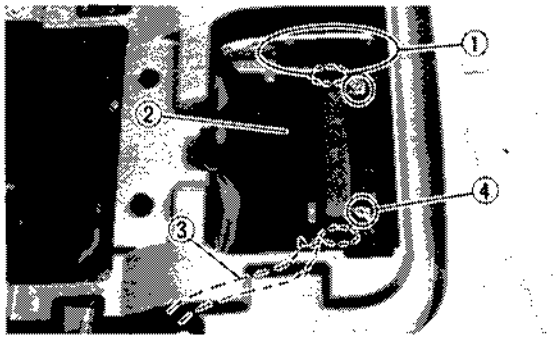
	Bolt ② , ③ (for USA): 7 Nm (0.7 m • kg, 5.1 ft • lb) **Bolt ③ (except for USA): 7 Nm (0.7 m • kg, 5,1 ft • lb)** **Bolt ④ (rear fender and frame): 7 Nm (0,7 m • kg, 5.1 ft • lb)** **Bolt ⑤ (rear fender and footrest plate): 7 Nm (0.7 m • kg, 5.1 ft • lb)**



4. Install:
   - Fuse holder ①
   - Battery ②
   - Breather hose ③

CAUTION:

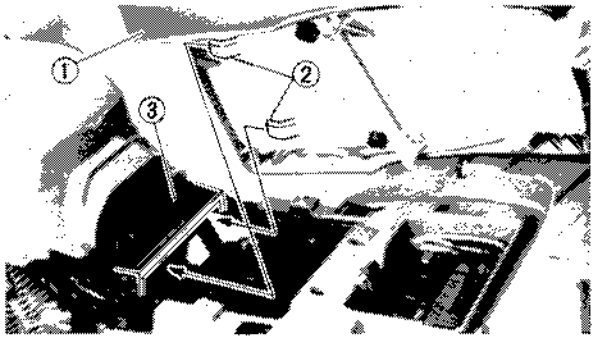
When installing the battery, be sure the breather hose is routed correctly. Refer to the "BATTERY INSPECTION" section.



5. Connect:
   - Battery leads (positive and negative)
   - Battery band

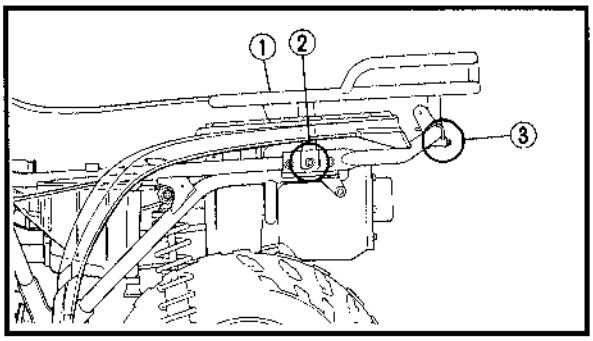
⚠ WARNING

Connect the positive lead ④ first.



6. Install:
   - Seat ①

NOTE:
Insert the lobes ② on the seat front into the receptacle ③ on the frame, then push down the seat at the rear.



7. Install:
   - Rear carrier ① (except for USA)

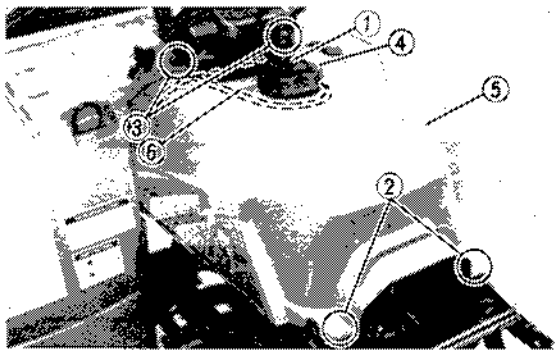
Bolt ② (rear carrier and frame):
33 Nm (3.3 m • kg, 24 ft • lb)
Bolt ③ (rear carrier and rear bumper):
8 Nm (0.8 m • kg, 5.8 ft • lb)

NOTE:
Do not forget to attach the spacer collar at the point where the carrier and bumper are connected.

FUEL TANK

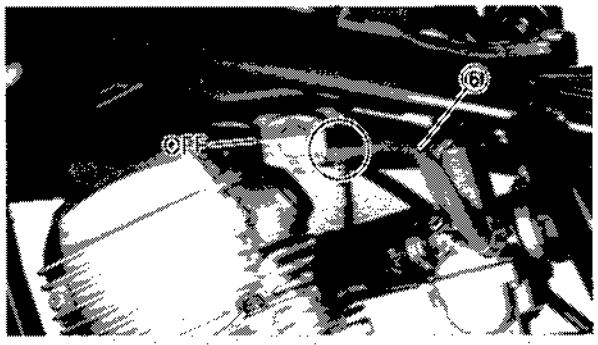
Removal

1. Place the machine on a level place.
2. Remove:
   - Seat
     Refer to the "REAR FENDER – Removal" section.



3. Disconnect:
   - Breather hose ① (tank cap side)
4. Remove:
   - Bolt ② (with flange collar)
   - Screw ③
   - Fuel tank cap ④
   - Fuel tank cover ⑤
   - Damper plate ⑥

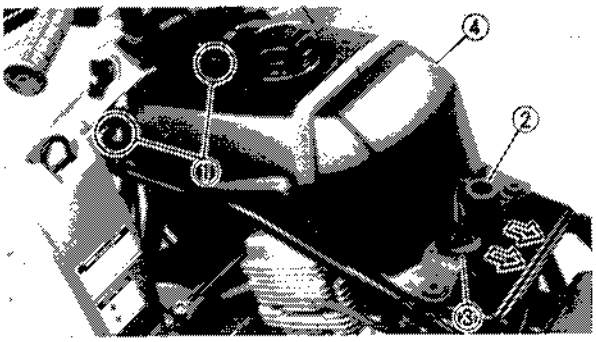
NOTE:
After removing the tank cover, immediately install the tank cap on the fuel tank.



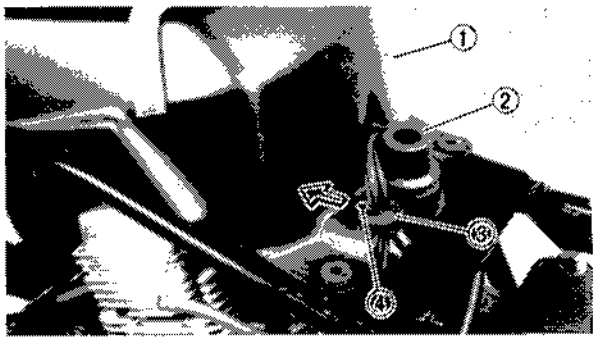
5. Turn the fuel cock lever to "OFF" position.
6. Disconnect :
   - Fuel hose ⑥

NOTE:
Place a rug on the engine to absorb a spilt fuel.

⚠ WARNING
- **Gasoline is highly flammable.**
- **Avoid spilling fuel on the hot engine.**

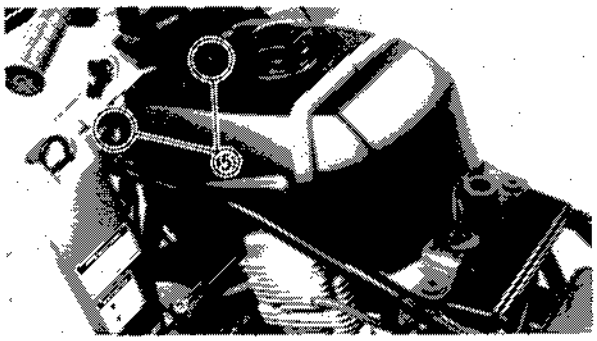


7. Remove:
   - Bolt ① (with washer and collar)
8. Disconnect:
   - Air duct ② (withe hoses)
   - Grommet ③ (withe hoses)
9. Remove:
   - Fuel tank ④



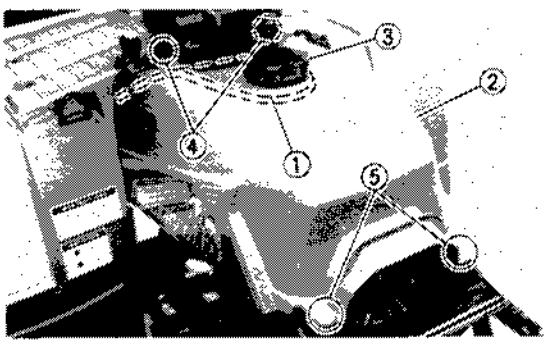
Installation
Reverse the removal procedures.
Note the following points.
1. Install:
   - Fuel tank ①
2. Connect:
   - Air duct ② (with hoses)
   - Grommet ③ (with hoses)

NOTE:
When installing the grommet, the projection ④ should be positioned forward.



3. Install:
   - Bolt ⑤ (with washer and collar)

	Bolt (fuel tank and frame): **7 Nm (0.7 m • kg, 5.1 ft • lb)**



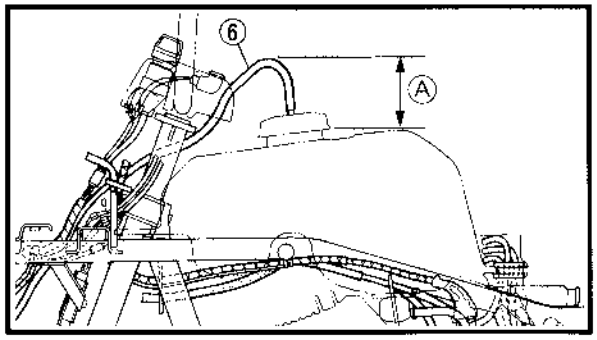
4. Install:
   - Damper plate ①
   - Fuel tank cover ②
   - Fuel tank cap ③
   - Screw ④
   - Bolt ⑤ (with flange collar)

	Screw (fuel tank cover and front fender): **2 Nm (0.2 m • kg, 1.4 ft • lb)**
	Bolt (fuel tank cover and frame): **7 Nm (0.7 m • kg, 5.1 ft • lb)**

NOTE:
Securely insert the lobes on the front fender into the receptacles on the fuel tank cover. Refer to the "FRONT FENDER - Installation" section.

5. Connect:
   - Breather hose ⑥

NOTE:
When installing the breather hose, the top of it should be positioned 100 mm (3.94 in) from the bottom of the fuel tank cap as shown by Ⓐ.



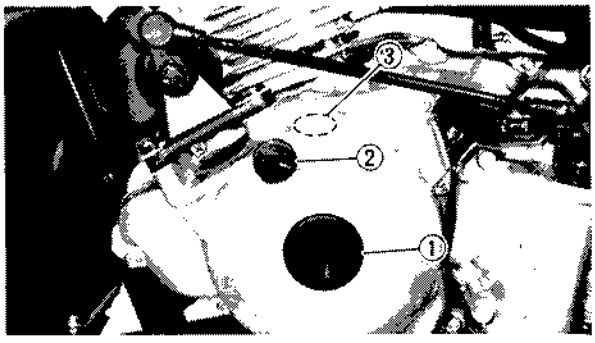
6. Install:
   - Seat
     Refer to the "REAR FENDER-Installation" section.

ENGINE

VALVE CLEARANCE ADJUSTMENT

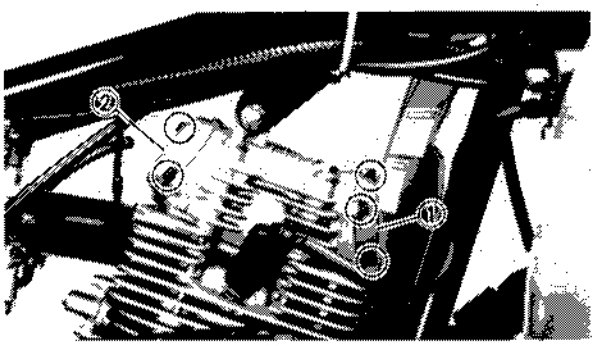
NOTE:
- The valve clearance must be adjusted when the engine is cool to the touch.
- Adjust the valve clearance when the piston is at the Top Dead Center (T.D.C.) on compression stroke.

1. Place the machine on a level place.
2. Remove:
   - Seat
   - Fuel tank cover
   - Fuel tank
     Refer to the "FUEL TANK - Removal" section.



3. Remove:
   - Plug ① (center)
   - Timing plug ② (for USA)
   - Timing plug ③ (except for USA)

NOTE:
Do not remove the starter pulley if the recoil starter is equipped.



4. Remove:
   - Tappet cover ① (exhaust)
   - Tappet cover ② (intake)

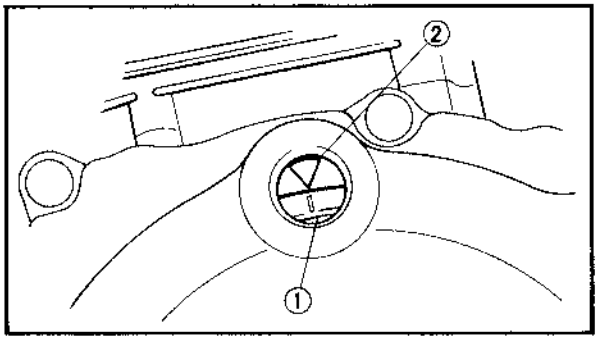
Adjustment

1. Measure:
   - Valve clearance

****

Measurement steps:

- Turn the crank shaft counterclockwise with the wrench.



NOTE:

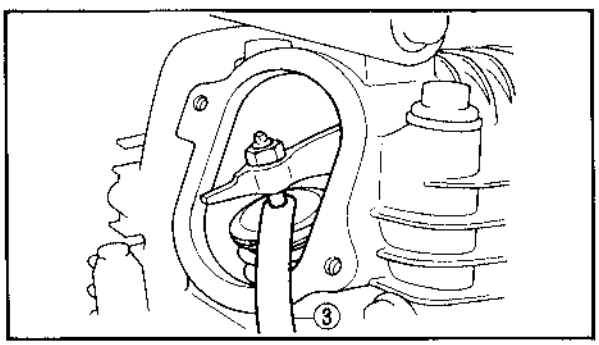
Turn the starter pulley counterclockwise with the recoil starter if the recoil starter is equipped.

- Align the "T" mark ① on the flywheel with the stationary pointer ② on the crankcase cover. When the "T" mark is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

NOTE:

T.D.C. on compression stroke check:

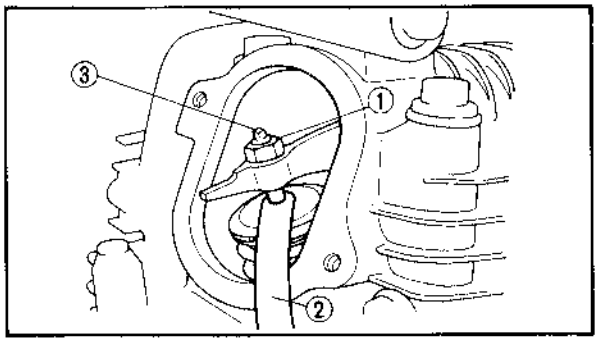
- Both rocker arms must have a valve clearance when the rotor match mark ① is aligned with the stationary pointer match mark ② .
- If not, give the crankshaft one counterclockwise turn to meet above condition.



- Measure the valve clearance using a Feeler Gauge ③ .
  Out of specification → Adjust clearance.

Intake valve (cold):
0.05 ~ 0.09 mm (0.002 ~ 0.004 in)
Exhaust valve (cold):
0.11 ~ 0.15 mm (0.004 ~ 0.006 in)

****



2. Adjust:
   • Valve clearance

****

Valve clearance adjustment steps:

- Loosen the locknut ①.
- Insert a Feeler Gauge ② between the adjuster end and the valve stem end.
- Turn the adjuster ③ clockwise or counterclockwise with the Valve Adjusting Tool until proper clearance is obtained.

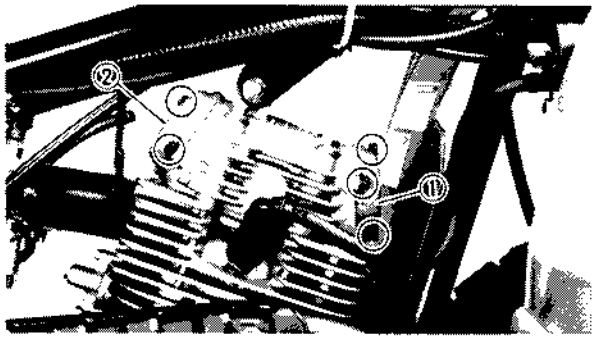
	Valve adjusting tool 3 mm (0.12 in): P/N. YM-08035, 90890-01311

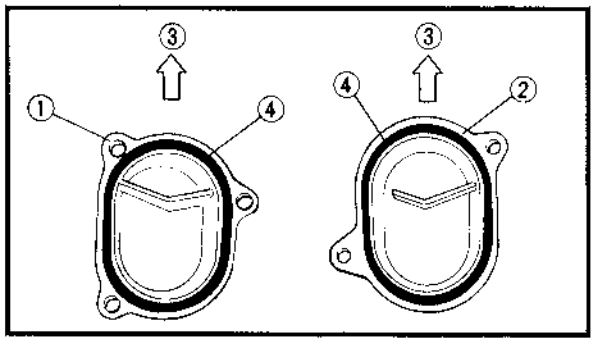
- Hold the adjuster to prevent it from moving and thoroughly tighten the locknut.

	Valve clearance adjusting locknut: 14 Nm (1.4 m • kg, 10 ft • lb)

- Once again, measure the valve clearance.
- If the clearance is incorrect, repeat above steps until the proper clearance is obtained.

****





Installation

Reverse the "Removal" procedure. Note the following points.

1. Install:
   • Tappet cover ① (exhaust)
   • Tappet cover ② (intake)

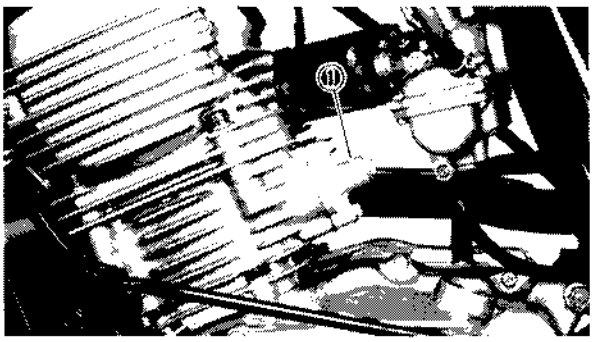
NOTE:

- Install the tappet covers with its ridge facing upward ③.
- Check the O-ring ④ for damage. If damaged, replace.

	Tappet cover: 10 Nm (1.0 m • kg, 7.2 ft • lb)

2. Install:
   - Fuel tank
   - Fuel tank cover
   - Seat

   Refer to the "FUEL TANK-Installation" section.



TIMING CHAIN TENSIONER ADJUSTMENT

This model has been equipped the automatic timing chain tensioner ① . No adjustment is necessary.

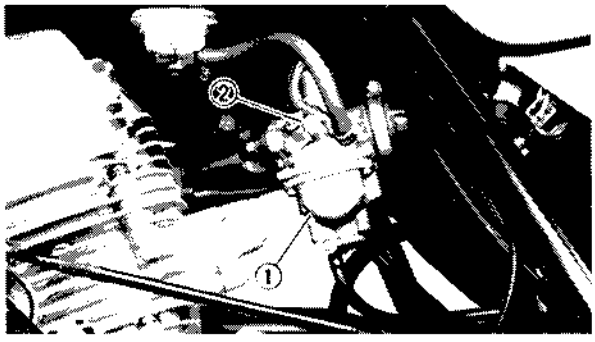
IDLE SPEED ADJUSTMENT

1. Place the machine on a level place.
2. Warm up engine for several minutes.
3. Adjust:
   - Engine idle speed

****

Adjustment steps:

- Turn the pilot screw ① clockwise until it is lightly seated.
- Loosen the pilot screw by turning it counterclockwise for the specified number of turns.



Pilot screw: 1-1/4 counterclockwise turns

- Turn the throttle stop screw ② until the Idle speed is in the specified range. Use the Inductive Tachometer to confirm the engine speed.

Clockwise	Idle speed becomes higher.
Counterclockwise	Idle speed becomes lower.
Inductive tachometer: P/N. YU-08036-A, 90890-03113	
Engine idle speed: 1,350 ~ 1,450 r/min	

- Turn the pilot screw ① again clockwise or counterclockwise in 1/8-turn increments to achieve the highest speed with just the pilot screw.
- Once again, turn the throttle stop screw ② to attain the specified idle speed.

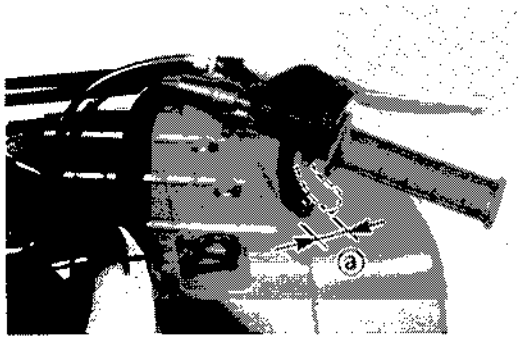
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4. Check:
   - Throttle cable free play
     Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" section.

THROTTLE CABLE FREE PLAY ADJUSTMENT

NOTE:
Before adjusting the throttle cable free play, the engine idle speed should be adjusted.

1. Place the machine on a level place.

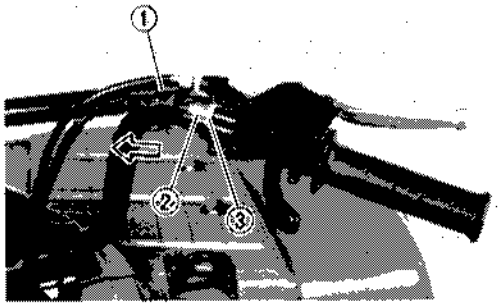


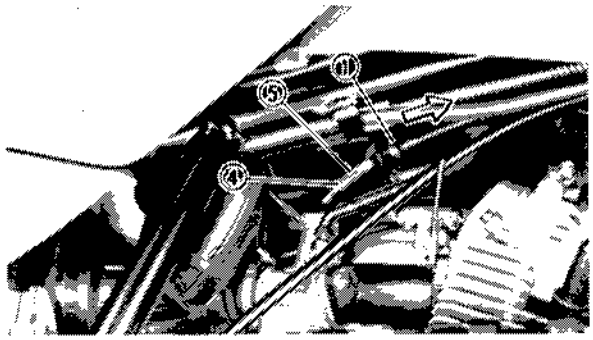
2. Check:
   - Throttle cable free play ⓐ
     Out of specification → Adjust.

Throttle cable free play:
3 ~ 5 mm (0.12 ~ 0.20 in)

3. Adjust:
   - Throttle cable free play

NOTE:
If the throttle cable free play can not be adjusted on the carburetor side, adjust it on the throttle housing side.





****

Adjustment steps:

- Pull back the adjuster covers ① from the both side (throttle housing and carburetor).
- Make sure that the adjuster ② and locknut ③ on the throttle housing side are fully tightened.
- Loosen the locknut ④ on the carburetor side.
- Turn the adjuster ⑤ clockwise or counterclockwise until the proper free play is obtained.

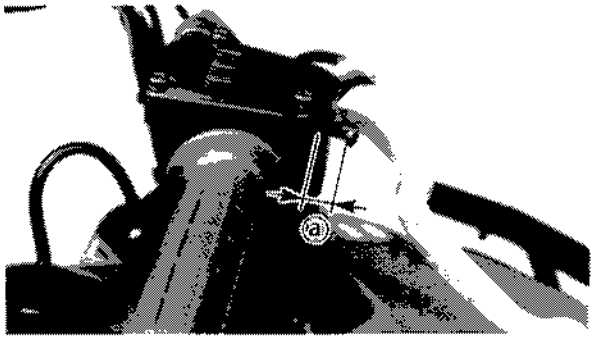
Clockwise	**Free play is increased.**
Counterclockwise	**Free play is decreased.**

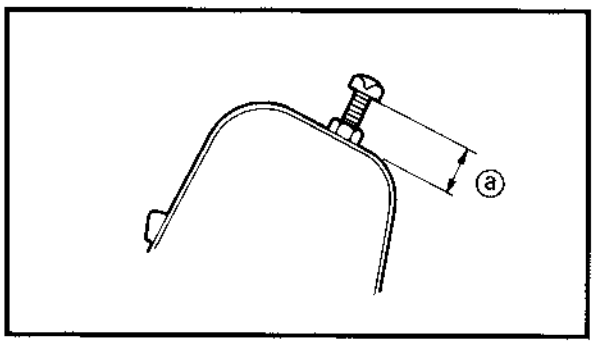
- Tighten the locknut.
- Reset the adjuster covers.

⚠ WARNING

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

****





SPEED LIMITER ADJUSTMENT

The speed limiter keeps the carburetor throttle from becoming full-open even when the throttle lever is pushed to a maximum. Screwing in the adjuster stops the engine speed from increasing.

1. Adjust:
   - Speed limiter length ⓐ

****

Adjustment steps:

- Loosen the locknut ①.
- Turn the adjuster ② clockwise or counterclockwise until the proper length is attained.

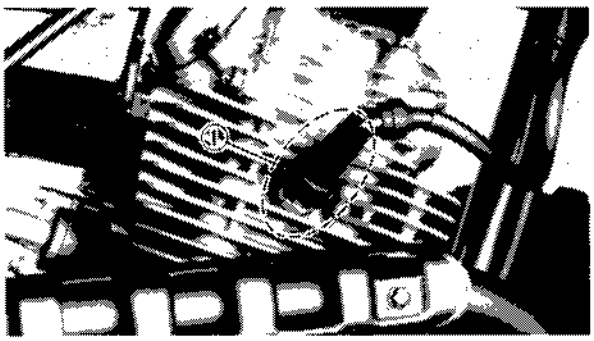
	Speed limiter standard length: 12 mm (0.47 in)

- Tighten the locknut.

⚠ WARNING

- **Particularly for a beginner rider, the speed limiter should be screwed in completely. Screw it out little by little as riding technique improves. Never remove the speed limiter from the outset.**
- **For proper throttle lever operation do not turn out the adjuster more than 12 mm (0.47 in). Also adjust the throttle lever free play always to 3 ~ 5 mm (0.12 ~ 0.20 in).**

****



SPARK PLUG INSPECTION

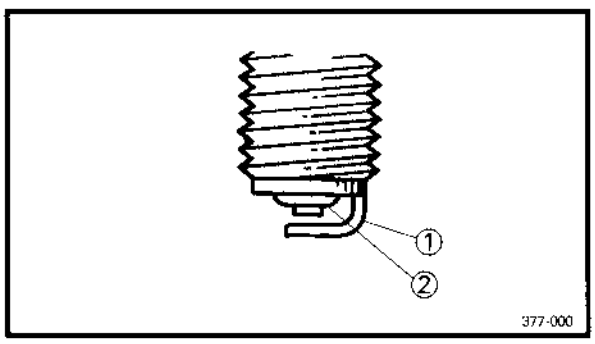
1. Place the machine on a level place.
2. Remove:
   - Spark plug ①

CAUTION:

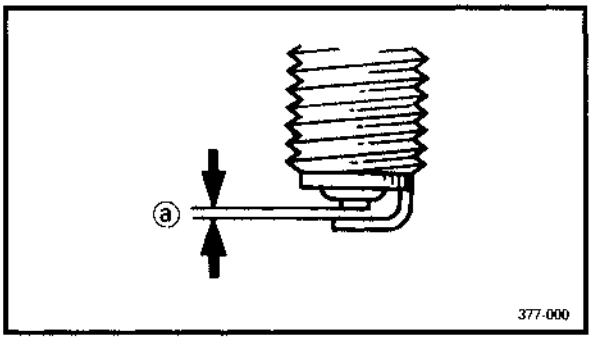
Before completely removing plug, use compressed air to clean the setting areas to prevent dirt particles from falling into the engine.

3. Inspect:
   - Spark plug type
     Incorrect → Replace.

Standard spark plug:
- **For USA, Oceania**
  D7EA (NGK) or X22ES-U (NIPPONDENSO)
- **For CDN, Europe, ZA**
  DR7ES (NGK)



4. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator color ②
     Normal condition is a medium to light tan color.
     Distinctly different color → Check the engine condition.



5. Clean:
   - Spark plug
     Clean the spark plug with a spark plug cleaner or wire brush.
6. Measure:
   - Spark plug gap ⓐ
     Out of specification → Regap.
     Use a wire gauge.

Spark plug gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

7. Tighten:
   - Spark plug

NOTE:
- Before installing a spark plug, clean the gasket surface and plug surface.
- Finger-tighten the spark plug before torquing to specification.

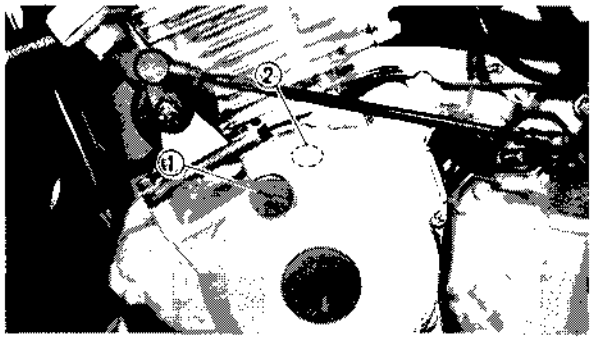
Spark plug:
17.5 Nm (1.75 m • kg, 12.5 ft • lb)

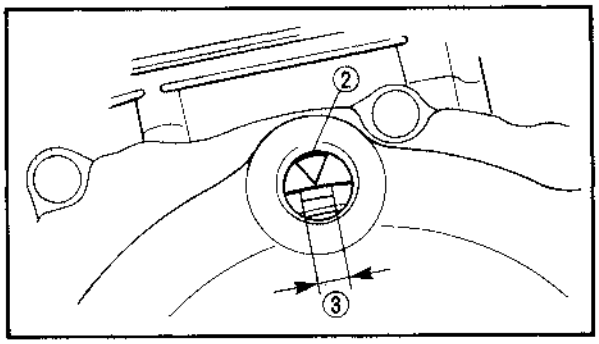
IGNITION TIMING CHECK

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

1. Place the machine on a level place.
2. Start the engine and let it warm up for several minutes, then stop the engine.
3. Attach:
   - Inductive tachometer
   - Timing light
     to spark plug lead.

Inductive tachometer:
P/N. YU-08036-A, 90890-03113
Timing light:
P/N. YM-33277-A, 90890-03141





4. Check:
   • Ignition timing

****

Checking steps:

- Remove the plug ① (for USA).
- Remove the plug ② (except for USA).
- Start the engine and let it idle at the specified idle speed.

	Idle speed: **1,400 r/min**

CAUTION:

Under extreme conditions, the oil may spurt out when running the engine. Therefore care should be used when running.

- Visually check the stationary pointer ② on the crankcase cover to verify it is within the firing range ③ indicated on the flywheel.
  Incorrect → Check flywheel and/or pulser coil assembly (tightness and/or damage).
  Refer to "CHAPTER 8. ELECTRICAL" section further incoformation.

NOTE:

Ignition timing is not adjustable.

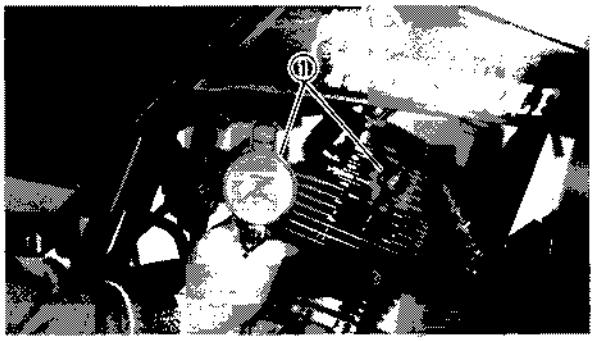
****

5. Install:
   • Plug
6. Detach:
   • Timing light
   • Inductive tachometer

COMPRESSION PRESSURE MEASUREMENT

NOTE:

- Insufficient compression pressure will result in performance loss.
- Before measuring the compression pressure, the valve clearance should be adjusted.
  Refer to "VALVE CLEARANCE ADJUSTMENT" section.



1. Place the machine on a level place.
2. Remove:
   - Spark plug
3. Measure:
   - Compression pressure

****

Measurement steps:

- Install the Compression Gauge ①.

Compression gauge:
P/N. YU-33223, 90890-03081
Adapter:
P/N. YU-33223-3, 90890-04082

- Crank over the engine with the electric starter (be sure the battery is fully charged) with the throttle wide-open until the compression reading on the gauge stabilizes.

⚠ WARNING

When cranking the engine, ground the spark plug lead to prevent sparking.

- Check readings with specified levels (see chart).

Compression pressure (at sea level):
Standard: 900 kPa (9.0 kg/cm², 128 psi)
Minimum: 800 kPa (8.0 kg/cm², 114 psi)
Maximum: 1,000 kPa (10.0 kg/cm², 142 psi)

- If pressure falls below the minimum level:
  1) Squirt a few drops of oil into the affected cylinder.
  2) Measure the compression again.

Compression pressure (with oil introduced into cylinder)	
Reading	**Diagnosis**
Higher than without oil	Worn or damaged pistons
Same as without oil	Defective ring(s), valves, cylinder head gasket or piston is possible.
Above maximum level	Inspect cylinder head, valve surface, or piston crown for carbon deposit.

- Remove the Compression Gauge.

****

4. Install:
   • Spark plug

	Spark plug: **17.5 Nm (1.75 m • kg, 12.5 ft • lb)**

Refer to "SPARK PLUG INSPECTION" section.

ENGINE OIL LEVEL INSPECTION

CAUTION:

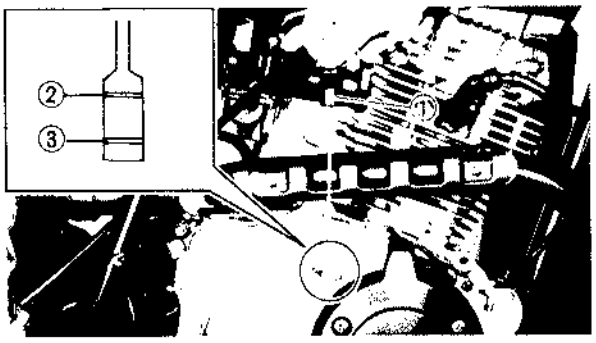
- **Do not add any chemical additives. Engine oil also lubricates the clutch and additives could cause clutch slippage.**
- **Do not allow foreign material to enter the crankcase.**

1. Place the machine on a level place.
2. Inspect:
   • Engine oil level
   Oil level low → Add sufficient oil

****

Inspection steps:

- Warm up the engine for several minutes, and stop it, then wait at least several minutes for the oil to drain back into the crankcase.



- Screw the dipstick ① completely out, and wipe the dipstick clean, then just rest the dipstick in the hole.
- Pull up the dipstick, and inspect the oil level whether or not it is between maximum ② and minimum level ③.
- If the level is lower, add the oil up to the proper level.

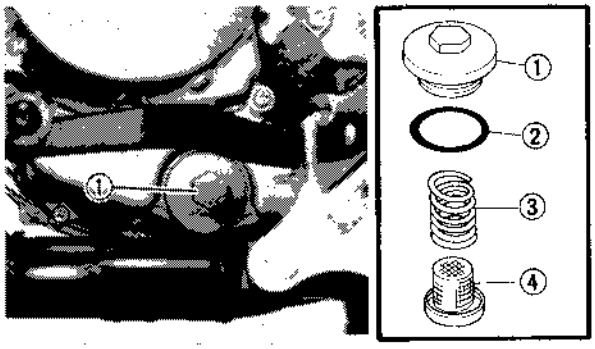
	Recommended oil: **At 5°C (40°F) or higher:** **SAE 20W40 type SE/SF or Yamalube 4 (20W40)** **At 15°C (60°F) or lower:** **SAE 10W30 type SE/SF or Yamalube 4 (10W30)**

****

ENGINE OIL REPLACEMENT

CAUTION:

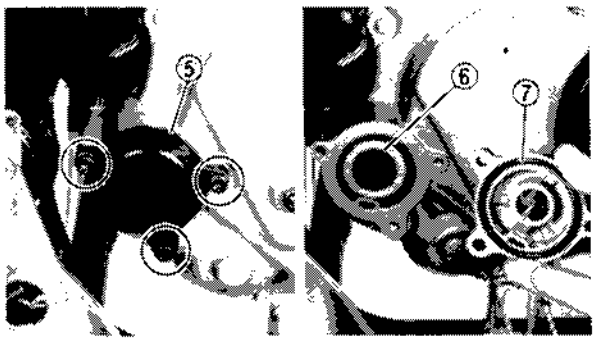
- **Do not add any chemical additives. Engine oil also lubricates the clutch and additives could cause clutch slippage.**
- **Do not allow foreign material to enter the crankcase.**



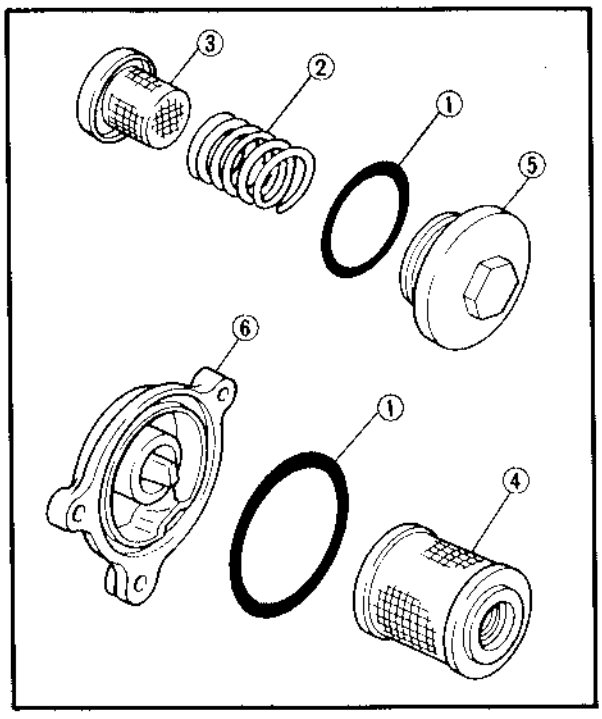
1. Place the machine on a level place.
2. Warm up the engine for several minutes, and stop it.
3. Place an oil pan under the engine.
4. Remove:
   - Dipstick
   - Drain plug ① (crankcase)
     Drain the engine oil.

CAUTION:

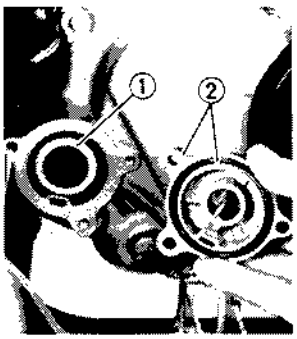
When removing the drain plug (crankcase) the compression spring ③, oil strainer ④ and O-ring ② will fall off. Take care not to lose these parts.

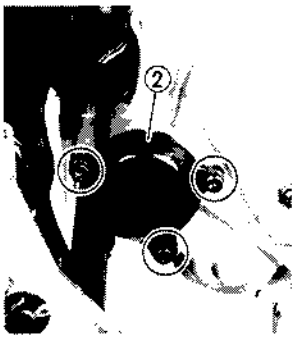


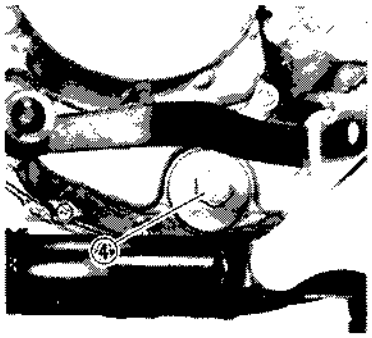
5. Remove:
   - Oil filter cover ⑤
   - Oil filter ⑥
   - O-ring ⑦

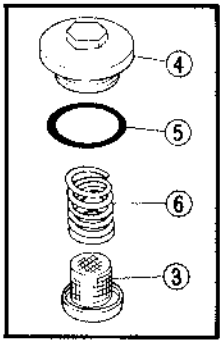


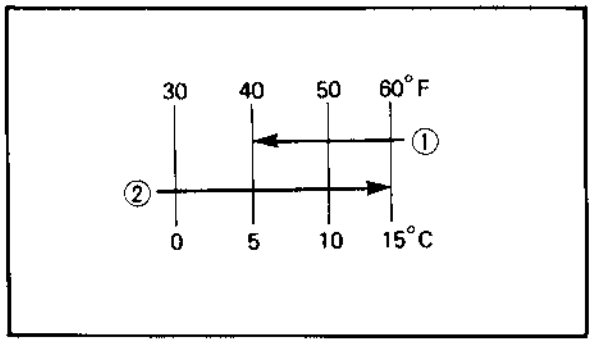
6. Inspect:
   - O-rings ①
   - Compression spring ②
   - Oil strainer ③
   - Oil filter ④
     Damage → Replace.
7. Clean:
   - Compression spring ②
   - Oil strainer ③
   - Oil filter ④
   - Drain plug ⑤ (crankcase)
   - Oil filter cover ⑥
     Wash them with a cleaning solvent.
8. Apply:
   - Engine oil (light coating)
     (to the O-rings)











9. Install:
   - Oil filter ①
   - Oil filter cover ② (with O-ring)
   - Oil strainer ③
   - Drain plug ④ (crankcase)

CAUTION:

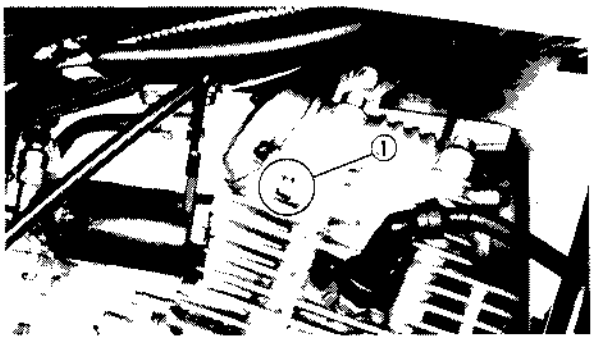
Before reinstalling the drain plug (crankcase), do not forget to fit the O-ring ⑤ , compression spring ⑥ and oil strainer. Be sure you fit each item in the correct position and order.

Oil filter cover:
10 Nm (1.0 m • kg, 7.2 ft • lb)
Drain plug (crankcase):
43 Nm (4.3 m • kg, 31 ft • lb)

10. Fill:
   - Crankcase

Recommended oil
At 5°C (40°F) or higher ① :
SAE 20W40 type SE/SF or Yamalube 4 (20W40)
At 15°C (60°F) or lower ② :
SAE 10W30 type SE/SF or Yamalube 4 (10W30)
Periodic oil change:
1.5 L (1.3 Imp qt, 1.6 US qt)
With oil filter cleaning/replacement:
1.6 L (1.4 Imp qt, 1.7 US qt)

11. Install:
   - Dipstick
12. Warm up the engine for 5 minutes or more, and stop it.
13. Inspect:
   - Oil leaks
   - Oil level
14. Inspect:
   - Oil flow



****

Inspection steps:

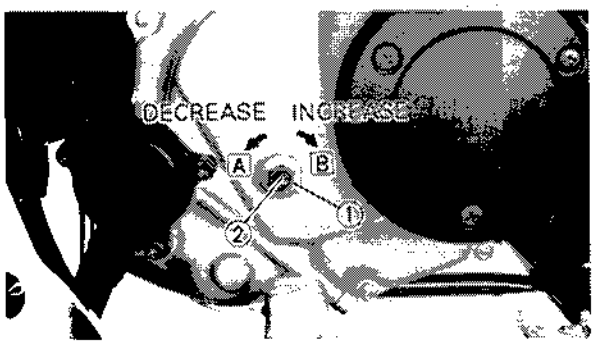
- Slightly loosen the oil gallery plug ① in the cylinder head.
- Start the engine and keep it idling until oil begins to seep from the oil gallery plug. If no oil comes out after one minutes, stop the engine immediately so it will not engine stick.

- Restart the engine after solving the problem(s), and recheck the oil pressure.
- Tighten the oil gallery plug to specification.

	Oil gallery plug: **7 Nm (0.7 m • kg, 5.1 ft • lb)**

****

15. Adjust:
    - Rear brake
      Refer to "REAR BRAKE LEVER AND PEDAL ADJUSTMENT" section.



CLUTCH ADJUSTMENT

Release lever free play adjustment

1. Adjust:
   - Release lever free play

****

Adjustment steps:

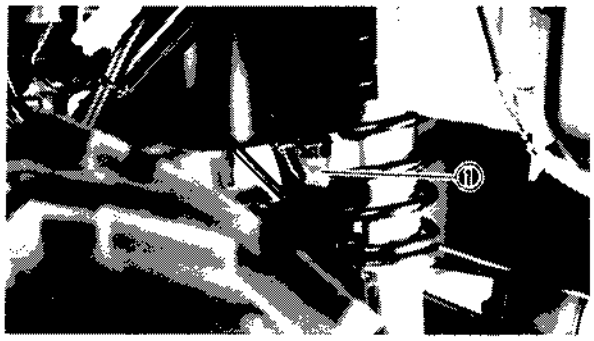
- Loosen the locknut ①.
- Slowly turn the adjuster ② counterclockwise until resistance is felt, then turn back it 1/8 clockwise, hold the adjuster ② in this position and tighten the locknut ① .

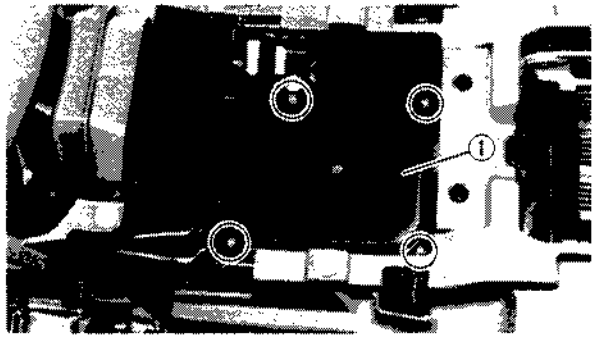
NOTE:

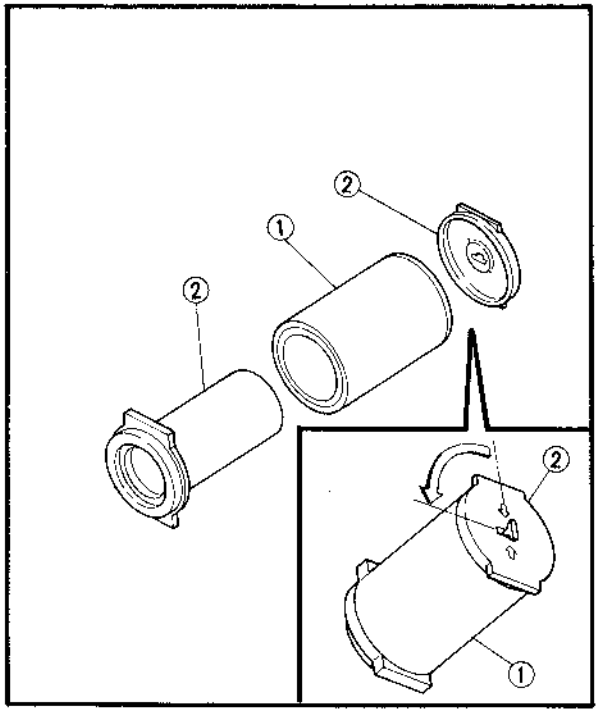
Turn the adjuster counterclockwise ("DECREASE" direction) [A] to decrease the clutch free play and turn it clockwise ("INCREASE" direction) [B] to increase the free play.

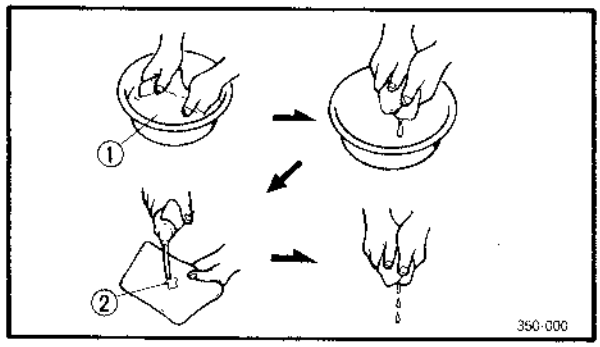
	Locknut (adjuster): **15 Nm (1.5 m • kg, 11 ft • lb)**

****









AIR FILTER CLEANING

NOTE:

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

1. Remove:
   - Seat
     Refer to "REAR FENDER-Removal" section.
2. Remove:
   - Cover ① (air filter case)
   - Air filter

3. Remove:
   - Air filter ①
   - Guide ②

NOTE:

When removing the air filter, rotate the air filter guide 1/4 turn, and remove the filter.

CAUTION:

The engine should never be run without the air filter; excessive piston and/or cylinder wear may result.

4. Inspect:
   - Air filter ①
   - Guide ②
     Damage → Replace.

5. Clean:
   - Air filter

****

Cleaning steps:

- Wash the filter gently, but thoroughly in solvent ①.

⚠ WARNING

Never use low flash point solvents such as gasoline to clean the filter. Such solvent may lead to a fire or explosion.

● Squeeze the excess solvent out of the filter and let dry.

CAUTION:

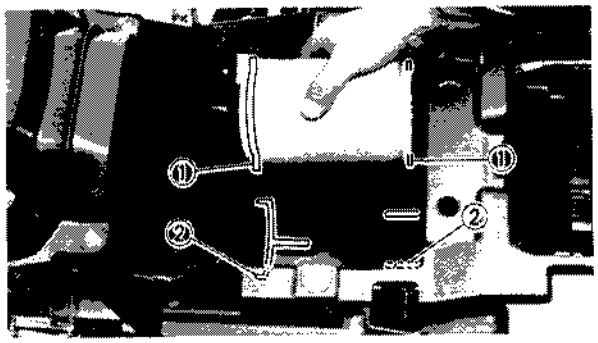
Do not twist the filter when squeezing the filter.

● Apply the SAE 10W30 motor oil ②.
● Squeeze out the excess oil.

NOTE:

The filter should be wet but not dripping.

****

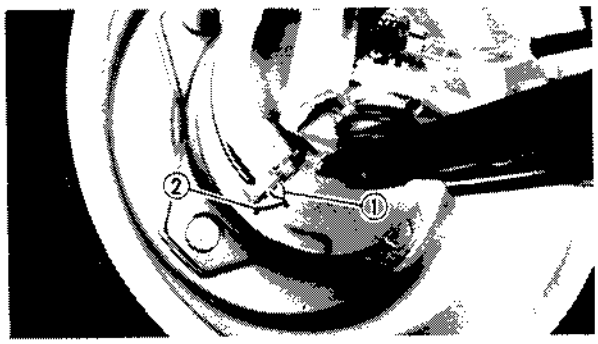


6. Install:
   • Air filter
     (to guide)
7. Install:
   • Air filter

NOTE:

• Insert the lobes ① on the filter guide into the receptacles ② on the filter case.
• Make sure its sealing surface matches the sealing surface of the case so there is no air leak.

8. Install:
   • Cover (air filter case)
   • Seat
     Refer to "REAR FENDER-Installation" section.

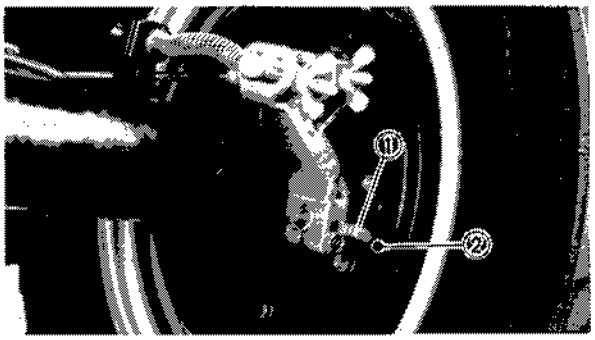


CHASSIS

FRONT AND REAR BRAKE LINING INSPECTION

Front brake

1. Apply the front brake.
2. Inspect:
   • Wear indicator ①
     Indicator reaches the wear limit mark ② → Replace brake shoes as a set.
     Refer to the "FRONT WHEEL AND FRONT BRAKE" section in CHAPTER 7.



Rear brake

1. Depress the Rear brake pedal.
2. Inspect:
   - Wear indicator ①
     Indicator reaches the wear limit mark ② → Replace brake shoes as a set.
     Refer to the "REAR BRAKE" section in CHAPTER 7.

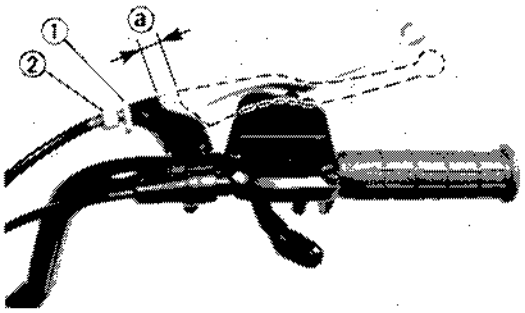
FRONT BRAKE ADJUSTMENT

NOTE:

Before adjusting the front brake, the front brake linings should be inspected.

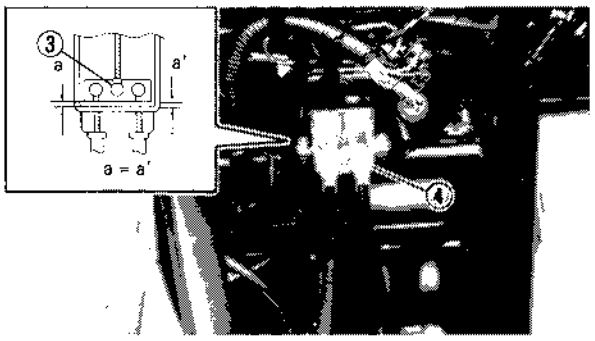
CAUTION:

Proper lever free play is essential to avoid excessive brake drag.



1. Check:
   - Front brake lever free play ⓐ
     Out of specification → Adjust.

Front brake lever free play:
5 ~ 8 mm (0.20 ~ 0.31 in) at lever pivot

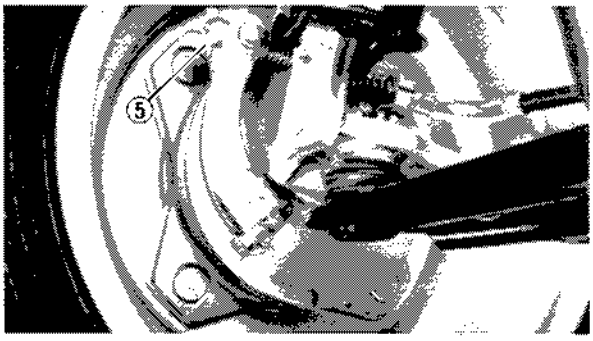


2. Adjust:
   - Front brake lever free play

****

Adjustment steps:

- Loosen the locknut ① and turn the adjuster ② clockwise to release the tension in the front brake cable.
- Visually check the cable joint ③ in the equalizer ④ to verify it is horizontal.
- If not horizontal, turn both adjuster ⑤ (Front hub — left and right) until the cable joint ③ is horizontal.
- Make sure that the both brakes (left and right) have some slight drag by lifting the front wheels off the ground, then spin the wheels.
- Turn the adjuster ② clockwise or counterclockwise until proper free play is obtained.



Clockwise	Free play is increased.
Counterclockwise	Free play is decreased.

● Tighten the locknut.

****

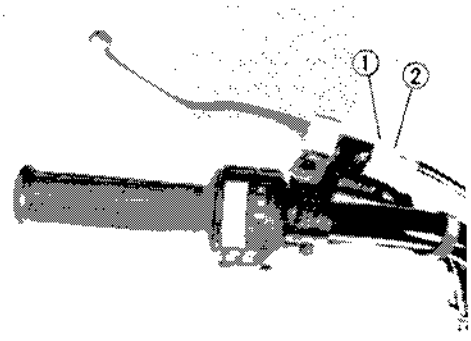
REAR BRAKE LEVER AND PEDAL ADJUSTMENT

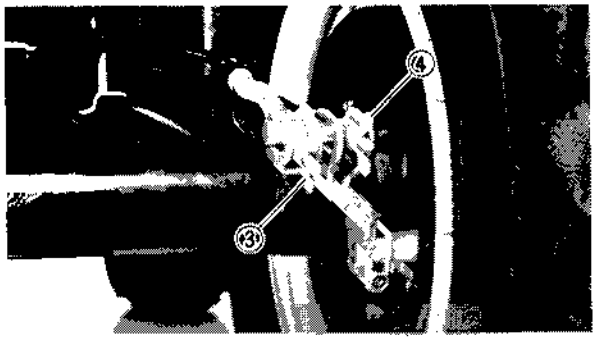
NOTE:
Before adjusting the rear brake, the rear brake linings should be inspected.

CAUTION:
Proper lever and pedal free play is essential to avoid excessive brake drag.

⚠ WARNING
Always adjust both the brake pedal and the brake lever whenever adjusting the rear brake.

1. Place the machine on a level place.





2. Adjust:
   - Brake lever free play
   - Brake pedal free play

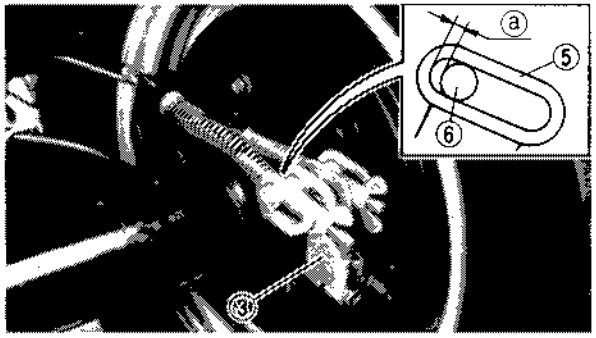
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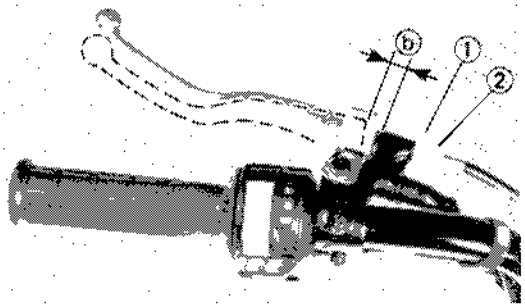
Adjustment steps:

NOTE:
Before adjusting the free play, pump the brake pedal 2 to 3 times.

- Fully loosen the locknut ① (handlebar) and fully turn in the brake lever adjuster ②.
- Fully loosen brake lever cable adjuster ③ and brake pedal adjuster ④.







- Tighten the brake pedal adjuster ④ until proper free play is attained.

Free play ⓐ (brake pedal):
20 ~ 30 mm (0.78 ~ 1.18 in)

- Turn the brake lever cable adjuster ③ clockwise until the gap ⓐ is within the specified limits.

Gap ⓐ :
0 ~ 1 mm (0 ~ 0.04 in)

⑤ Brake cam lever
⑥ pin

- Turn out the brake lever cable adjuster ② (handlebar) until proper free play is attained.

Free play ⓑ (brake lever):
5 ~ 8 mm (0.2 ~ 0.3 in) at lever pivot

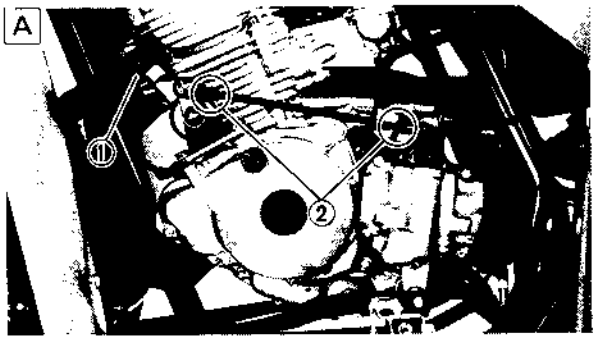
- Tighten the locknut ① (handlebar).
- Inspect brake lever and brake pedal free play. If out of specification, perform adjustment steps again.

⚠ WARNING

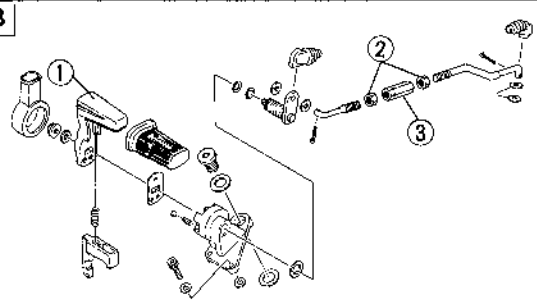
After this adjustment is performed, block the rear of the machine off the ground, and spin the rear wheels to ensure there is no brake drag. If any brake drag is noticed, perform the above steps again.

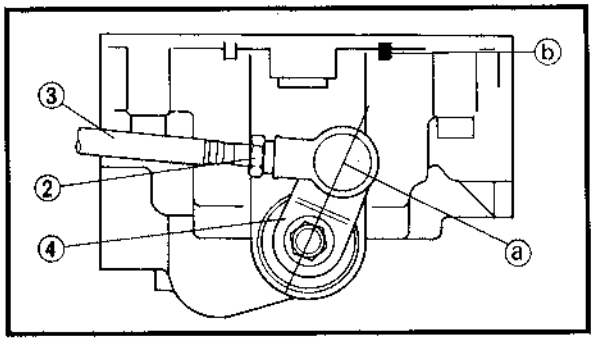
****

A



B





DRIVE SELECT LEVER POSITION ADJUSTMENT

1. Adjust:
   - Drive select lever position

****

Adjustment steps:

- Place the machine on a level place.
- Shift the transmission in first gear, and move the select lever ① to reverse position.
- Loosen the locknuts ②.
- Turn the select lever adjuster ③ in or out until lever ④ center line ⓐ aligns with match mark ⓑ on the crankcase cover.
- Tighten the locknuts②.

Locknut (select lever adjuster): 8 Nm (0.8 m • kg, 5.8 ft • lb)

NOTE:

After adjusting the drive select lever, be sure the reverse indicator light comes on when the drive select lever is in reverse position.

A For USA
B Except for USA

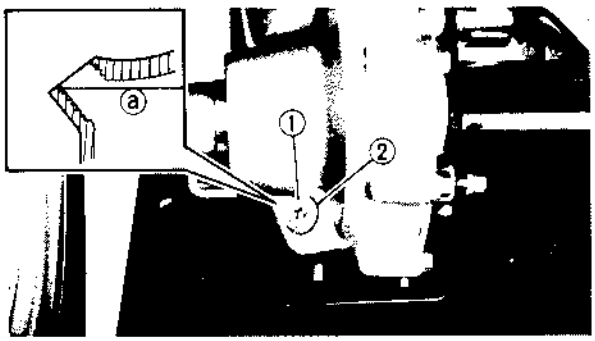
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FINAL DRIVE GEAR OIL LEVEL INSPECTION

1. Inspect:
   - Final drive gear oil level
     Oil level low → Add sufficient oil.

NOTE:

The engine should be cool (at atmospheric temperature).



****

Inspection steps:

- Place the machine on a level place.
- Place an oil pan under the final drive gear case.
- Remove the filler bolt ① and copper washer ②.
- Visually check the oil level. Correct oil level ⓐ should be at the lower brim of the hole.

- If the oil level is low, add the recommended oil up to the specified level. Refer to "FINAL DRIVE GEAR OIL REPLACEMENT" section.
- Inspect the copper washer for damage. If damaged, replace it
- Install the copper washer and filler bolt.

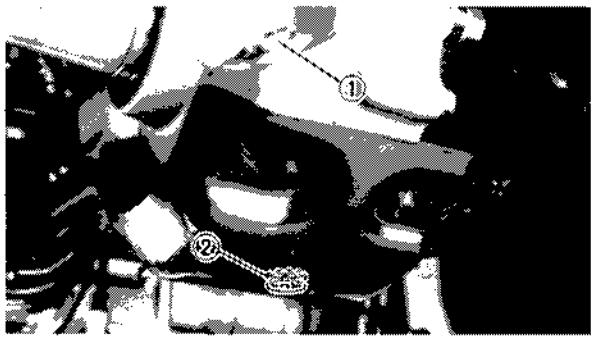
NOTE:
- Before installing the filler bolt, do not forget to fit the copper washer.
- After installing the filler bolt, inspect the oil leaks.

	Filler bolt (final drive gear case): 23 Nm (2.3 m • kg, 17 ft • lb)

****

FINAL DRIVE GEAR OIL REPLACEMENT

1. Place the machine on a level place.
2. Place an oil pan under the final drive gear case.



3. Remove:
   - Filler bolt ① (final drive gear case)
   - Drain plug ② (gear case)

   Drain the final drive gear oil.
4. Inspect:
   - Copper washer (filler bolt)
   - Copper washer (drain plug)

   Damage → Replace.
5. Install:
   - Drain plug (final drive gear case)

	Drain plug (final drive gear case): 23 Nm (2.3 m • kg, 17 ft • lb)

6. Fill:
   - Final drive gear case

CAUTION:

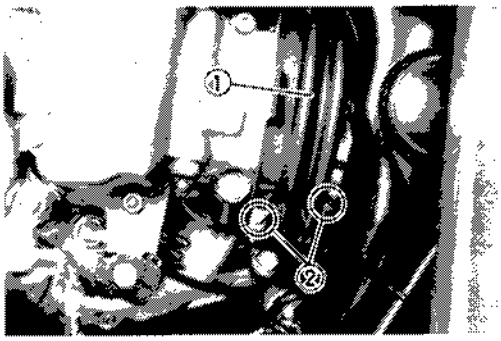
Do not allow foreign material to enter the final drive gear case.

Recommended oil:
SAE 80 API "GL–4" hypoid gear oil
If desired, and SAE 80W90 hypoid gear oil may be used for all condition.
Periodic oil chang:
0.12 L (0.10 Imp qt, 0.13 US qt)
Total amount:
0.13 L (0.11 Imp qt, 0.14 US qt)

7. Install:
   - Filler bolt (final drive gear case)

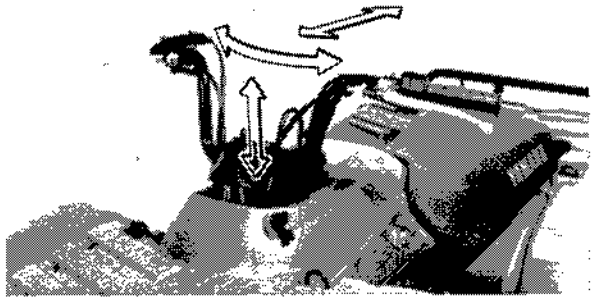
NOTE:
After filling the oil, inspect the oil leaks.

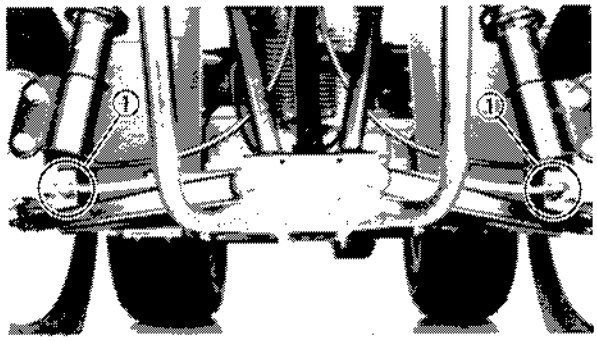
Filler bolt (final drive gear case):
23 Nm (2.3 m • kg, 17 ft • lb)



DRIVE SHAFT DUST BOOT INSPECTION

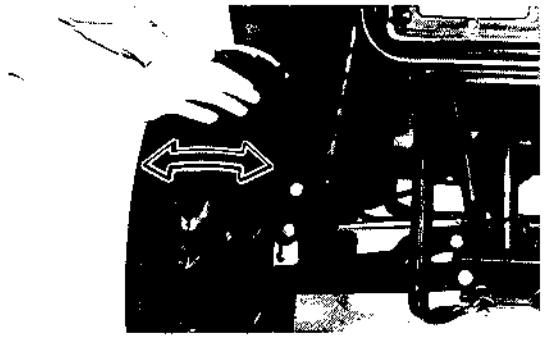
1. Inspect:
   - Dust boot ①
     Wear/Damage → Replace.
     Loose clamp ② → Tighten.
     Refer to the "REAR SHOCK ABSORBER AND SWINGARM" section in CHAPTER 7.



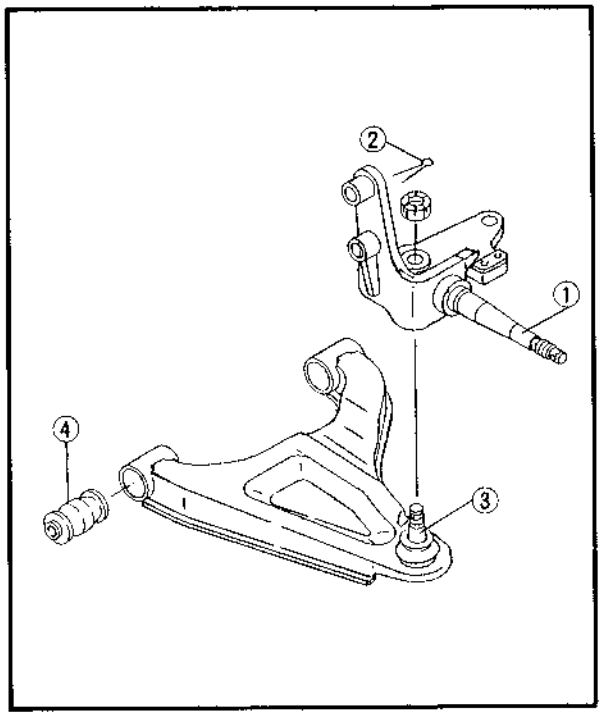


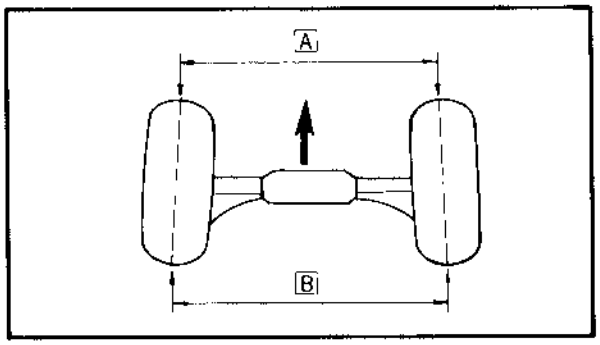
STEERING SYSTEM INSPECTION

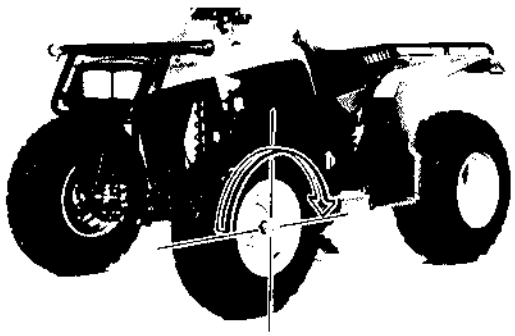
1. Place the machine on a level place.
2. Check:
   - Steering shaft bushings and bearings
     Move the handlebar up and down, and/or back and forth.
     Excessive play → Replace the steering shaft bushings and or bearings.
     Refer to "STEERING SYSTEM" section in the CHAPTER 7.
3. Check:
   - Tie-rod ends
     Turn the handlebar to the left and/or right until it stops completely, then slightly move the handlebar from left to right.
     Tie-rod end ① has any vertical play → Replace the tie-rod end(s).
     Refer to the "STEERING SYSTEM" section in CHAPTER 7.



4. Raise the front end of the machine so that there is no weight on the front wheels.
5. Check:
   - Knuckles and/or wheel bearings
     Move the wheels laterally back and forth.
     Excessive free play → Replace the following parts.
     1) Wheel bearings
     2) Knuckle shaft(s) ①
     3) Cotter pin(s) ②
     4) Stud boll(s) ③ (lower arm)
     5) Bushings ④ (lower arm)
     Refer to the "STEERING SYSTEM" section in CHAPTER 7.







TOE-IN ADJUSTMENT

1. Place the machine on a level place.
2. Measure:
   - Toe-in
     Out of specification → Adjust.

****

Toe-in measurement steps:

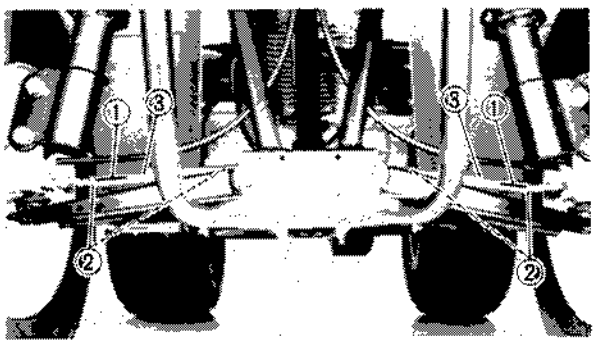
- Mark both front tire tread centers.
- Raise the front end of the machine so that there is no weight on the front tires.
- Fix the handlebar straight ahead.
- Measure the width [A] Between the marks.
- Rotate the front tires 180 degrees until the mark come exactly opposite.
- Measure the width [B] between the marks.
- Calculate the toe-in using the formula given below.

Toe-in = [B] − [A]

Toe-in:
0 ~ 10 mm (0 ~ 0.39 in)

● If the toe-in is incorrect, adjust the toe-in.

****



3. Adjust:
   • Toe-in

****

Adjustment steps:

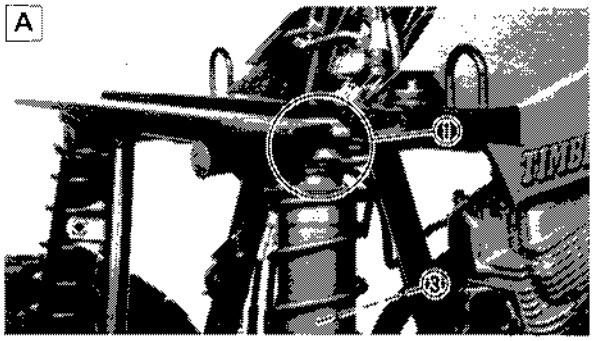
● Place a confirmation marks ① on the both tie-rods end.
● Loosen the rod end locknuts ② of both tie-rods.
● The same number of turns should be given to both tie-rods ③ right and left until the specified toe-in is obtained, so that the lengths of the rods will be kept the same.
● Tighten the rod end locknuts ② of both tie-rods.

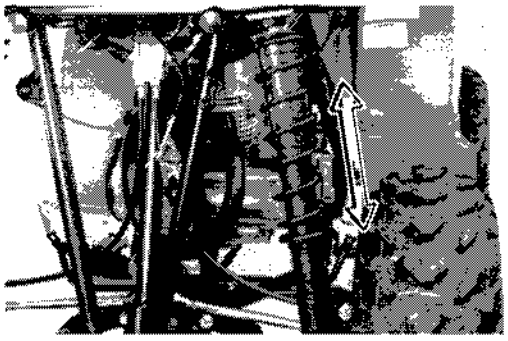
Locknut (rod end):
30 Nm (3.0 m • kg, 22 ft • lb)

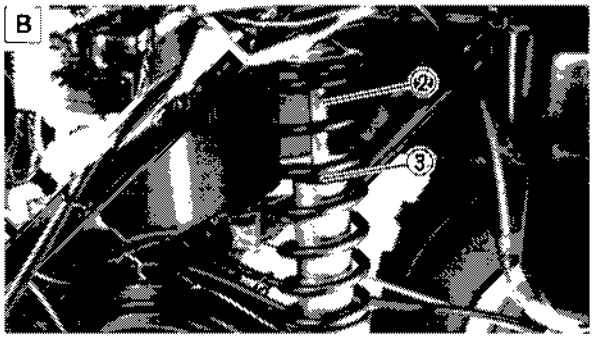
⚠ WARNING

- **Be sure that both tie-rods (left and right) are turned by the same amount. If not, the machine will go right or left even though the handlebar is positioned straight and it may lead to mishandling and accident.**
- **After setting the toe-in to specification, run the machine slowly for some distance with the hands lightly on the handlebar and check that the handlebar responds correctly. If not, turn either the right or left tie-rod within the toe-in specification.**

****









FRONT AND REAR SHOCK ABSORBERS INSPECTION

1. Place the machine on a level place.
2. Check:
   - Ball joint complete ① (front)
     Cracks/Damage → Replace as a set.
   - Damper rod ② (rear)
     Scratch/Damage → Replace as a set.
   - Oil leakage ③
     Excessive oil leakage → Replace as a set.
     Refer to the "FRONT SHOCK ABSORBER AND LOWER ARM" section or "REAR SHOCK ABSORBER AND SWINGARM" section in CHAPTER 7.
3. Check:
   - Operation
     Pump the shock absorbers up and down for several times.
     Unsmooth operation → Replace as a set.
     Refer to the "FRONT SHOCK ABSORBER AND LOWER ARM" section or "REAR SHOCK ABSORBER AND SWINGARM" section in CHAPTER 7.

[A] Front shock absorber
[B] Rear shock absorber

TIRE INSPECTION

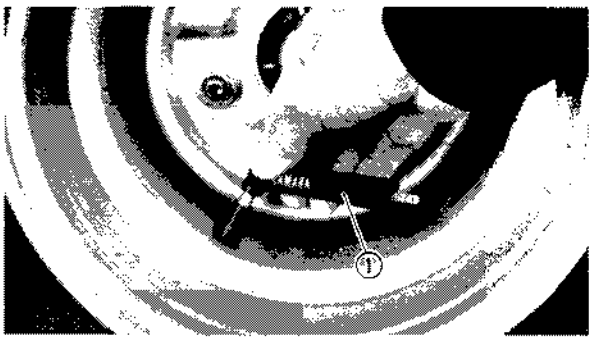
⚠ WARNING

This model is equipped with low pressure tires. It is important that they be inflated correctly and maintained at the proper pressures.

- TIRE CHARACTERISTICS
  1) Tire characteristics influence the handling of ATV's. The tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. If other tire combinations are used, they can adversely affect your machine's handling characteristics and are therefore not recommended.

	Manufacturer	Size	Type
Front	DUNLOP	AT22 × 7-10	KT701
Rear	DUNLOP	AT22 × 10-10	KT705

- TIRE PRESSURE
  1) Recommende tire pressure
     Front 20 kPa (0.20 kgf/cm², 2.8 psi)
     Rear 25 kPa (0.25 kgf/cm², 3.6 psi)
  2) Tire pressure below the minimum specified could cause the tire to dislodge from the rim under severe riding conditions.
     The following are minimums:
     Front 17 kPa (0.17 kgf/cm², 2.4 psi)
     Rear 22 kPa (0.22 kgf/cm², 3.1 psi)
  3) Use no more than
     Front 250 kPa (2.5 kgf/cm², 36 psi)
     Rear 250 kPa (2.5 kgf/cm², 36 psi
     When seating the tire beads. Higher pressures may cause the tire to burst.
     Inflate the tires very slowly and carefully. Fast inflation could cause the tire to burst.
- MAXIMUM LOADING LIMIT
  1) Vehicle load limits: 140 kg (309 lb)*
     *Total weight of cargo, rider, and accesories.



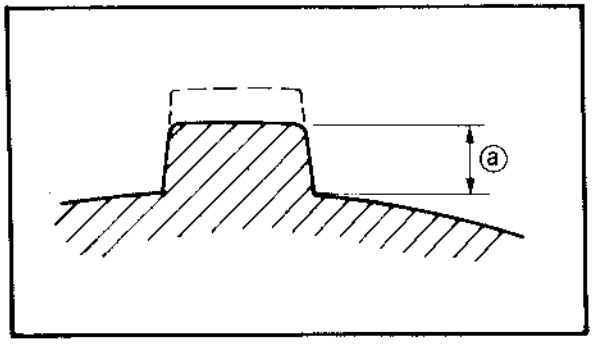
1. Measure:
   - Tire pressure (cold tire pressure)
     Out of specification → Adjust.

NOTE:
- The Low-pressure tire gauge ① is included in the standard equipment.
- If dust or the like is stuck to this gauge, it does not provide correct readings. Therefore, make two measurements on the tire pressure and get the second reading.

⚠ WARNING

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

Cold tire pressure	Front	Rear
Standard	20 kPa (0.20 kgf/cm², 2.8 psi)	25 kPa (0.25 kgf/cm², 3.6 psi)
Minimum	17 kPa (0.17 kgf/cm², 2.4 psi)	22 kPa (0.22 kgf/cm², 3.1 psi)
Maximum	23 kPa (0.23 kgf/cm², 3.2 psi)	28 kPa (0.28 kgf/cm², 3.4 psi)

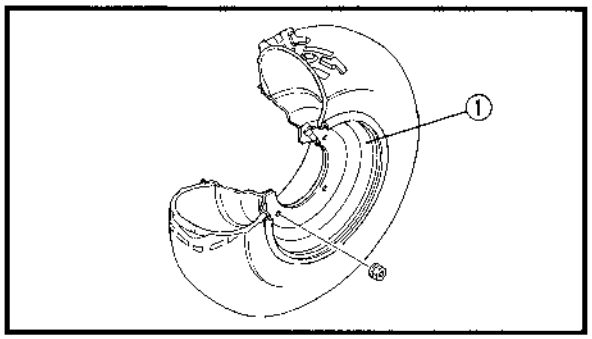


2. Inspect:
   - Tire surfaces
     Wear/Damage → Replace.

⚠ WARNING

It is dangerous to ride with a wornout tire. When a tire wear is out of specification, replace the tire immediately.

Tire wear limit ⓐ:
front and rear: 2.0 mm (0.08 in)



WHEEL INSPECTION

1. Inspect:
   - Wheels ①
     Cracks/Bends/Damage → Replace.

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

⚠ WARNING
Never attempt even small repairs to the wheel.

ELECTRICAL

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.**

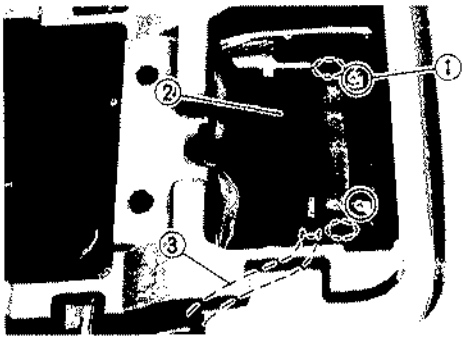
Antidote (INTERNAL):
- **Drink large quantities of water or milk follow with milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.**

Batteries also generate explosive hydrogen gas. 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:
   - Seat

   Refer to the "REAR FENDER" section.

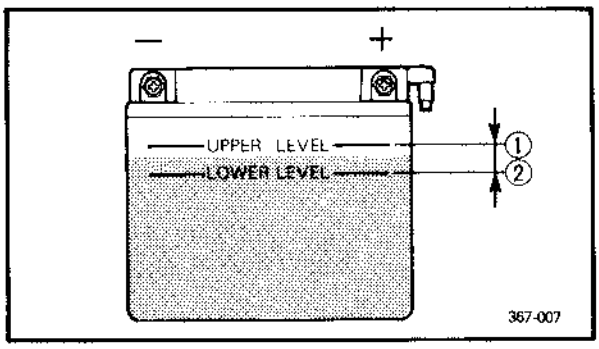


2. Disconnect:
   - Battery leads (positive and negative)
   - Battery band

⚠ WARNING

Disconnect the negative lead ① first.

3. Remove:
   - Battery ②
   - Breather hose ③ (battery side)



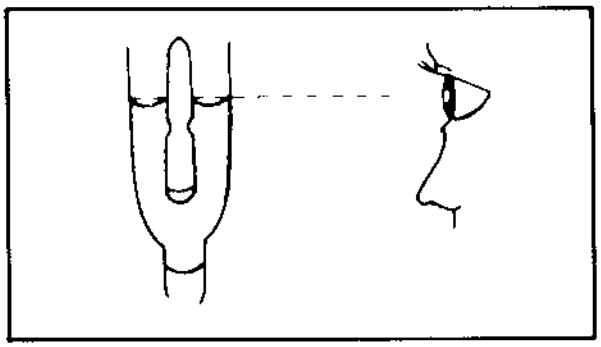
4. Inspect:
   - Battery fluid level

   Battery fluid level low → Fill.

   Fluid level should be between upper level ① and lower level ② marks.

CAUTION:

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



5. Inspect:
   - Battery fluid specific gravity

   Out of specification → Charge.

Charging current: 1.2 amps/10 hrs **Specific gravity: 1.280 at 20°C (68°F)**

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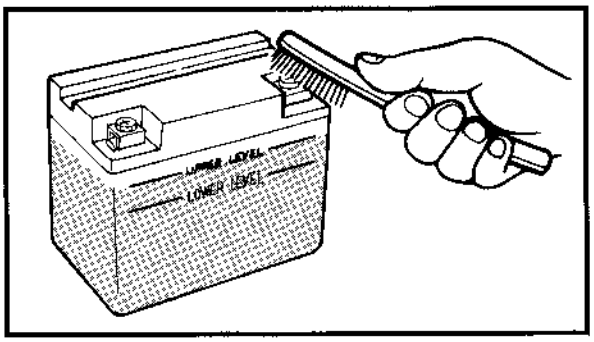
Replace the battery if:

- Battery voltage will not rise to a specific value or 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 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.

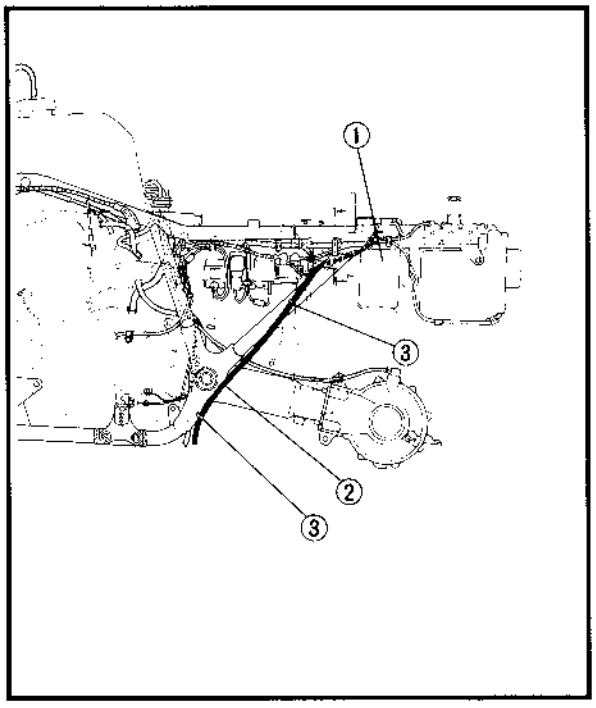


6. Inspect:
   - Battery terminal
     Dirty terminal → Clean with wire brush.
     Poor connection → Correct.

NOTE:

After cleaning the terminals, apply grease lightly to the terminals.

7. Inspect:
   - Breather hose
     Obstruction → Remove.
     Damage → Replace.

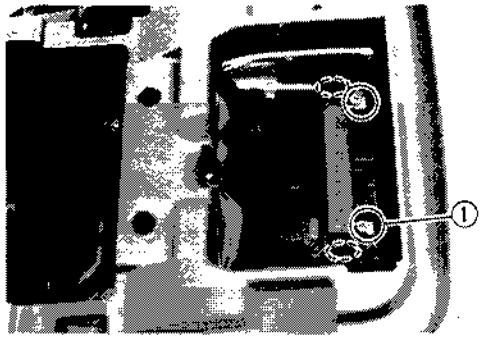


8. Install:
   - Battery ①
   - Breather hose ②
     Refer to the "CABLE ROUTING" section in CHAPTER 2.

CAUTION:

When installing the battery, be sure the breather hose is routed correctly. If the breather hose touches the frame or exits in such a way as to cause battery electrolyte or gas to exit onto the frame, structual and cosmetic damage to the machine can occur.

③ Breather hose guide



9. Connect:
   - Battery leads (positive and negative)
   - Battery band

⚠ WARNING

Connect the positive lead ① first.

10. Install:
    - Seat

    Refer to the "REAR FENDER" section.

FUSE INSPECTION

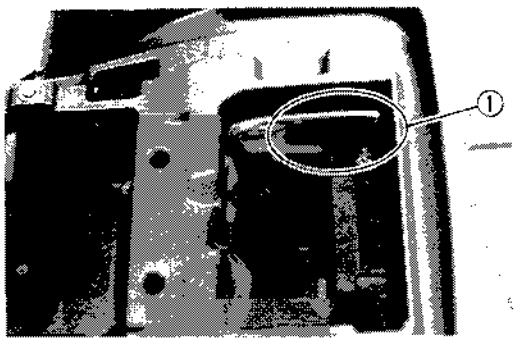
CAUTION:

Don't forget to turn off the main switch when checking or replacing the fuse. Otherwise, it may cause accidental shortcircuiting.

⚠ WARNING

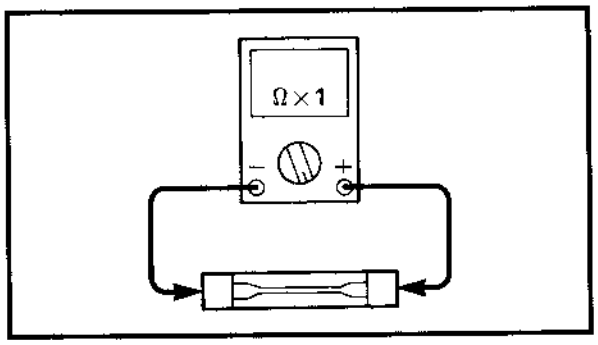
Do not use fuses of a higher amperage rating than those recommended. Substitution of a fuse of improper rating can cause extensive electrical system damage and possible fire.

Description	Amperage	Quantity
Main	10A	1
Spare	10A	1



1. Remove:
   - Seat

   Refer to the "REAR FENDER-Removal" section.
2. Remove:
   - Fuse holder ①
   - Fuse



3. Inspect:
   • Fuse

****

Inspection steps:

● Connect the Pocket Tester to the fuse and check it for continuity.

NOTE:

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

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

● If the tester is indicated at ∞. The fuse is blown, replace it.

****

4. Replace:
   • Blown fuse

****

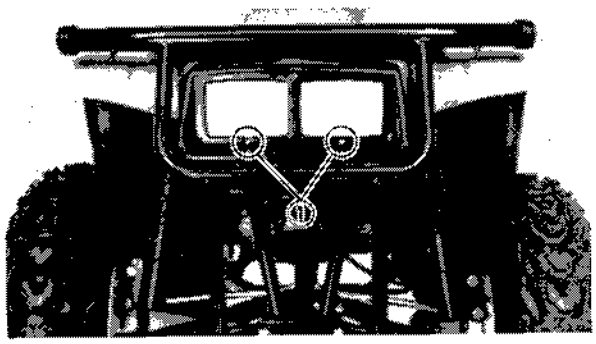
Blown fuse replacement steps:

● Turn off ignition and the circuit.
● Install a new fuse of proper amperage.
● Turn on the switches and see if the electrical device operates.
● Fuse interrupts the circuit again → Check electrical system.
  Refer to "CHAPTER 8. ELECTRICAL" for further information.

****

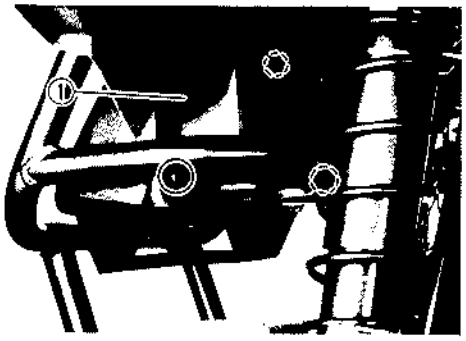
5. Install:
   • Fuse holder
   • Seat
   Refer to the "REAR FENDER-Installation" section.

HEADLIGHT BEAM ADJUSTMENT



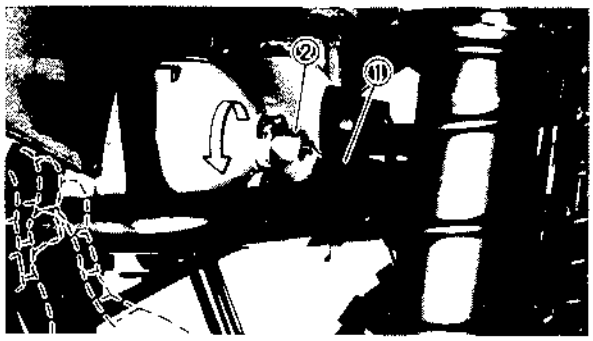
1. Adjust:
   • Headlight beam (vertically)

Vertical adjustment	
Higher	Turn the adjusting screw ① clockwise.
Lower	Turn the sdjusting screw ① counterclockwise.



HEADLIGHT BULB REPLACEMENT

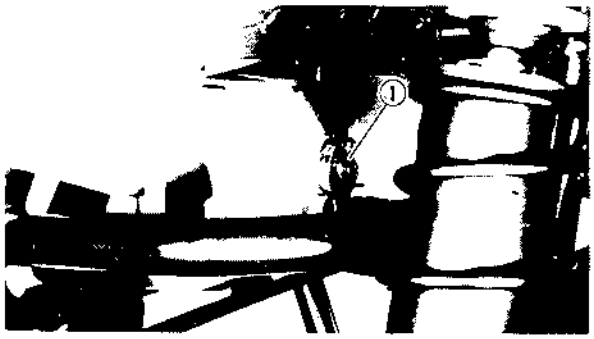
1. Remove:
   - Headlight cover ①



2. Pull back the bulb cover ① .
3. Disconnect:
   - Bulb holder ②
     While pushing the bulb holder ② , turn it counterclockwise.

NOTE:

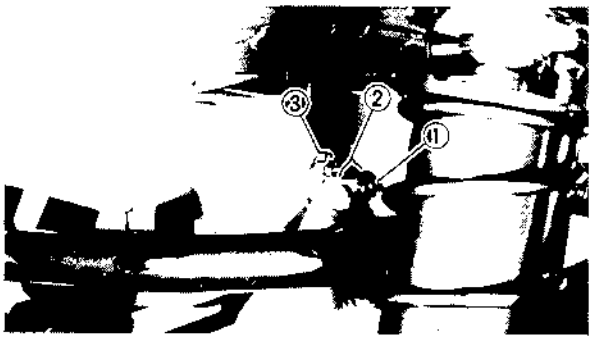
Hold the head light on the front side while removing the bulb socket.



4. Remove:
   - Bulb ①

⚠ WARNING

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



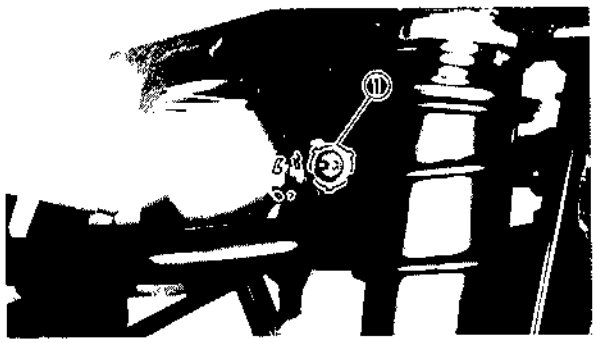
5. Install:
   - Bulb ① (new)

NOTE:

Make sure the projection ②on the bulb is meshed with the slot ③on the light case.

CAUTION:

Avoid touching glass part of bulb. Also keep it free from oil otherwise, transparency of glass, bulb life and illuminous flux will be adversely affected. If oil gets on bulb, clean it with a cloth moistened thoroughly with alcohol or lacquer thinner.



6. Connent:
   - Bulb holder ①

NOTE:
Make sure the projections on the bulb holder are meshed with the slots on the light case.

7. Set the bulb cover to the bulb holder.

8. Install:
   - Headlight cover

NOTE:
Securely install the rubber grommet of the head light lead to the head light cover.

9. Adjust:
   - Headlight beam
     Refer to "HEADLIGHT BEAM ADJUSTMENT" section.

ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

- It is not necessary to remove the engine in order to remove the following components:
  * Cylinder head
  * Cylinder
  * Piston
  * Primary and secondary clutches
  * Oil pump
  * Shift shaft
  * CDI Magneto
- It is necessary to remove the rear wheel drive assembly in order to remove the engine assembly.

PREPARATION FOR REMOVAL

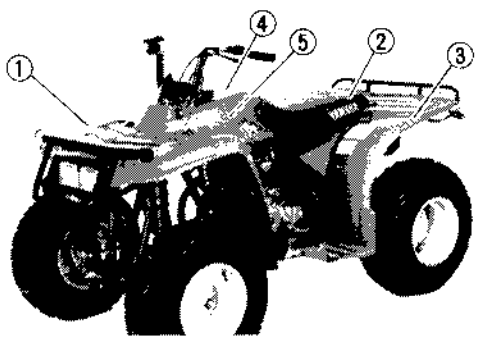
1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to "CHAPTER 1. GENERAL INFORMATION-SPECIAL TOOLS " section.

NOTE:

When disassembling the engine, keep mated parts together. This includes gears, cylinder, piston and other parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.

3. During engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.
4. Place the machine on a level place.

FRONT FENDER AND REAR FENDER



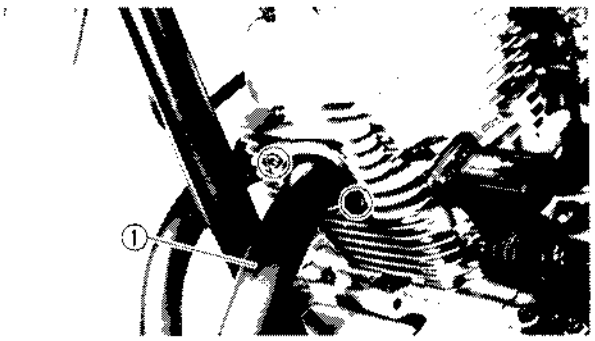
1. Remove:
   - Front fender ①
   - Seat ②
   - Rear fender ③
   - Fuel tank cover ④
   - Fuel tank ⑤
   - Front carrier (except for USA)
   - Rear carrier (except for USA)

   Refer to the "FENDERS AND FUEL TANK-Removal" section in CHAPTER 3.

ENGINE OIL

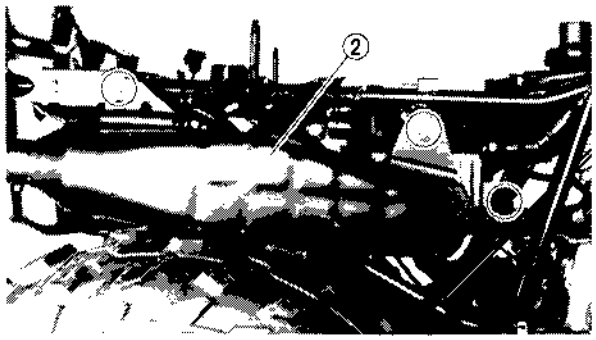
1. Drain:
   - Engine oil

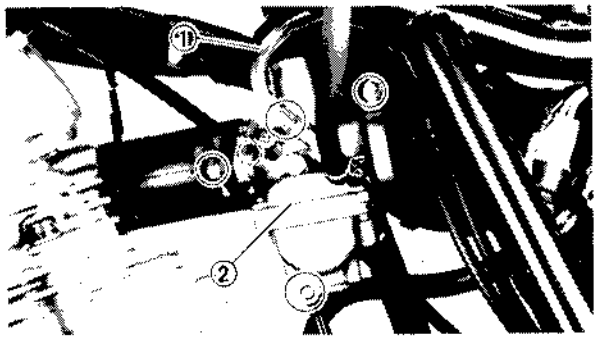
   Refer to the "ENGINE OIL REPLACEMENT" section in CHAPTER 3.



EXHAUST PIPE AND MUFFLER

1. Remove:
   - Exhaust pipe ①
   - Muffler ②





CARBURETOR

1. Drain:
   - Fuel (float chamber)

NOTE:

Place a rag under the over flow hose to absorb a spilt fuel.

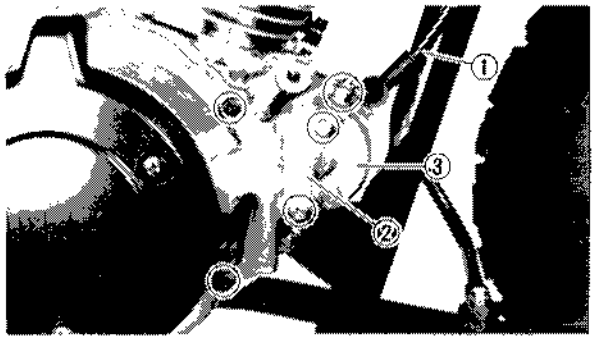
⚠ WARNING

Gasoline is highly flammable. Avoid spilling fuel on the hot engine.

2. Disconnect:
   - Breather hose ①
3. Remove:
   - Carburetor ②

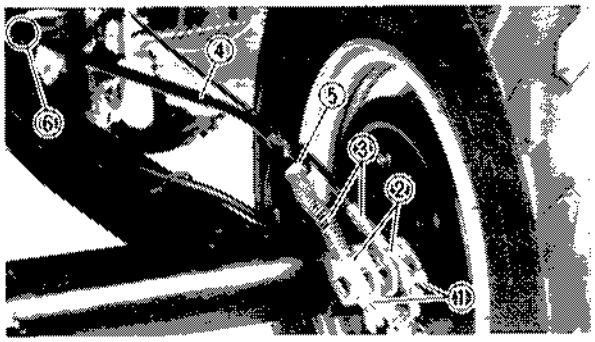
NOTE:

Cover the carburetor with a clean rag to prevent dirt or forein material from entering the carburetor.



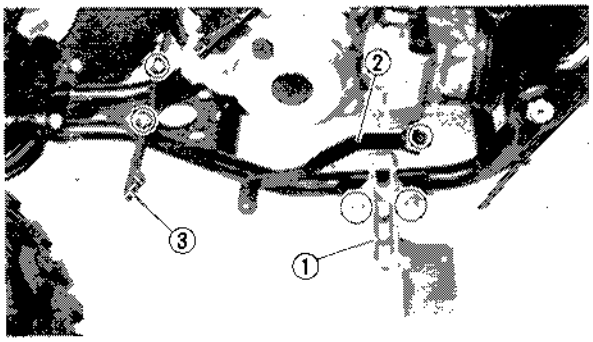
STARTER MOTOR

1. Disconnect:
   - Starter motor lead ①
2. Remove:
   - Starter motor bracket ②
   - Starter motor ③

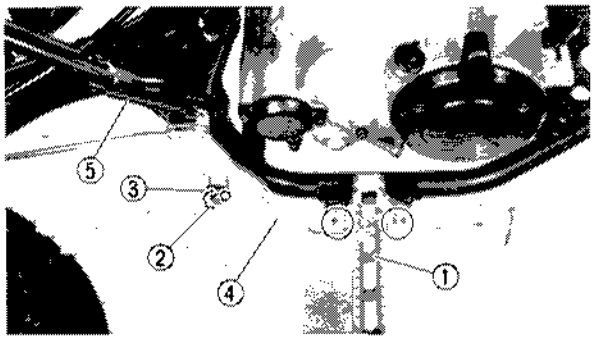


REAR BRAKE CABLES AND FOOTREST

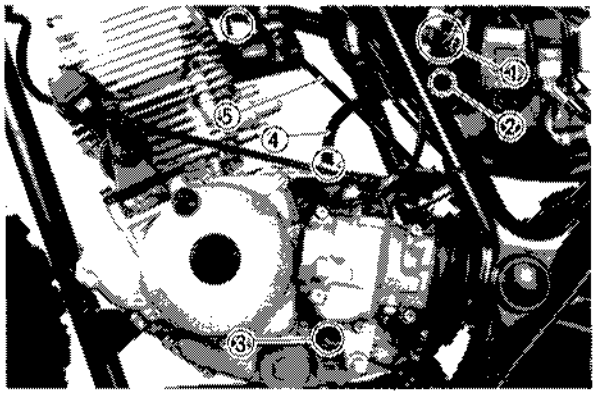
1. Remove:
   - Adjusters ① (brake lever and brake pedal)
   - Pins ②
   - Springs ③
2. Disconnect:
   - Brake cable ④
     (from brake cable bracket ⑤ and cable guide ⑥)



3. Remove:
   - Footrest ① (left)
   - Shift pedal ②
   - Front fender stay ③

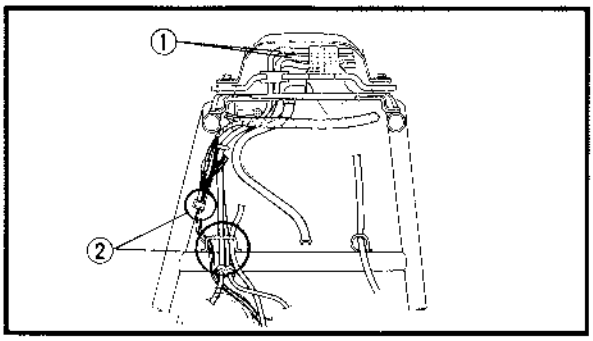


4. Remove:
   - Footrest ① (right)
   - Coffer pin ②
   - Washer ③
   - Brake pedal ④
5. Disconnect:
   - Spring ⑤



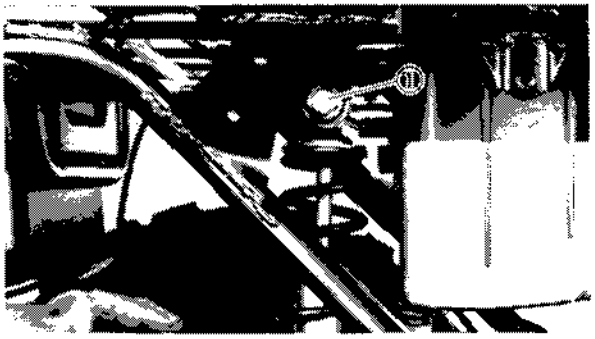
WIRINGS AND HOSES

1. Disconnect:
   - Spark plug lead
   - CDI magneto leads ①
   - "REVERSE" switch lead ②
   - "NEUTRAL" switch lead ③
   - Breather hose ④ (crankcase)
   - Brake cable ⑤ (from cable guide)

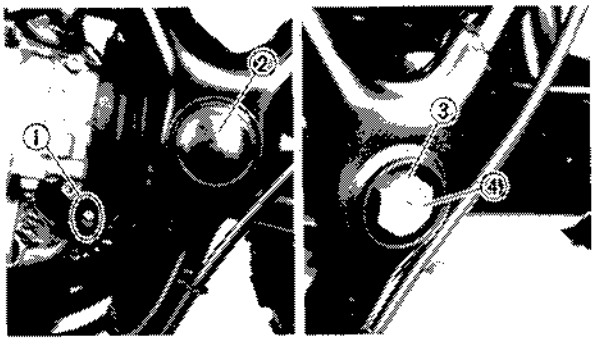


REAR WHEEL DRIVE ASSEMBLY AND SWINGARM

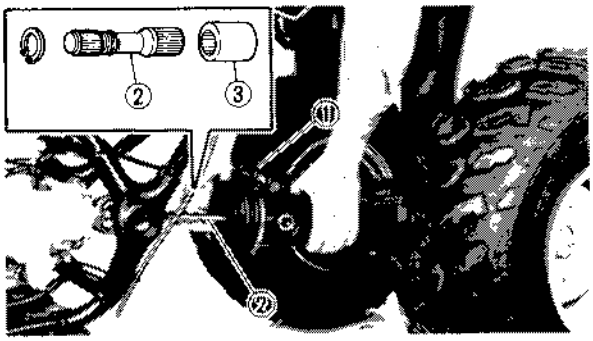
1. Disconnect:
   - Breather hose ① (final gear housing and rear brake dram)
     (from the cable guides ② of main frame)
2. Block the front wheels, and elevate the rear wheels by placing the suitable stand under the frame.



3. Remove:
   - Bolt ① (rear shock absorber-top)



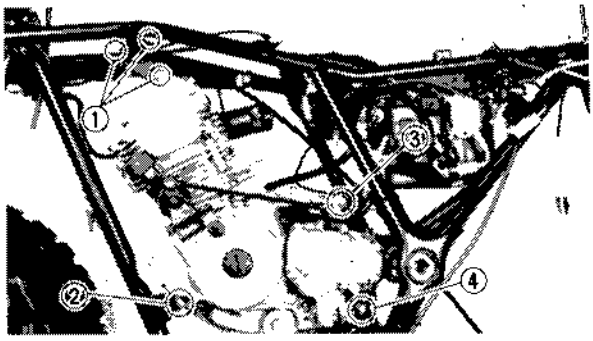
4. Remove:
   - Clamps ① (rubber boot)
   - Pivot shaft caps ②
   - Locknuts ③ (pivot shaft)
   - Pivot shafts ④ (swingarm)



5. Remove:
   - Rear wheel drive assembly/swingarm

CAUTION:

- **When removing the swingarm, hold the shock absorber ① so that it may not fall over.**
- **When the swingarm is disconnected from the rubber boot, the drive shaft ② and coupling gear ③ may fall off.**
  Be careful not to lose these parts.



ENGINE REMOVAL

1. Remove:
   - Bolts ① (engine mounting-top)
   - Bolt ② (engine mounting-front)
   - Bolt ③ (engine mounting-rear upper)
   - Bolt ④ (engine mounting-rear lower)
2. Remove:
   - Engine assembly (to right side)

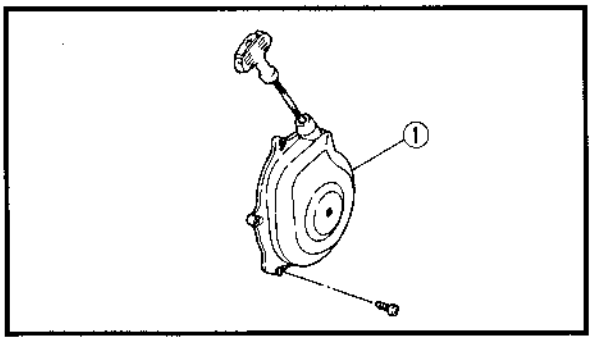
ENGINE DISASSEMBLY

CYLINDER HEAD ASSEMBLY, CYLINDER AND PISTON

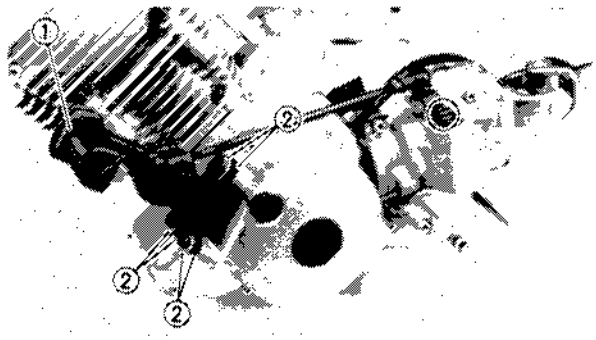
NOTE:

With the engine mounted cylinder head assembly, cylinder and piston can be maintained by removing the following parts.

- Fuel tank
- Exhaust pipe
- Carburetor
- Engine stays (top)



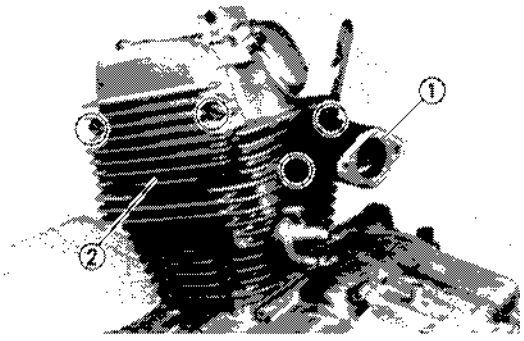
1. Remove:
   - Recoil starter assembly ① (except for USA)



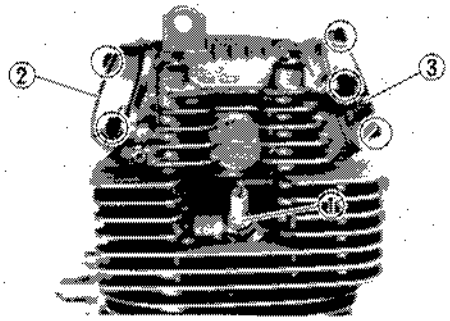
2. Remove:
   - Drive select lever assembly ①
   - Washers ②

CAUTION:

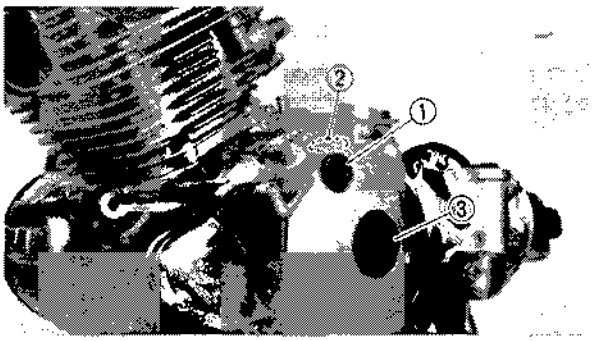
Be careful not to lose washers.



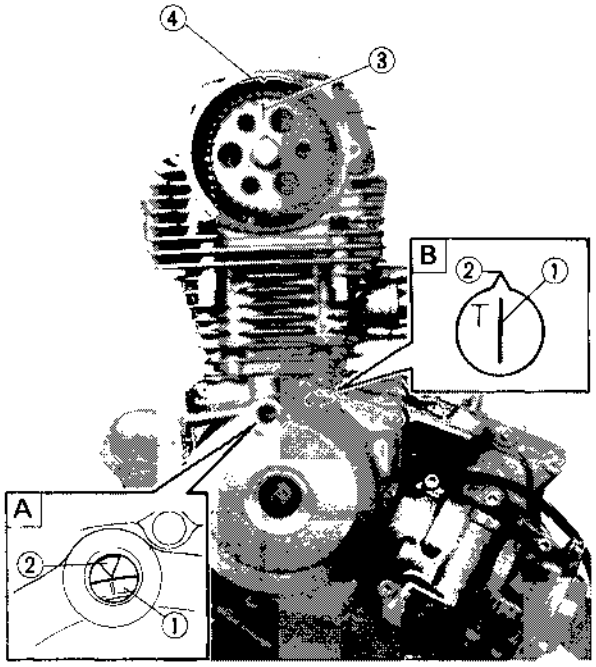
3. Remove:
   - Carburetor joint ①
   - Cam sprocket cover ②



4. Remove:
   - Spark plug ①
   - Tappet cover ② (intake)
   - Tappet cover ③ (exhaust)



5. Remove:
   - Timing plug ① (for USA)
   - Timing plug ② (except for USA)
   - Plug ③ (center) (for USA)



6. Align:
   - "T" mark on the rotor
     With the stationary pointer on the crankcase cover.

****

TDC alignment steps:

- Turn the crankshaft counterclockwise with wrench.
- Align the "T" mark ① on the rotor with the stationary pointer ② on the crankcase cover. When the "T" mark is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

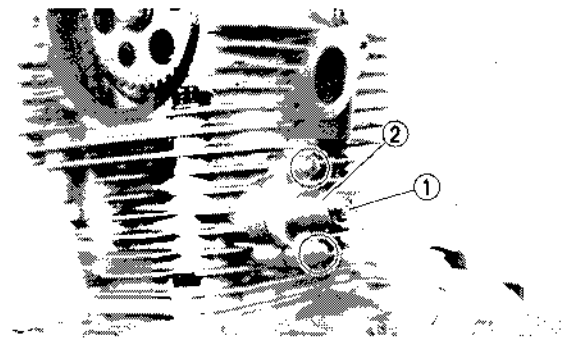
NOTE:

TDC on compression stroke check:

- Both rocker arms must have a valve clearance when the cam sprocket match mark ③ is aligned with the cylinder head match mark ④.
- If not, give the crankshaft one counterclockwise turn too meet above condition.

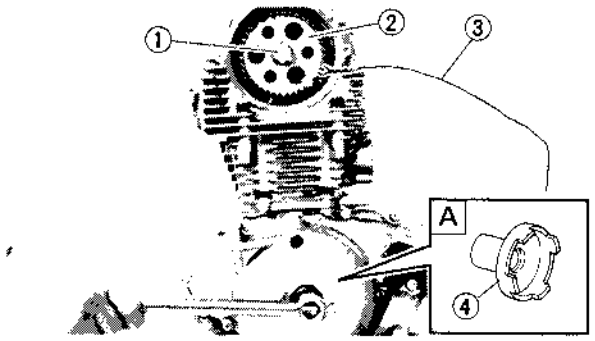
[A] For USA
[B] Except for USA

****



7. Loosen:
   - Cap bolt ① (chain tensioner)

8. Remove:
   - Chain tensioner ②

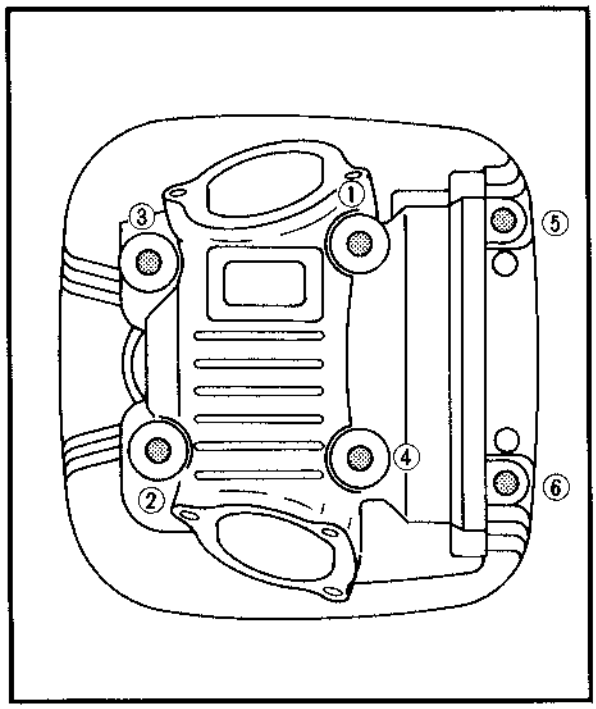


9. Remove:
   - Bolt ①
   - Cam sprocket ②

NOTE:
- Fasten a safety wire ③ to the timing chain to prevent if from falling into the crankcase.
- When removing the cam sprocket, it is not necessary to separate the timing chain.
- Hold the starter pulley ④ (except for USA) by the Rotor Holder to loosen the bolt on the cam sprocket.

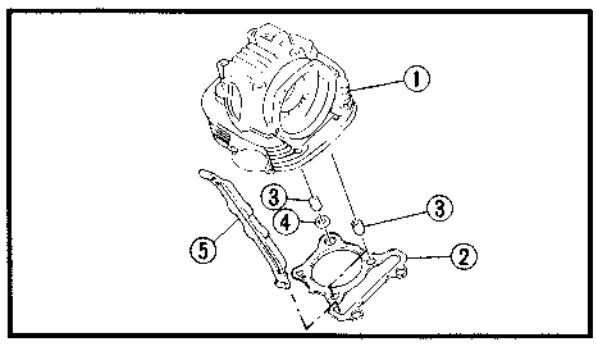
	Rotor holder (except for USA): P/N. YU-01235, 90890-01235

A Except for USA

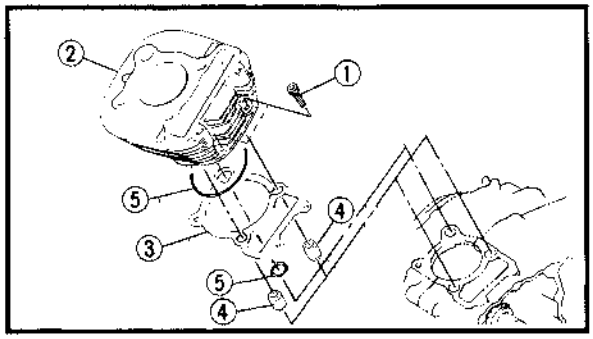


10. Remove:
    - Bolts (cylinder head)

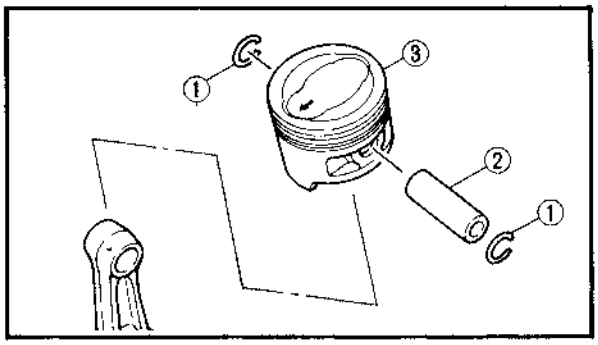
NOTE:
- Loosen the bolts 1/4 turn each and remove them after all are loosened.
- Loosen the bolts starting with the highest numbered one.
- The embossed numbers in the cylinder head designate the tightening sequence.



11. Remove:
    - Cylinder head assembly ①
    - Gasket ② (cylinder head)
    - Dowel pins ③
    - Oil seal ④
    - Chain guide ⑤ (exhaust)



12. Remove:
- Bolts ① (cylinder)
- Cylinder ②
- Gasket ③ (cylinder)
- Dowel pins ④
- O-ring ⑤



13. Remove:
- Piston pin clip ①
- Piston pin ②
- Piston ③

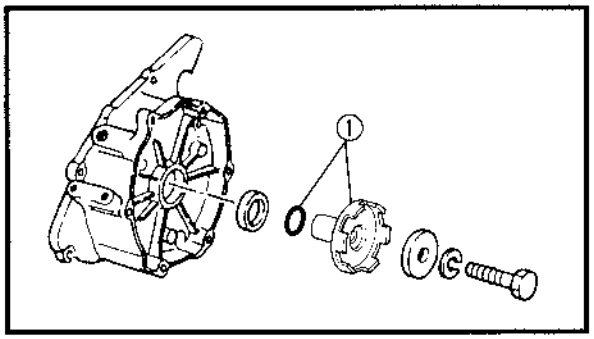
NOTE:
- Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.
- Before removing the piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use Piston Pin Puller.

	Piston pin puller: **P/N. YU-01304, 90890-01304**

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

STARTER PULLEY (EXCEPT FOR USA) CDI MAGNETO

NOTE:
With the engine mounted, the CDI magneto can be maintained by removing the following parts:
- Drive select lever assembly
- Recoil starter assembly (except for USA)/ Starter pully (except for USA).

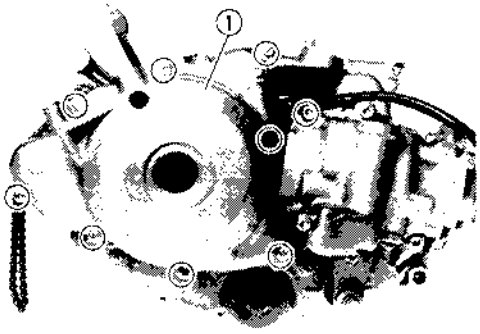


1. Remove:
   - Starter pulley ① (except for USA)

NOTE:
Hold the starter pulley by the Rotor Holder to loosen the bolt on the starter pulley.

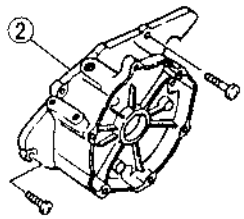
	Rotor holder: **P/N. YU-01235, 90890-01235**

A

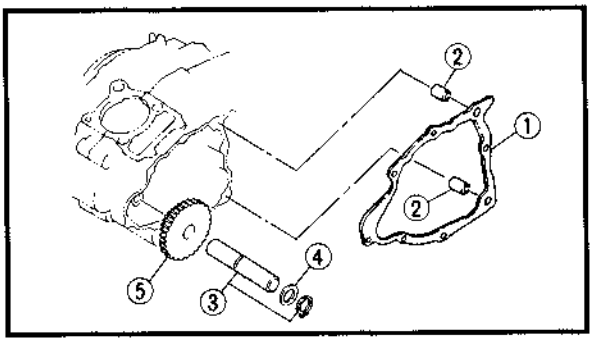


2. Remove:
   - Crankcase cover ① (left) (for USA)
   - Crankcase spacer ② (left) (except for USA)

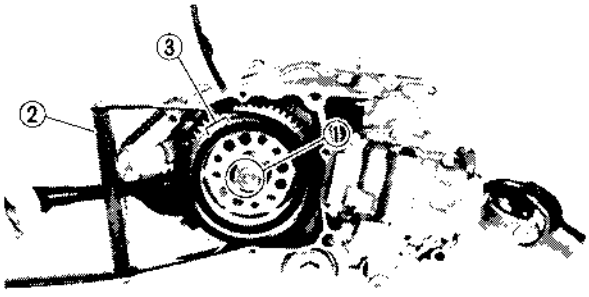
B



A For USA
B Except for USA



3. Remove:
   - Gasket ①
   - Dowel pins ②
   - Shaft ③
   - Washer ④
   - Idle gear ⑤ (starter)



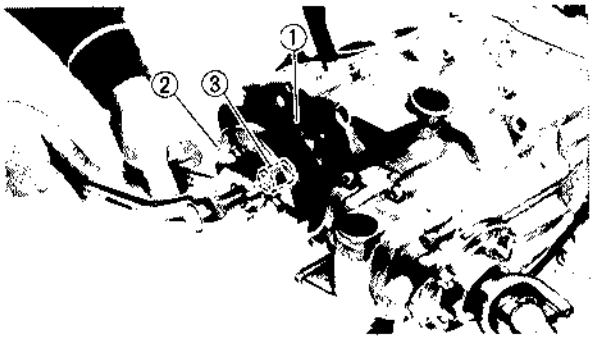
4. Remove:
   - Bolt ① (CDI magneto)

NOTE:
Loosen the bolt (CDI magneto) while holding the (for USA) with the rotor holder ② .

	Rotor holder (for USA): **P/N. YS-01880, 90890-01701**

CAUTION:

Do not allow the rotor holder to touch the projection ③ on the CDI magneto.

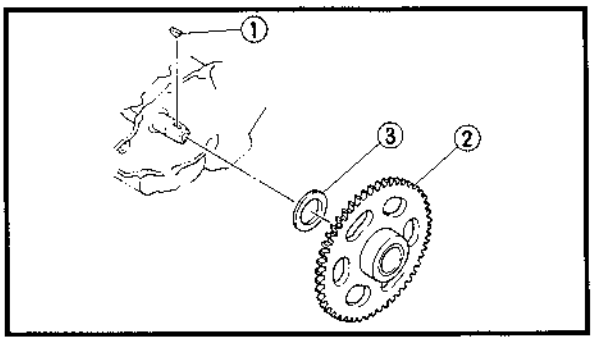


5. Remove:
   - CDI magneto ①

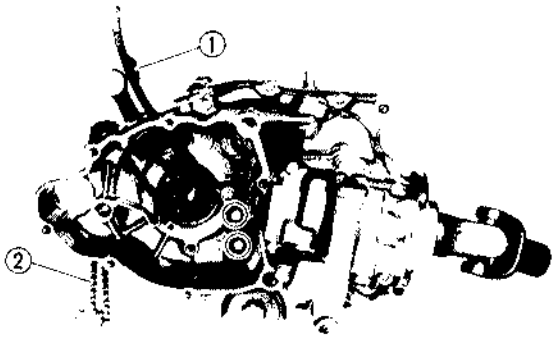
NOTE:

Use the Flywheel puller ② and Attachment ③ .

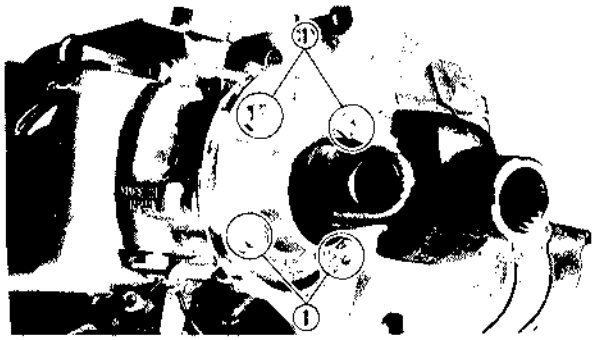
Flywheel puller:
P/N. YU-33270, 90890-01362
Attachment:
P/N. YM-33282, 90890-04089 (for USA)
P/N. YU-33278, 90890-04087 (except for USA)



6. Remove:
   - Woodruff key ①
   - Driven gear ② (starter)
   - Washer ③

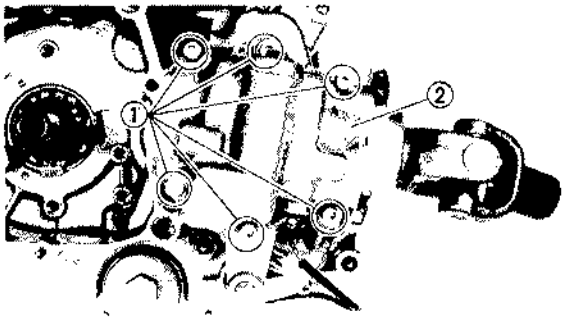


7. Remove:
   - Chain guide ① (intake)
   - Timing chain ②

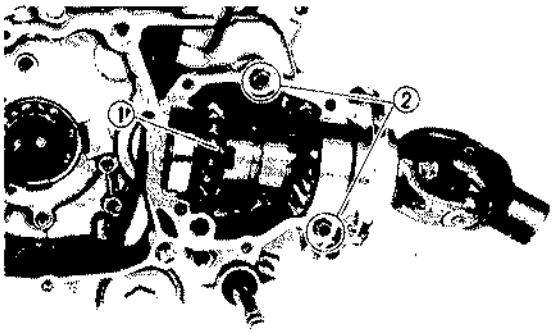


MIDDLE DRIVEN PINION GEAR

1. Remove:
   - Bolts ① (bearing housing)



2. Remove:
   - Bolts ① (middle gear case cover)
   - Middle gear case cover ②

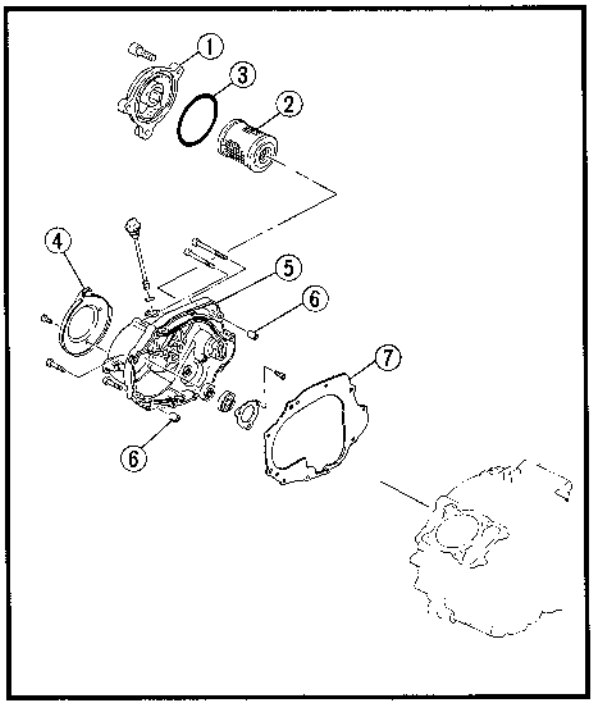


3. Remove:
   - Middle driven pinion gear assembly ①
   - Dowel pins ②

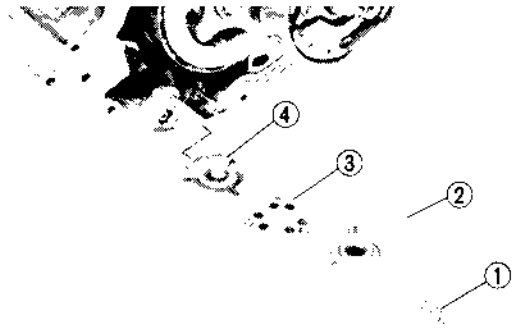
PRIMARY AND SECONDARY CLUTCHES

NOTE:

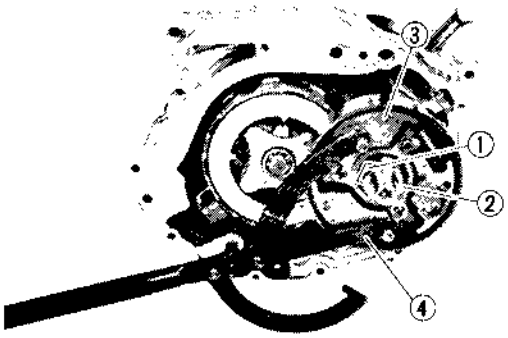
With the engine mounted, the primary and secondary clutches can be maintained by removing the following parts:
- Starter motor
- Crankcase cover (right)



1. Remove:
   - Oil filter cover ①
   - Oil filter ②
   - O-ring ③
   - Clutch cover protector ④
   - Crankcase cover ⑤ (right)
   - Dowel pins ⑥
   - Gasket ⑦



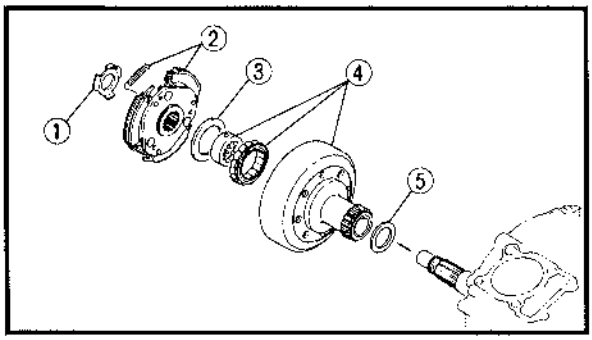
2. Remove:
   - Spring ① (clutch release lever)
   - Shift guide #1 ②
   - Ball holder ③
   - Shift guide #2 ④



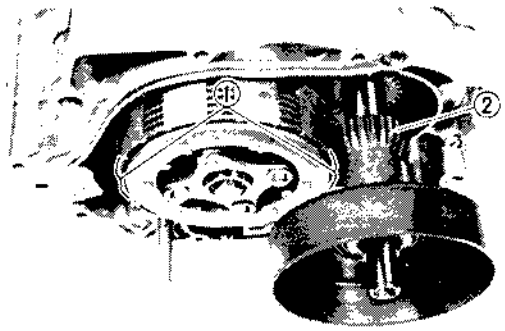
3. Straighten:
   - Lock washer tab ①
4. Remove:
   - Nut ② (primary clutch)

NOTE:
Hold the clutch carrier ③ by the Rotor Holder ④ to loosen the nut.

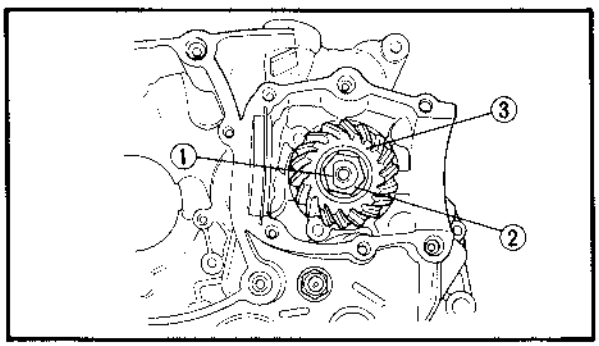
	Rotor holder: **P/N. YU-01235, 90890-01235**



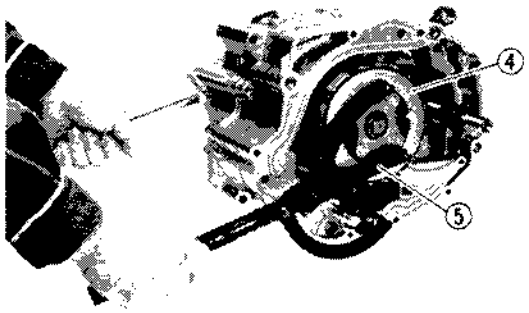
5. Remove:
   - Lock washer ①
   - Clutch carrier assembly ②
   - Washer ③
   - Clutch housing ④ (primary)
   - Washer ⑤



NOTE:
The secondary clutch housing has two grooves ① machined into it to permit the primary drive gear behind the primary clutch to clear the secondary clutch. Align one of these grooves with the primary gear ② before removing the primary clutch assembly.



6. Flatten:
   - Nut tab ① (drive pinion gear)
7. Remove:
   - Nut ② (drive pinion gear)
   - Drive pinion gear ③

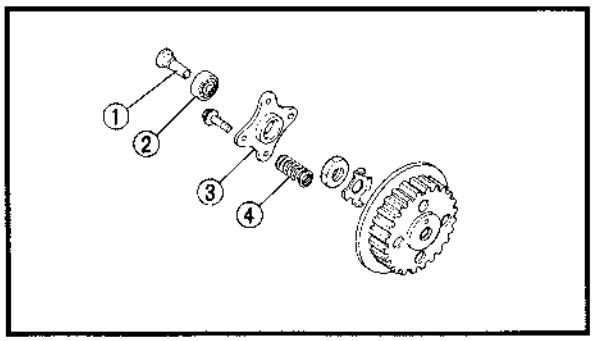


NOTE:

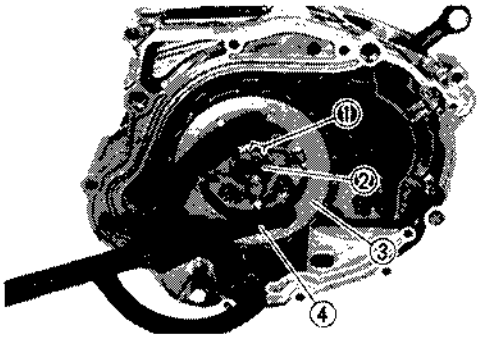
- Hold the clutch boss ④ on the secondary clutch by the Rotor Holder ⑤ to loosen the nut (driven pinion gear)

	Rotor holder: **P/N. YU-01235, 90890-01235**

- Put the engine in 1st, and carry out the operation.



8. Remove:
   - Push rod ①
   - Bearing ②
   - Bearing holder ③
   - Clutch springs ④

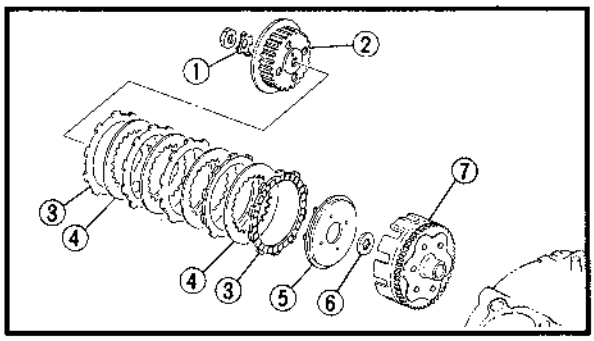


9. Straighten:
   - Lock washer tab ① (clutch boss)
10. Remove:
   - Nut ② (clutch boss)

NOTE:

Hold the clutch boss ③ by the Rotor Holder ④ to loosen the nut.

	Rotor holder: **P/N. YU-01235, 90890-01235**



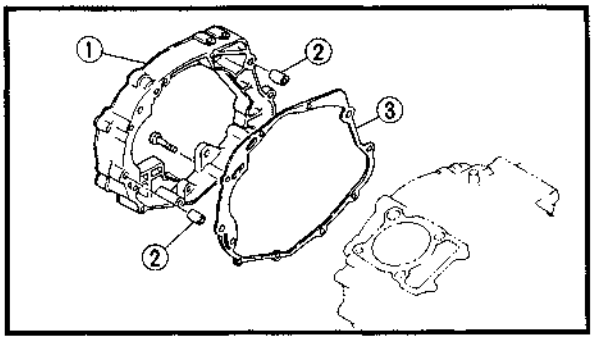
11. Remove:
   - Lock washer ①
   - Clutch boss ②
   - Friction plates ③
   - Clutch plates ④
   - Pressure plate ⑤
   - Washer ⑥
   - Clutch housing ⑦

OIL PUMP AND SHIFTER

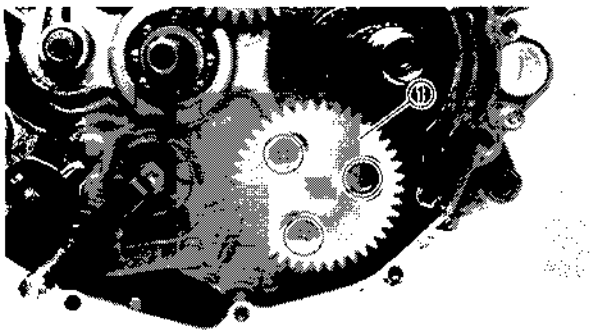
NOTE:

With the engine mounted, the oil pump assembly can be maintained by removing the following parts:

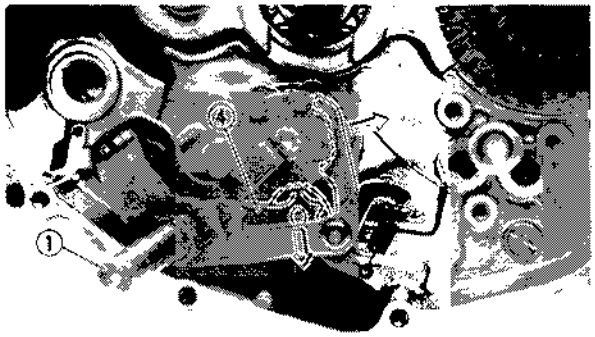
- Starter motor
- Crankcase cover (right)
- Primary and secondary clutches
- Crankcase spacer (right)



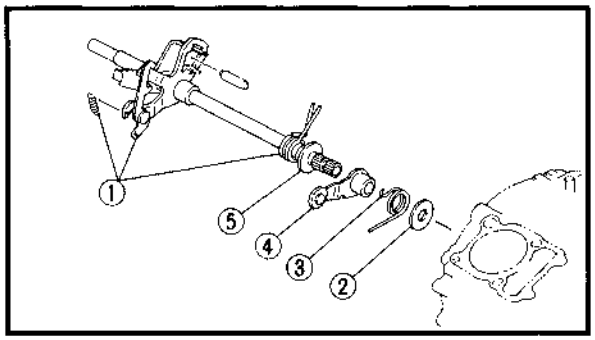
1. Remove:
   - Crankcase spacer ① (right)
   - Dowel pins ②
   - Gasket ③



2. Remove:
   - Oil pump assembly ①
   - Gasket

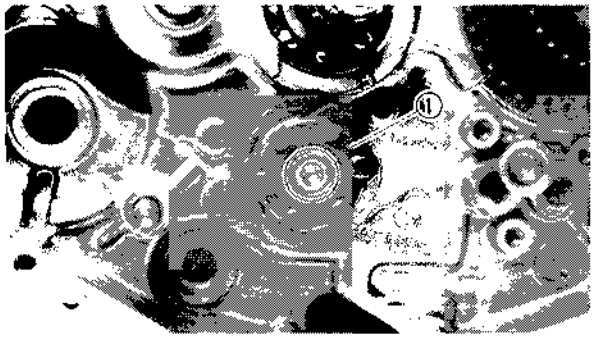


3. Remove:
   - Shift lever assembly ①
   - Washer ②
   - Return spring ③
   - Stopper lever ④
   - Washer ⑤



NOTE:

Push the shift pawl and the stopper lever to the arrow direction and remove them from the segment.



4. Remove:
   - Segment ① (shift cam)
     Use the torx wrench to remove.

NOTE:

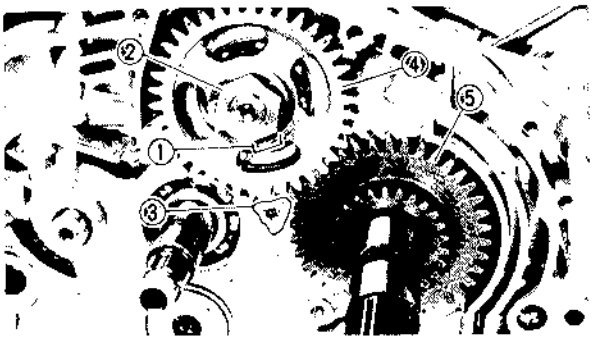
When removing the segment, the dowel pin will fall off. Take care not to lose the pin.

BALANCER DRIVEN GEAR

NOTE:

With the engine mounted, the balancer driven gear can be maintained by removing the following parts:

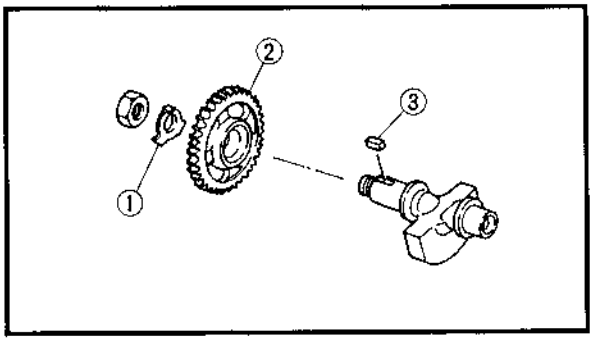
- Starter motor
- Crankcase cover (right)
- Primary and secondary clutches
- Crankcase spacer (right)
- Oil pump assembly



1. Straighten:
   - Lock washer tab ① (driven gear)
2. Remove:
   - Nut ② (driven gear)

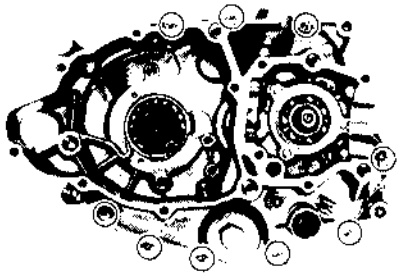
NOTE:

Place a folded rag ③ between the teeth of the driven gear ④ and drive gear ⑤ to lock them.



3. Remove:
   - Lock washer ①
   - Balancer gear ② (driven)
   - Straight key ③

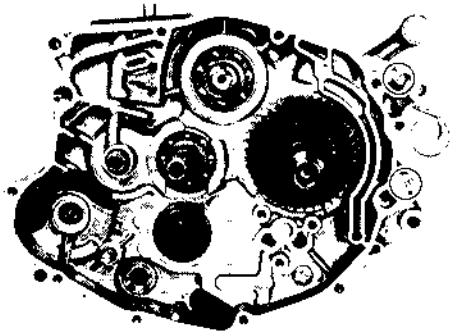
CRANKCASE (LEFT)

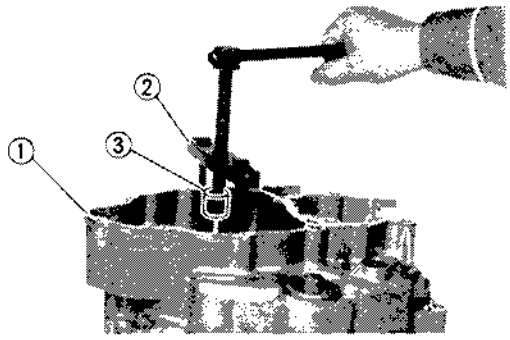


1. Remove:
   - Screws (crankcase)

NOTE:

Working in a crisscross pattern, loosen all screws 1/4 turn each. Remove them after all are loosened.





2. Remove:
   - Crankcase ① (left)
   - Dowel pins

****

Removal steps:

● Attach the Crankcase Separating Tool ② and Attachment ③ to the left side crankcase.

Crankcase Separating Tool:
P/N. YU-01135-A, 90890-01135
Attachment:
P/N. YM-33282, 90890-04089 (for USA)
P/N. YM-33278, 90890-04087 (except for USA)

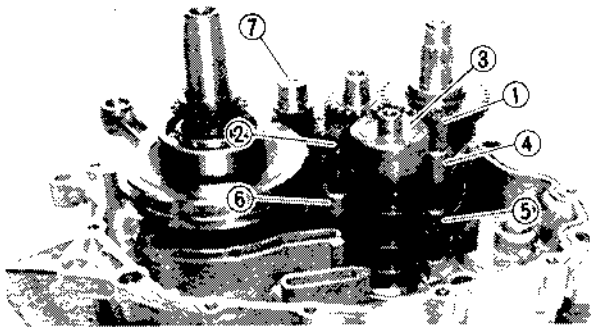
NOTE:

Fully tighten the tool holding bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.

● As pressure is applied, alternately tap on the front engine mounting boss, transmission shafts and balancer shaft.

CAUTION:

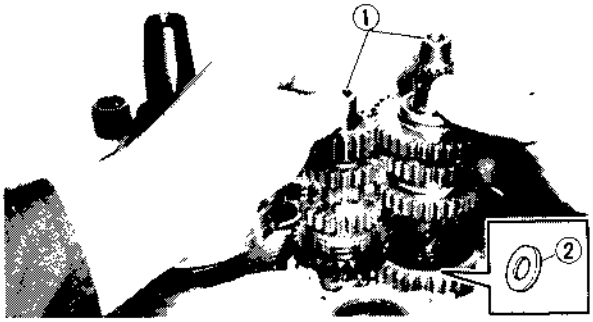
- **Use soft hammer to tap on the case half.**
- **Tap only on reinforced portions of case.**
- **Do not tap on gasket mating surface.**
- **Work slowly and carefully.**
- **Make sure the case halves separate evenly. If one end "hangs up", take pressure off the push screw, realign, and start over. If the cases do not separate, check for a remaining case screw or fitting. Do not force.**



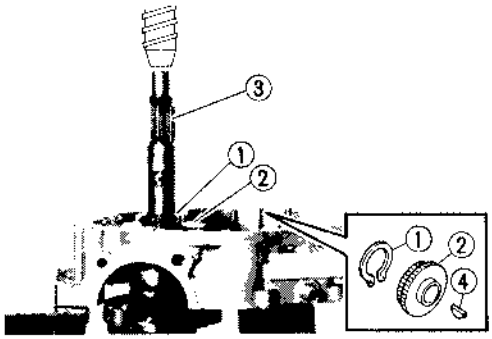
BALANCER SHAFT, TRANSMISSION AND CRANKSHAFT

1. Remove:
   - Guide bar #1 ① (long)
   - Guide bar #2 ② (short)
   - Shift cam ③
   - Shift fork #3 ④
   - Shift fork #2 ⑤
   - Shift fork #1 ⑥
   - Balancer shaft ⑦

NOTE:
Note the position of each part. Pay particular attention to the location and direction of shift forks.

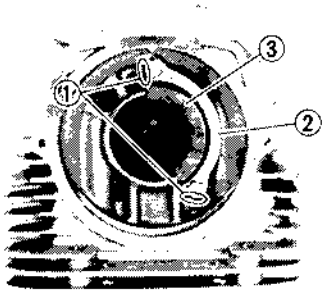


2. Remove:
   - Transmission assembly ① (main axle and drive axle)
   - Washer ② (drive axle)



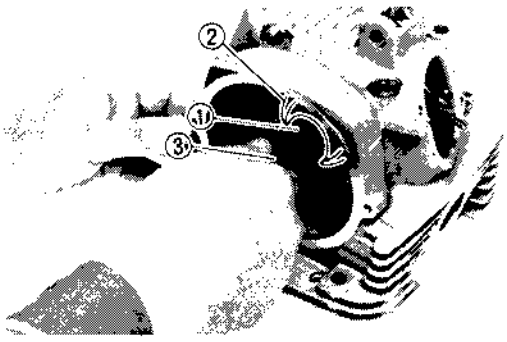
3. Remove:
   - Circlip ①
4. Remove:
   - Balancer drive gear ②
   - Crankshaft ③
     (from right crankcase)
   - Woodruff key ④

NOTE:
Use a hydraulic press to remove the balancer drive gear ② from the crankshaft.



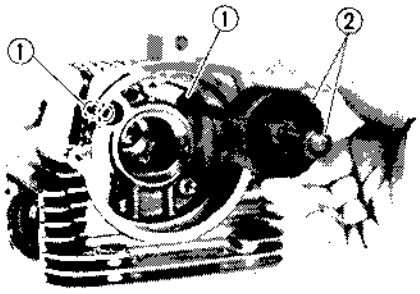
CYLINDER HEAD

1. Straighten:
   - Lock washer tabs ①
2. Remove:
   - Lock washer ②
   - Retainer ③ (camshaft bushing)



3. Remove:
   - Camshaft ①
   - Camshaft bushing ②

NOTE:
Screw in a suitable length of 10 mm bolt ③ into the thread hole on the camshaft, and pull out the camshaft.



4. Remove:
   - Rocker arm shafts ①
   - Rocker arms (intake/exhaust)

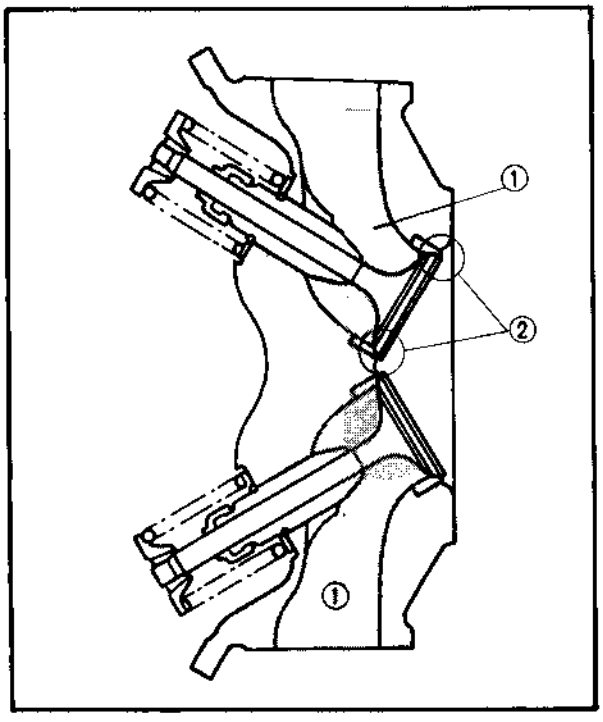
NOTE:
Attach the Slide Hammer Set ② to the rocker arm shaft, and then slide out the them.



Slide hammer set:
P/N. YU-01083-A
Slide hammer bolt:
P/N. 90890-01083
Weight:
P/N. 90890-01084

VALVE

NOTE:
Before removing the internal parts (valve, valve spring, valve seat etc.) of the cylinder head, the valve sealing should be checked.



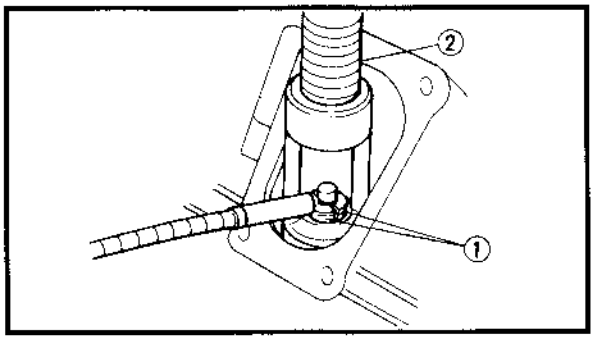
1. Check:
   - Valve sealing
     Leakage at valve seat → Inspect the valve face, valve seat and valve seat width.
     Refer to "INSPECTION AND REPAIR -VALVE SEAT".

****

Valve seat checking steps:

- Pour a clean solvent ① into the intake and exhaust ports.
- Check the valve seating.
  There should be no leakage at the valve seat ② .

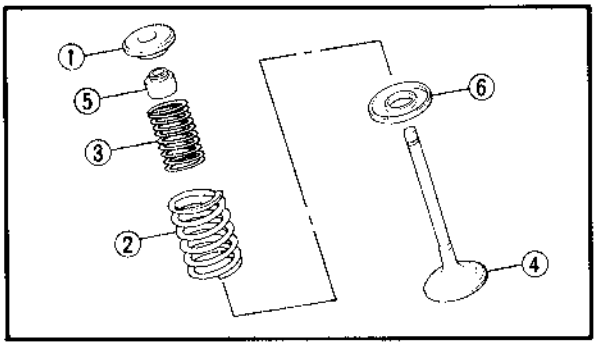
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2. Remove:
   - Valve cotters ①

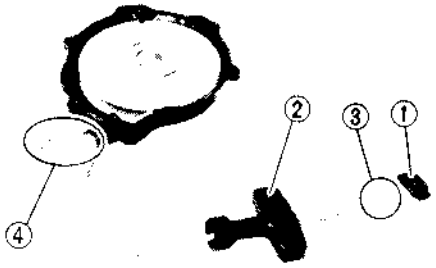
NOTE:
Attach the Valve Spring Compresser ② between the valve spring seat and cylinder head to remove the valve cotters.

	Valve spring compresser: **P/N. YM-04019, 90890-04019**



3. Remove:
   - Valve spring seat ① (upper)
   - Valve spring ② (outer)
   - Valve spring ③ (inner)
   - Valve ④
   - Valve stem seal ⑤
   - Valve spring seat ⑥ (lower)

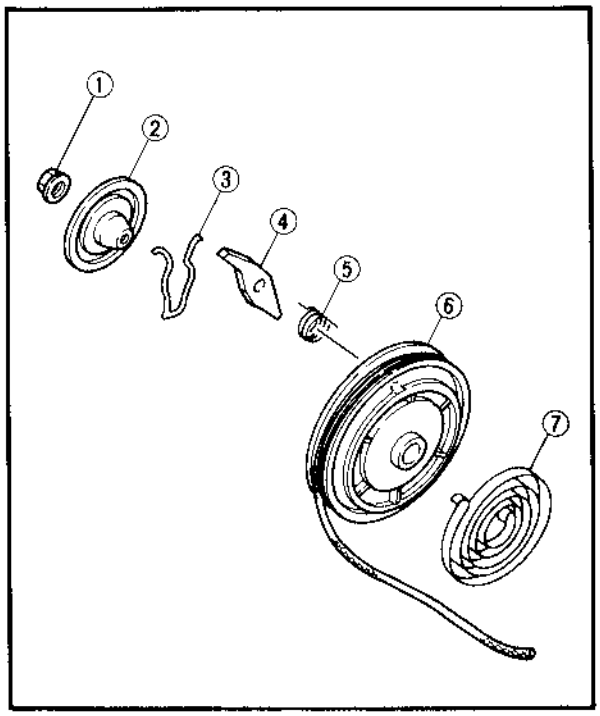
NOTE:
Identify each part position very carefuly so that it can be reinstalled in its original place.



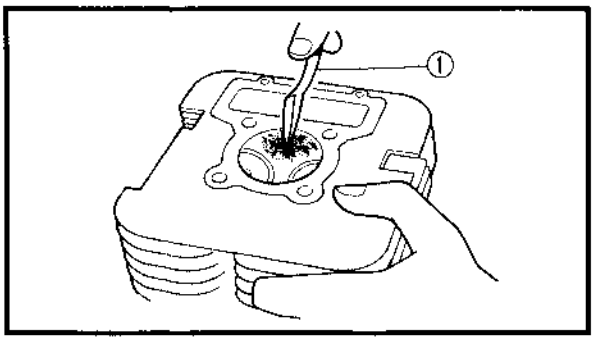
RECOIL STARTER (EXCEPT FOR USA)

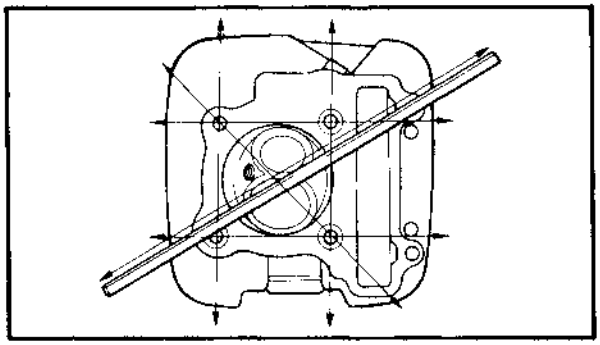
1. Remove:
   - Cap ①
   - Starter handle ②

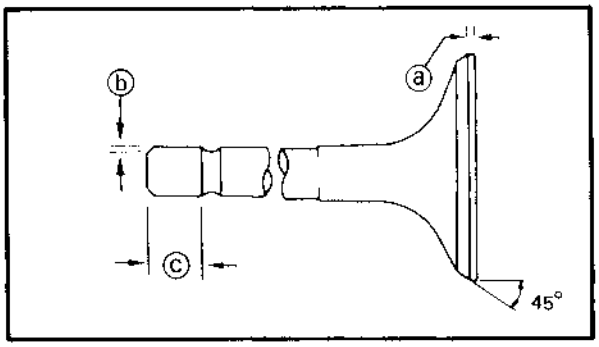
NOTE:
Before untying knot ③ , pull out the rope long enough to make knot ④ on the rope so that the rope is not pulled into the case.



2. Remove:
   - Nut ①
   - Drive plate ②
   - Spring ③
   - Drive pawl ④
   - Spring ⑤ (drive pawl)
   - Sheave drum ⑥
   - Spring ⑦ (starter)







INSPECTION AND REPAIR

CYLINDER HEAD

1. Eliminate:
   - Carbon deposit
     Use the rounded scraper ① .

NOTE:

Do not use a sharp instrument and avoid damaging or scratching:
- Spark plug thread
- Valve seat
- Cylinder head

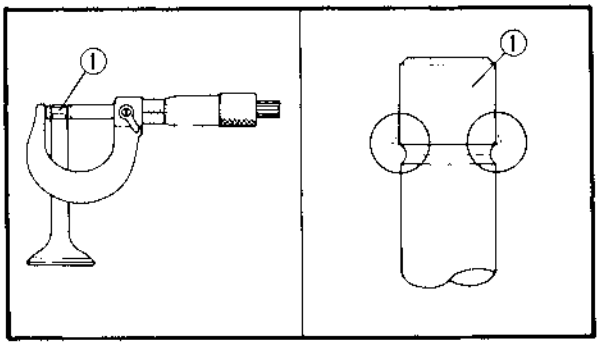
2. Measure:
   - Cylinder head warpage
     Out of specification → Resurface/Replace.

Cylinder head warp:
Less than 0.03 mm (0.0012 in)

INTAKE AND EXHAUST VALVE

1. Check:
   - Valve face
   - Stem end
     Wear/Pitting/Out of specification → Replace.

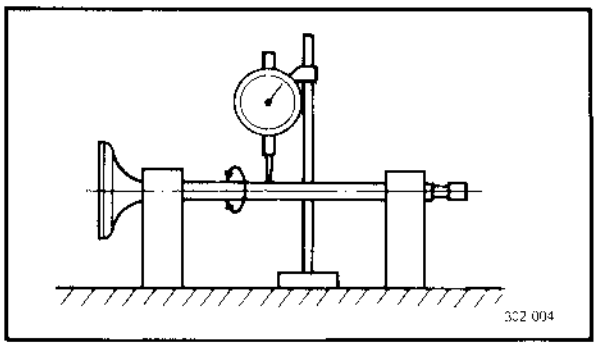
Minimum thickness (service limit) ⓐ :
0.8 mm (0.031 in)
Beveled ⓑ :
0.5 mm (0.020 in)
Minimum length (service limit) ⓒ :
4.0 mm (0.157 in)



2. Inspect:
   - Valve stem end ①
     Mushroom shape/Larger diameter than rest of stem → Replace valve, valve guide, and oil seal.

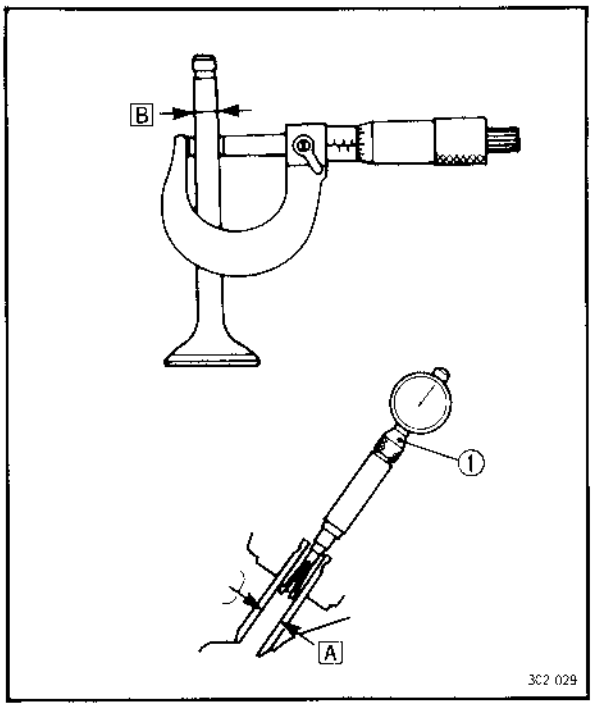
NOTE:

Deburr any deformed valve stem end ① . Use an oil stone to smooth the stem end.



3. Measure:
   - Valve stem runout
     Out of specification → Replace.

	Stem runout: **Less than: 0.03 mm (0.0012 in)**



4. Measure:
   - Valve stem clearance

Valve stem clearance =
Valve guide inside diameter A − Valve stem diameter B

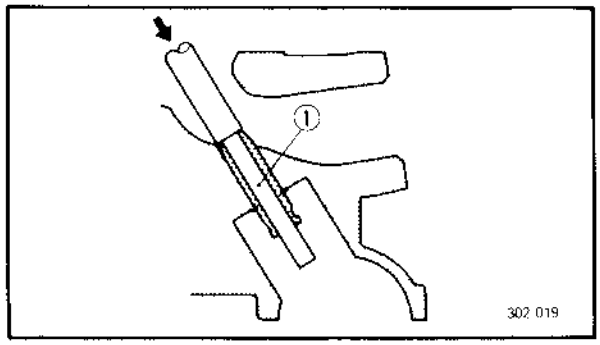
Out of specification → Replace either valve and/or guide.
Use a Micrometer and Bore Gauge ①.

	Valve stem clearance	Limit
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.10 mm (0.0039 in)

VALVE GUIDE

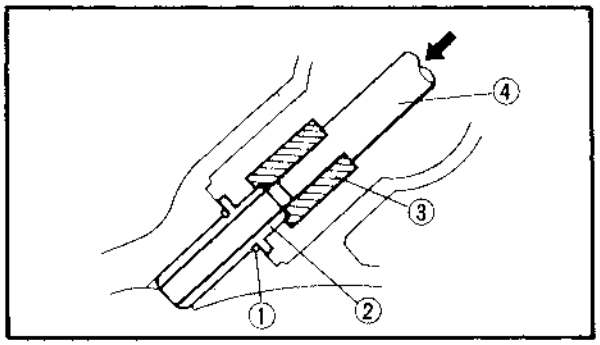
NOTE:
- Always replace the valve guide if the valve is replaced.
- Always replace the oil seal if the valve is removed.

1. Inspect:
   - Valve guide
     Wear/Oil leakage into cylinder → Replace.
2. Remove:
   - Valve guide
     Use the Valve Guide Remover ①.



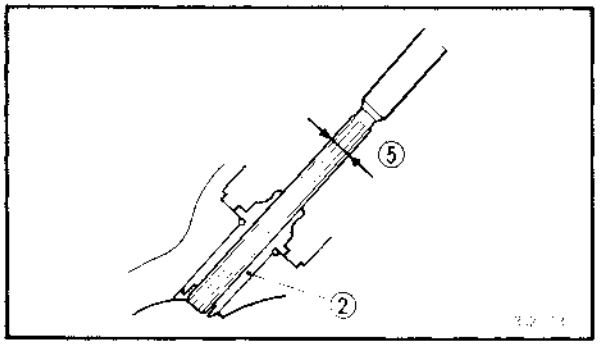
	Valve guide remover (6.0 mm): **P/N. YM-04064-A, 90890-04064**

NOTE:
Heat the head in an oven to 100°C (212°F) to ease guide removal and installation and to maintain correct interference fit.



3. Install:
   - Circlip ① (new)
   - Valve guide ② (new)
     Use the Valve Guide Installer ③ with the Valve Guide Remover ④.

Valve guide installer:
P/N. YM-04065-A, 90890-04065
Valve guide remover (6.0 mm):
P/N. YM-04064-A, 90890-04064



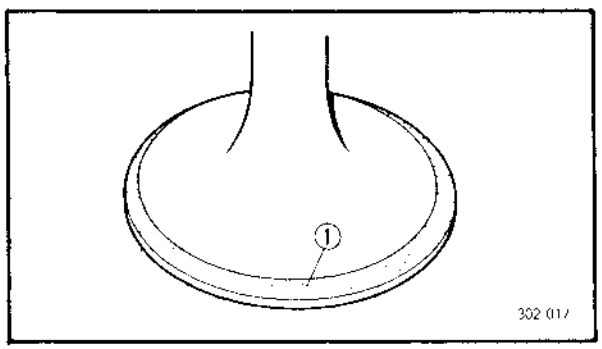
4. Bore valve guide ② to obtain proper valve stem clearance.
   Use the Valve Guide Reamer ⑤ (6.0 mm).

Valve guide reamer (6.0 mm):
P/N. YM-04066, 90890-04066

NOTE:
Reface the valve seat after installing the valve guide.

VALVE SEAT

1. Eliminate:
   - Carbon deposit
     (from valve seat and valve face)
2. Inspect:
   - Valve seat
     Pitting/Wear → Reface valve seat.

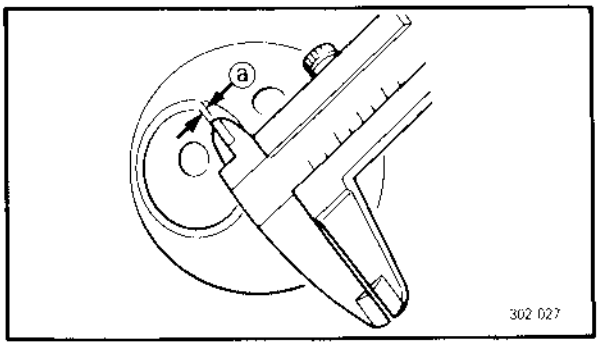


3. Measure:
   - Valve seat width
     Out of specification → Reface valve seat.

****

Measurement steps:

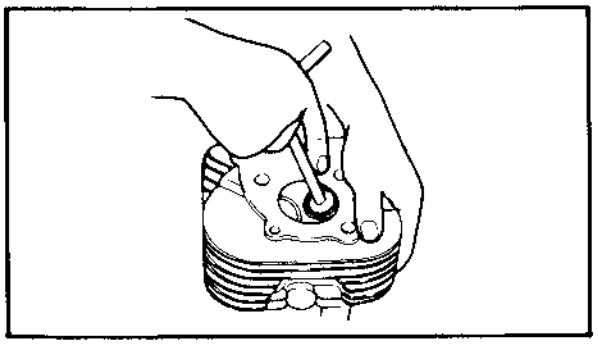
- Apply the Mechanic's bluing dye ① (Dykem) to the valve face.
- Install the valve into the cylinder head.

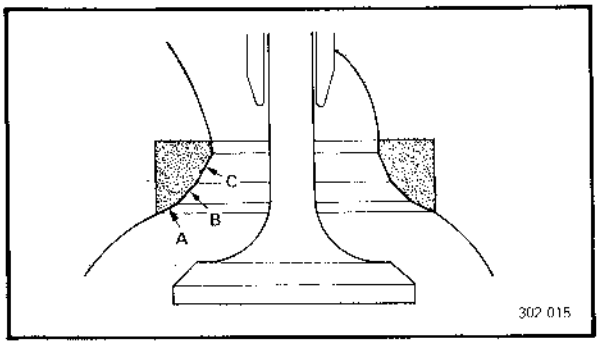


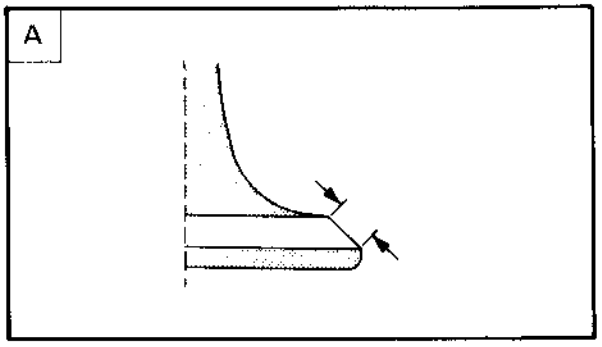
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Remove the valve from the cylinder head.
- Measure the valve seat width ⓐ.
  When the valve seat and valve face make contact, bluing will be applied to the valve face.

	Valve seat width	Limit
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	1.6 mm (0.063 in)
Exhaust		

- If the valve seat width is too wide, too narrow, or seat has not centered. The valve seat must be refaced.







4. Reface:
   - Valve seat
     Use 30°, 45° and 60° Valve Seat Cutter.

	Valve seat cutter set: P/N. YM-91043-B

CAUTION:

Remove just enough material to achieve satisfactory seat. When twisting cutter, keep and even downward pressure to prevent chatter marks.

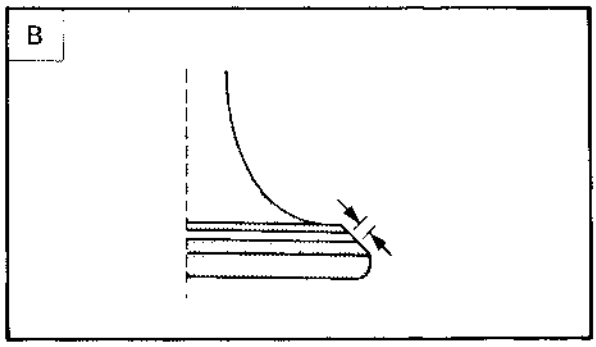
Cut sections as follows	
Section	Cutter
A	30°
B	45°
C	60°

****

Valve seat refacing steps:

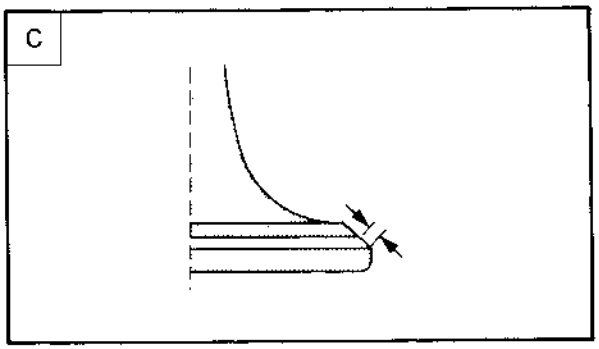
Ⓐ Valve face indicates that valve seat is centered on valve face but is too wide.

Valve seat cutter set		Desired result
Use lightly	30° cutter	To reduce valve seat width to 1.0 mm (0.04 in)
	60° cutter	



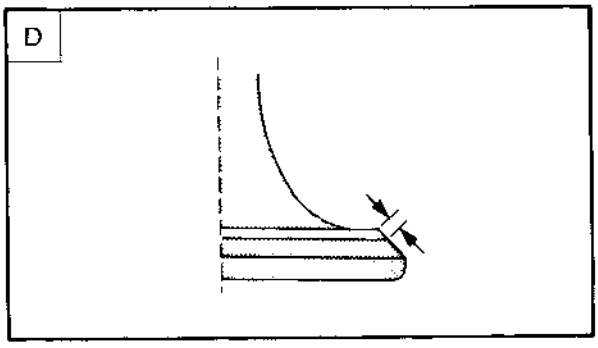
Ⓑ Valve seat is in the middle of the valve face but too narrow.

Valve seat cutter set		Desired result
Use	45° cutter	To achieve a uniform valve seat width of 1.0 mm (0.04 in)



Ⓒ Valve seat is too narrow and right up near valve margin.

Valve seat cutter set		Desired result
Use	30° cutter	To center the seat and to achieve its width of 1.0 mm (0.04 in)
	45° cutter	



Ⓓ Valve seat is too narrow and is located down near the bottom edge of the valve face.

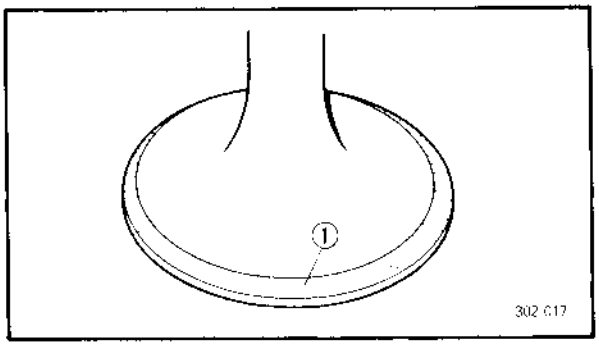
Valve seat cutter set		Desired result
Use	60° cutter, first	To center the seat and increase its width.
	45° cutter	

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5. Lap:
   - Valve face
   - Valve seat

NOTE:

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



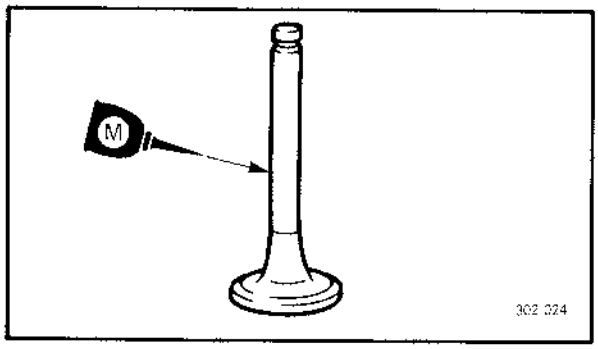
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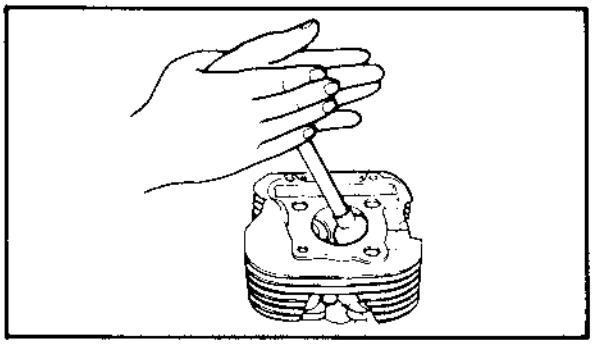
Valve lapping steps:

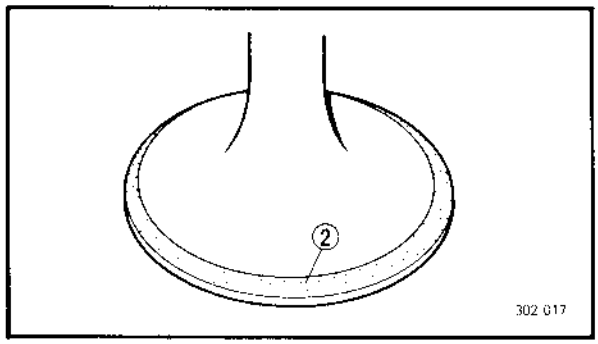
- Apply a coarse lapping compound ① to the valve face.

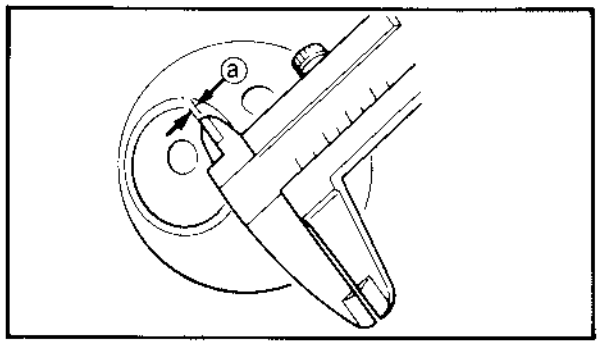
CAUTION:

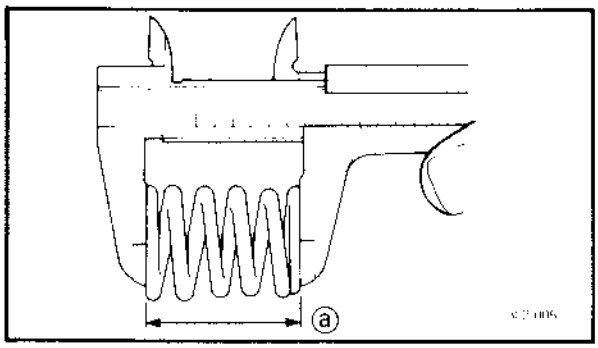
Be sure no compound enteres the gap between the valve stem and guide.











- Apply a molybdnum disulfide oil to the valve stem.
- Install the valve into the cylinder head.
- Turn the valve until the valve face and valve seat are evenly polished, then clean off all compound.

NOTE:

To obtain the best lapping result, lightly tap the valve seat while rotating the valve back and forth between your hand.

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

NOTE:

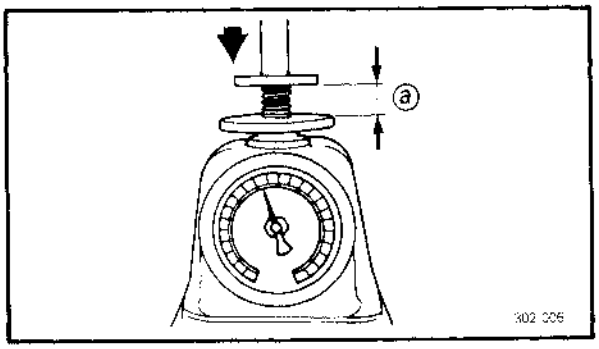
Be sure to clean off all compound from the valve face and valve seat after every lapping operation.

- Apply the Mechanic's bluing dye ② (Dykem) to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Remove the valve from the cylinder head.
- Measure the valve seat width ⓐ again. If the valve seat width is out of specification, reface and lap the valve seat.

VALVE SPRING

1. Measure:
   - Valve spring free length ⓐ (inner and outer)
     Out of specification → Replace.

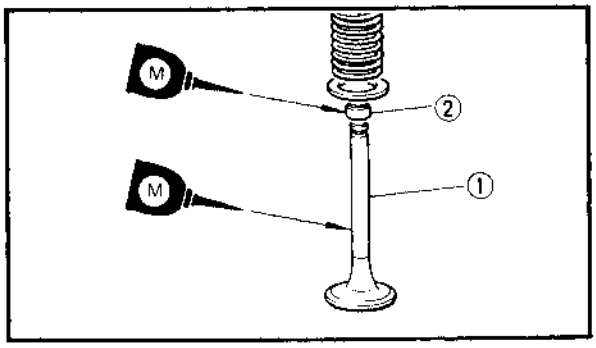
Valve spring free length	
Inner spring (IN/EX)	Outer spring (IN/EX)
35.5 mm (1.4 in)	37.2 mm (1.46 in)



2. Measure:
   - Valve spring installed force
     Out of specification → Replace inner and outer springs as a set.

ⓐ Installed length

Valve spring installed force	
Inner spring (IN/EX)	8.4 ~ 10.2 kg (18.5 ~ 22.5 lb) at 30.5 mm (1.2 in)
Outer spring (IN/EX)	16.6 ~ 20.4 kg (36.6 ~ 45.0 lb) at 32.0 mm (1.26 in)



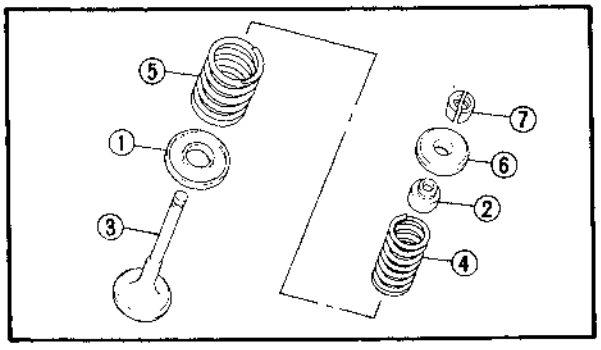
VALVE INSTALLATION

1. Lubricate:
   - Valve stem ①
   - Oil seal ②

Molybdenum disulfide oil:

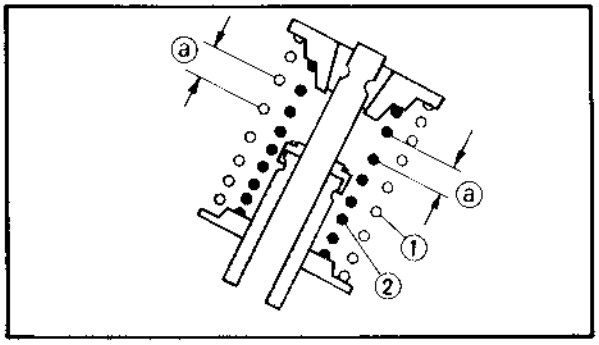
2. Install:
   - Intake valves
   - Exhaust valves

NOTE:
Be sure to reinstall in its original place.



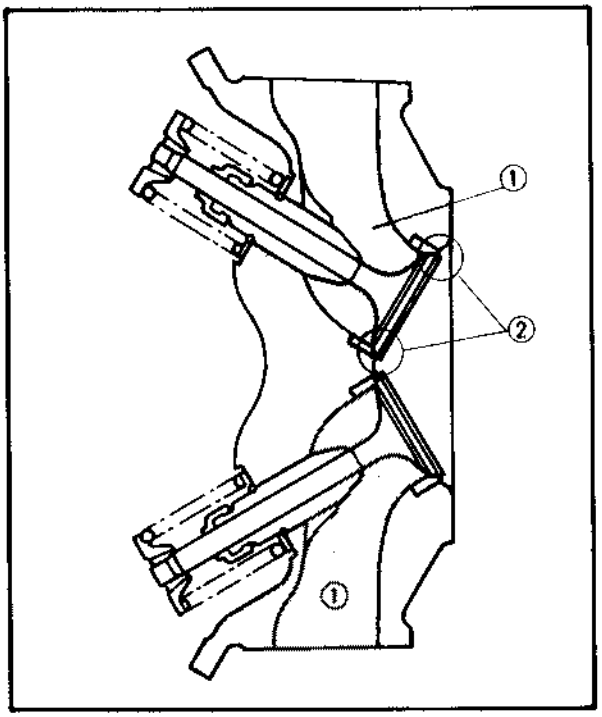
3. Install:
   - Valve spring seat ① (lower)
   - Oil seal ②
   - Valve ③
   - Valve spring ④ (inner)
   - Valve spring ⑤ (outer)
   - Valve spring seat ⑥ (upper)
   - Valve cotters ⑦
     Use the Valve Spring Compressor.

Valve spring compressor: P/N. YM-04019, 90890-04019



NOTE:
All valve springs must be installed with the larger pitch ⓐ upward as shown.

① Outer spring
② Inner spring



4. Check:
   • Valve sealing
   Leakage at valve seat → Reface, relap or replace valve, relap.
   Refer to "VALVE SEAT".

****

Valve seat checking steps:

- Pour a clean solvent ① into the intake and exhaust ports.
- Check the valve sealing, there should be no leakage at the valve seat ②.

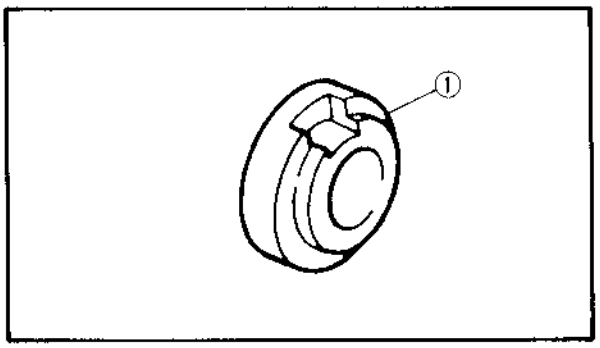
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Relapping steps:

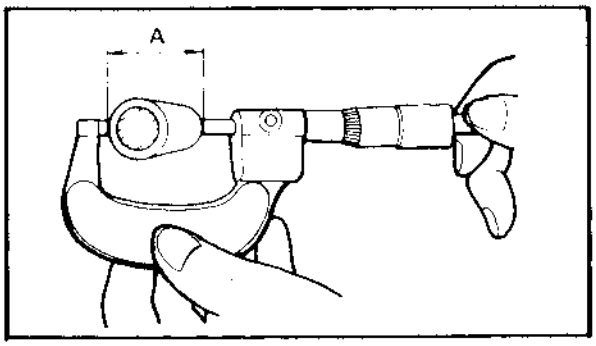
- Reassemble head parts.
- Repeat lapping steps using fine lapping compound.
- Clean all parts thoroughly.
- Reassemble and check for leakage again using solvent.
- Repeat steps as often as necessary to effect a satisfactory seal.

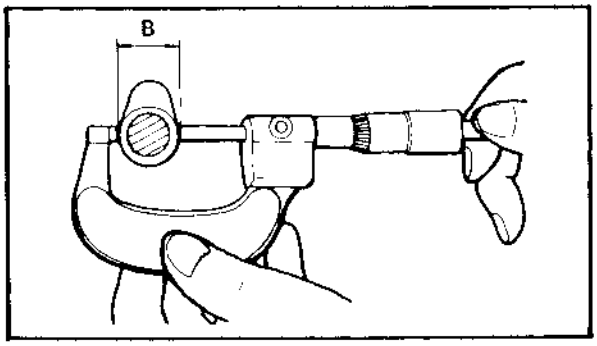
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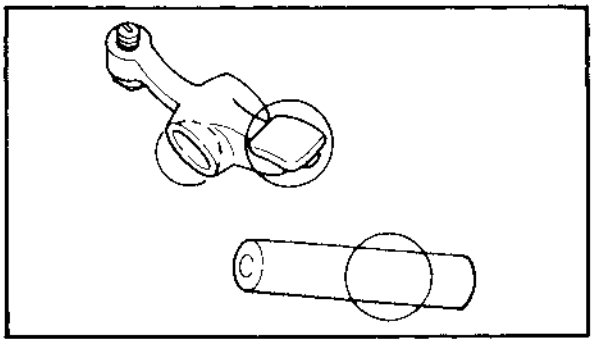


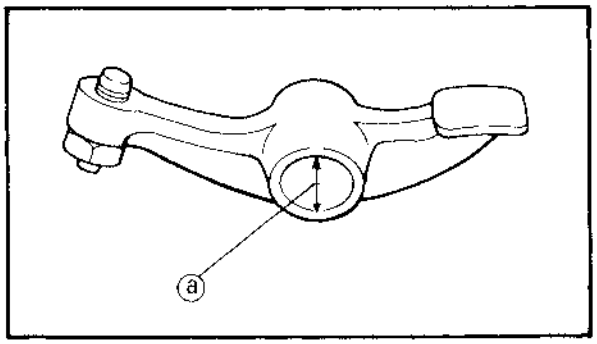
CAM SHAFT

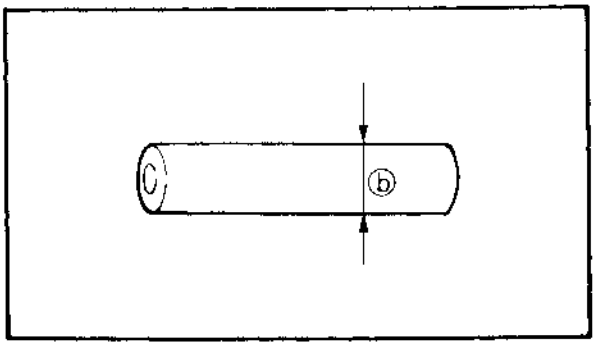
1. Inspect:
   • Camshaft bushing ①
   Wear/Damage → Replace.











2. Inspect:
   - Cam lobes
     Pitting/Scratches/Blue discoloration → Replace.
3. Measure:
   - Cam lobes
     Use a Micrometer.
     Out of specification → Replace.

	Cam lobe Limit "A"	Cam lobe Limit "B"
Intake	36.487 mm (1.4404 in)	30.081 mm (1.1843 in)
Exhaust	36.532 mm (1.4383 in)	30.202 mm (1.1891 in)

ROCKER ARM AND ROCKER ARM SHAFT

1. Inspect:
   - Rocker arm shafts
   - Rocker arms
     Wear/Damage → Replace.

****

Rocker arm shaft and arm inspection steps:

- Inspect the two areas on the rocker arm for sings of unusual wear.
  1) Rocker arm shaft hole.
  2) Cam-lobe-contact surface.
     Excessive wear → Replace.
- Inspect the surface condition of the rocker arm shaft.
  Pitting/Scratches/Blue discoloration → Replace/ Check lubrication.
- Measure the inside diameter ⓐ of the rocker arm hole.
  Out of specification → Replace.

Rocker arm inside diameter:
12.000 ~ 12.018 mm
(0.4724 ~ 0.4731 in)

- Measure the outside diameter ⓑ of the rocker arm shaft.
  Out of specification → Replace.

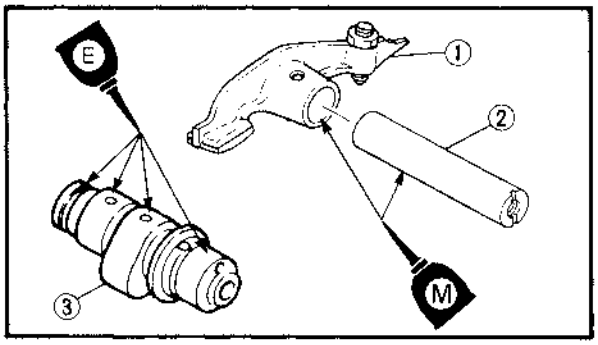
Rocker arm shaft outside diameter:
11.985 ~ 11.991 mm
(0.4718 ~ 0.4721 in)

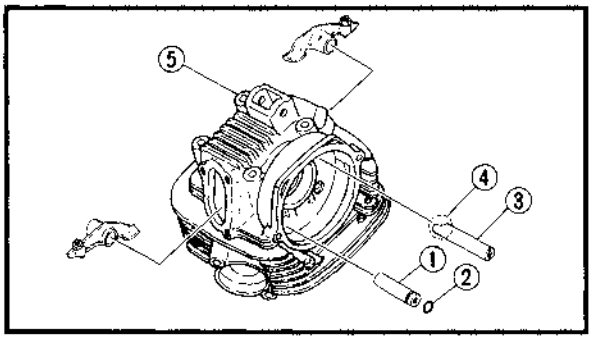
- Calculate the clearance by subtracting the rocker-arm-shaft outside diameter from the rocker-arm inside diameter.

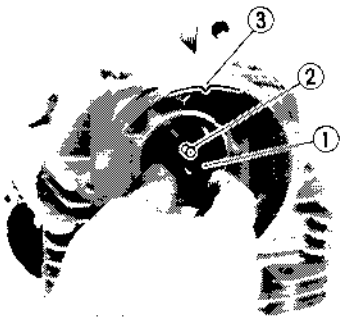
Arm-to-shaft clearance =
Rocker arm inside diameter ⓐ – Rocker arm shaft outside diameter ⓑ

Out of specification → Replace as a set.

Arm-to-shaft clearance:
0.009 ~ 0.033 mm
(0.0004 ~ 0.0013 in)
< Limit >:
0.037 mm (0.0015 in)







2. Lubricate:
   - Rocker arms ①
   - Rocker arm shafts ②
   - Cam shaft ③ (cam lobe/jounal)

Rocker arms/rocker arm shafts:
Molybdenum disulfide oil
Cam shaft:
SAE 10W30 motor oil

3. Install:
   - Rocker arms
   - Rocker arms shafts

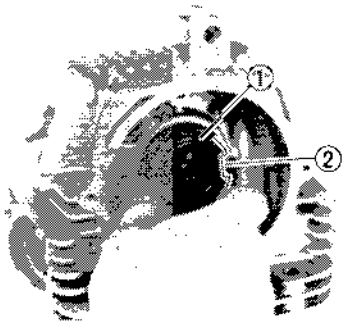
NOTE:

- Thread hole of the rocker arm shaft should be placed outside.
- Install the shorter rocker arm shaft ① (with O-ring ②) on the exhaust side and the longer shaft ③ (with cutaway ④) on the intake side.
- Align the slit ④ on the rocker arm shaft (intake) with the cylinder head bolt hole ⑤ and install the rocker arm shaft.

4. Install:
   - Camshaft ①
     (to cylinder head)

NOTE:

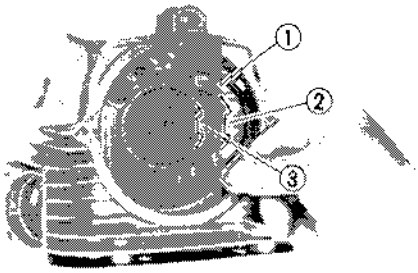
The pin ② on the end of the camshaft must align with the timing mark ③ on the cylinder head.



5. Install:
   - Camshaft bushing ①

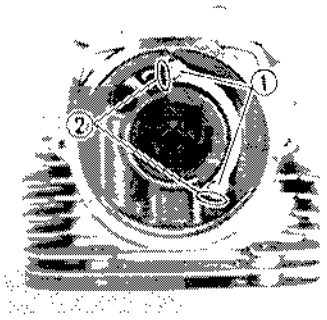
NOTE:
The cut-out portion ② of the bushing must be flush with the cylinder head.

CAUTION:
Do not cock the bushing during installation. The bushing must be perpendicular to the camshaft during installation.



6. Install:
   - Retainer ① (camshaft bushing)
   - Lock washer (new)

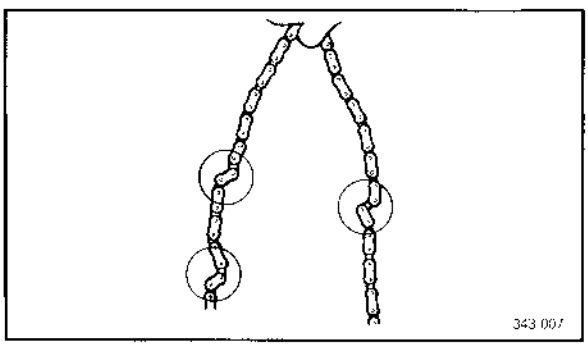
NOTE:
Be sure that the projection ② on the retainer align with the cut-out portion ③ on the camshaft busing.



7. Tighten:
   - Bolts ① (camshaft bushing retainer)

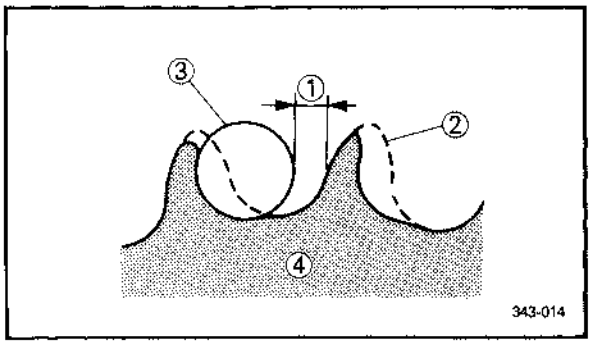
	Bolts (camshaft bushing retainer): 8 Nm (0.8 m • kg, 5.8 ft • lb)

8. Bend the lock washer tabs ② .



TIMING CHAIN

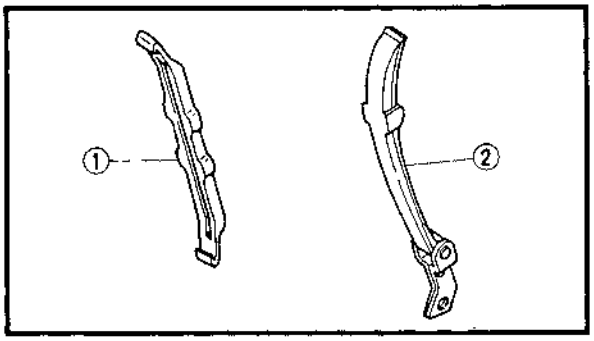
1. Inspect:
   - Timing chain
     Chain stretch/Stiff/Cracks → Replace.



CAM SPROCKET AND CAM DRIVE SPROCKET

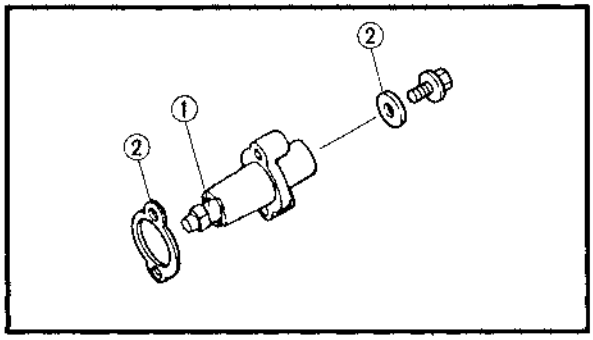
1. Inspect:
   - Cam sprocket
   - Cam drive sprocket (crank shaft)
     Wear/Damage → Replace cam sprocket and timing chain as a set.

① 1/4 tooth
② Correct
③ Roller
④ Sprocket



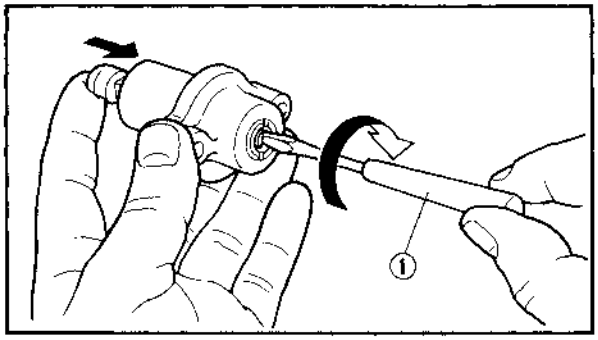
TIMING CHAIN GUIDE

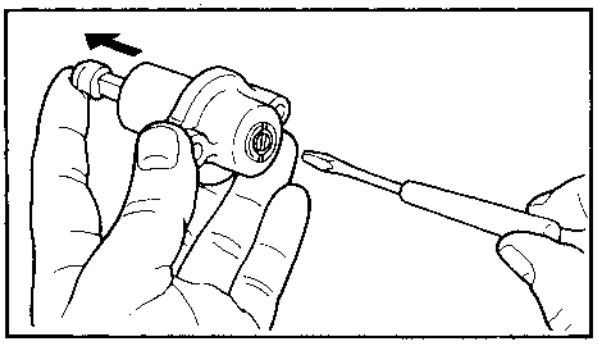
1. Inspect:
   - Timing chain guide ① (exhaust)
   - Timing chain guide ② (intake)
     Wear/Damage → Replace.



TIMING CHAIN TENSIONER

1. Inspect:
   - Chain tensioner rod ①
   - Gaskets ②
     Damage/Wear → Replace.





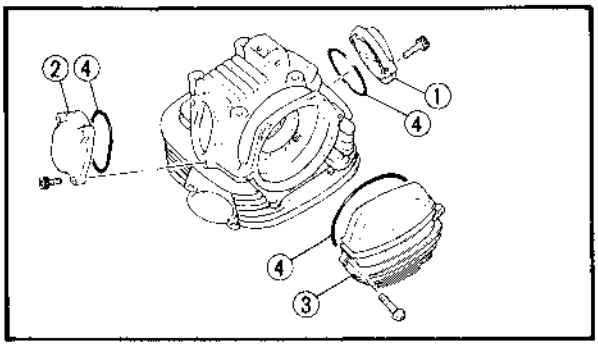
2. Check:
   - Timing chain tensioner play

****

Checking steps:

- While pressing the tensioner rod lightly with fingers, use a thin screwdriver ① and wind the tensioner rod up fully clockwise.
- When releasing the screwdriver by pressing lightly with fingers, make sure that the tensioner rod will come out smoothly.
- If not, replace the tensioner assembly.

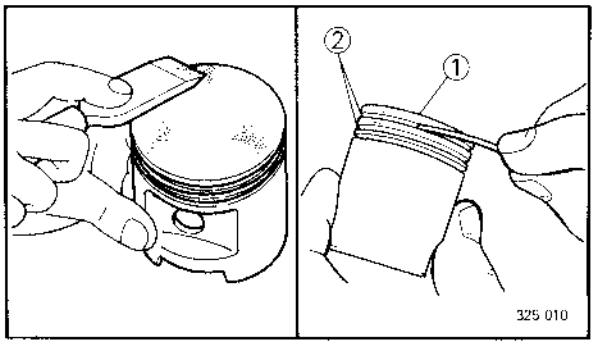
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TAPPET COVER AND CAM SPROCKET COVER

1. Inspect:
   - Tappet covers (intake ① and exhaust ②)
   - Cam sprocket cover ③
   - O-rings ④

   Cracks/Damage → Replace.



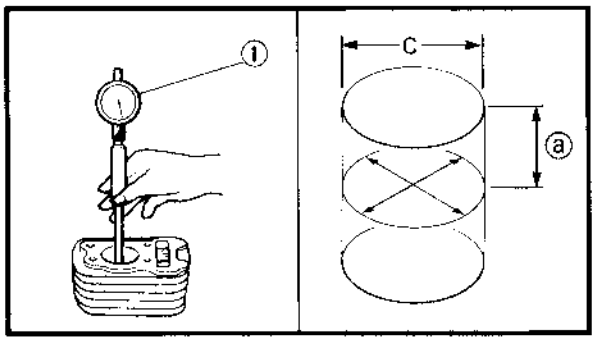
CYLINDER AND PISTON

1. Eliminate:
   - Carbon deposits

   (from the piston crown and ring grooves.)

2. Inspect:
   - Cylinder and piston walls

   Vertical scratches → Rebore or replace cylinder and piston.



3. Measure:
   - Piston-to-cylinder clearance

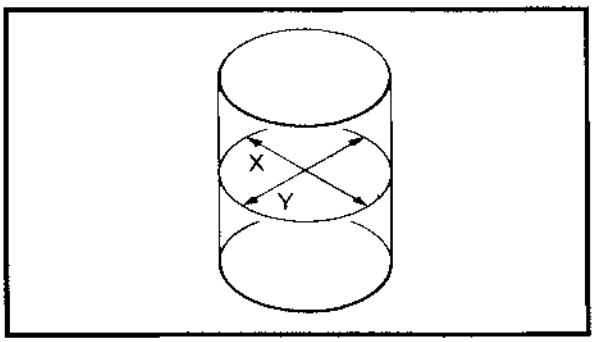
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Measurement steps:

First steps

- Measure the cylinder bore "C" with a cylinder bore gauge ①.

ⓐ 45 mm (1.77 in) from the cylinder top

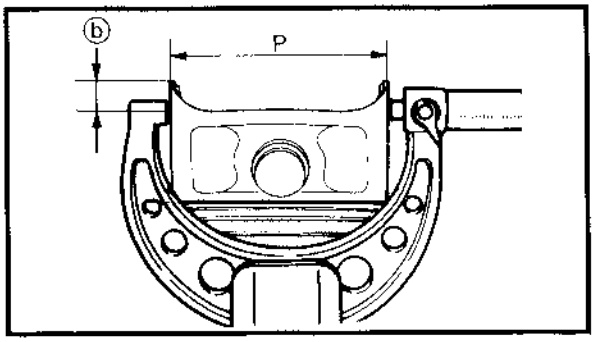


NOTE:

Measure the cylinder bore "C" in parallel to and at right angles to the cylinder matching surface. Then, find the average of the measurements.

	Standard	Wear limit
Cylinder bore "C"	70.97 ~ 71.02 mm (2.794 ~ 2.796 in)	71.10 mm (2.799 in)
$C = \frac{X+Y}{2}$		

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



2nd steps

- Measure the piston skirt diameter "P" with a micrometer.
  ⓑ 4 mm (0.16 in) from the piston bottom edge

Piston skirt Diameter "P"	
Standard	70.92 ~ 70.97 mm (2.792 ~ 2.794 in)
Oversize 2	71.50 mm (2.815 in)
Oversize 4	72.00 mm (2.846 in)

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

3rd steps

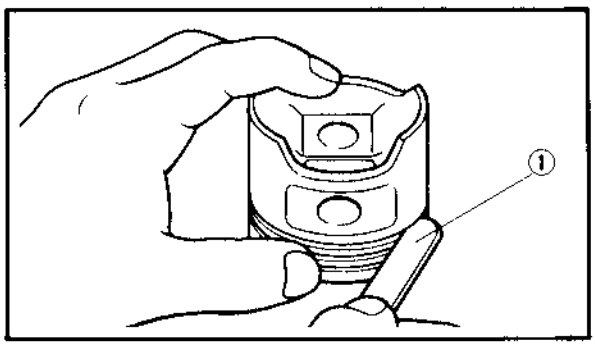
- Find the piston-to-cylinder clearance with following formula.

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

Piston-to-cylinder clearance:
0.04 ~ 0.06 mm
(0.0016 ~ 0.0024 in)
< Limit >:
0.1 mm (0.004 in)

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

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PISTON RING AND PISTON PIN

Piston ring

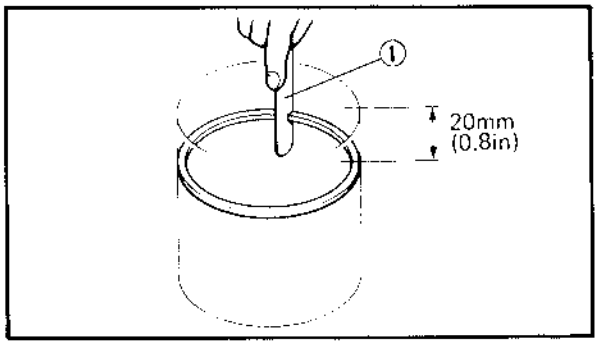
1. Measure:
   - Side clearance
     Use the Feeler Gauge ① .
     Out of specification → Replace piston and/or rings as a set.

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

	Side clearance	
	Standard	Limit
Top ring	0.03 ~ 0.07 mm (0.001 ~ 0.003 in)	0.12 mm (0.005 in)
2nd ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)	0.12 mm (0.005 in)

2. Position:
   - Piston ring
     (into cylinder)

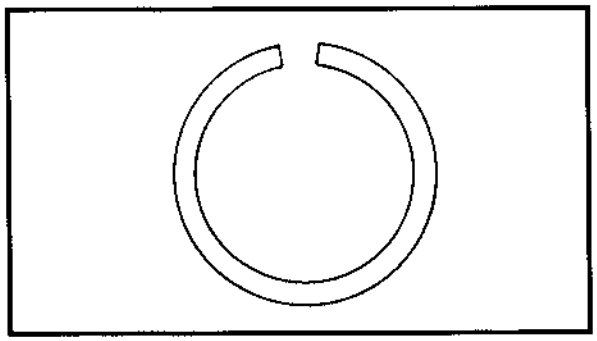
NOTE:
Insert the ring into the cylinder, and push it approximately 20 mm (0.8 in) into the cylinder. Push the ring with the piston crown so that the ring will be at a right angle to the cylinder bore.



3. Measure:
   - End gap
     Use a Feeler Gauge ①
     Out of specification → Replace rings as set.

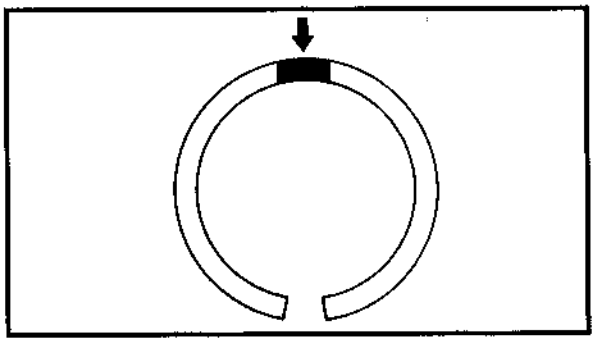
	End gap	
	Standard	Limit
Top ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.4 mm (0.016 in)
2nd ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.4 mm (0.016 in)
Oil ring	0.3 ~ 0.9 mm (0.012 ~ 0.035 in)	–

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



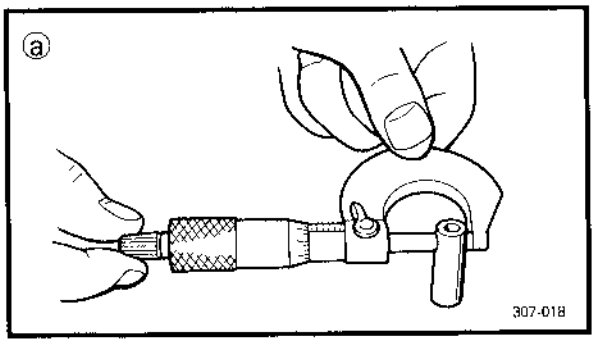
Piston ring oversize
   - Top and 2nd piston ring
     Oversize top and middle ring sizes are stamped on top of ring.

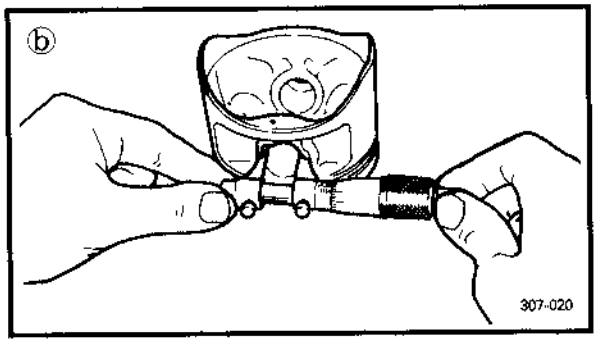
Oversize 2	0.50 mm (0.0197 in)
Oversize 4	1.00 mm (0.0394 in)



- Oil control ring
  Expander spacer of bottom ring (oil control ring) is color-coded to identify sizes.

Size	Color
Oversize 2	Blue
Oversize 4	Yellow





Piston pin

1. Inspect:
   - Piston pin
     Blue discoloration/Grooves → Replace then inspect lubrication system.
2. Measure:
   - Outside diameter ⓐ (piston pin)
     Out of specification → Replace.

Outside diameter (piston pin):
15.991 ~ 16.000 mm
(0.6296 ~ 0.6299 in)

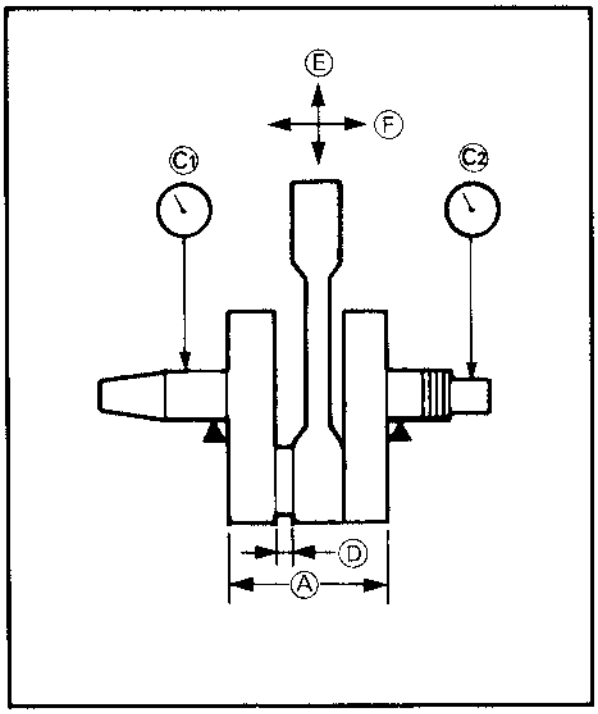
3. Measure:
   - Piston pin bore inside diameter ⓑ (piston)
     Out of specification → Replace.

Piston pin bore inside diameter (piston):
16.002 ~ 16.013 mm
(0.63 ~ 0.6304 in)

4. Measure:
   - Piston pin-to-piston clearance
     Out of specification → Replace piston.

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

Piston pin-to-piston clearance:
0.002 ~ 0.022 mm
(0.0001 ~ 0.0009 in)
<Limit> 0.07 mm (0.003 in)



CRANKSHAFT

1. Measure:
   - Crank width Ⓐ
     Out of specification → Replace or repair.

Crank width:
55.95 ~ 56.00 mm
(2.203 ~ 2.205 in)

   - Runout Ⓒ
     Out of specification → Replace or repair.

< Runout limit >:
Ⓒ1: 0.03 mm (0.0012 in)
Ⓒ2: 0.06 mm (0.0024 in)

   - Side clearance Ⓓ
     Out of specification → Replace or repair.

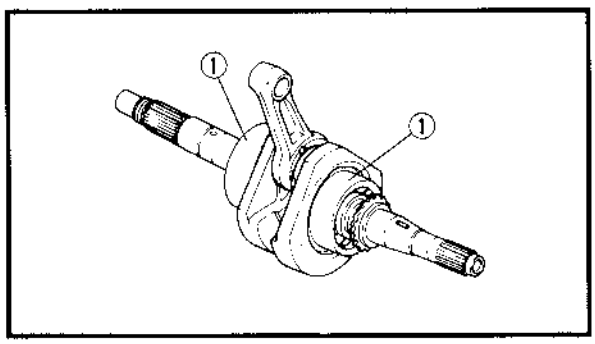
Big end side clearance:
0.35 ~ 0.65 mm (0.014 ~ 0.026 in)

   - Big end radial clearance Ⓔ
     Out of specification → Replace or repair.

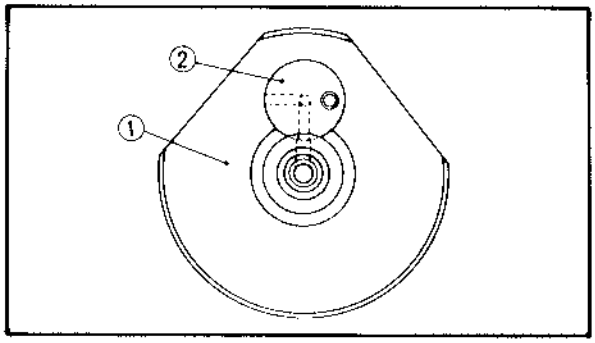
Big end raidal clearance:
0.010 ~ 0.025 mm
(0.0004 ~ 0.0010 in)

   - Small end free play Ⓕ
     Out of specification → Replace or repair.

Small end free play:
0.8 ~ 1.0 mm (0.032 ~ 0.040 in)
< Limit>:
2.0 mm (0.08 in)



2. Inspect:
   - Crankshaft bearings ①
     Abnormal noise/Turn roughly/Free play → Replace.

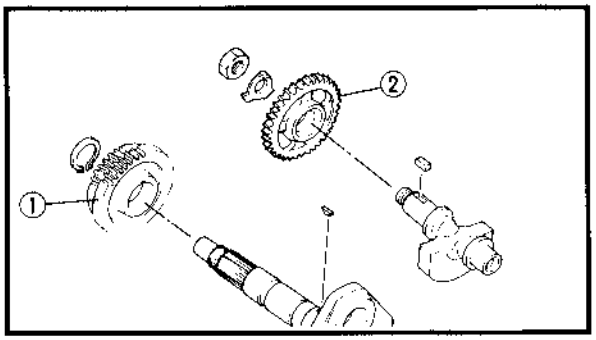


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Crankshaft reassembling point:

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

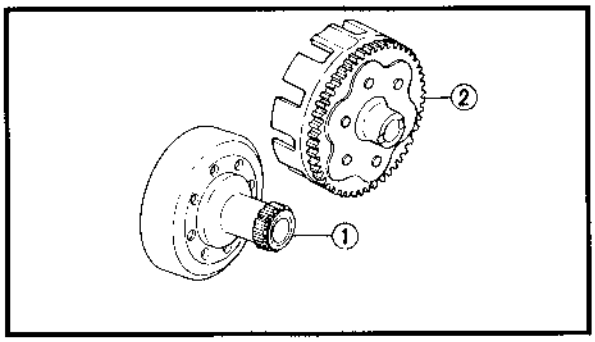
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BALANCER DRIVE GEAR AND DRIVEN GEARS

1. Inspect:
   - Balancer drive gear teeth ①
   - Balancer driven gear teeth ②

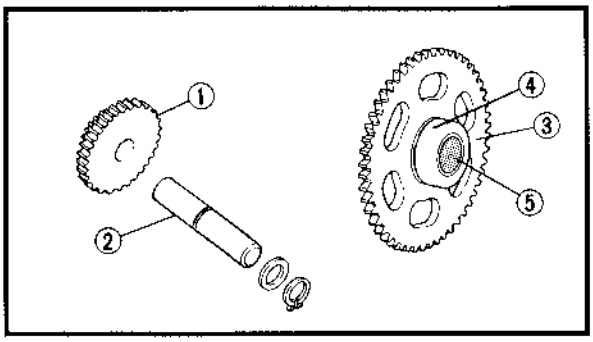
   Wear/Damage → Replace both gears.



PRIMARY GEARS AND STARTER

1. Inspect:
   - Drive gear ①
   - Driven gear ②

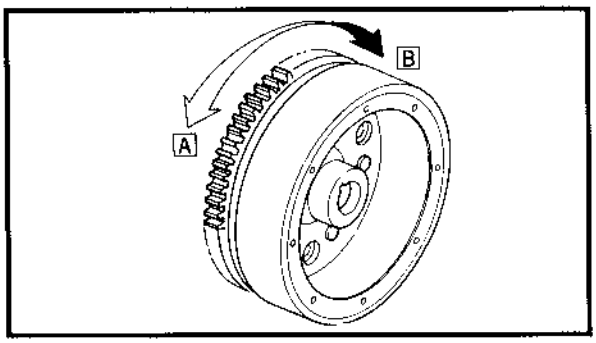
   Scratches/Wear/Damage → Replace.
   Excessive noises during operation → Replace both gears.



2. Inspect:
   - Idler gear ① (starter)
   - Idler gear shaft ②

   Scratches/Wear/Damage → Replace.
   - Driven gear ③ (starter)
   - Roller contact surface ④
   - Bearing ⑤ (driven gear)

   Scratch/Wear/Damage → Replace starter driven gear assembly.

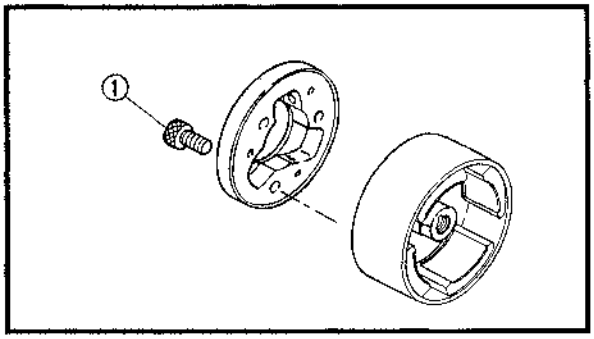


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Starter clutch operation

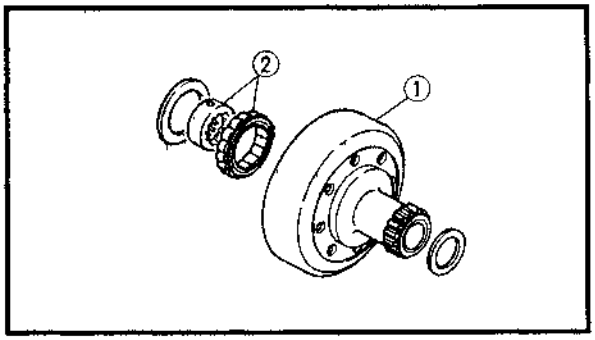
- Install the starter driven gear to the starter clutch, and hold the starter clutch.
- When turning the starter driven gear counter clockwise [A], the starter clutch and the driven gear should be engaged.
  If not, the starter clutch is faulty. Replace it.
- When turning the starter driven gear clockwise [B], the starter driven gear should turn freely. If not, the starter clutch is faulty. Replace it.

****



3. Inspect:
   - Bolts ① (starter clutch)
     Loose → Replace with a new one, and calk the end of the bolt.

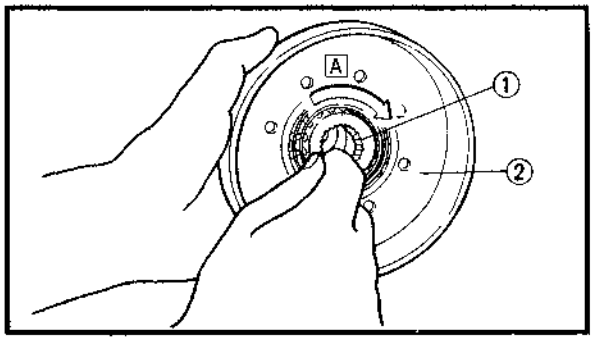
Bolts (starter clutch):
30 Nm (3.0 m • kg, 22 ft • lb)
LOCTITE®
Calk the end of the bolt



PRIMARY CLUTCH

Clutch housing

1. Inspect:
   - Clutch housing ① (inner surface)
     Heat damage/Wear/Damage → Replace.
   - Bearings ② (clutch housing)
     Chafing/Wear/Damage → Replace.

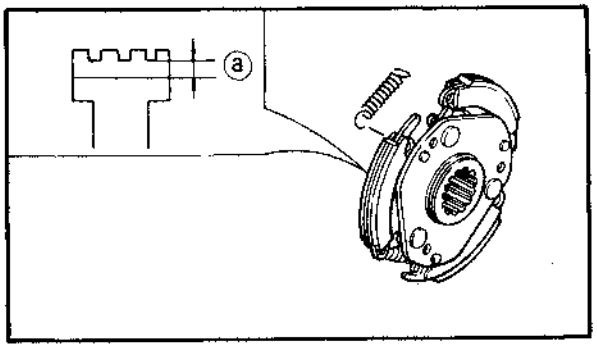


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One way clutch operation

Be sure that the splined inner collar ① turns clockwise Ⓐ.
If the operation is not smooth or if it turns counterclockwise, replace the inner collar ① and primary clutch housing ② as a set.

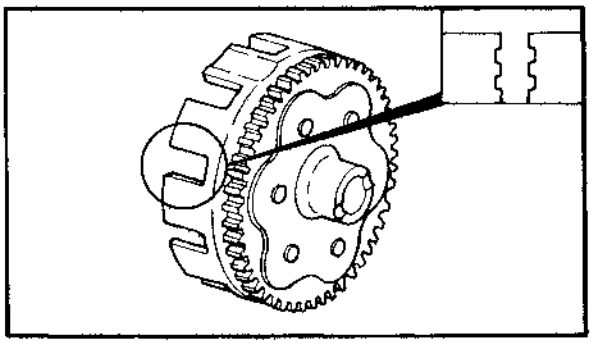
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Clutch carrier

1. Inspect:
   - Clutch shoe
     Heat damage → Replace.
2. Measure:
   - Clutch shoe thickness
     Out of specification → Replace.

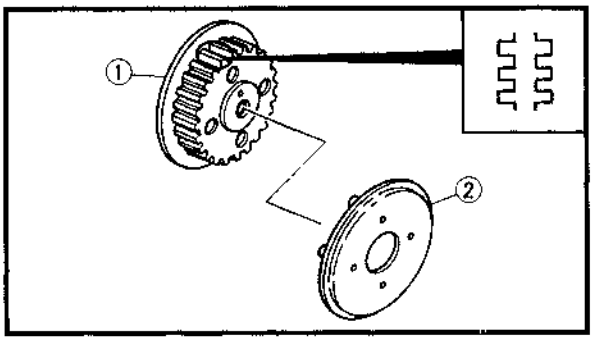
Clutch shoe wear limit ⓐ:
1.5 mm (0.06 in)



SECONDARY CLUTCH

Clutch housing

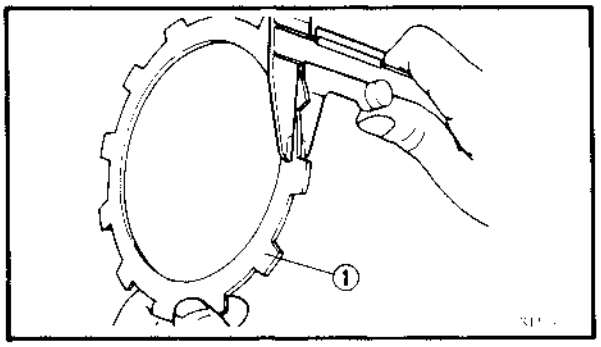
1. Inspect:
   - Dogs on the housing
     Cranks/Wear/Damage → Deburr or replace.



Clutch boss and pressure plate

1. Inspect:
   - Clutch boss splines ①
   - Pressure plate splines ②

   Scoring/Wear/Damage → Replace clutch boss assembly and/or pressure plate.



Friction plates

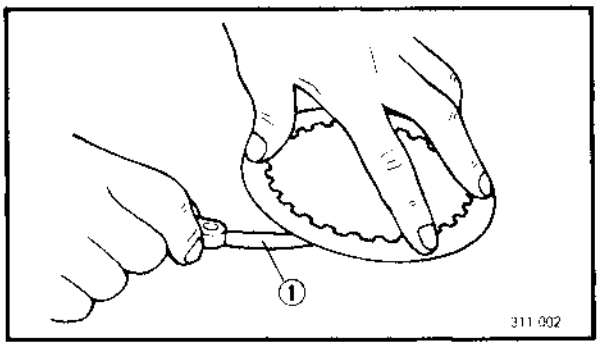
1. Inspect:
   - Friction plate ①

   Damage/Wear → Replace friction plate as a set.
2. Measure:
   - Friction plate thickness

   Measure at all four points.

   Out of specification → Replace friction plate as a set.

Wear limit:
2.8 mm (0.110 in)



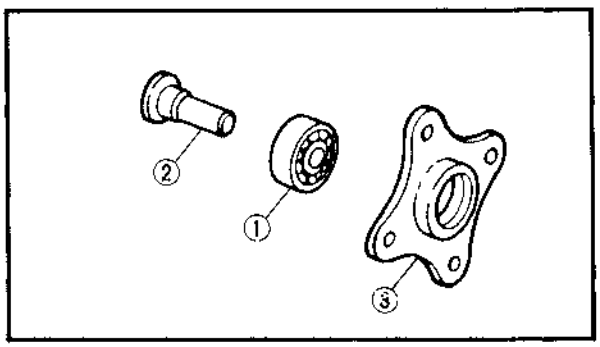
Clutch plates

1. Measure:
   - Clutch plate warpage

   Use the surface plate and the Feeler Gauge ①.

   Out of specification → Replace.

Warp limit:
0.2 mm (0.008 in)

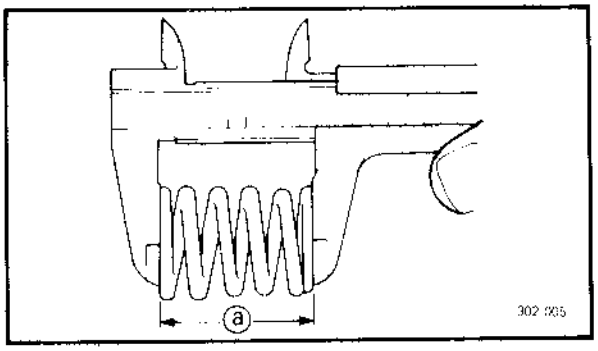


Push rod and push rod bearing

1. Inspect:
   - Bearing ① (push rod)

   Roughness/Sluggishness → Replace.
   - Push rod ②
   - Bearing holder ③

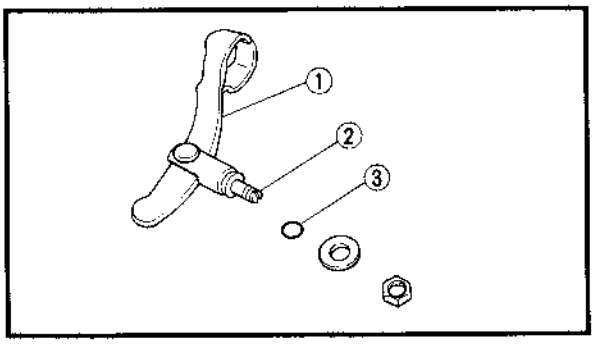
   Wear/Damage → Replace.



Clutch spring

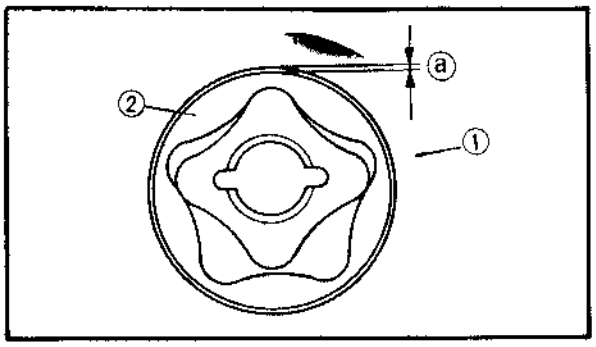
1. Inspect:
   - Clutch spring
     Wear/Damage → Replace.
2. Measure:
   - Clutch spring free length ⓐ
     Out of specification → Replace springs as a set.

Clutch spring minimum length:
32.9 mm (1.30 in)



Clutch release lever

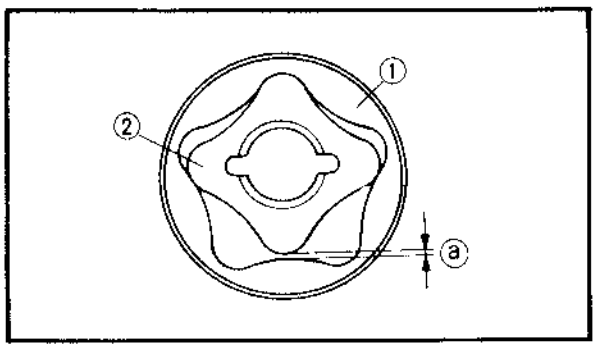
1. Inspect:
   - Release lever ①
   - Adjuster ②
   - O-ring ③
     Cracks/Wear/Damage → Replace.



OIL PUMP

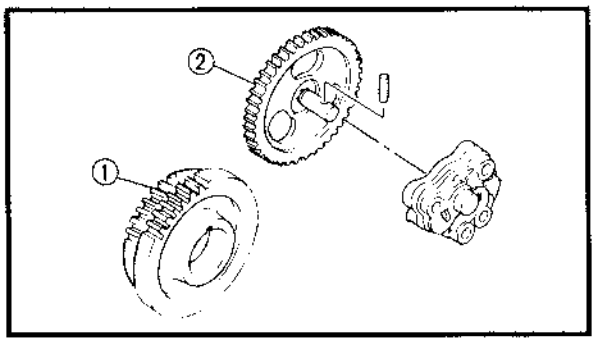
1. Measure:
   - Housing ① /Outer rotor ② clearance ⓐ
     Use a Feeler Gauge.
     Out of specification → Replace oil pump assembly.

Side clearance limit:
0.09 mm (0.004 in)

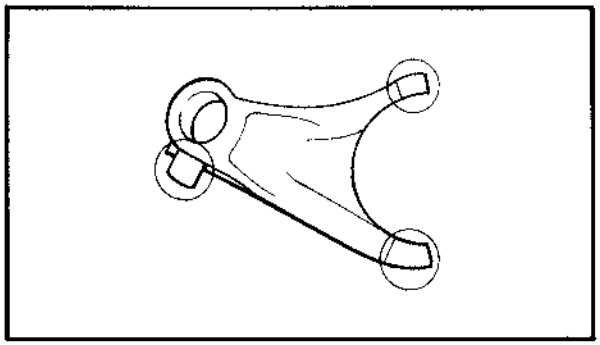


2. Measure:
   - Outer rotor ① /Inner rotor ② clearance ⓐ
     Use a Feeler Gauge.
     Out of specification → Replace oil pump assembly.

Tip clearance limit:
0.20 mm (0.008 in)



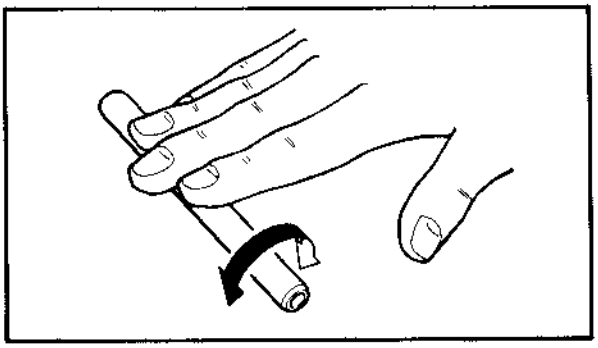
3. Inspect:
   - Oil pump drive gear ①
   - Oil pump driven gear ②
     Wear/Cracks/Damage → Replace.



TRANSMISSION AND SHIFTER

Shift fork and guide bar

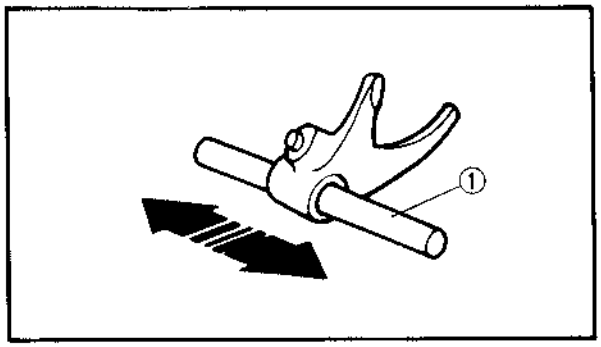
1. Inspect:
   - Shift forks
     On the gear and shift cam contact surfaces.
     Wear/Chafing/Bends/Damage → Replace.



2. Inspect:
   - Guide bars
     Roll the guide bar on a flat surface.
     Bends → Replace.

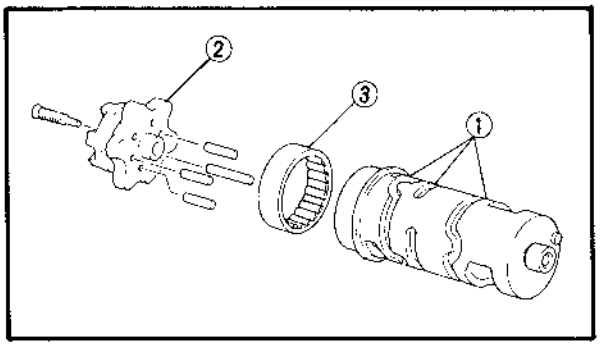
⚠ WARNING

Do not attempt to straighten a bent guide bar.



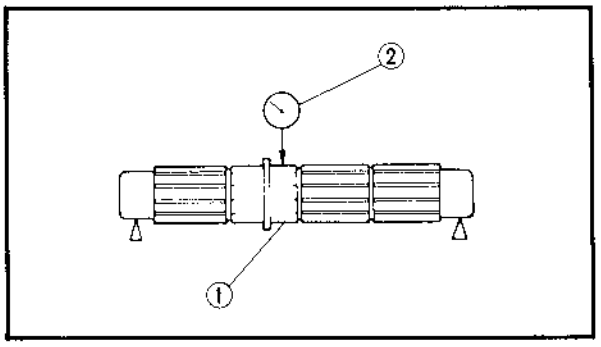
3. Check:
   - Shift fork movement
     On its guide bar ①.
     Unsmooth operation → Replace fork and/or guide bar.

Shift cam



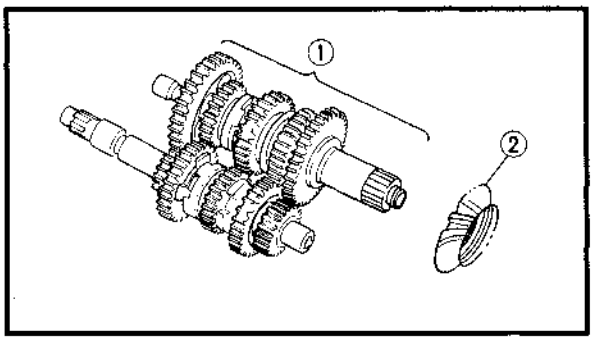
1. Inspect:
   - Shift cam grooves ①
     Wear/Damage/Scratches → Replace.
   - Shift cam segment ②
     Damage/Wear → Replace.
   - Shift cam bearing ③
     Roughness/Sluggishness → Replace.

Main/drive axle and gears



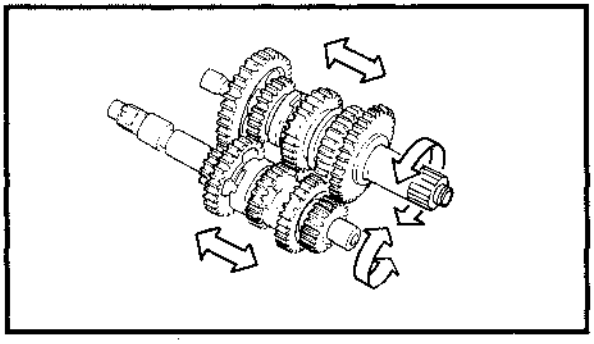
1. Measure:
   - Axle runout ① (main and drive axles)
     Use centering device and Dial Gauge ②.
     Out of specification → Replace.

Runout Limit:
0.08 mm (0.0031 in)

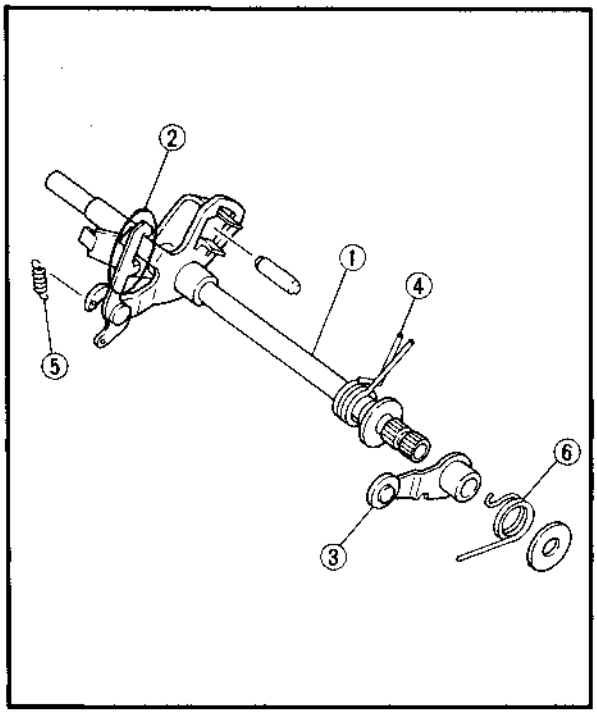


2. Inspect:
   - Gears (transmission ① and drive pinion ②)
   - Mating dogs
     Cracks/Damage/Wear → Replace.

NOTE:
When the drive pinion gear is replaced, be sure to adjust the drive pinion gear shim(s), refer to the "DRIVE TRAIN-MIDDLE GEAR SERVICE" section in CHAPTER 6.

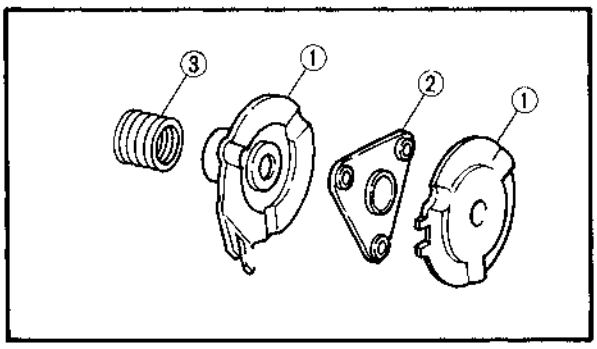


3. Check:
   - Gear movement (transmission)
     Unsmooth operation → Replace.



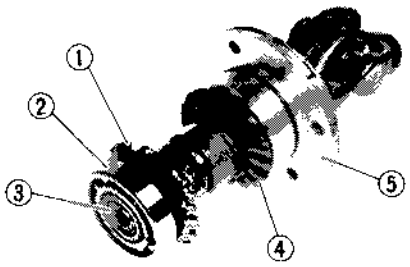
Shift shaft and stopper lever

1. Inspect:
   - Shift shaft ①
   - Shift pawls ②
     Bend/Wear/Damage → Replace.
2. Inspect:
   - Stopper lever ③
     Roller turns roughly → Replace.
     Bend/Damage → Replace.
3. Inspect:
   - Torsion spring ④ (shift shaft)
   - Spring ⑤ (shift pawls)
   - Return spring ⑥ (stopper lever)
     Wear/Damage → Replace.



Shift guide

1. Inspect:
   - Shift guides ①
   - Ball holder/Ball ②
   - Spring ③
     Wear/Cranks/Damage → Replace.



MIDDLE GEAR

1. Inspect:
   - Middle driven pinion gear ①
   - Bearing ②
   - Middle driven shaft ③
   - Reverse gear ④
   - Bearing housing ⑤

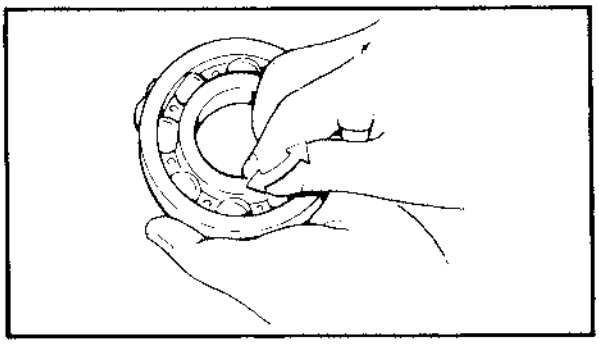
   Damage/Wear → Replace.
2. Check:
   - Bearing movement

   Turns roughly → Replace.

NOTE:

When the driven pinion gear, reverse gear, middle driven shaft and/or bearing housing are replaced, be sure to adjust the middle gear shim(s).

Refer to the "DRIVE TRAIN-MIDDLE GEAR SERVICE" section in CHAPTER 6.



BEARINGS AND OIL SEALS

1. Inspect:
   - Bearings

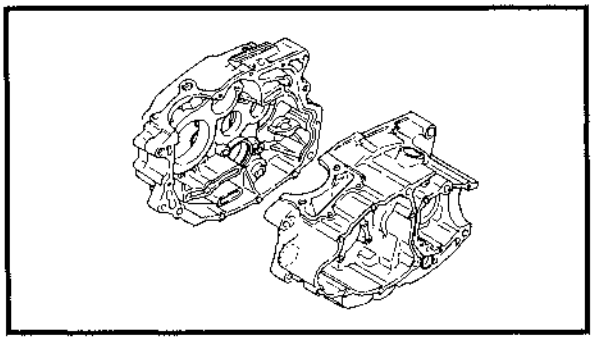
   Pitting/Damage → Replace.
2. Inspect:
   - Oil seals

   Damage/Wear → Replace.

CIRCLIPS AND WASHERS

1. Inspect:
   - Circlips
   - Washers

   Damage/Looseness/Bends → Replace.

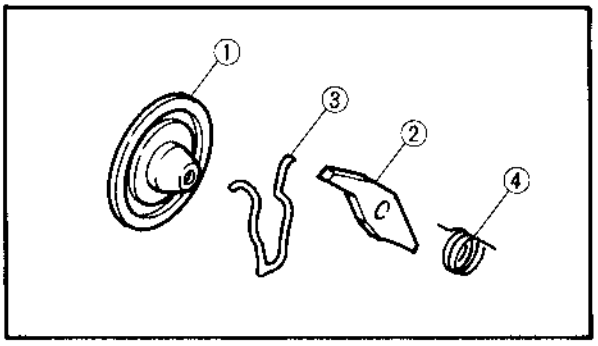


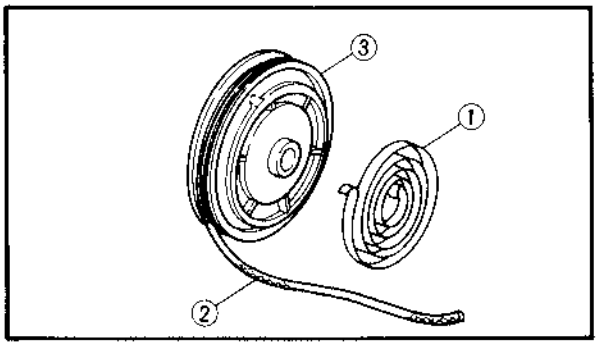
CRANKCASE

1. Thoroughly wash the case halves in mild solvent.
2. Clean all the gasket mating surfaces and crankcase mating surfaces thoroughly.

3. Inspect:
   - Crankcase
     Cranks/Damage → Replace.
   - Oil delivery passages
     Clog → Blow out with compressed air.

NOTE:
When the crankcase is replaced, be sure to adjust the middle gear shim(s), refer to "DRIVE TRAIN-MIDDLE GEAR SERVICE" section in CHAPTER 6.

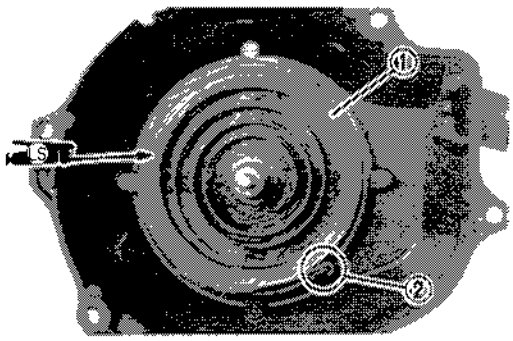




RECOIL STARTER (EXCEPT FOR USA)

1. Inspect:
   - Drive plate ①
     Cracks Bends/Damage → Replace.
   - Drive pawl ②
   - Spring ③
   - Spring ④ (drive pawl)
     Wear/Cracks/Damage → Replace.

2. Inspect:
   - Spring ① (starter)
     Wear/Cracks/Damage → Replace.
   - Starter rope ②
     Wear/Breaks/Damage → Replace.
   - Sheave drum ③
     Cracks/Damage → Replace.



ENGINE ASSEMBLY AND ADJUSTMENT

RECOIL STARTER (EXCEPT FOR USA)

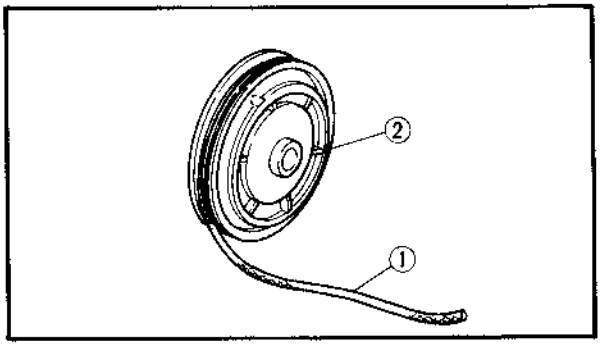
1. Install:
   - Starter spring ①

NOTE:

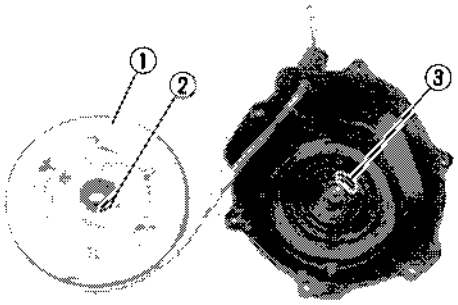
Mesh the spring hook ② wise the case slit, then carefully wind the spring clockwise, and fit the spring into the case.

2. Lubricate:
   - Starter spring

Lithium-soap base grease



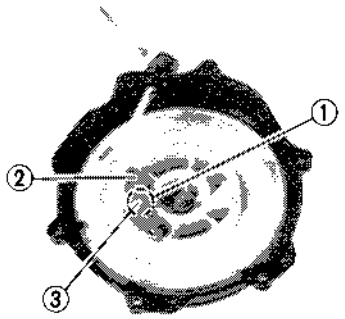
3. Wind the rope ① 4-1/2 turns clockwise around the sheave drum ② , and set the rope onto the drum slit.



4. Install:
   - Sheave drum ①
     (into starter case)

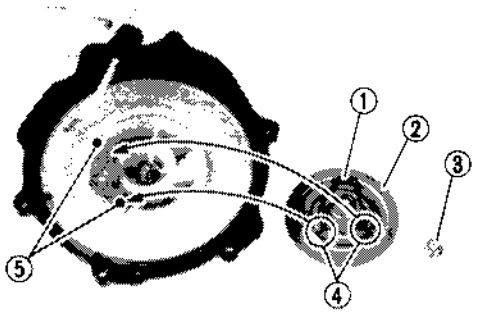
NOTE:

Mesh the hook of the sheave drum ② with the spring hook ③ .



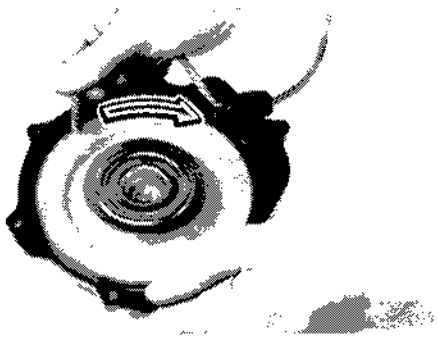
5. Install:
   - Spring ① (drive pawl)
   - Drive pawl ②
6. Lubricate:
   - Drive pawl pivot ③

Lithium-soap base grease

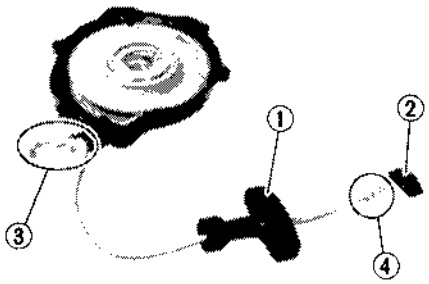


7. Install:
   - Spring ①
   - Friction plate ②
   - Nut ③

NOTE:
Insert the spring hooks ④ into the holes of the drive pawl ⑤.



8. Turn the sheave drum 3-turns clockwise to preload the starter spring.

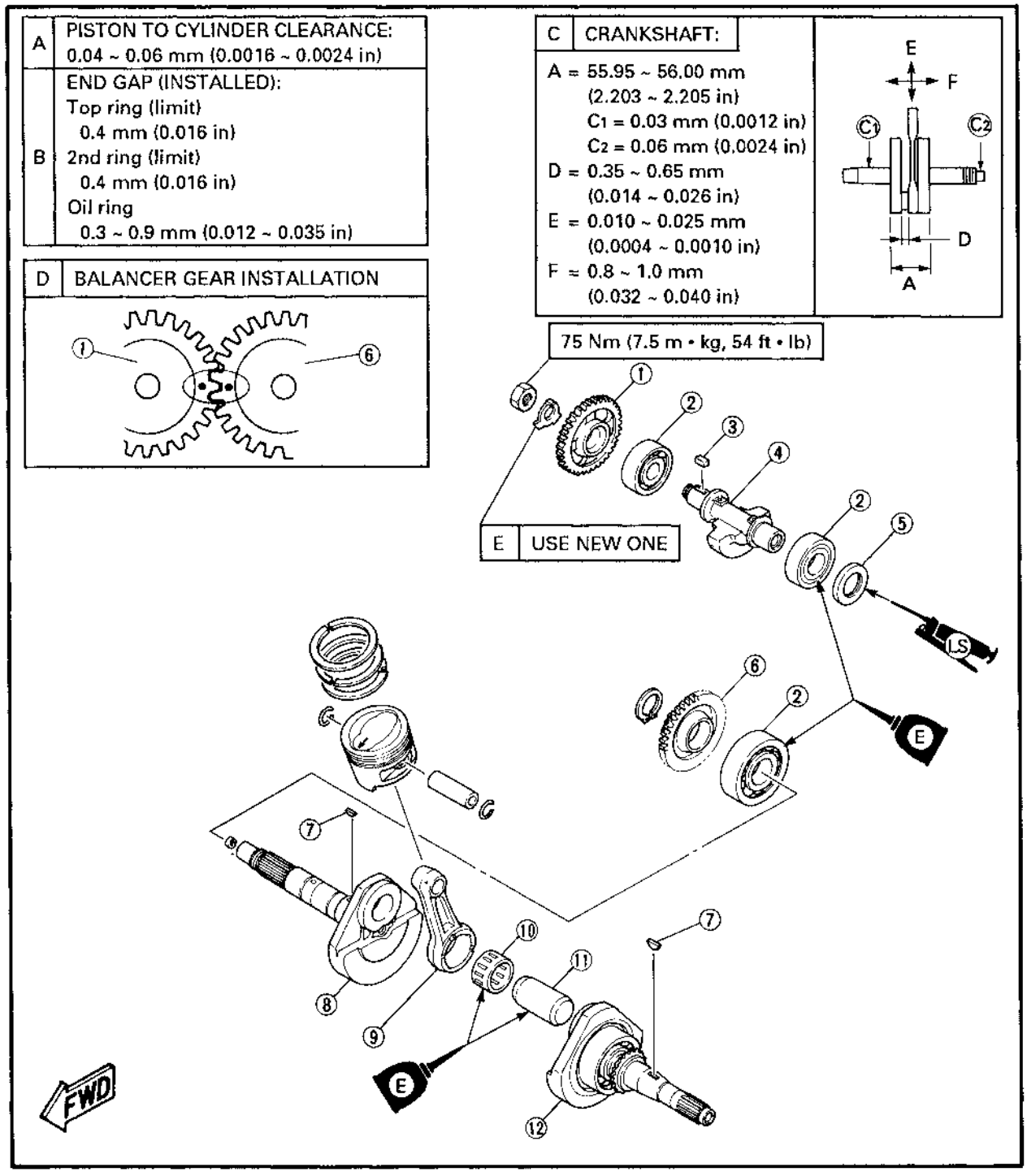


9. Install:
   - Starter handle ①
   - Cap ②

NOTE:
- Pass the rope through the case hole and make knot ③ on the rope so that the rope is not pulled into the case.
- Untying knot ③ after making knot ④.

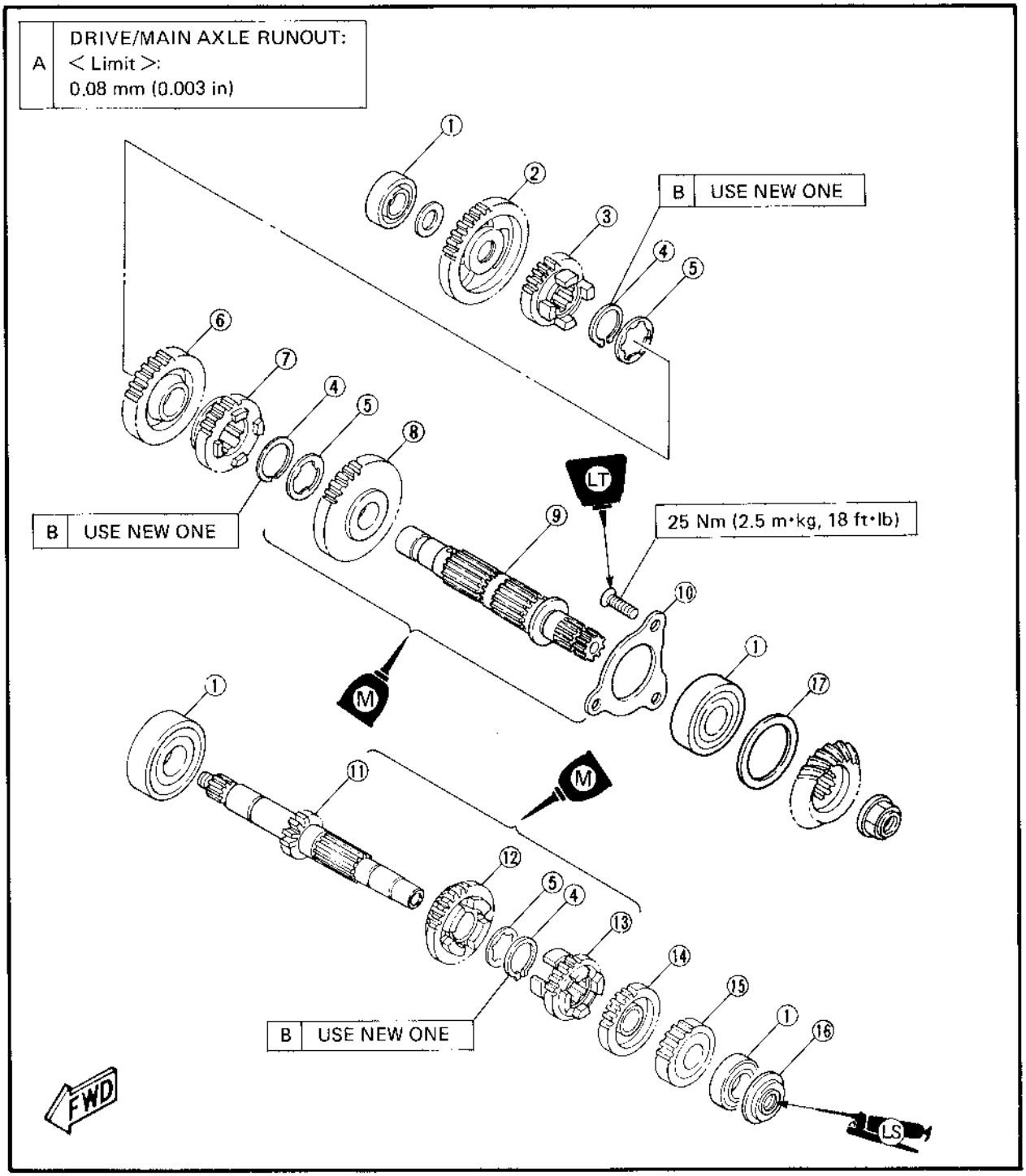
CRANKSHAFT/BALANCER

① Balancer driven gear
② Bearing
③ Straight key
④ Balancer
⑤ Oil seal
⑥ Balancer drive gear
⑦ Woodruff key
⑧ Crank (right)
⑨ Connecting rod
⑩ Small end bearing
⑪ Crank pin
⑫ Crank (left)



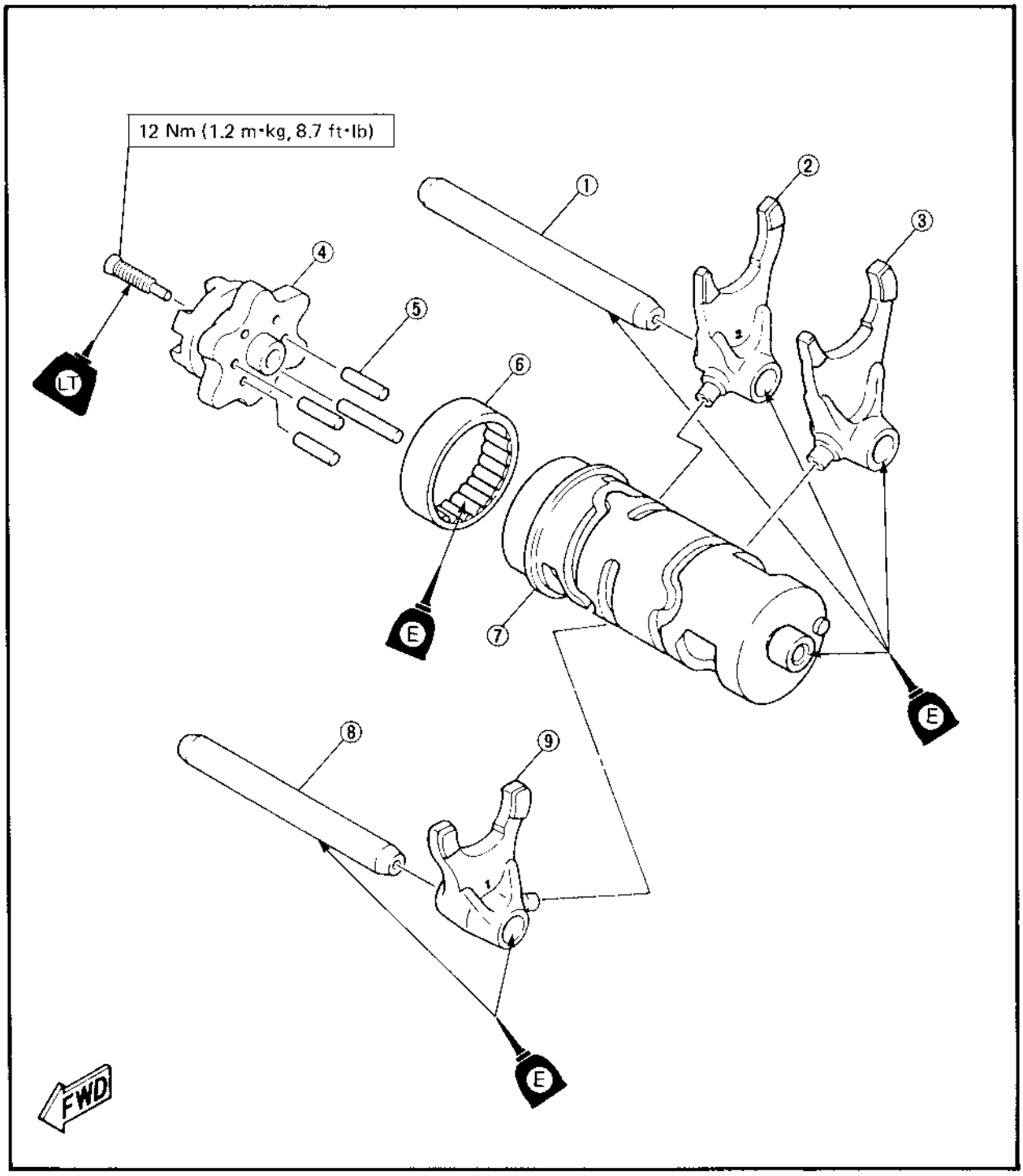
TRANSMISSION

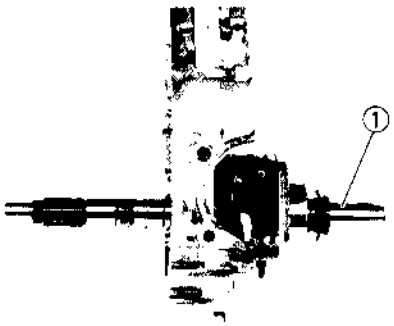
① Bearing
② 1st wheel gear
③ 5th wheel gear
④ Circlip
⑤ Washer
⑥ 3rd wheel gear
⑦ 4th wheel gear
⑧ 2nd wheel gear
⑨ Drive axle
⑩ Bearing retainer
⑪ Main axle
⑫ 5th pinion gear
⑬ 3rd pinion gear
⑭ 4th pinion gear
⑮ 2nd pinion gear
⑯ Oil seal
⑰ Shim



SHIFTER

① Guide bar #1 (long)
② Shift fork #2
③ Shift fork #3
④ Shift cam segment
⑤ Pin
⑥ Bearing
⑦ Shift cam
⑧ Guide bar #2 (short)
⑨ Shift fork #1

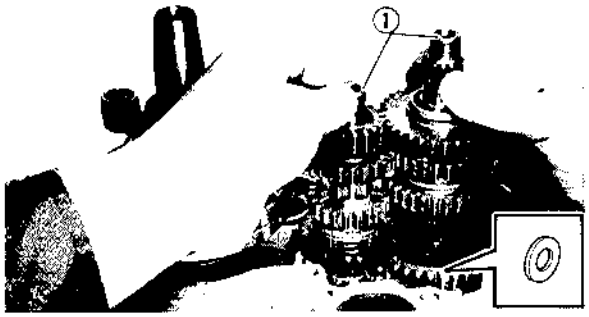




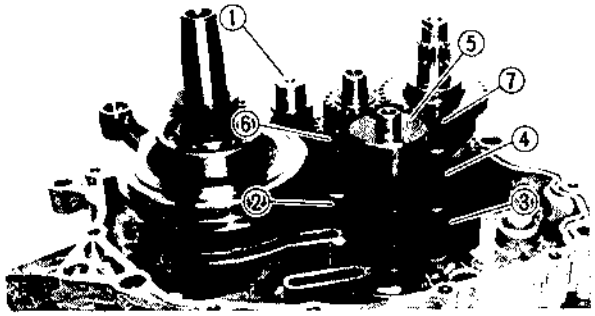
CRANKSHAFT, TRANSMISSION AND BALANCER SHAFT

1. Install:
   - Crankshaft ①
     (to right crankcase)

NOTE:
Hold the connecting rod at top dead center with one hand while installing the crankshaft.

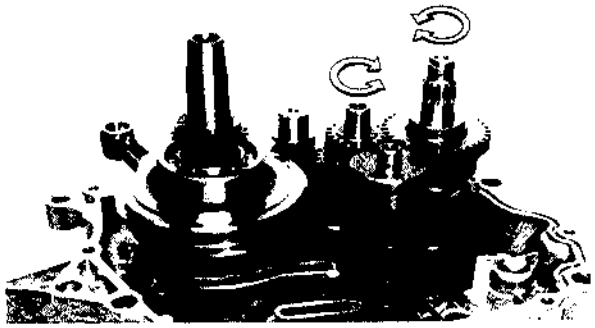


2. Install:
   - Transmission assembly ① (main axle and drive axle)



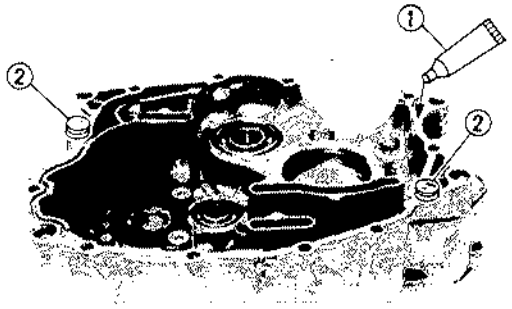
3. Install:
   - Balancer shaft ①
   - Shift fork #1 ②
   - Shift fork #2 ③
   - Shift fork #3 ④
   - Shift cam ⑤
   - Guide bar #2 ⑥ (short)
   - Guide bar #1 ⑦ (long)

NOTE:
Each shift fork is identified by a number cast on its side.



4. Check:
   - Transmission and shifter operation
     Unsmooth operation → Repair.

NOTE:
- Oil each gear and bearing thoroughly.
- Before assembling the crankcase, be sure that the transmission is in neutral and that the gears turn freely.



CRANKCASE (LEFT)

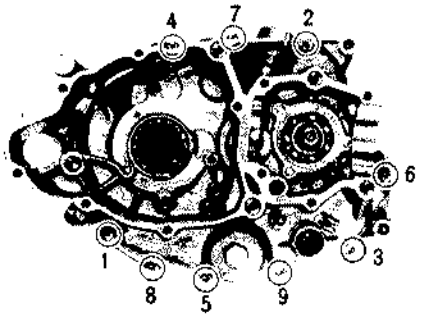
1. Apply:
   - Sealant ①
   (to matching surfaces of both case halves)

	Sealant (quicke gasket®): ACC-11001-01 **Yamaha bond No. 1215: 90890-85505**

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

CAUTION:

Before installing and torquing the crankcase holding screws, be sure to check whether the transmission is functioning properly by manually rotating the shift cam either way.

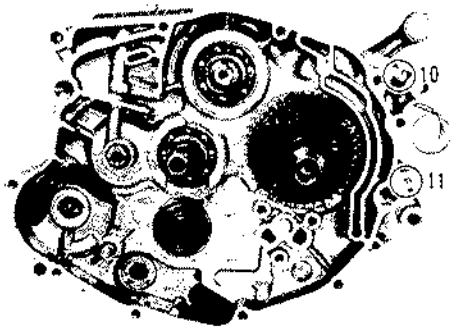


4. Tighten:
   - Screws (crankcase)

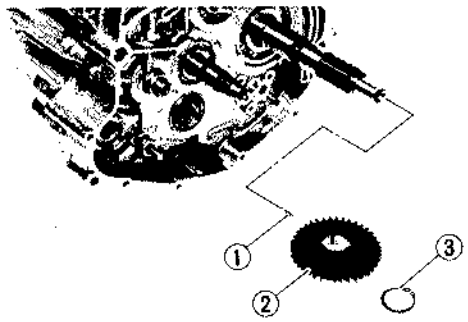
NOTE:

Tighten the screw starting with the lowest numbered one.

	Screws (crankcase): 7 Nm (0.7 m • kg, 5.1 ft • lb)

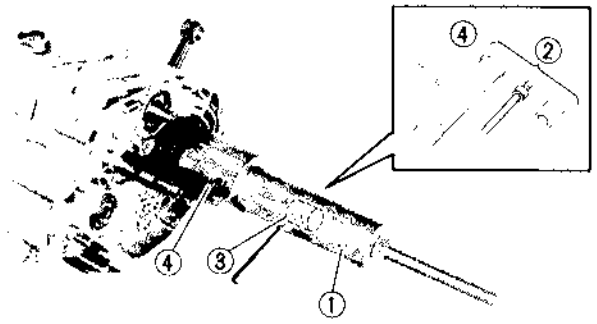


5. Apply:
   - 4-stoke engine oil
   To the crank pin, bearing and oil delivery hole.
6. Check:
   - Crankshaft and transmission operation
   Unsmooth operation → Repair.

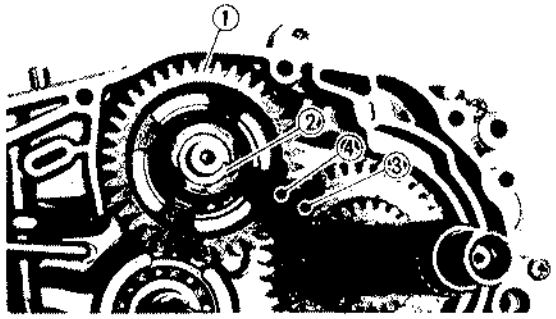


BALANCER DRIVEN AND DRIVE GEARS

1. Install:
   - Woodruff key ①
   - Balancer gear ② (drive)
   - Circlip ③

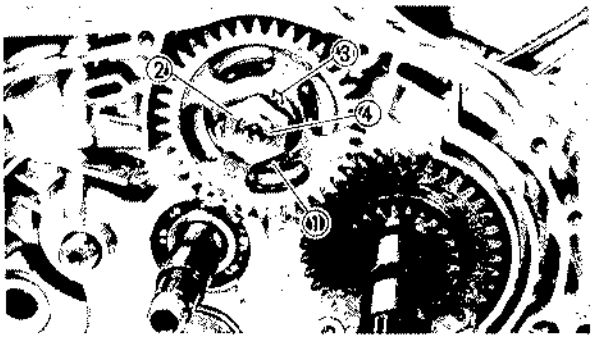


Crankshaft installer set ① :
P/N. YU-90050
Buffer boss installer set ② :
P/N. 90890-04088
Adapter #11 ③ :
P/N. YM-33279
Spacer ④ (crankshaft):
P/N. YM-90070-A, 90890-04060



2. Install:
- Balancer gear ① (driven)
- Straight key ②

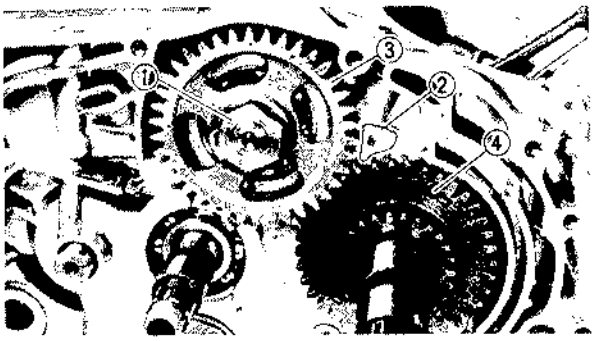
NOTE:
Align the drive gear mark ③ with the driven gear mark ④.



3. Install:
- Lock washer ①
- Nut ② (driven gear)

⚠ WARNING
Always use a new lock washer.

NOTE:
Install the lock washer tab ③ into the key way of the balancer shaft ④.



4. Tighten:
- Nut ① (driven gear)

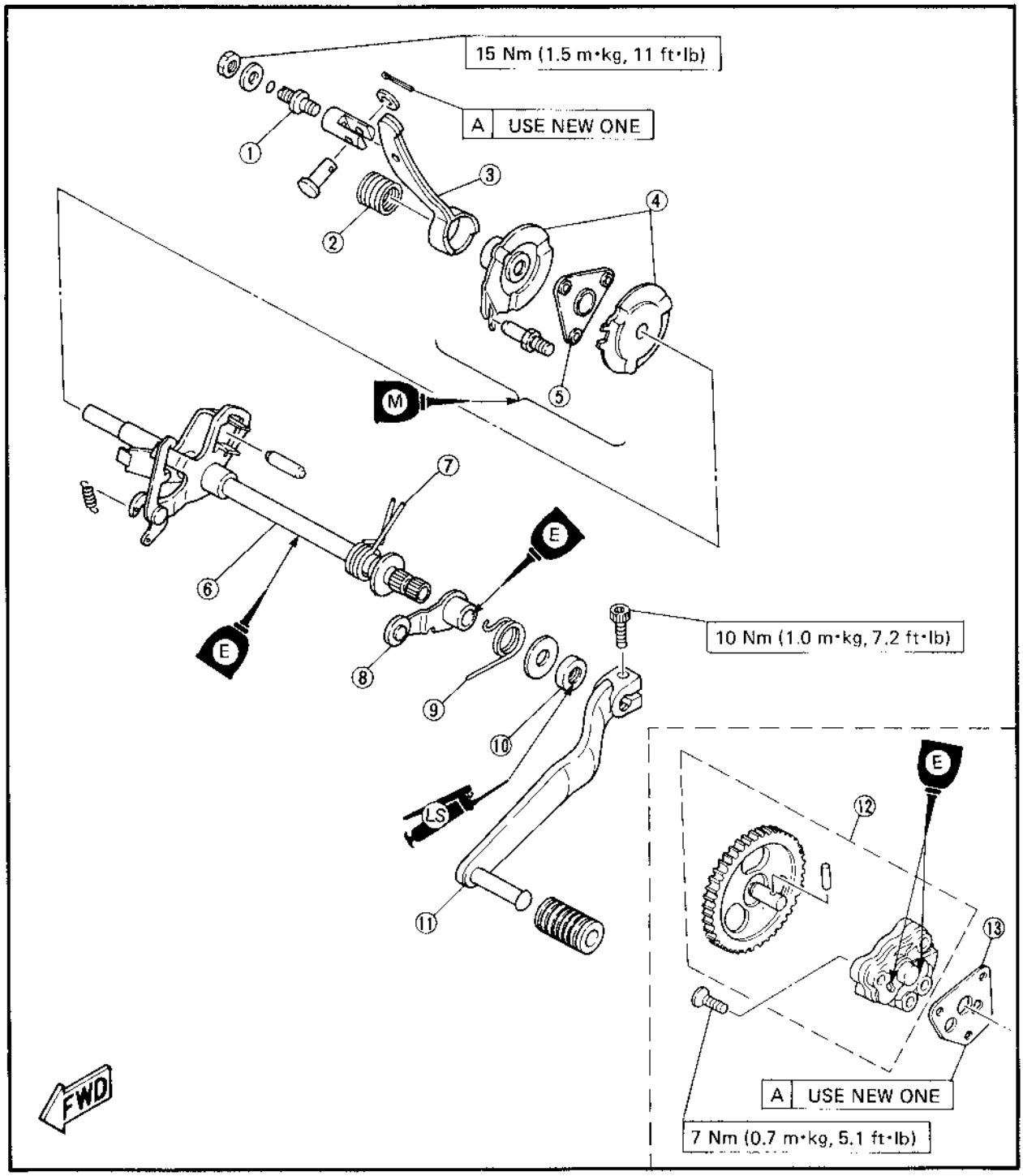
Nut (balancer driven gear):
75 Nm (7.5 m• kg, 54 ft • lb)

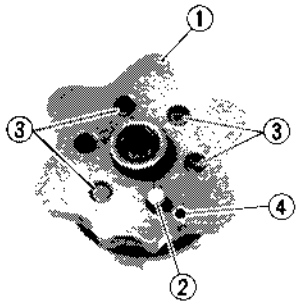
NOTE:
Place a folded rag ② between the teeth of the driven gear ③ and drive gear ④ to lock them.

5. Bend the lock washer tab.

SHIFT SHAFT/OIL PUMP

① Adjuster
② Spring
③ Release lever
④ Shift guides
⑤ Ball holder
⑥ Shift shaft
⑦ Torsion spring
⑧ Stopper lever
⑨ Return spring
⑩ Oil seal
⑪ Shift pedal
⑫ Oil pump assembly
⑬ Gasket



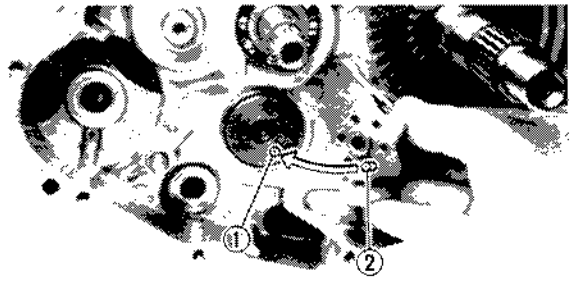


SHIFTER AND OIL PUMP

1. Install:
   - Segment ①
   - Pin ② (long)
   - Pin ③ (short)

NOTE:

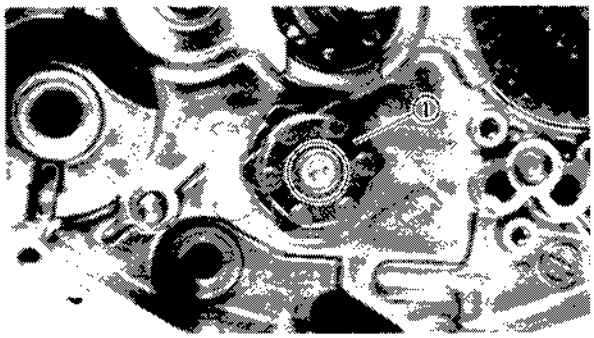
Install the pin ② (long) to the match mark ④ position.



2. Install:
   - Segment (shift cam)

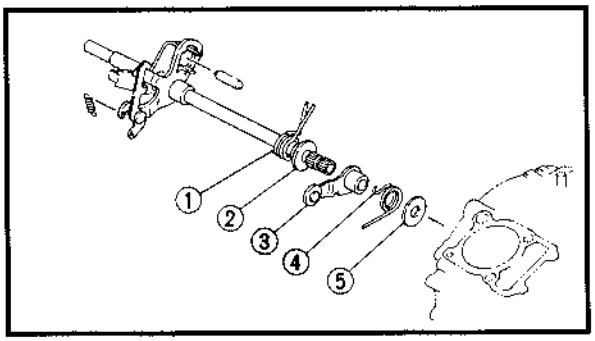
NOTE:

Align the hole ① of the shift cam with the pin ② (long) of the segment.

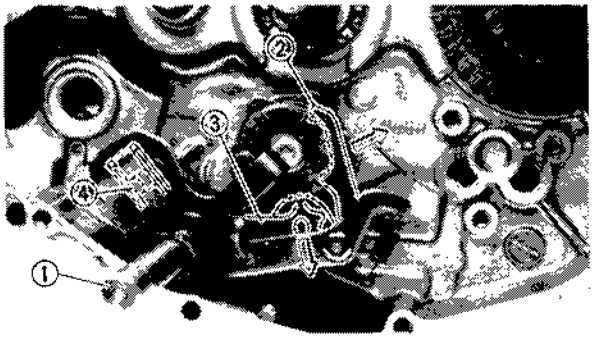


3. Tighten:
   - Screw ① (segment)

Screw (segment):
12 Nm (1.2 m • kg, 8.7 ft • lb)
Use LOCTITE®



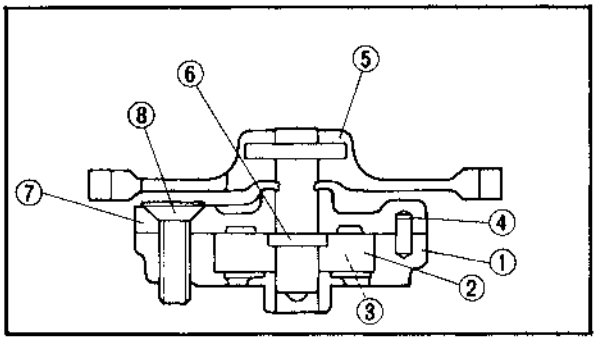
4. Install:
   - Torsion spring ① (to shift shaft)
   - Washer ②
   - Stopper lever ③ with return spring ④
   - Washer ⑤



5. Install:
   - Shift shaft ①

NOTE:

- Before installing the shift shaft, apply the grease to the oil seal lip (crankcase-left).
- Push the shift pawl ② and the stopper lever ③ to the arrow direction and install them to the segment.
- Be sure the stopper shaft ④ is placed between the spring hooks.



6. Apply:
   - 4-stroke engine oil
     (to the oil pump inner parts)

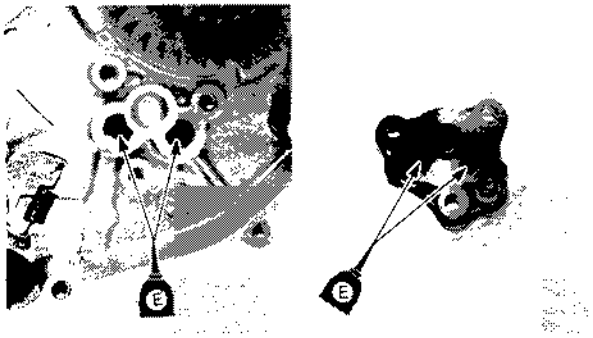
7. Install:
   - Rotor housing ①
   - Outer rotor ②
   - Inner rotor ③
   - Dowel pins ④
   - Oil pump driven gear ⑤
   - Dowel pin ⑥
   - Oil pump cover ⑦
   - Screw ⑧

	Screw: **7 Nm (0.7 m • kg, 5.1 ft • lb)**

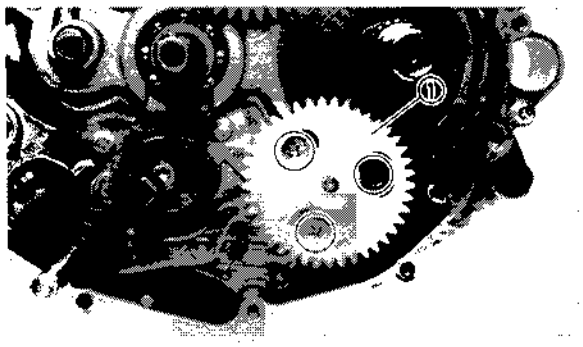
8. Apply:
   - 4-stroke engine oil
     (to the oil passages in the crankcase)

CAUTION:

Apply a liberal amount of 4-stroke engine oil to the oil pump passages in the crankcase, or the engine may be damaged.



9. Apply:
   - 4-stroke engine oil
     (to the oil passages in the oil pump)

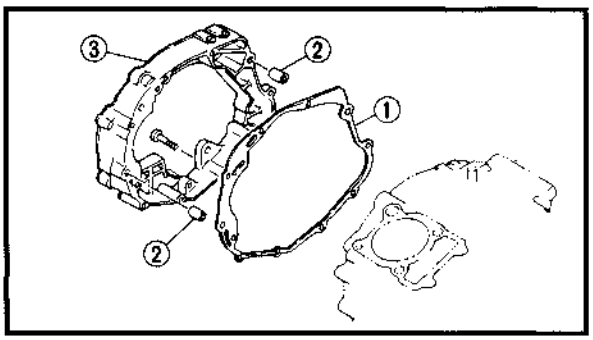


10. Install:
    - Gasket
    - Oil pump assembly ①

	Oil pump: **7 Nm (0.7 m • kg, 5.1 ft • lb)**

⚠ WARNING

Always use a new gasket.



11. Install:
    - Gasket ① (new)
    - Dowel pin ②
    - Crankcase spacer ③ (right)

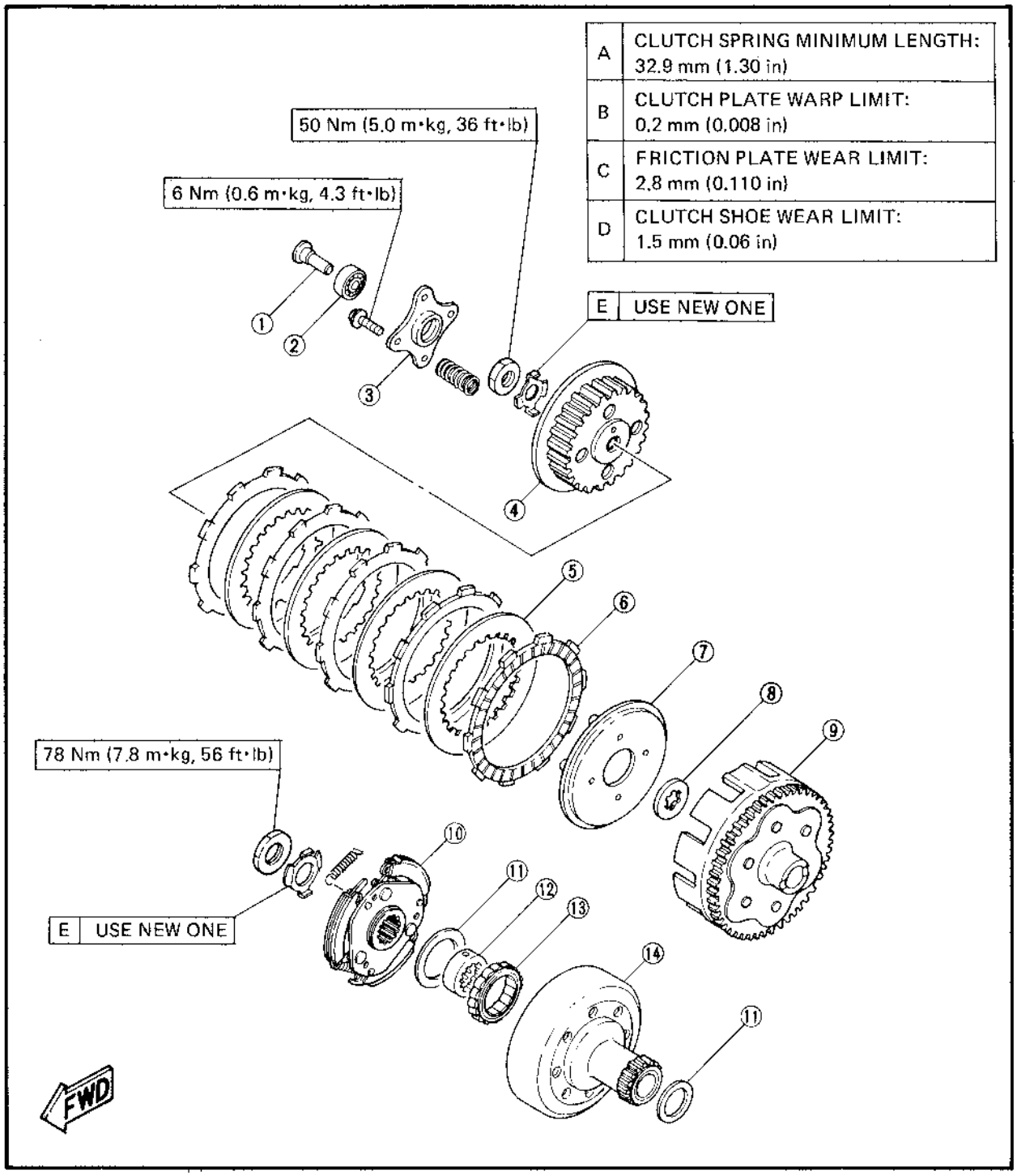
	Crankcase spacer (right): **7 Nm (0.7 m • kg, 5.1 ft • lb)**

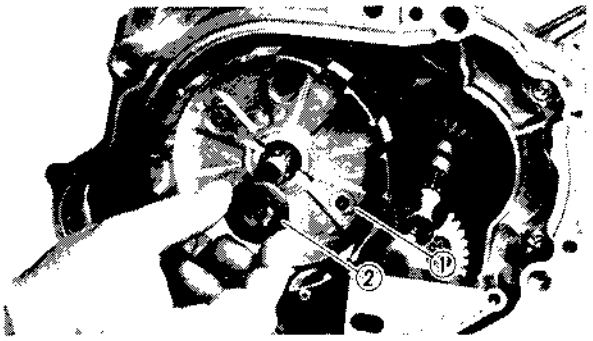
⚠ WARNING

Always use a new gasket.

CLUTCH

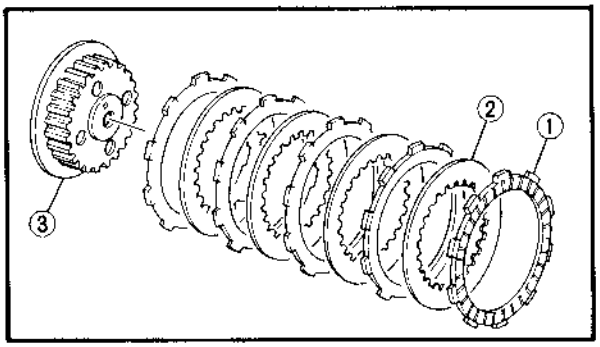
① Push rod
② Bearing
③ Bearing holder
④ Clutch boss
⑤ Clutch plate
⑥ Friction plate
⑦ Pressure plate
⑧ Washer
⑨ Clutch housing (secondary)
⑩ Clutch carrier assembly
⑪ Washer
⑫ Inner collar
⑬ One way bearing
⑭ Clutch housing (primary)





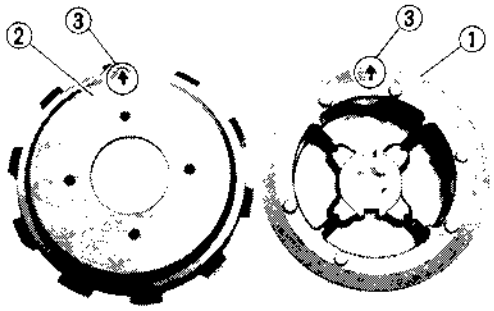
PRIMARY AND SECONDARY CLUTCHES

1. Install:
   - Clutch housing ① (secondary)
   - Washer ②



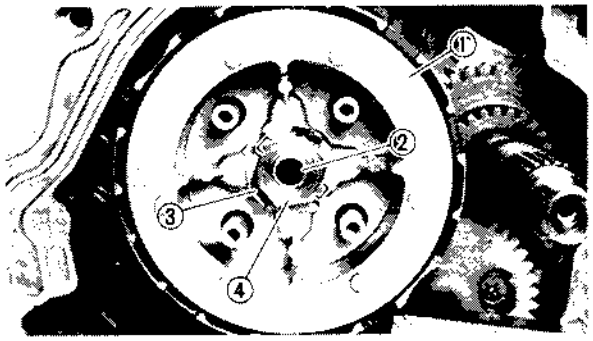
2. Install:
   - Friction plates ①
   - Clutch plates ②
     (to clutch boss ③)

NOTE:
Install the clutch plates and friction plates alternately on the clutch boss, starting with a friction plate and ending with a friction plate.



3. Install:
   - Clutch boss ①
     (to pressure plate assembly ②)

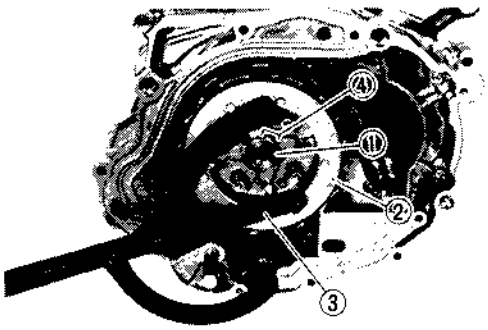
NOTE:
Align the arrow marks ③ on the clutch boss with the pressure plate.



4. Install:
   - Secondary clutch assembly ①
     (to main axle ②)
   - Lock washer ③
   - Nut ④ (clutch boss)

⚠ WARNING
Always use a new lock washer.

NOTE:
Make sure that the tabs of the lock washer engages the indentations in the clutch boss.



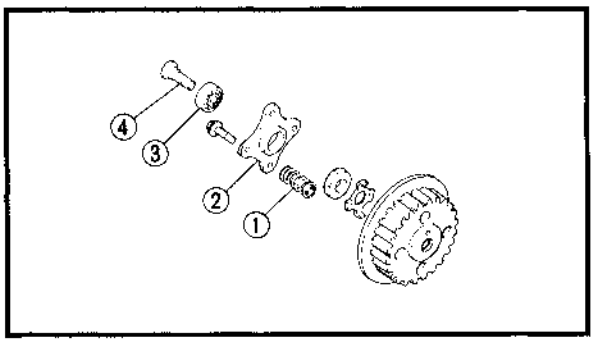
5. Tighten:
   - Nut ① (clutch boss)

	Nut (clutch boss): **50 Nm (5.0 m • kg, 36 ft • lb)**

NOTE:
Hold the clutch boss ② by the Rotor Holder ③ to tighten the nut.

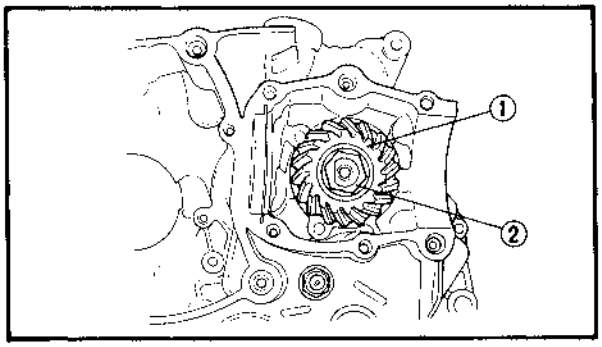
	Rotor holder: **P/N. YU-01235, 90890-01235**

6. Bend the lock washer tab ④.



7. Install:
   - Clutch springs ①
   - Bearing holder ②
   - Bearing ③
   - Push rod ④

	Bolts (clutch spring): **6 Nm (0.6 m • kg, 4.3 ft • lb)**

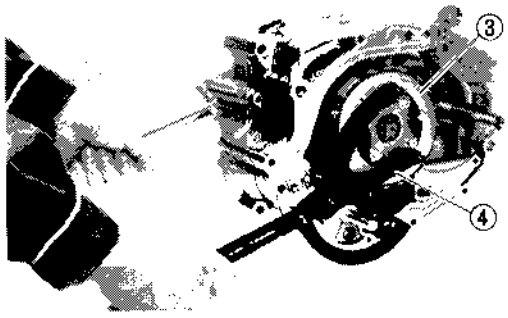


8. Install:
   - Drive pinion gear ①
   - Nut ② (drive pinion gear)

WARNING:
Always use a new drive pinion gear nut.

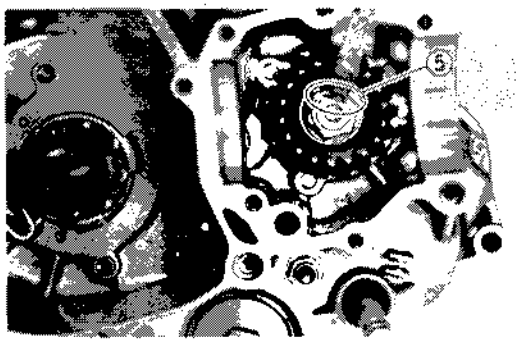
9. Tighten:
   - Nut ② (drive pinion gear)

	Nut (drive pinion gear): **60 Nm (6.0 m • kg, 43 ft • lb)**

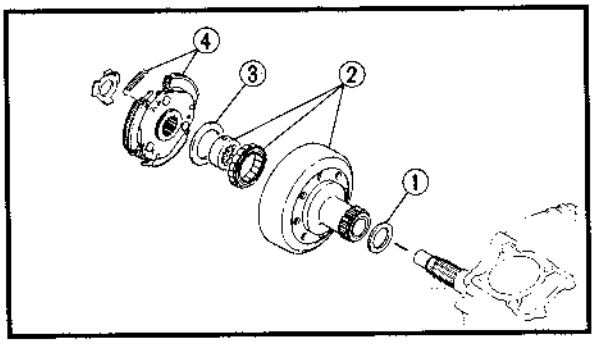


NOTE:
Hold the clutch boss ③ on the secondary clutch by the Rotor Holder ④ to tighten the nut.

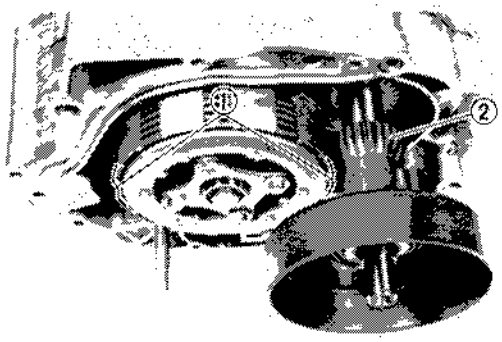
	Rotor holder: **P/N. YU-01235, 90890-01235**



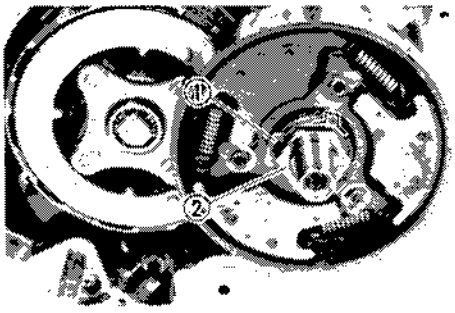
10. Lock the threads ⑤ with drift punch.



11. Install:
- Washer ①
- Clutch housing ② (primary)
- Washer ③
- Clutch carrier assembly ④



NOTE:
- The secondary clutch housing has two grooves ① machined into it permit the primary drive gear behind the primary clutch to clear the secondary clutch.
- Align one of these grooves with the primary gear ② before installing the primary clutch housing.

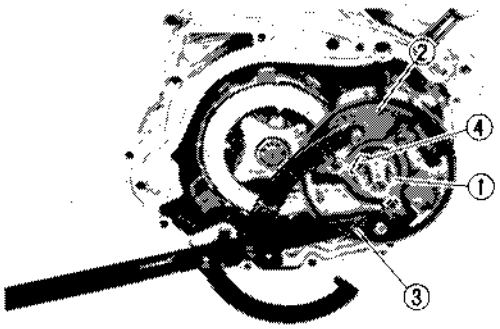


12. Install:
- Lock washer ①
- Nut ② (primary clutch)

⚠ WARNING

Always use a new lock washer.

NOTE:
Make sure that the tabs of the lock washer engages the indentations in the clutch carrier.



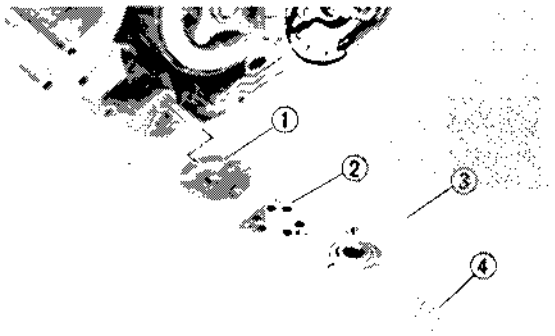
13. Tighten:
- Nut ① (primary clutch)

	Nut (primary clutch): **78 Nm (7.8 m • kg, 56 ft • lb)**

NOTE:
Hold the clutch carrier ②by the Rotor Holder ③to tighten the nut.

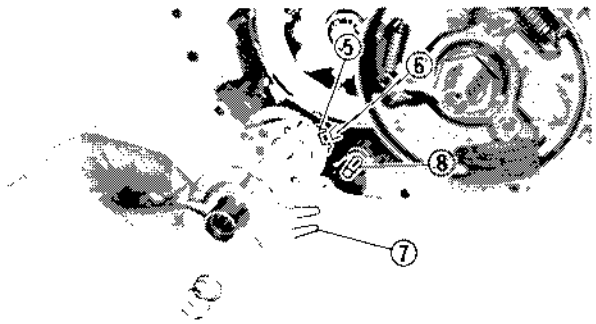
	Rotor holder: **P/N. YU-01235, 90890-01235**

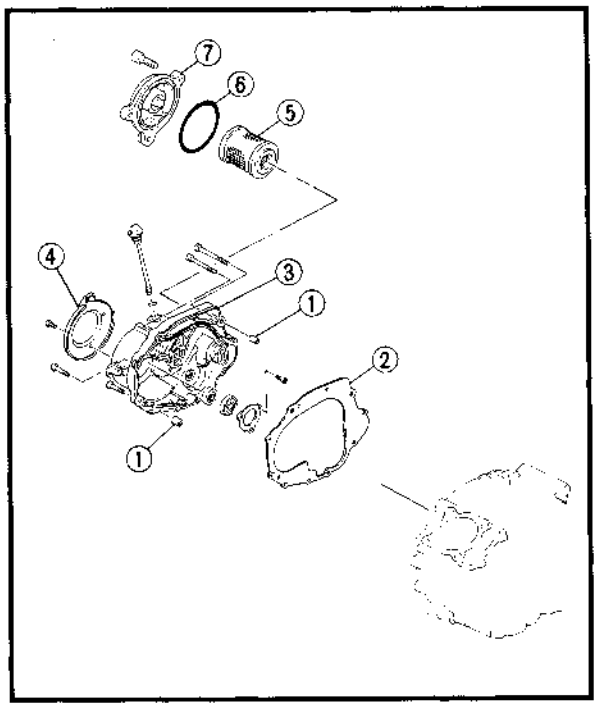
14. Bend the lock washer tab ④.



15. Install:
- Shift guide #2 ①
- Ball holder ②
- Shift guide #1 ③
- Spring ④ (clutch release lever)

NOTE:
- The slot ⑤ in the shift guide #2 must engage the shift shaft projection ⑥.
- The slot ⑦ in the shift guide #1 must engage the stopper shaft ⑧.



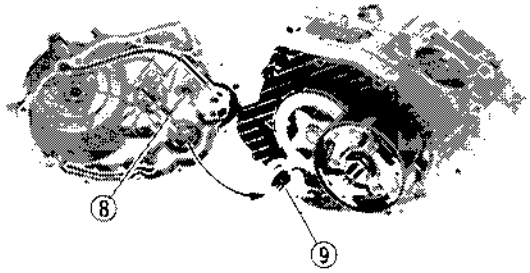


16. Install:
- Dowel pins ①
- Gasket ②
- Crankcase cover ③
- Clutch cover protector ④
- Oil filter ⑤
- O-ring ⑥
- Oil filter cover ⑦

⚠ WARNING

Always use a new gasket.

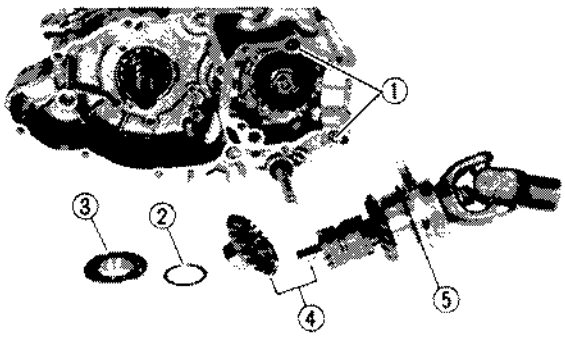
NOTE:
The clutch release lever ⑧ engages the shift guide #1 ⑨.



17. Tighten:
- Screws (crankcase cover)

NOTE:
Tighten the screws in stage, using a crisscross pattern.

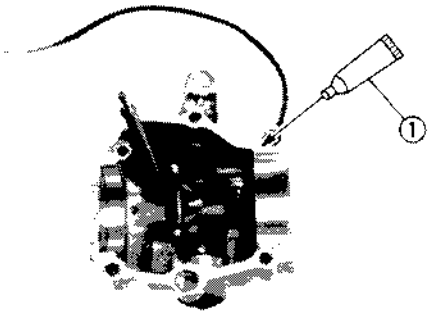
	Screws (crankcase cover): **7 Nm (0.7 m • kg, 5.1 ft • lb)**



MIDDLE DRIVEN GEAR

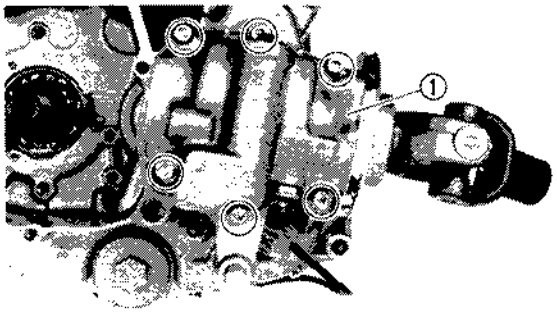
1. Install:
   - Dowel pins ①
   - Shims ② (to middle driven shaft)
   - Bearing ③
   - Middle driven shaft assembly ④

NOTE:
Apply the grease to the O-ring ⑤.



2. Apply:
   - Sealant ①
     (to matching surface of middle shaft case cover)

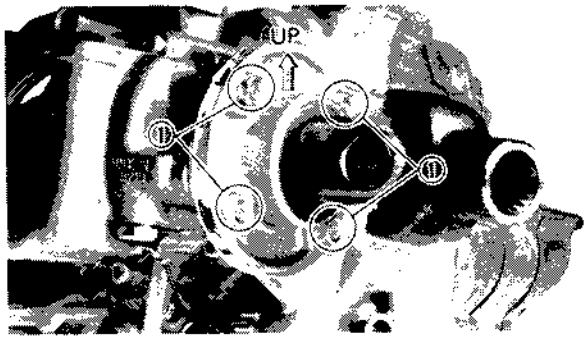
	Sealant (Quick gasket®): **P/N. ACC-11001-01** **Yamaha Bond No. 1215:** **P/N. 90890-85505**



3. Install:
   - Case cover ① (middle driven shaft)

	Bolt (middle shaft case cover): **10 Nm (1.0 m • kg, 7.2 ft • lb)**

NOTE:
Before installing the middle gear case cover onto the crankcase, shift the gear into "FORWARD".



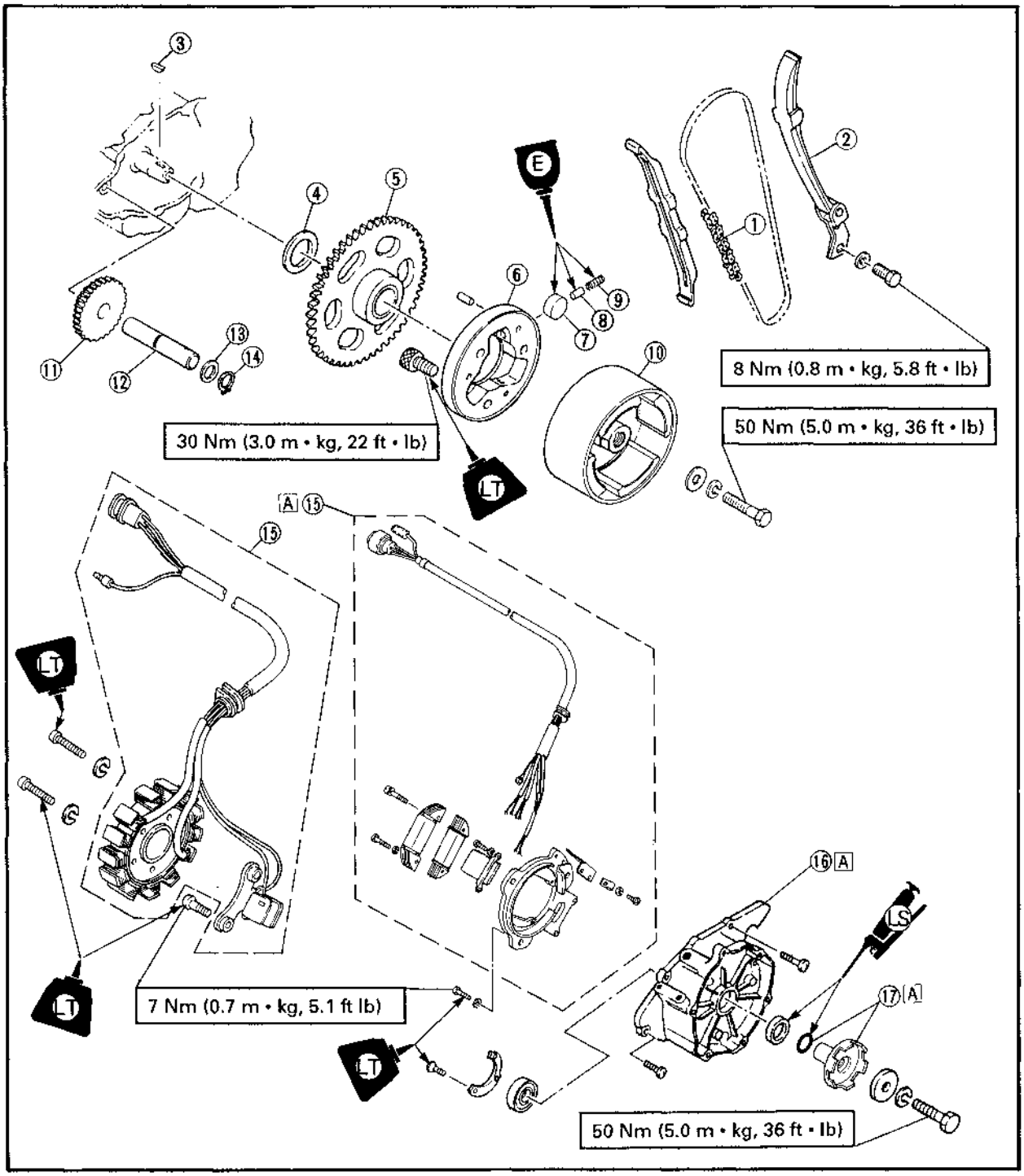
4. Tighten:
   - Bolts ① (bearing housing)

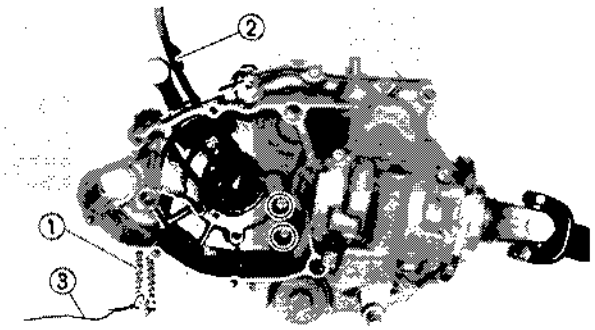
	Bolt (bearing housing): **25 Nm (2.5 m • kg, 18 ft • lb)**

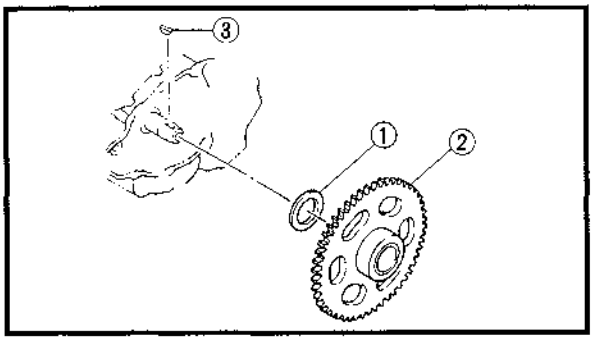
NOTE:
When installing the bearing housing onto the crankcase, make sure that the arrow sign is facing upwards.

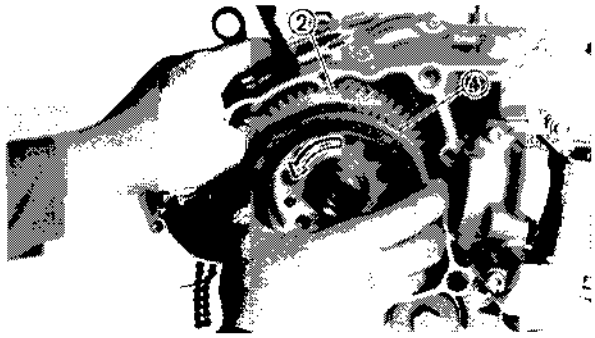
STARTER PULLEY (EXCEPT FOR USA)/CDI MAGNETO

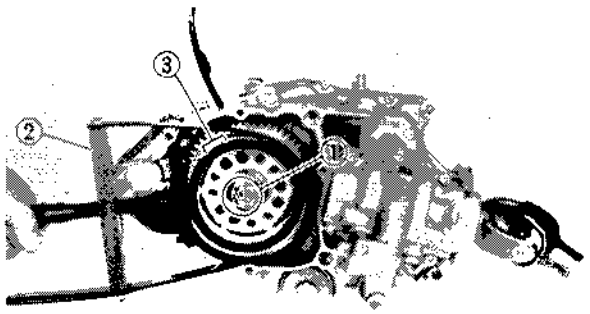
① Timing chain
② Timing chain guide (intake)
③ Woodruff key
④ Washer
⑤ Starter driven gear
⑥ Starter clutch
⑦ Dowel pin
⑧ Starter clutch spring cap
⑨ Compression spring
⑩ CDI magneto
⑪ Starter idle gear
⑫ Shaft
⑬ Washer
⑭ Circlip
⑮ Stator assembly
⑯ Crankcase spacer
⑰ Starter pulley
[A] Except for USA











STARTER PULLEY (EXCEPT FOR USA) AND CDI MAGNETO

1. Install:
   - Timing chain ①
   - Chain guide ② (intake)

	Chain guide (intake): **8 Nm (0.8 m • kg, 5.8 ft • lb)**

NOTE:

Fasten a safety wire ③ to the timing chain to prevent it from falling into the crankcase.

2. Install:
   - Washer ①
   - Driven gear ② (starter)
   - Woodruff key ③
   - CDI magneto ④

NOTE:

- Clean the tapered portions of the crankshaft and CDI magneto.
- When installing the CDI magneto , make sure the key is properly seated in the key way of the crankshaft, and install the CDI magneto ④ to the crankshaft, then while holding the starter driven gear ② , set the CDI magneto to the driven gear, turn it counterclockwise.

3. Install:
   - Bolt ① (CDI magneto) (for USA)

	Bolt (CDI magneto): **50 Nm (5.0 m • kg, 36 ft • lb)**

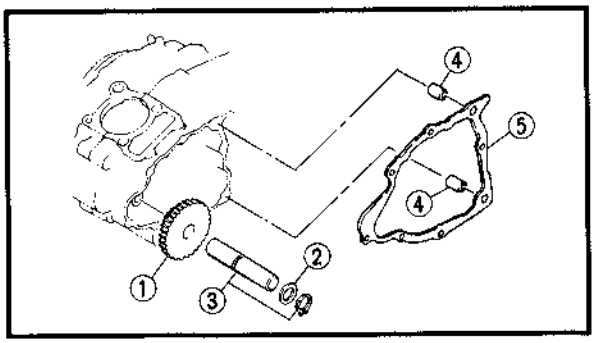
NOTE:

Tighten the bolt (CDI magneto) while holding the CDI magneto with the rotor holder ② .

	Rotor holder (for USA): **P/N. YS-01880, 90890-01701**

CAUTION:

Do not allow the rotor holder to touch the projection ③ on the CDI magneto.

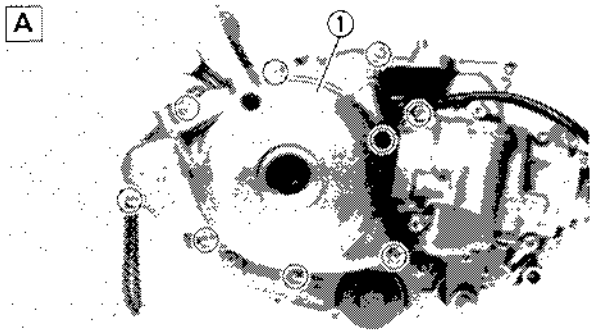


4. Install:
   - Idle gear ① (starter)
   - Washer ②
   - Shaft ③
   - Dowel pins ④
   - Gasket ⑤

⚠ WARNING

Always use a new gasket.

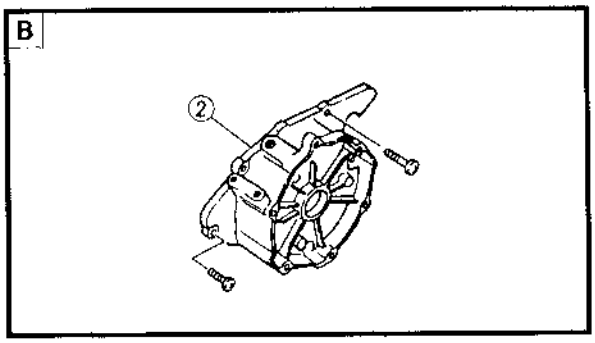
A

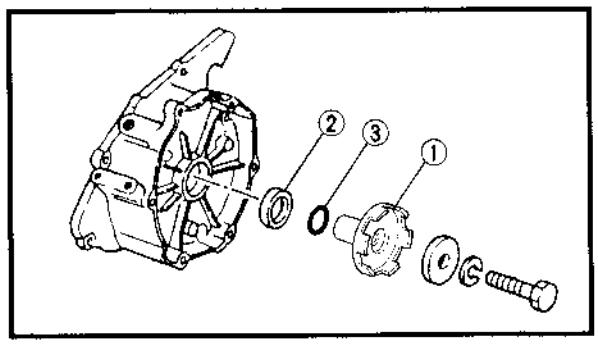


5. Install:
   - Crankcase cover ① (left) (for USA)
   - Crankcase spacer ② (left) (except for USA)
   - Screws

	Screw (crankcase cover/crankcase spacer): **7 Nm (0.7 m • kg, 5.1 ft • lb)**

B





A For USA
B Except for USA

5. Install:
   - Starter pulley ① (except for USA)

	Bolt (starter pulley): **50 Nm (5.0 m • kg, 36 ft • lb)**

NOTE:

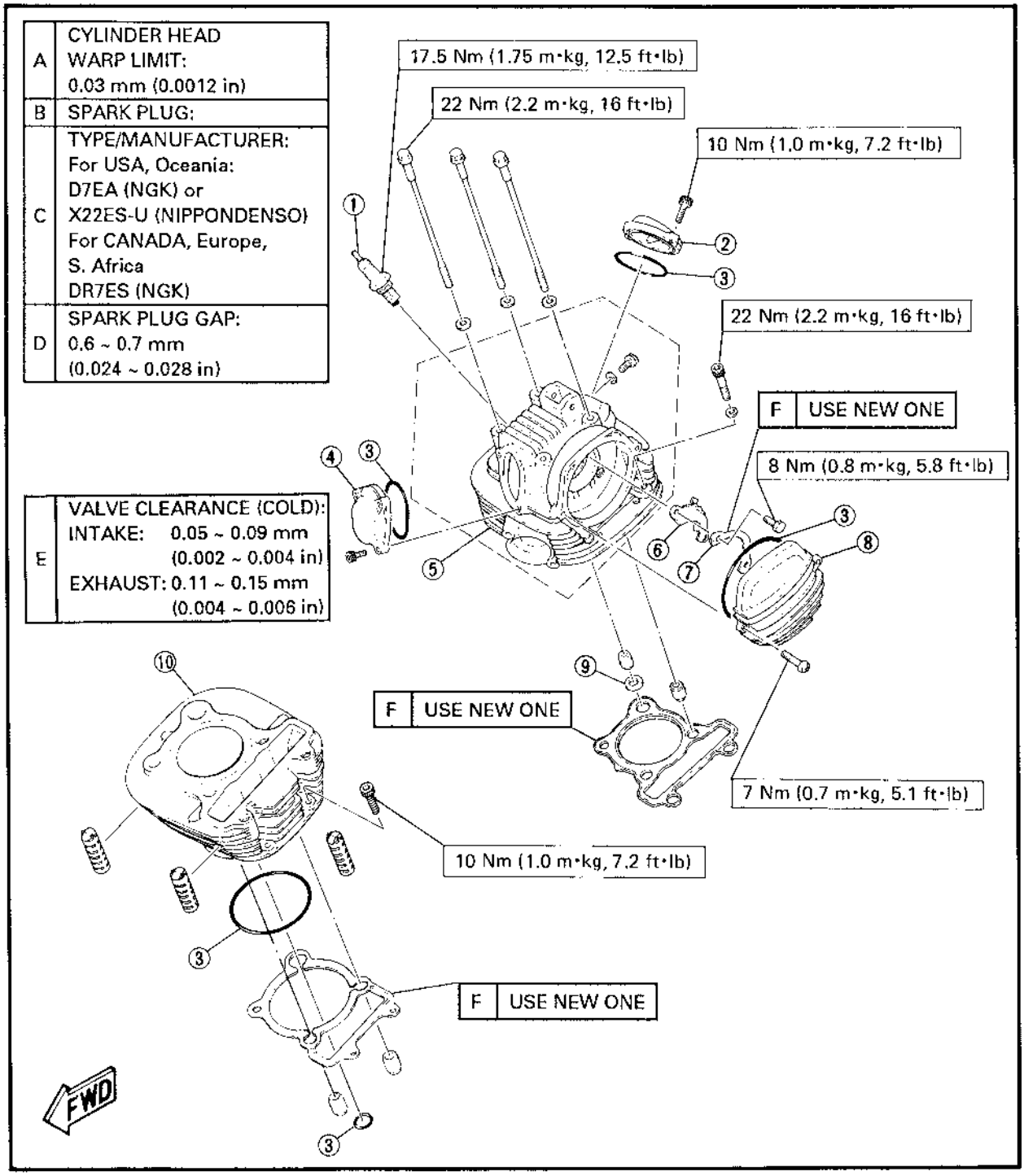
- Hold the starter pulley by the Rotor Holder to tighten the bolt.

	Rotor holder: **P/N. YU-01235, 90890-01235**

- Before installing the starter pulley, apply the grease to the oil seal rip ② and O-ring ③.

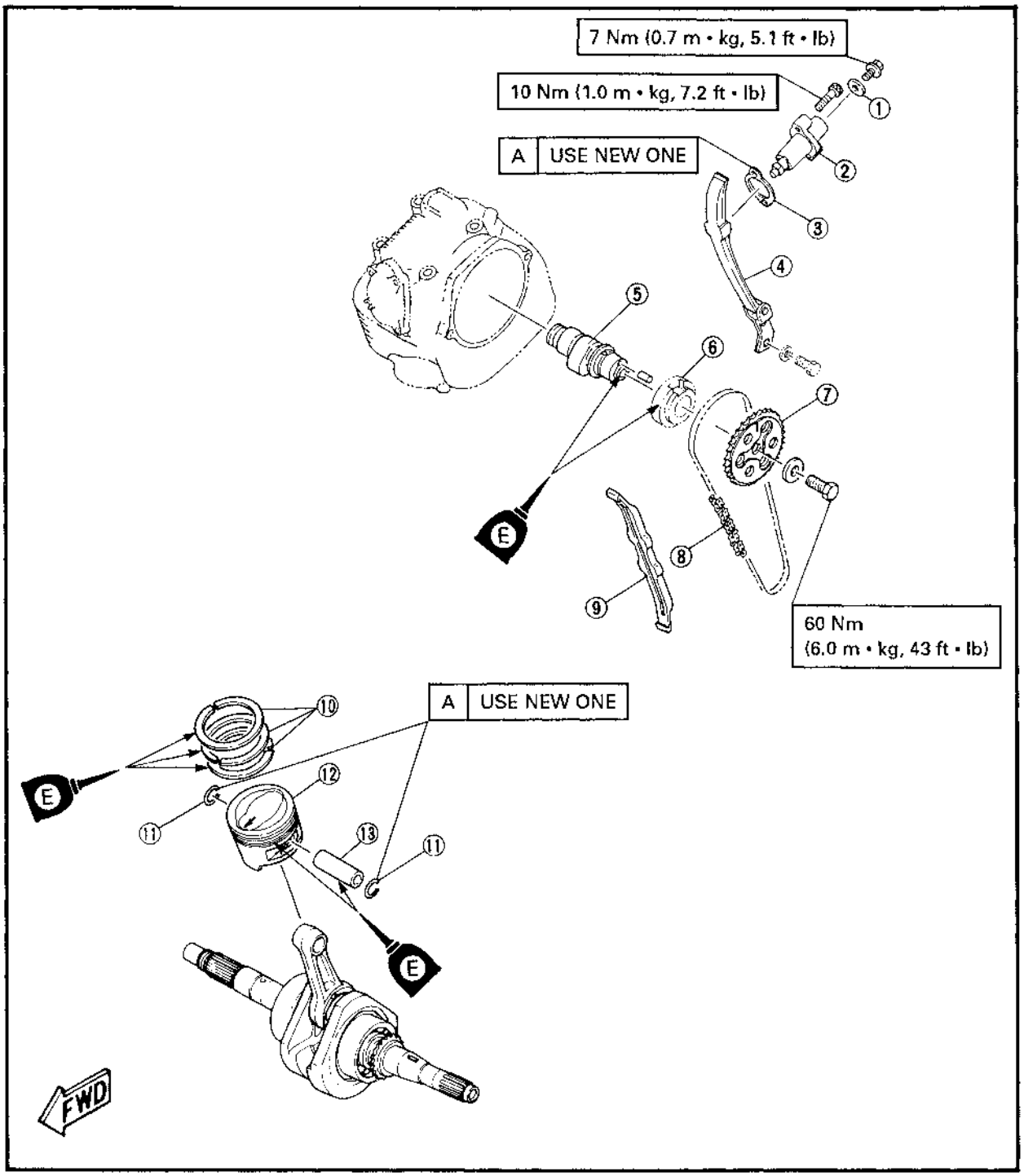
CYLINDER AND CYLINDER HEAD ASSEMBLY

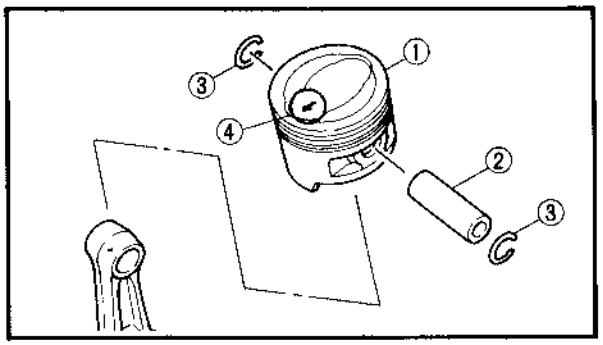
① Spark plug
② Tappet cover (intake)
③ O-ring
④ Tappet cover (exhaust)
⑤ Cylinder head
⑥ Bearing retainer
⑦ Lock washer
⑧ Cam sprocket cover
⑨ Oil seal
⑩ Cylinder



PISTON, CAMSHAFT AND TIMING CHAIN

① Gasket
② Timing chain tensioner
③ Gasket
④ Timing chain guide (intake)
⑤ Camshaft
⑥ Camshaft bushing
⑦ Cam sprocket
⑧ Timing chain
⑨ Timing chain guide (exhaust)
⑩ Piston ring
⑪ Piston pin clip
⑫ Piston
⑬ Piston pin





CYLINDER HEAD ASSEMBLY, CYLINDER AND PISTON

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

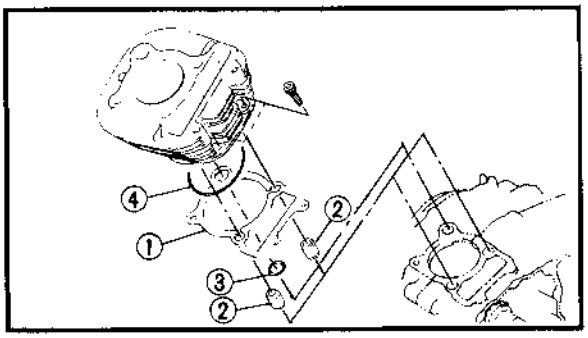
NOTE:

- The arrow ④ on the piston must point to the front of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the pin clip and material into the crankcase.

⚠ WARNING

Always use a new piston pin clip.

2. Apply:
   - 4-stroke engine oil
     To the piston pin, piston ring grooves and piston skirt areas.
3. Install:
   - Gasket ① (cylinder)
   - Dowel pins ②
   - O-ring ③
   - O-ring ④ (to cylinder)



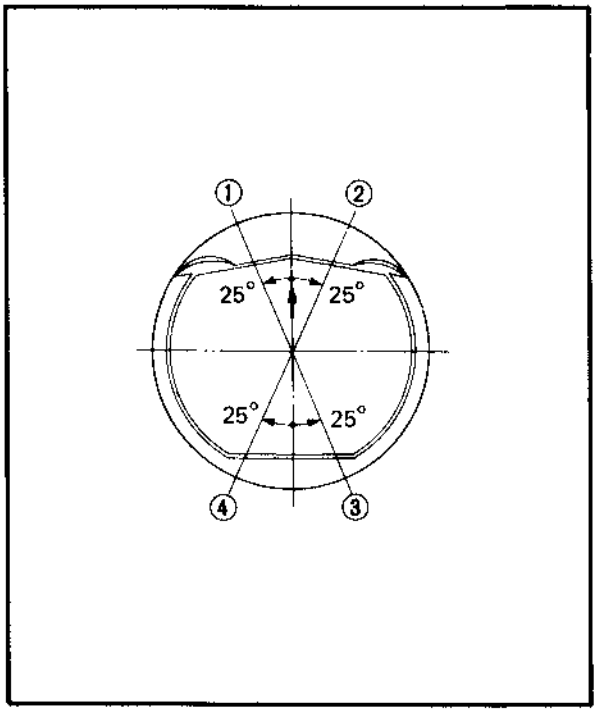
⚠ WARNING

Always use new gasket and O-ring.

4. Offset the piston ring end gaps as shown.

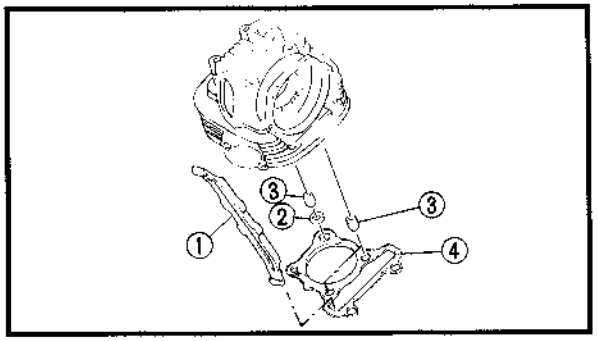
NOTE:

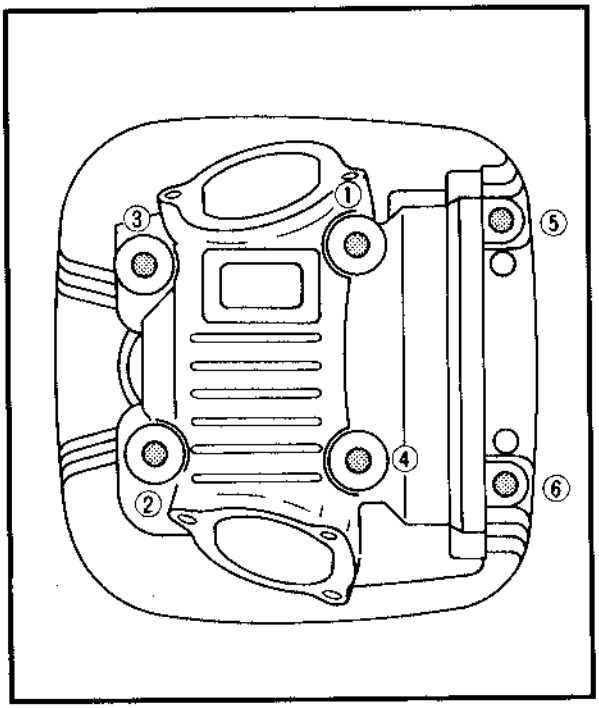
- Be sure to check the manufacturer's marks or numbers stamped on the rings are on the top side of the rings.
- Before installing the cylinder, apply a liberal coating of 4-stroke engine oil to the piston rings.

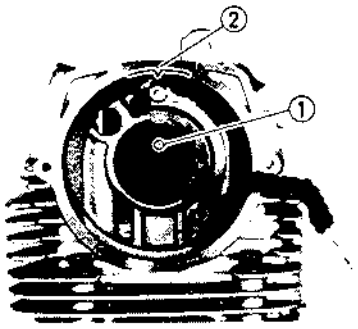


① Top ring
② Oil ring (lower rail)
③ 2nd ring
④ Oil ring (upper rail)









5. Install:
   - Cylinder ①
   - Bolts (cylinder)-temporary tighten

NOTE:
- Install the cylinder with one hand while compressing the piston rings with the other hand.
- Pass the timing chain through the chain cavity.

6. Install:
   - Chain guide ① (exhaust)
   - Oil seal ②
   - Dowel pins ③
   - Gasket ④ (cylinder head)

⚠ WARNING

Always use a new gasket.

7. Install:
   - Cylinder head assembly
   - Bolts (cylinder head)

NOTE:
- Apply the 4-stroke engine oil onto the washers.
- Tighten the bolts starting with the lowest numbered one.
- The embossed numbers in the cylinder head designate the tightening sequence.

8. Tighten:
   - Bolts ① ~ ④ (cylinder head)
   - Bolts ⑤, ⑥ (cylinder head and cylinder)
   - Bolts (cylinder)

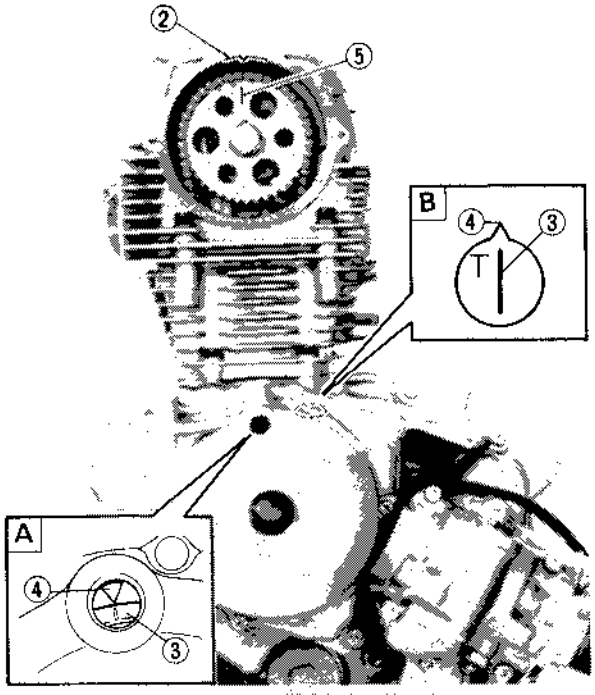
Bolt (cylinder head):
22 Nm (2,2 m • kg, 16 ft • lb)
Bolt (cylinder head and cylinder):
22 Nm (2.2 m • kg, 16 ft • lb)
Bolt (cylinder):
10 Nm (1.0 m • kg, 7.2 ft • lb)

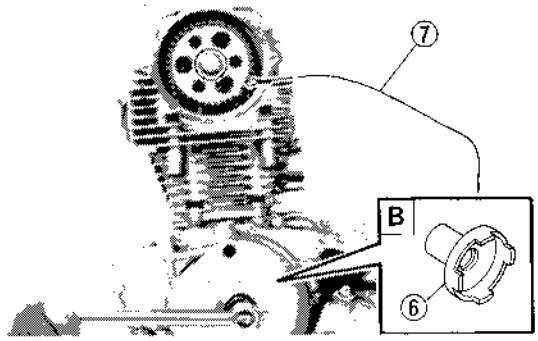
9. Install:
   - Cam sprocket

****

Cam sprocket installing steps:

● Rotate the camshaft to align the camshaft pin ① with the cylinder head match mark ②.





- Turn the crankshaft counterclockwise until the TDC mark ③ is aligned with the stationary pointer ④ on the crankcase cover or crankcase spacer.
- Place the timing chain onto the cam sprocket.
- Install the cam sprocket onto the camshaft, and finger tighten the sprocket bolt.

NOTE:

- When installing the cam sprocket, keep the timing chain as tense as possible on the exhaust side.
- Align the mutch mark ⑤ on the cam sprocket with the stationary pointer ② on the cylinder head.

- Insert your into the timing chain tensioner hole, and push the timing chain damper inward.
- While pushing the timing chain damper, be sure cam sprocket match mark ⑤ align the cylinder head match mark ② .
- If marks is aligned, tighten the cam sprocket bolt.

Bolt (cam sprocket):
60 Nm (6.0 m • kg, 43 ft • lb)

NOTE:

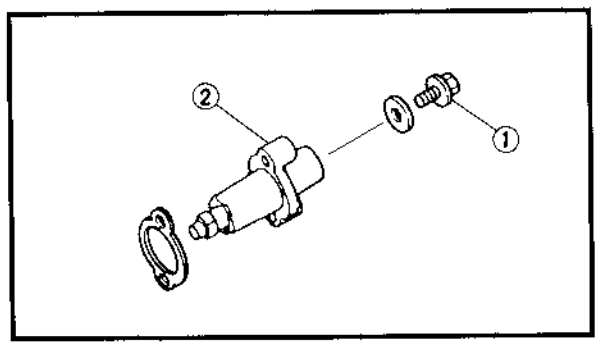
Hold the starter pulley ⑥ (except for USA) by the Rotor Holder to tighten the bolt of the cam sprocket.

Rotor holder (except for USA):
P/N. YU-01235, 90890-01235

- If marks do not align, change the meshing position of sprocket and chain.
- Remove a safety wire ⑦ from the timing chain.

A For USA
B Except for USA

****

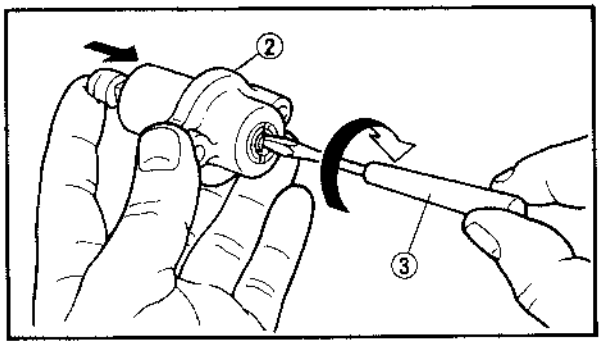


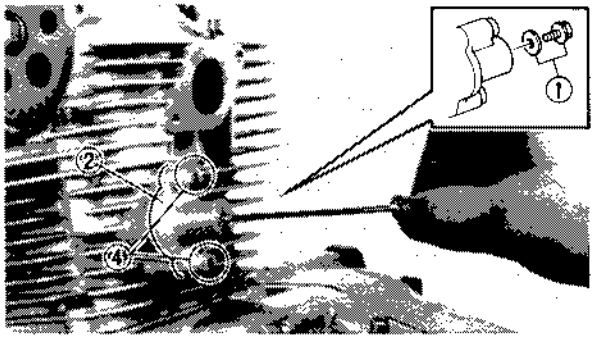
10. Install:
    - Timing chain tensioner assembly

****

Installation steps:

- Remove the chain tensioner cap ① from the chain tensioner assembly ② .
- Insert a small screwdriver ③ into the tensioner body slit. While pressing the tensioner rod, rotate the screwdriver clockwise until it stops turning.





● While holding the screwdriver in this position, and install the tensioner assembly ② (with the gasket) onto the cylinder, then temporary tighten the tensioner assembly holding bolts ④.

⚠ WARNING

Always use a new gasket.

● Remove the screwdriver from the tensioner body, and torque the tensioner assembly holding bolts.

Bolt (cam chain tensioner assembly):
10 Nm (1.0 m • kg, 7.2 ft • lb)

● Install the tensioner cap ① with the gasket.

⚠ WARNING

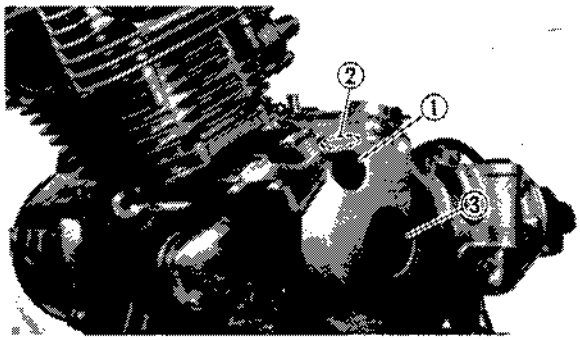
Always use a new gasket.

Cam chain tensioner cap:
7 Nm (0.7 m • kg, 5.1 ft • lb)

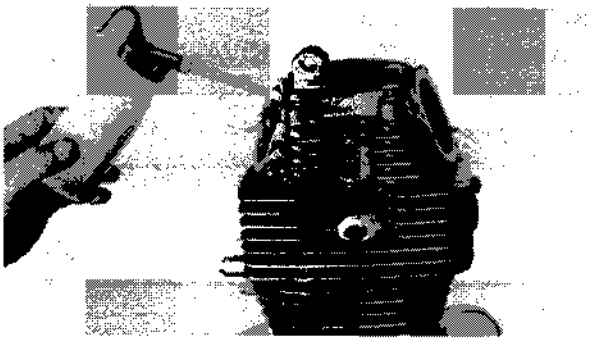
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11. Adjust:
    • Valve clearance
    Refer to the "VALVE CLEARANCE ADJUSTMENT" section in CHAPTER 3.

Intake valve (cold):
0.05 ~ 0.09 mm (0.002 ~ 0.004 in)
Exhaust valve (cold):
0.11 ~ 0.15 mm (0.004 ~ 0.006 in)

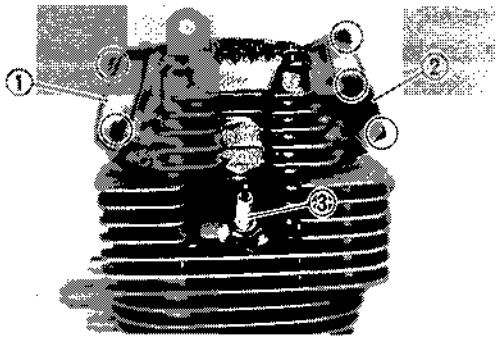


12. Install:
    • Timing plug ① (for USA)
    • Timing plug ② (except for USA)
    • Plug ③ (center) (for USA)



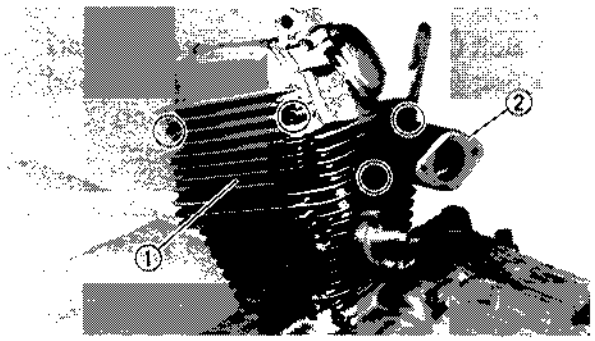
13. Apply:
- 4-stroke engine oil
  (to the camshaft upper side)

Oil quantity:
0.05 L (0.044 Imp • qt, 0.053 US • qt)



14. Install:
- Tappet cover ① (intake)
- Tappet cover ② (exhaust)
- Spark plug ③

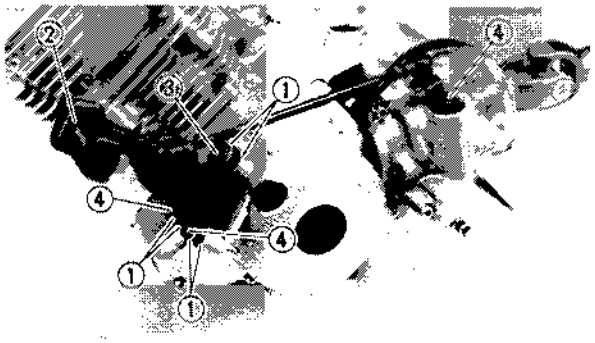
Bolt (tappet cover):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Spark plug:
17.5 Nm (17.5 m • kg, 12.5 ft • lb)



15. Install:
- Cam sprocket cover ①
- Carburetor joint ②

Screw (cam sprocket cover):
7 Nm (0.7 m • kg, 5.1 ft • lb)
Bolt (carburetor joint):
12 Nm (1.2 m • kg, 8.7 ft • lb)

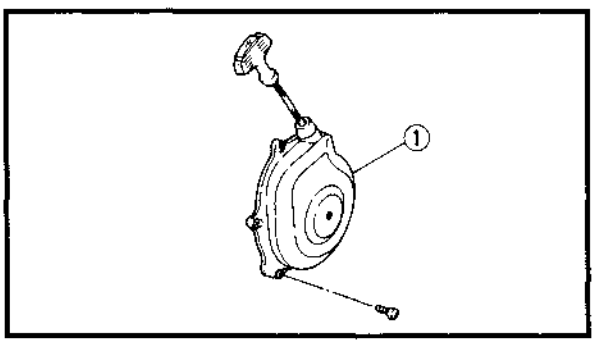
NOTE:
Inspect the O-ring of the carburetor joint. If damaged, replace it.



16. Install:
- Washers ①
- Drive select lever assembly ②

NOTE:
Before installing the drive select lever assembly, do not forget to fit the washers.

Bolt ③ (drive select lever assembly):
15 Nm (1.5 m • kg, 11 ft • lb)
Bolt ④ (drive select lever assembly):
10 Nm (1.0 m • kg, 7.2 ft • lb)



17. Install:
- Recoil starter assembly ① (except for USA)

Recoil starter assembly:
10 Nm (1.0 m • kg, 7.2 ft • lb)

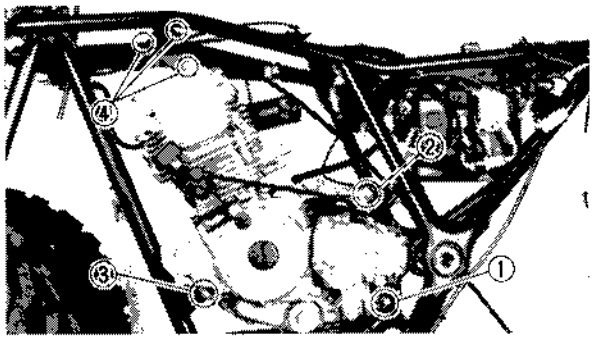
REMOUNTING ENGINE

Reverse the "ENGINE REMOVAL" procedure.
Note the following points.

⚠ WARNING

Securely support the machine so there is no danger of it falling over.

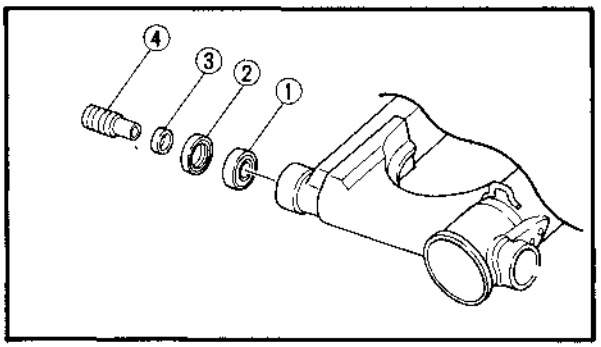
1. Install:
   - Engine assembly
     (from right side)

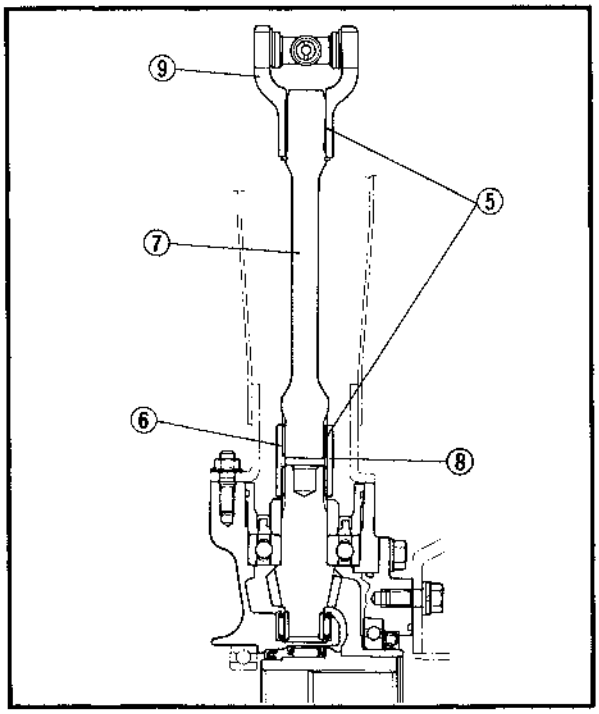


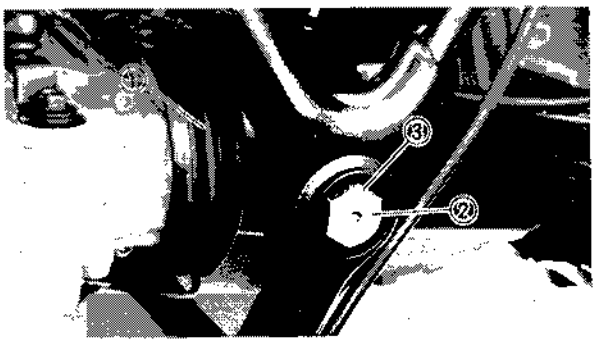
2. Install:
   - Bolt ① (engine mounting – rear lower)
   - Bolt ② (engine mounting – rear upper)
   - Bolt ③ (engine mounting – front)
   - Bolts ④ (engine mounting – top)

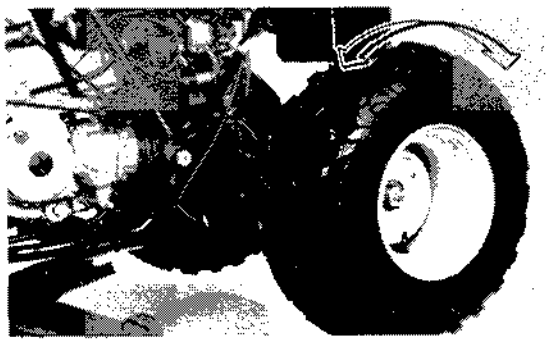
NOTE:

- All mounting bolts should be installed from the right of the machine.
- Temporary tighten the nuts and bolt, do not torque them at this point.









3. Install:
   - Rear wheel drive assembly and swingarm.

NOTE:

- Before installing the swingarm. Lubricate the following parts.
  Swingarm pivot side:
  1) Bearings ①
  2) Oil seals ②
  3) Collars ③
  4) Pivot shafts ④
  Drive shaft side:
  1) Drive shaft splines ⑤
  2) Coupling gear splines ⑥

	Lithium-soap Base Grease

- Before installing the swingarm, do not forget to fit the drive shaft ⑦ and coupling gear ⑧.
- Insert the drive shaft ⑦ into the universal joint ⑨ properly.

4. Connect:
   - Rubber boot ①
5. Install:
   - Pivot shafts ② (swingarm)
   - Locknuts ③ (pivot shafts)

NOTE:

Temporary tighten the pivot shafts and locknuts, do not torque them at this point.

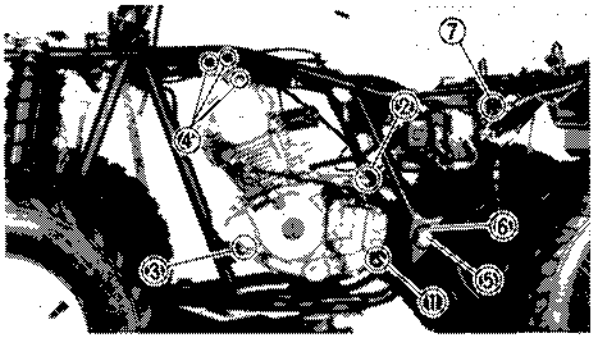
6. Check:
   - Drive shaft operation

****

Checking steps:

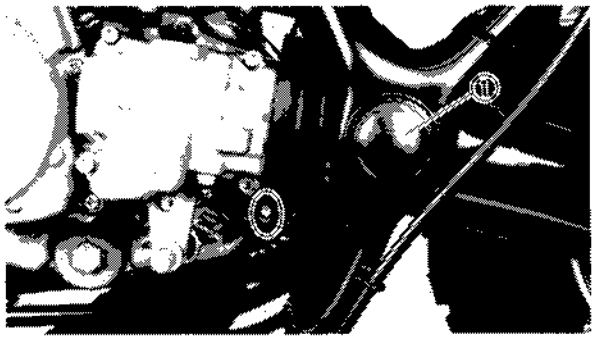
- Block the front wheels, and elevate the rear wheels by placing the suitable stand under the flame.
- Move the rear wheels back and forth.
- Check the drive shaft operation. If there is unsmooth operation recheck the drive shaft condition of installation.

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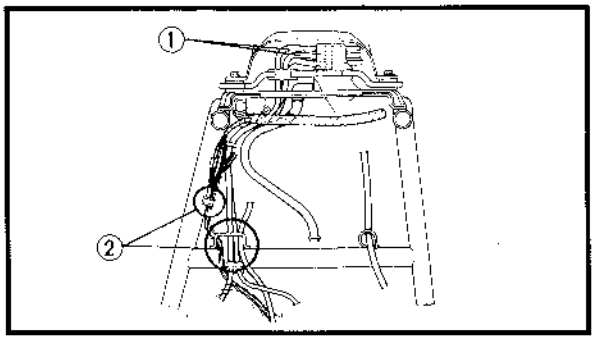


7. Tighten:
   - Bolt ① (engine mounting – rear lower)
   - Bolt ② (engine mounting – rear upper)
   - Bolt ③ (engine mounting – front)
   - Bolts ④ (engine mounting – top)
   - Pivot shafts ⑤ (swingarm)
   - Locknuts ⑥ (Pivot shaft)
   - Bolt ⑦ (rear shock absorber – top)

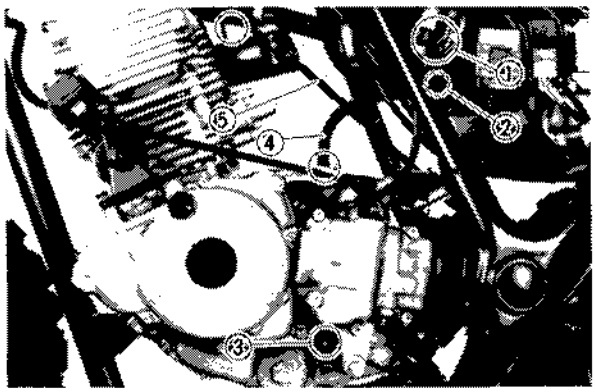
Bolt (engine mounting – rear lower):
33 Nm (3.3 m • kg, 24 ft • lb)
Bolt (engine mounting – rear upper):
33 Nm (3.3 m • kg, 24 ft • lb)
Bolt (engine mounting – front):
33 Nm (3.3 m • kg, 24 ft • lb)
Bolts (engine mounting – top):
33 Nm (3.3 m • kg, 24 ft • lb)
Pivot shaft (swingarm):
6 Nm (0.6 m • kg, 4.3 ft • lb)
Locknut (pivot shaft):
130 Nm (13 m • kg, 94 ft • lb)
Bolt (rear shock absorber – top):
50 Nm (5.0 m • kg, 36 ft • lb)



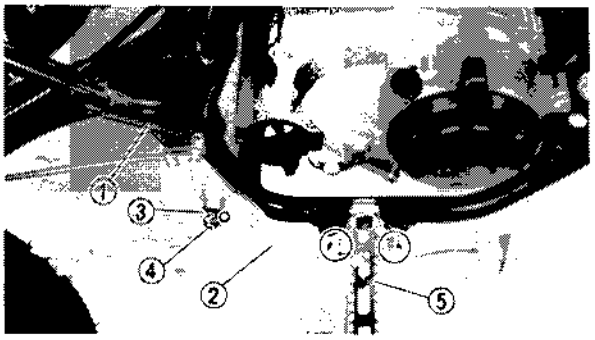
8. Install:
   - Pivot shaft caps ①



9. Connect:
   - Breather hose ① (final gear housing and rear brake dram)
     (to the cable guides ② of main frame)
     Refer to the "CABLE ROUTING" section in CHAPTER 2.



10. Connect:
    - Spark plug lead
    - CDI magneto leads ①
    - "REVERSE" switch lead ②
    - "NEUTRAL" switch lead ③
    - Breather hose ④ (crankcase)
    - Brake cable ⑤ (to cable guide)
      Refer to the "CABLE ROUTING" section in CHAPTER 2.

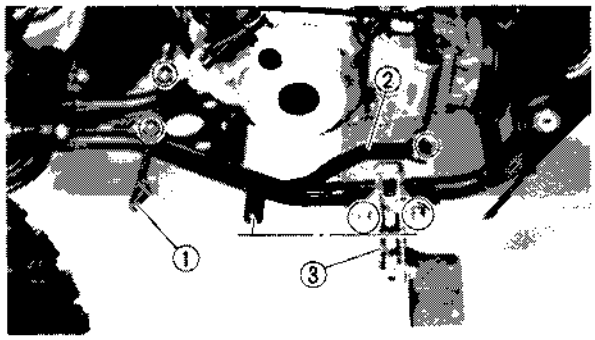


11. Connect:
    - Spring ①
12. Install:
    - Brake pedal ②
    - Washer ③
    - Cotter pin ④
    - Footrest ⑤ (right)

	Bolt (footrest): **55 Nm (5.5 m • kg, 40 ft • lb)**

⚠ WARNING

Always use a new cotter pin.

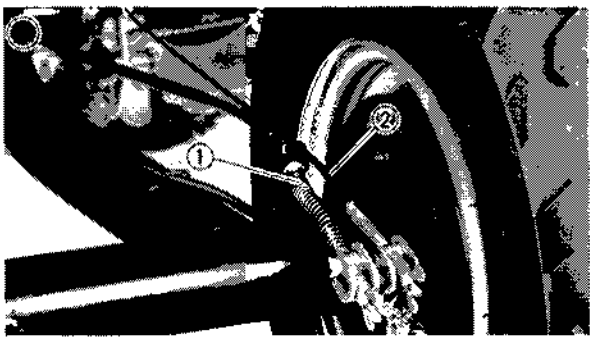


13. Install:
    - Font fender stay ①
    - Sift pedal ②
    - Footrest ③ (left)

	Bolt (shift pedal): **10 Nm (1.0 m • kg, 7.2 ft • lb)** **Bolt (footrest):** **55 Nm (5.5 m • kg, 40 ft • lb)**

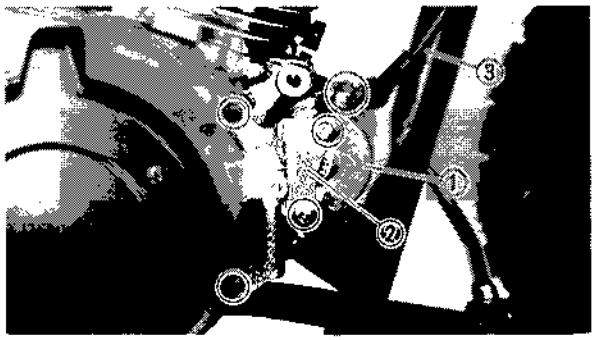
NOTE:

The center of the shift pedal ② should be aligned with the top of the footrest ③.



14. Connect:
    - Brake cable ① (rear)
    - Brake pedal rod ②
15. Adjust:
    - Rear brake

      Refer to the "REAR BRAKE LEVER AND PEDAL ADJUSTMENT" section in CHAPTER 3.



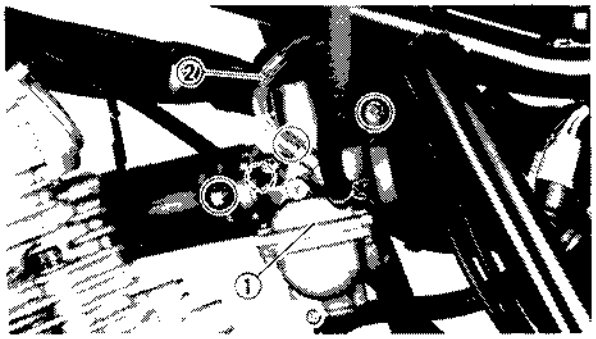
16. Install:
    - Starter motor ①
    - Bracket ② (starter motor)

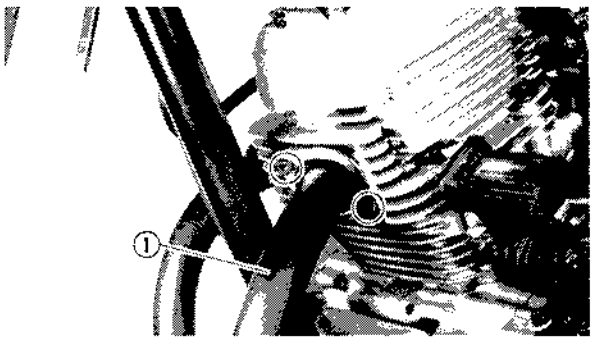
NOTE:

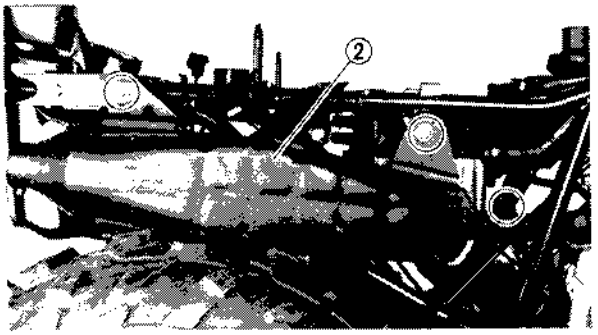
Before installing the starter motor, apply the grease to the O-ring.

	Bracket (starter motor): **7 Nm (0.7 m • kg, 5.1 ft • lb)**

17. Connect:
    - Starter motor lead ③







18. Install:
- Carburetor ①

	Nut (carburetor and carburetor joint): 8 Nm (0.8 m • kg, 5.8 ft • lb) **Hose clamp (carburetor and joint hose): 2 Nm (0.2 m • kg, 1.4 ft • lb)**

19. Connect:
- Breather hose ②

20. Install:
- Exhaust pipe ①
- Muffler ②

	Bolt (muffler): 27 Nm (2.7 m • kg, 19 ft • lb) **Bolt (muffler and exhaust pipe): 20 Nm (2.0 m • kg, 14 ft • lb)** **Bolt (exhaust pipe): 10 Nm (1.0 m • kg, 7.2 ft • lb)**

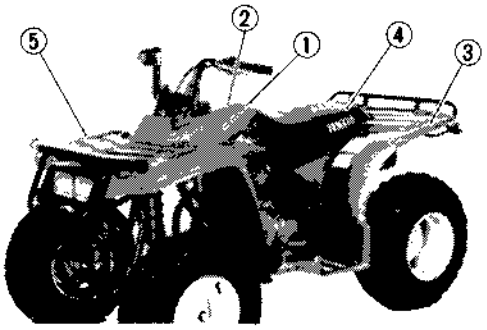
21. Fill:
- Crankcase

	Total amount: 1.8 L (1.6 Imp qt, 1.9 US qt)

Refer to the "ENGINE OIL REPLACEMENT" section in CHAPTER 3.

22. Adjust:
- Release lever free play (clutch)
  Refer to the "CLUTCH ADJUSTMENT" section in CHAPTER 3.

23. Adjust:
- Drive select lever position
  Refer to the "DRIVE SELECT LEVER POSITION ADJUSTMENT" section in CHAPTER 3.



24. Install:
- Fuel tank ①
- Fuel tank cover ②
- Rear fender ③
- Seat ④
- Front fender ⑤
- Front carrier (except for USA)
- Rear carrier (except for USA)

Bolt (rear fender – frame, fender stay and footrest plate):
7 Nm (0.7 m • kg, 5.1 ft • lb)
Bolt (front bumper and frame):
15 Nm (1.5 m • kg, 11 ft • lb)
Bolt (front fender and frame):
15 Nm (1.5 m • kg, 11 ft • lb)
Nut (front fender and fender stay):
7 Nm (0.7 m • kg, 5.1 ft • lb)
Screm (front fender and fuel tank cover):
2 Nm (0.2 m • kg, 1.4 ft • lb)
Except for USA
Bolt (front carrier and frame):
33 Nm (3.3 m • kg, 24 ft • lb)
Nut (front carrier and front bumper):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Bolt (rear carrier and frame):
33 Nm (3.3 m • kg, 24 ft • lb)
Bolt (rear carrier and rear bumper):
8 Nm (0.8 m • kg, 5.8 ft • lb)

Refer to the "FENDERS AND FUEL TANK-Installation" section in CHAPTER 3.

25. Inspect:
- Oil leakage

26. Check:
- "NEUTRAL" indicator light operation
- "REVERSE" indicator light operation

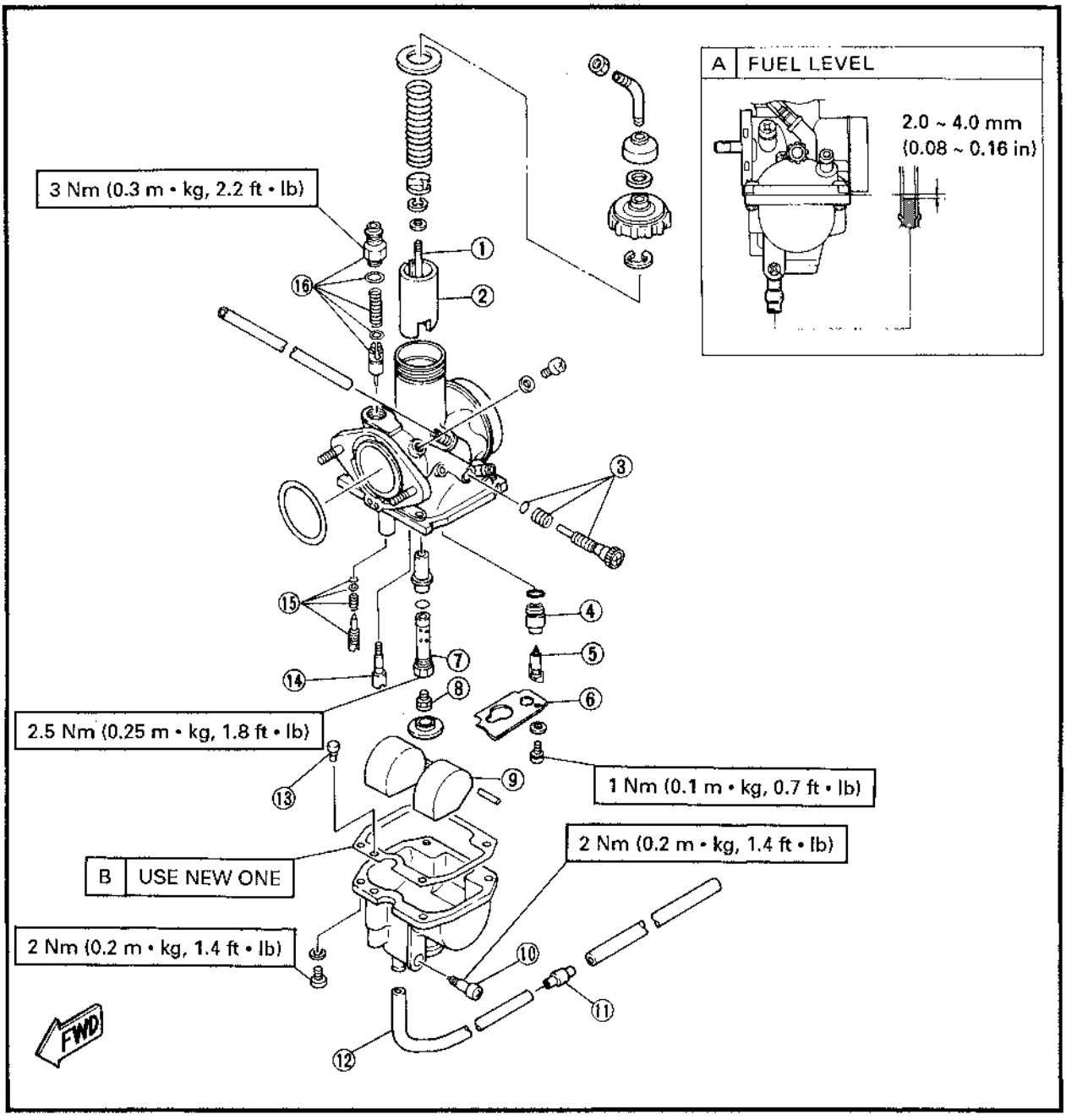
Poor operation → Repair.

CARBURETION

CARBURETOR

① Jet needle
② Throttle valve
③ Throttle stop screw set
④ Valve seat
⑤ Needle valve
⑥ Baffle plate
⑦ Needle jet
⑧ Main jet
⑨ Float
⑩ Drain screw
⑪ Oneway valve
⑫ Overflow hose
⑬ Starter jet
⑭ Pilot jet
⑮ Pilot screw set
⑯ Starter plunger set

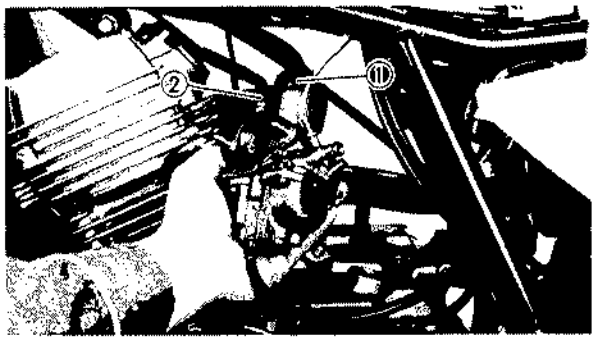
SPECIFICATIONS		
Main Jet	(M.J.)	#85
Main Air Jet	(M.A.J.)	ø1.6
Jet Needle	(J.N.)	5L10-4
Needle Jet	(N.J.)	O-4 (#390)
Pilot Jet	(P.J.)	#20
Pilot Screw	(P.S.)	1 and 1/4 turns out
Float Height	(F.H.)	21.0 ~ 22.0 mm (0.83 ~ 0.87 in)
Fuel Level	(F.L.)	2.0 ~ 4.0 mm (0.08 ~ 0.16 in)
Engine Idling Speed		1,350 ~ 1,450 r/min



5

REMOVAL

1. Remove:
   - Seat
   - Fuel tank cover
   - Fuel tank
   Refer to the "FENDERS AND FUEL TANK-FUEL TANK-Removal" section in CHAPTER 3.
2. Remove:
   - Carburetor
   Refer to the "ENGINE REMOVAL-CARBURETOR" section in CHAPTER 4.
3. Disconnect:
   - Throttle valve assembly ①
   - Starter plunger assembly ②
   (from carburetor)

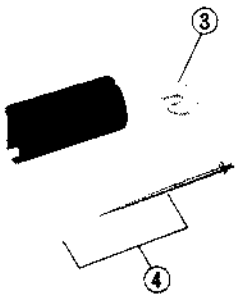


DISASSEMBLY

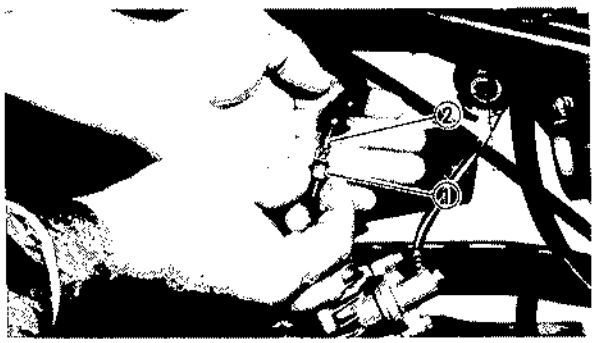
NOTE:

The following parts can be cleaned and inspected without disassembly.
- Throttle stop screw set
- Pilot screw set

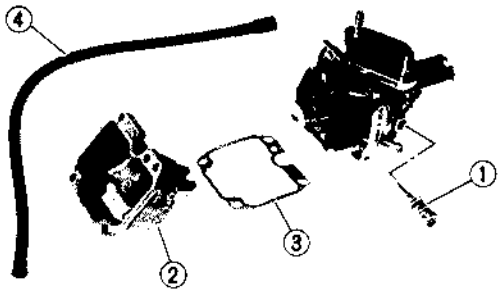




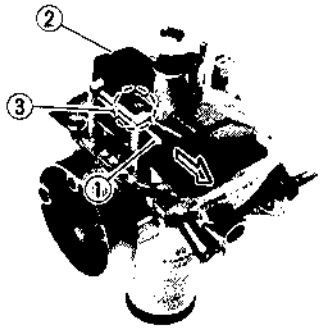
1. Remove:
   - Throttle valve ①
   - Spring ②
   - Stopper ③ (jet needle)
   - Jet needle set ④



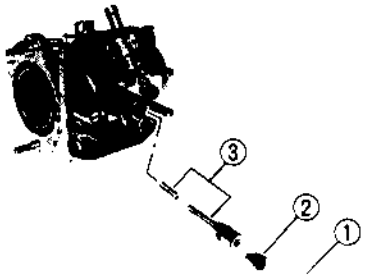
2. Remove:
   - Starter plunger ①
   - Spring ②



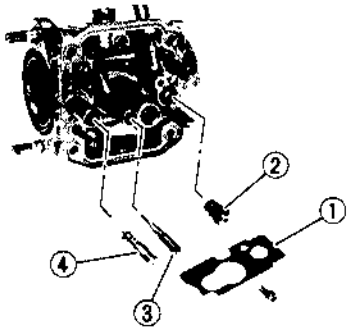
3. Remove:
   - Throttle stop screw set ①
   - Float chamber body ②
   - Gasket ③ (float chamber body)
   - Overflow hose ④ (float chamber)



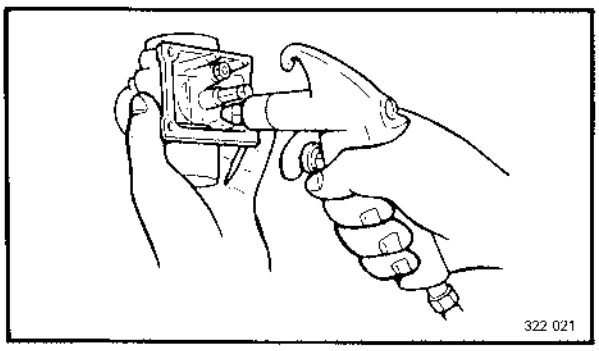
4. Remove:
   - Float pin ①
   - Float ②
     (with needle valve) ③



5. Remove:
   - Main jet ring ①
   - Main jet ②
   - Needle jet set ③



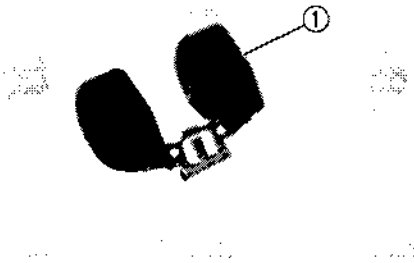
6. Remove:
   - Baffle plate ①
   - Valve seat ②
   - Pilot jet ③
   - Pilot screw set ④



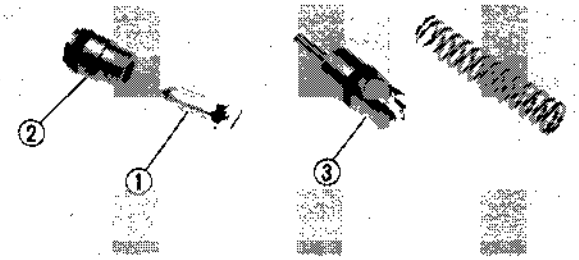
INSPECTION

1. Inspect:
   - Carburetor body
   - Float chamber body
   - Fuel passage
     Cracks/Damage → Replace.
     Clog → Clean.

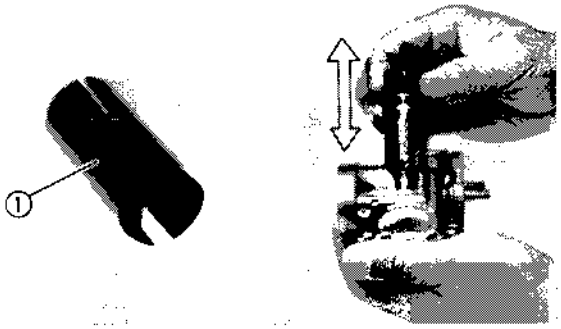
NOTE:
- Use a petroleum based solvent for cleaning.
- Blow out all passages and jets with compressed air.



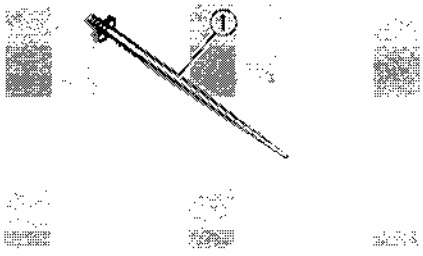
2. Inspect:
   - Float ①
     Wear/Damage → Replace.



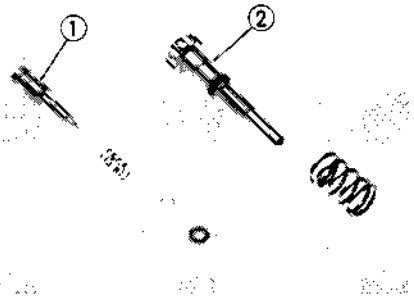
3. Inspect:
   - Needle valve ①
   - Valve seat ②
   - Starter plunger ③
     Wear/Damage → Replace.



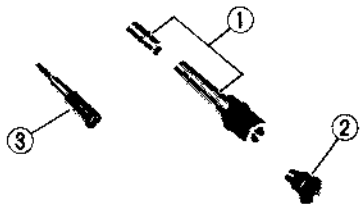
4. Inspect:
   - Throttle valve ①
     Wear/Scratches/Damage → Replace.
5. Check:
   - Free movement
     Stick → Replace.
     Insert the throttle valve into the carburetor body, and check for free movement.



6. Inspect:
   - Jet needle ①
     Bends/Wear/Damage → Replace.



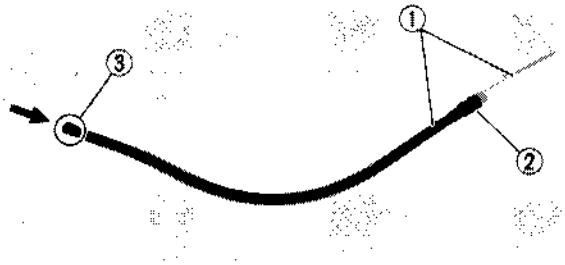
7. Inspect:
   - Pilot screw ①
   - Throttle stop screw ②
     Wear/Damage → Replace.



8. Inspect:
   - Needle jet set ①
   - Main jet ②
   - Pilot jet ③

   Wear/Damage → Replace.
   Clog → Clean.

NOTE:
Blow out the jets with compressed air.



9. Inspect:
   - Overflow hoses ① /Oneway valve ②

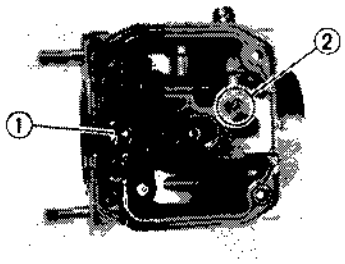
   Clog/Damage → Replace.

NOTE:
Blow into the smaller end ③ of the overflow hose (with the oneway valve). Air should pass freely through the valve in this direction only.

ASSEMBLY

Reverse the "DISASSEMBLY" procedure. Note the following points.

CAUTION:
- **Before reassembling, wash all parts in clean gasoline.**
- **Always use new gasket.**

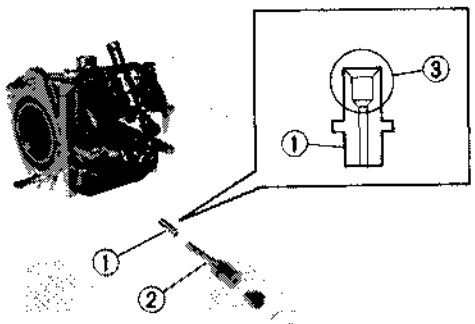


1. Adjust:
   - Pilot screw ①

Pilot screw:
1 and 1/4 turns out

2. Tighten:
   - Screw ② (baffle plate)

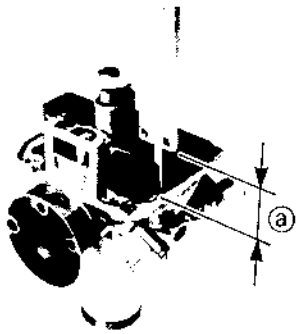
Screw (baffle plate):
1 Nm (0.1 m • kg, 0.7 ft • lb)

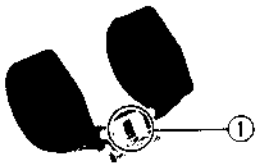


3. Install:
   - Needle jet #1 ①
   - Needle jet #2 ②

NOTE:
Be sure to install the indented end ③ of the needle jet #1 ① in the carburetor.

Needle Jet #2:
2.5 Nm (0.25 m • kg, 1.8 ft • lb)





4. Measure:
   - Float height ⓐ
     Out of specification → Adjust.

****

Flat height measurement and adjustment steps:

- Hold the carburetor in an upside down position.
- Measure the carburetor between the mating surface of the float chamber body (gasket removed) and top of the float using a gauge.

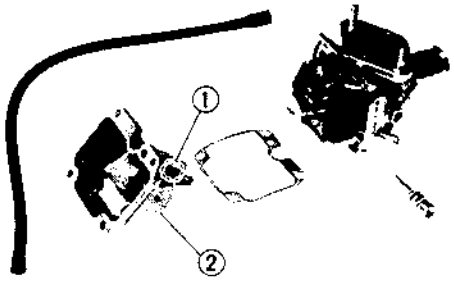
Float height:
21.0 ~ 22.0 mm (0.83 ~ 0.87 in)

NOTE:

The float arm should be resting on the needle valve, but not compressing the needle valve.

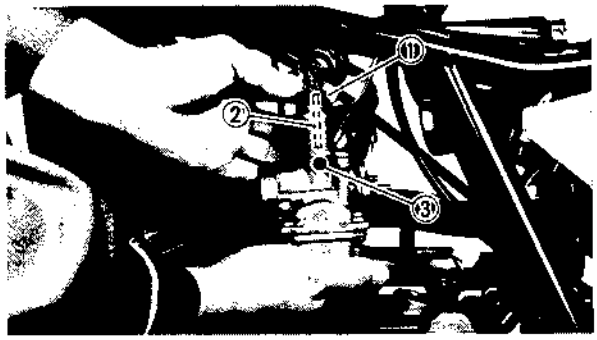
- If the float height is not within specification, inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang ① on the float.
- Recheck the float height.

****



5. Install:
   - Drain screw ①
   - Float chamber body ②

Drain screw:
2 Nm (0.2 m • kg, 1.4 ft • lb)
Float chamber body:
2 Nm (0.2 m • kg, 1.4 ft • lb)



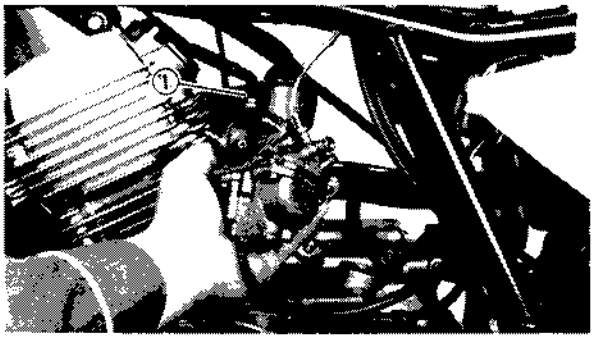
INSTALLATION

Reverse the "REMOVAL" procedures. Note the following points.

1. Install:
   - Throttle valve ①

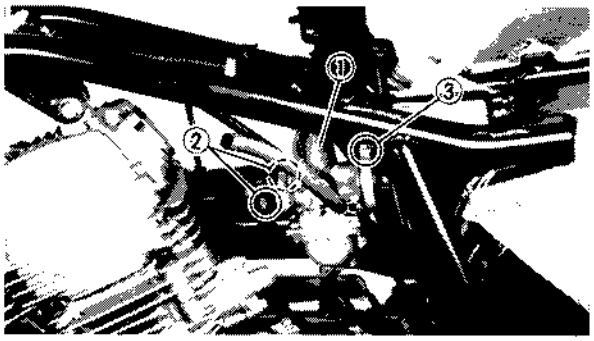
NOTE:

Align the groove ② of the throttle valve with the projection ③ of the carburetor body.



2. Install:
   - Starter plunger ①

	Starter plunger: **3 Nm (0.3 m • kg, 2.2 ft • lb)**



3. Install:
   - Carburetor ①

	Nut ②(carburetor and carburetor joint): **8 Nm (0.8 m • kg, 5.8 ft • lb)** **Hose clamp ③ (carburetor and joint hose):** **2 Nm (0.2 m • kg, 1.4 ft • lb)**

CAUTION:

Make sure the carburetor overflow hose is routed correctly.

4. Check:
   - Throttle cable operation
     Unsmooth operation → Repair.
5. Attach the sub tank (fuel) to the carburetor body nozzle.
6. Adjust:
   - Idle speed

	Engine idle speed: **1,350 ~ 1,450 r/min**

Refer to the "IDLE SPEED ADJUSTMENT" section in CHAPTER 3.

7. Adjust:
   - Throttle cable free play

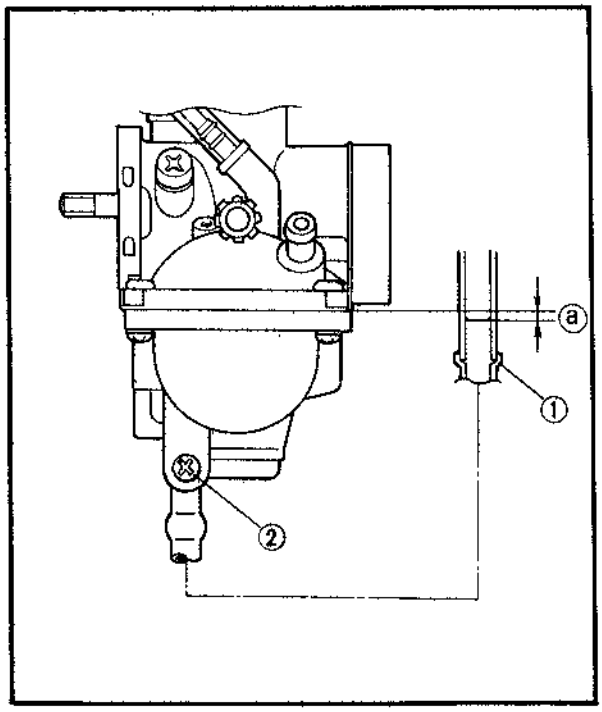
	Throttle cable free play: **3 ~ 5 mm (0.12 ~ 0.20 in)**

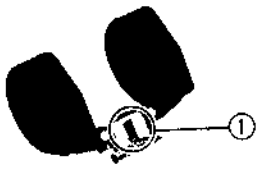
Refer to the "THROTTLE CABLE FREE PLAY ADJUSTMENT" section in CHAPTER 3.

FUEL LEVEL ADJUSTMENT

NOTE:

Before adjusting the fuel level, the float height should be adjusted.





1. Measure:
   - Fuel level ⓐ
     Out of specification → Adjust.

****

Fuel level measurement and adjustment steps:

- Place the machine on a level place.
- Attach the Fuel Level Gauge ① to the float chamber body nozzle.

Fuel level gauge:
P/N. YM-01312-A, 90890-01312

- Loosen the drain screw ② and start the engine.
- Place tube vertically next to the center of the mating line of the carburetor body and float chamber body.
- Measure the fuel level ⓐ with gauge.

Fuel level:
2.0 ~ 4.0 mm (0.08 ~ 0.16 in)
Below the carburetor body edge

- If the fuel level is incorrect, adjust the fuel level:
- Remove the carburetor.
- Inspect the valve seat and needle valve.
- If both are fine, adjust the float height by bending the float tang ① on the float.
- Recheck the fuel level.

****

2. Detach:
   - Sub tank (fuel)
3. Install:
   - Fuel tank
   - Fuel tank cover
   - Seat

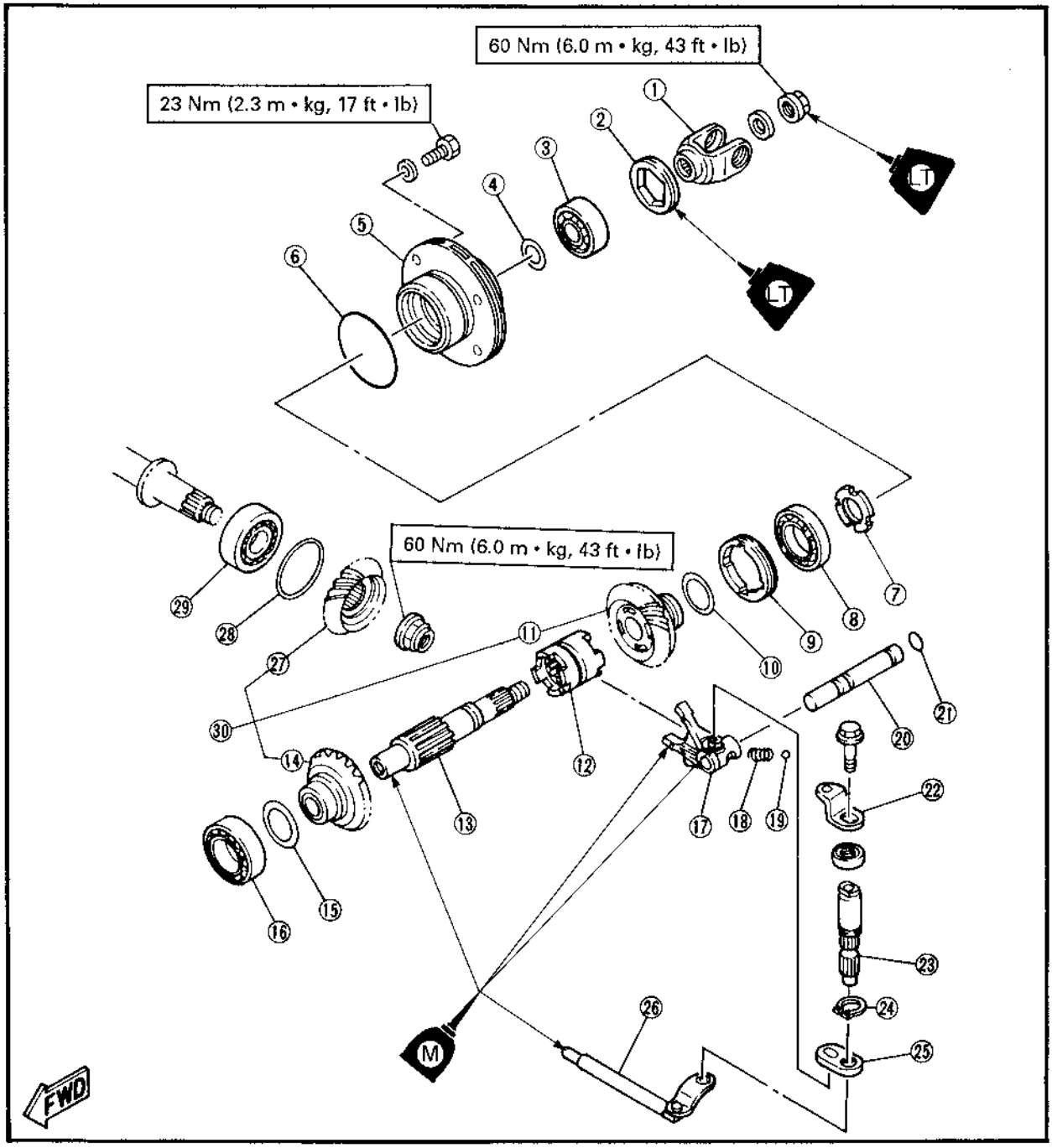
   Refer to the "FENDERS AND FUEL TANK-FUEL TANK-Installation" section in CHAPTER 3.

DRIVE TRAIN

MIDDLE GEAR SERVICE

MIDDLE GEAR

① Universal joint
② Bearing retainer 1
③ Bearing
④ Shims
⑤ Bearing housing
⑥ O-ring
⑦ Reverse gear securing nut
⑧ Bearing
⑨ Bearing retainer 2
⑩ Shims
⑪ Reverse gear
⑫ Dog clutch
⑬ Middle driven shaft
⑭ Driven pinion gear
⑮ Shims
⑯ Bearing
⑰ Shift fork 4
⑱ Spring
⑲ Ball
⑳ Shift fork guide bar
㉑ Oring
㉒ Lever
㉓ Shift lever shaft
㉔ Circlip
㉕ Shift lever
㉖ Stopper shaft
㉗ Drive pinion gear
㉘ Shims
㉙ Bearing
㉚ Middle gear camp

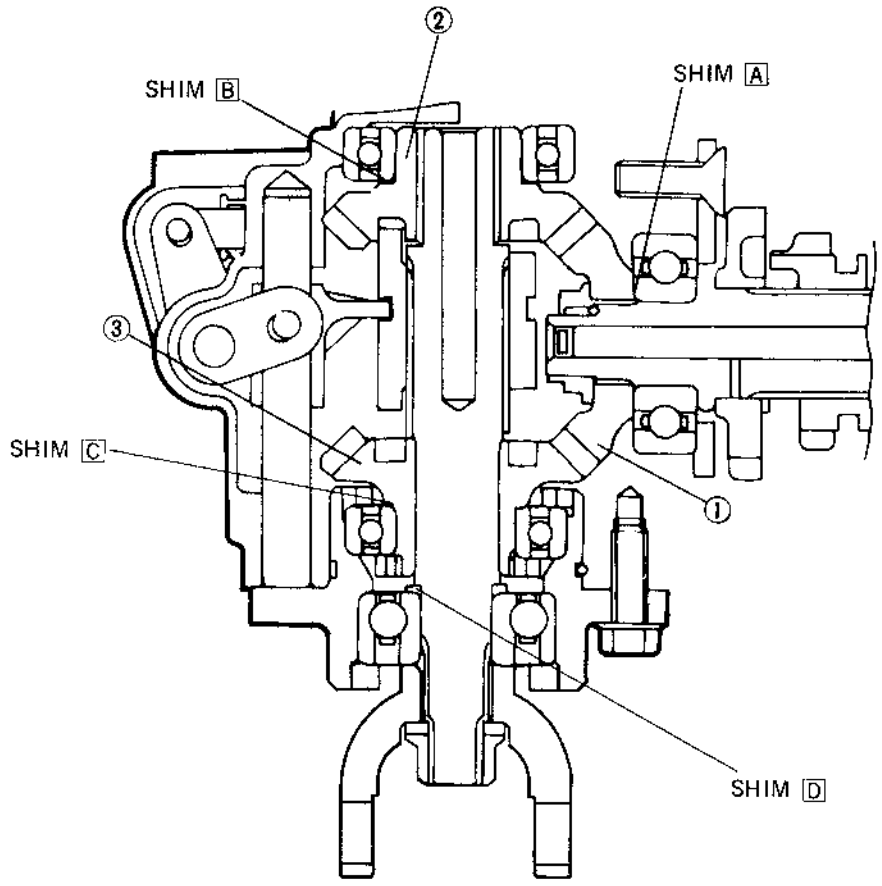


6

MIDDLE GEAR SHIMS

When the crankcase assembly and/or the middle gear comp., etc. are replaced, be sure to adjust the middle gear shim(s).
Refer to the "MIDDLE GEAR SHIM SELECTION and MIDDLE GEAR LASH ADJUSTMENT" section.

① Drive pinion gear
② Driven pinion gear (forward gear)
③ Reverse gear
[A] Drive pinion gear shim
[B] Driven pinion gear shim
[C] Reverse gear shim
[D] Middle driven shaft shim

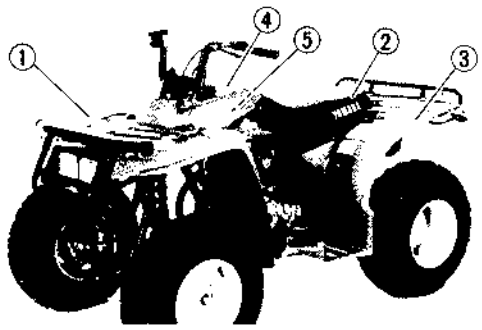


REMOVAL

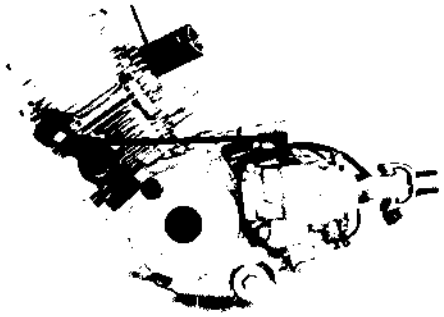
NOTE:

It is necessary to remove the rear wheel drive assembly and/or engine assembly in order to service the middle gear, refer to the "ENGINE OVERHAUL" section in CHAPTER 4.

1. Drain:
   - Engine oil
     Refer to the "ENGINE OIL REPLACEMENT" section in CHAPTER 3.
2. Remove:
   - Front fender ①
   - Seat ②
   - Rear fender ③
   - Fuel tank cover ④
   - Fuel tank ⑤
   - Front carrier (except for USA)
   - Rear carrier (except for USA)
     Refer to the "FENDERS AND FUEL TANK-Removal" section in CHAPTER 3.

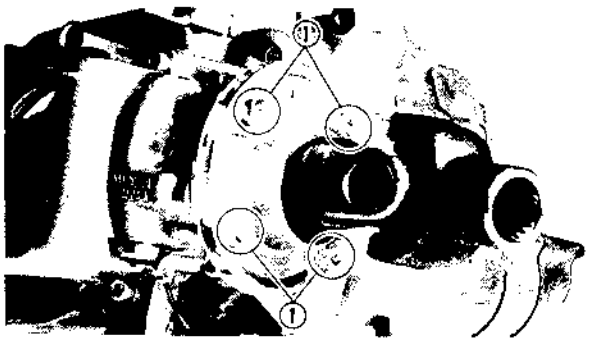


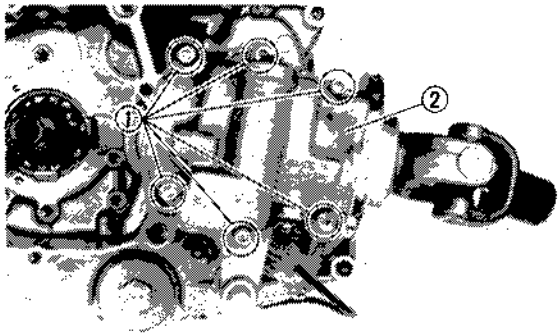
3. Remove:
   - Engine assembly
     Refer to the "ENGINE REMOVAL" section in the CHAPTER 4.



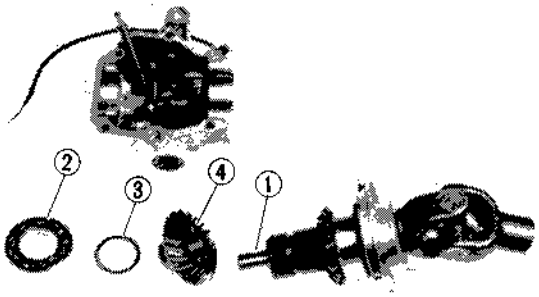
Middle driven pinion gear

1. Remove:
   - Bolts ① (bearing housing)
     Refer to the "ENGINE DISASSEMBLY – MIDDLE DRIVEN GEAR" section in CHAPTER 4.

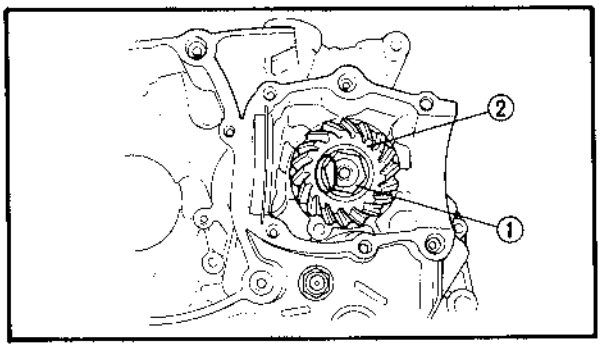




2. Remove:
   - Bolts ① (middle gear case cover)
   - Middle gear case cover ②
   - Dowel pins



3. Remove:
   - Middle driven shaft assembly ①
   - Bearing ②
   - Shim ③
   - Driven pinion gear ④



Middle drive axle

1. Remove:
   - Nut ① (middle drive pinion gear)
   - Middle drive pinion gear ②

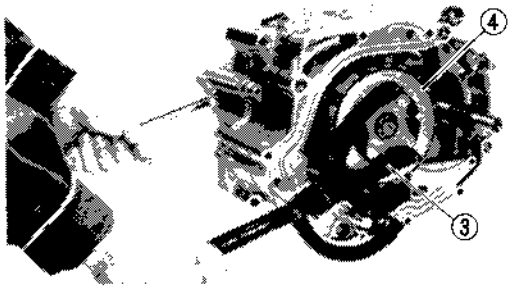
NOTE:

- Flatten the punched portion of the middle drive gear nut using the drift punch.
- Put the engine in 1st, and carry out the operation.

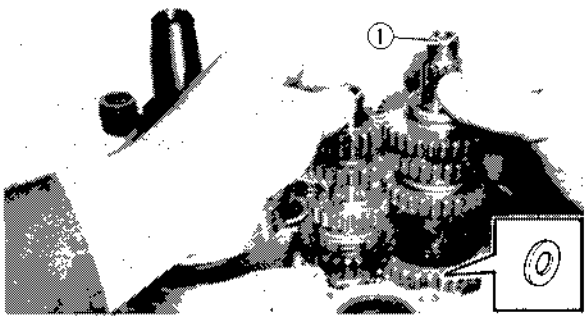
Use the Rotor holder ③hold the clutch boss ④.



Rotor holder:
P/N. YU-01235, 90890-01235

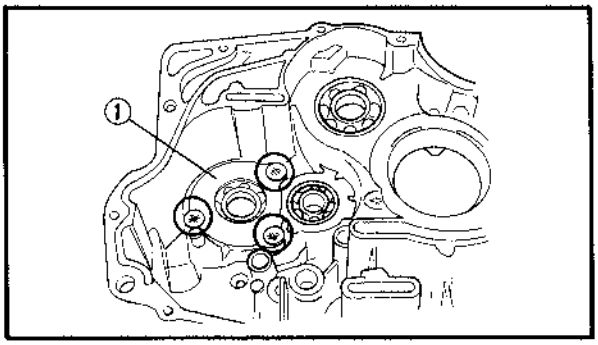


Refer to the "ENGINE DISASSEMBLY – PRIMARY AND SECONDARY CLUTCHES" section in CHAPTER 4.

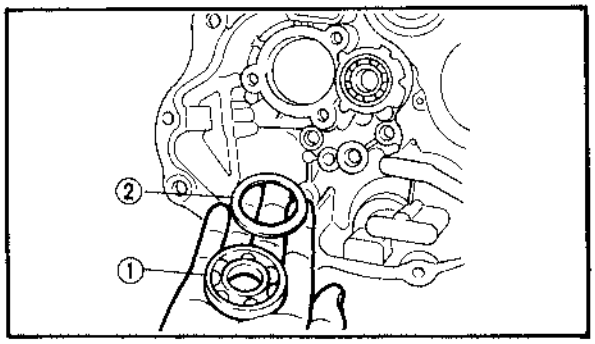


2. Remove:
   - Middle drive axle assembly ①

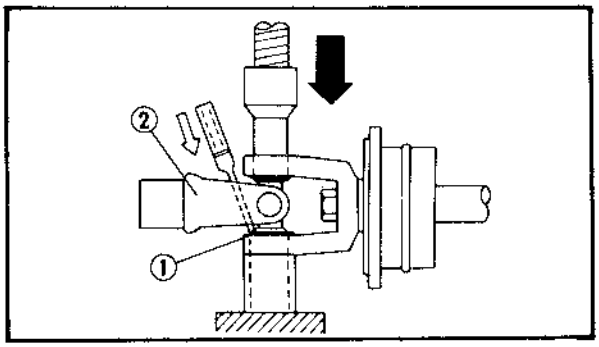
   Refer to the "ENGINE DISASSEMBLY – BALANCER SHAFT, TRANSMISSION AND CRANKSHAFT" section in CHAPTER 4.



3. Remove:
   - Bearing retainers ①
     Use a #40 Torx Driver.



4. Remove:
   - Bearing ①
   - Shim ②



DISASSEMBLY

Middle driven shaft

1. Remove:
   - Universal joint

****

Removal steps:

- Remove the circlips ①.
- Place the U-joint in a press.
- With a suitable diameter pipe beneath the yoke, press the bearing into the pipe as shown.

NOTE:

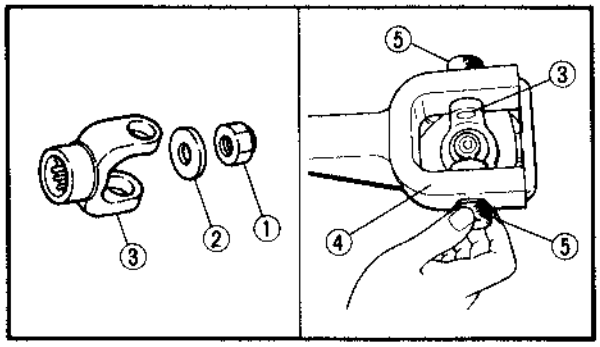
It may be necessary to lightly tap the yoke with a punch.

- Repeat the steps for the opposite bearing.
- Remove the yoke and U-joint ②.

NOTE:

It may be necessary to lightly tap the yoke with a punch.

****

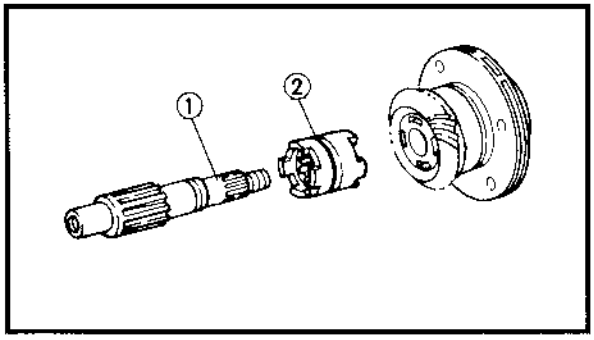


2. Remove:
   - Nut①(U-joint)
   - Washer ②
   - U-joint ③

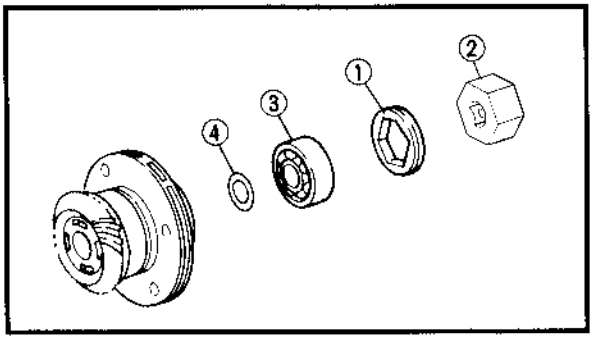
NOTE:

Hold the U-joint ③ by the Universal Joint Holder ④ and Attachment ⑤ to loosen the nut.

Universal joint holder:
P/N. YM-04062, 90890-04062
Attachment:
P/N. YM33291, 90890-04096



3. Remove:
   - Middle driven shaft ①
   - Dog clutch ②

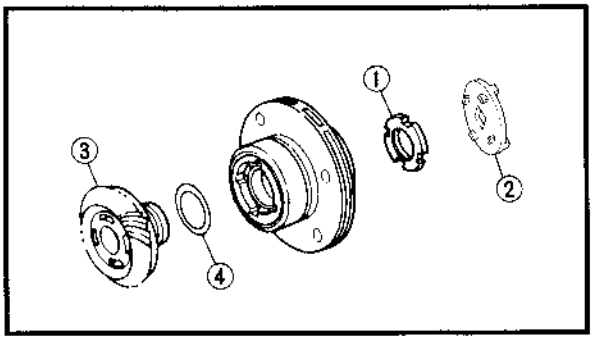


4. Remove:
   - Bearing retainer ①

NOTE:
- Use a Bearing retainer wrench ②.

Bearing retainer wrench 32 mm (1.26 in):
P/N. YM-33289,90890-04104

   - Bearing ③
   - Shim(s) ④

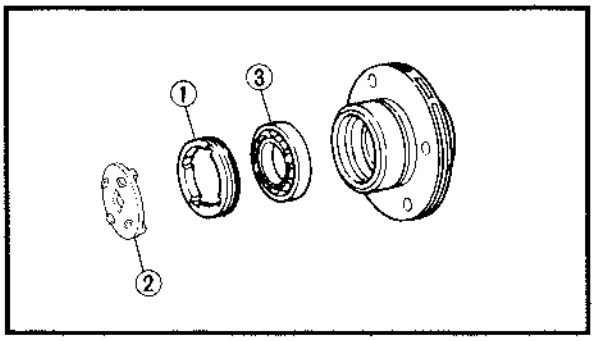


5. Remove:
   - Reverse gear securing nut ①

NOTE:
- The reverse gear securing nut has left-hand threads; turn the nut clockwise to loosen it.
- Use a Ring nut wrench ②.

Ring nut wrench:
P/N. YM-1391, 90890-01391

   - Reverse gear ③
   - Shim(s) ④

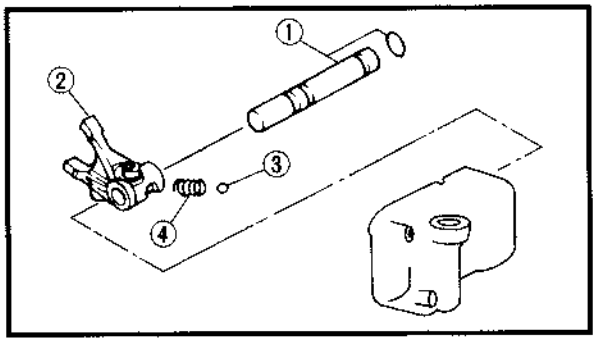


6. Remove:
   - Bearing retainer ①

NOTE:
- Use a Ring nut wrench ②.

Ring nut wrench:
P/N. YM-1391, 90890-01391

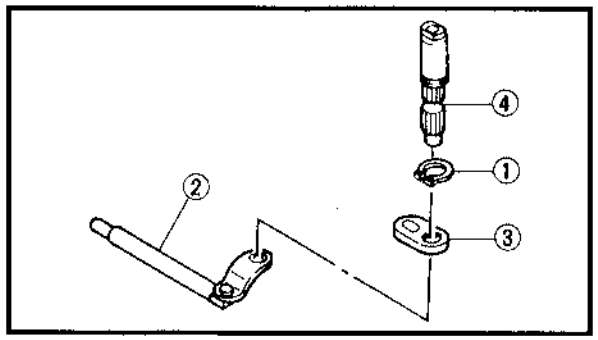
- Bearing ③



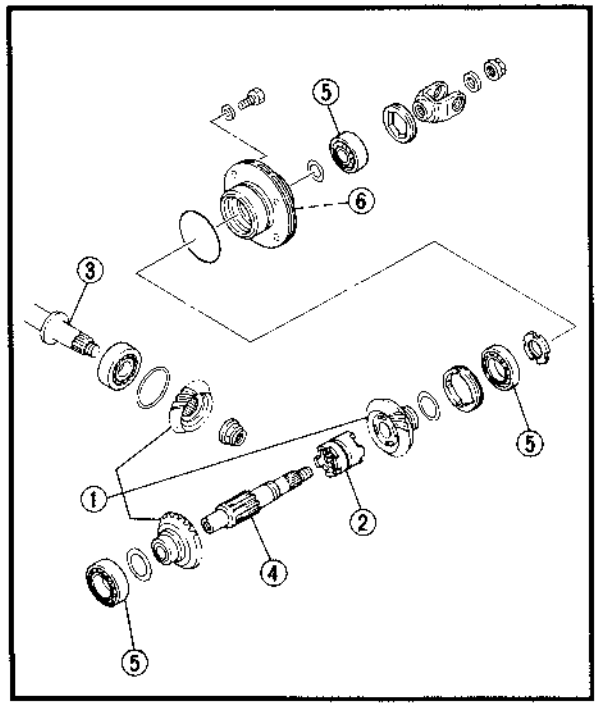
Shift lever

1. Remove:
   - Shift fork guide bar ①
   - Shift fork ②
   - Ball ③
   - Spring ④

NOTE:
When removing the shift fork guide bar, the ball will fall off. Take care not lose the ball.



2. Remove:
   - Circlip ①
   - Stopper shaft ②
   - Shift lever ③
   - Shift lever shaft ④

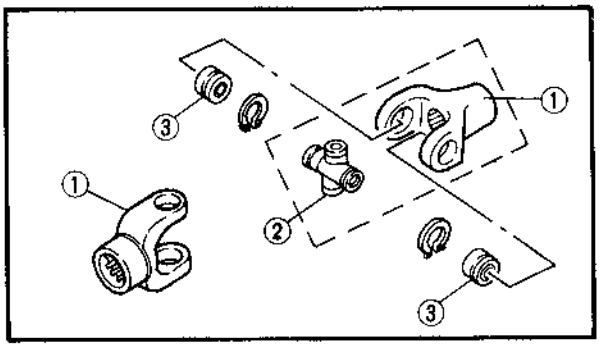


INSPECTION

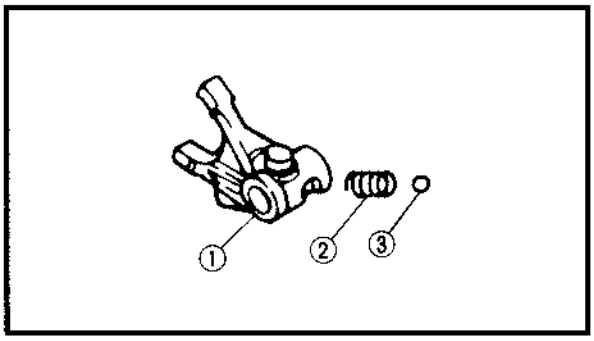
1. Inspect:
   - Gear teeths (middle gear camp.) ①
     Pitting/Galling/Wear → Replace.
   - Dog clutch ②
     Wear/Cracks/Damage → Replace.
   - Middle drive shaft ③
   - Middle driven shaft ④
     Bends/Damage → Replace.

NOTE:
When the middle gear and/or middle driven shaft are replaced, be sure to adjust the middle gear shim(s), refer to the "MIDDLE GEAR SHIM SELECTION" section.

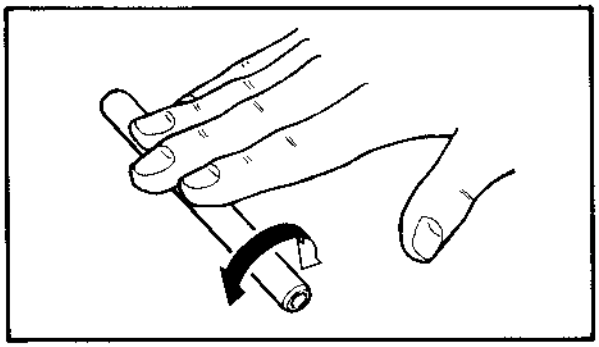
2. Inspect:
   - Bearings ⑤
     Pitting/Damage → Replace.
   - Oil seal ⑥
     Wear/Damage → Replace.



3. Check:
   - Universal joints ①
   - Yoke ②
   - Bearings ③
     Wear/Cracks/Damage → Replace.



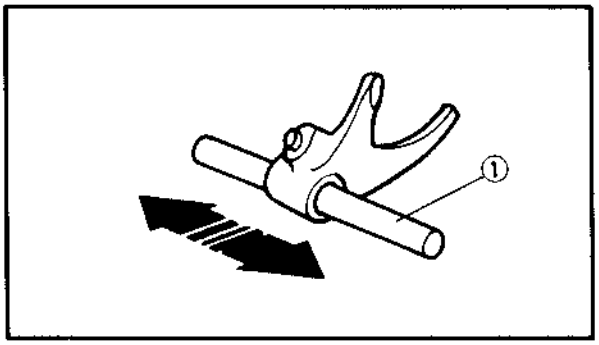
4. Inspect:
   - Shift fork 4 ①
     On the dog clutch and shift lever contact surfaces.
     Wear/Chafing/Bends/Damage → Replace.
   - Spring ②
     Wear/Damage → Replace.
   - Ball (stopper) ③
     Wear/Damage/Scratches → Replace.



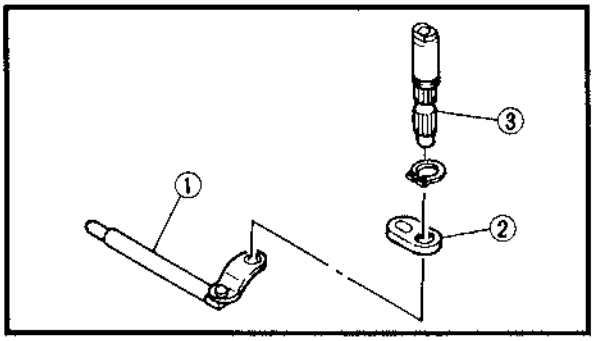
5. Inspect:
   - Guide bar
     Roll the guide bar on a flat surface.
     Bends → Replace.

⚠ WARNING

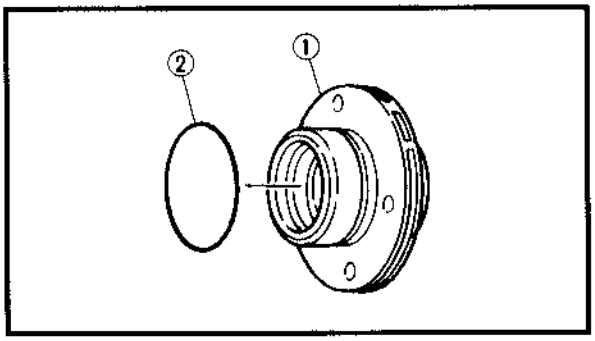
Do not attempt to straighten a bent guide bar.



6. Check:
   - Shift fork movement
     On its guide bar ①.
     Unsmooth operation → Replace fork and/or guide bar.



7. Inspect:
   - Stopper shaft ①
   - Shift lever ②
   - Shift lever shaft ③
     Bends/Cracks/Damage → Replace.



8. Inspect:
   - Bearing housing ①
     Cracks/Damage → Replace bearing housing assembly.
   - O-ring ②
     Wear/Damage → Replace.

NOTE:
When the bearing housing assembly is replaced, be sure to adjust the middle gear shim(s), refer to the "MIDDLE GEAR SHIM SELECTION" section.

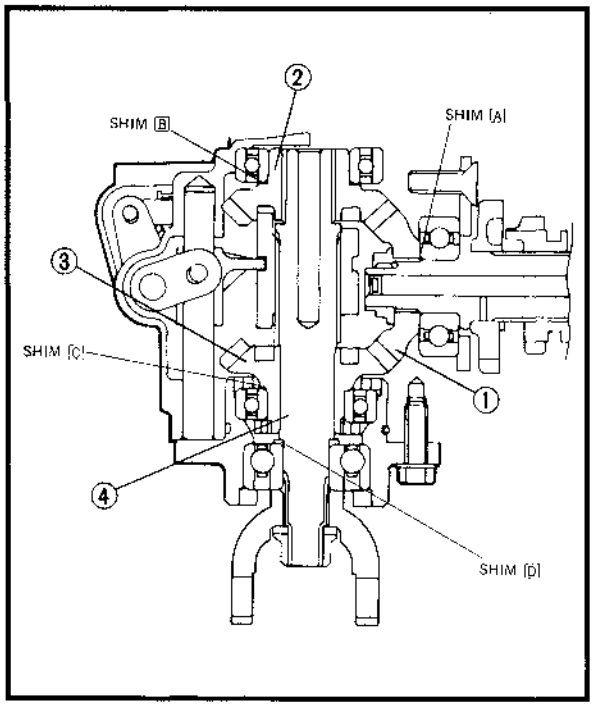
MIDDLE GEAR SHIM SELECTION

Install the crankcase, middle gears and middle driven shaft by using shim(s) with their respective thickness(es) calculated from the numbers specified on the following parts.

- Crankcase
- Drive pinion gear
- Driven pinion gear
- Reverse gear
- Bearing housing
- Middle driven shaft

Be sure to adjust the middle gear shim(s), when the following parts replaced.

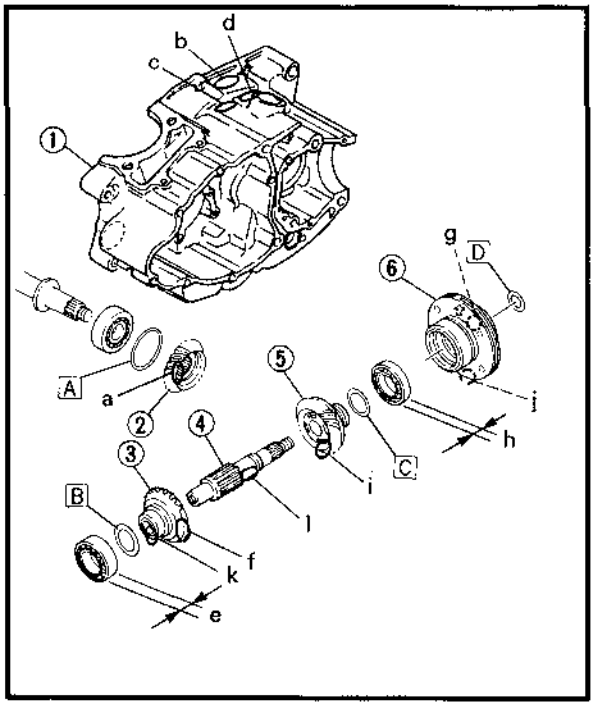
- Crankcase
- Drive pinion gear
- Driven pinion gear
- Reverse gear
- Bearing housing
- Middle driven shaft



Shim location

[A] = Drive pinion gear shim
[B] = Driven pinion gear shim
[C] = Reverse gear shim
[D] = Middle driven shaft shim

① Drive pinion gear
② Driven pinion gear
③ Reverse gear
④ Middle driven shaft



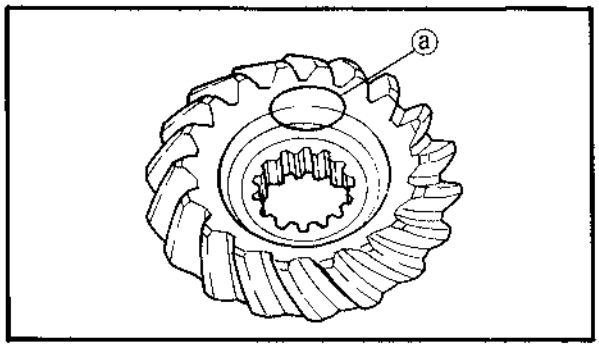
Replaced parts	Adjust shim
Crankcase	[A] [B] [C] [D]
Drive pinion gear	[A]
Driven pinion gear	[B] [D]
Reverse gear	[C] [D]
Bearing housing	[C] [D]
Middle driven shaft	[D]

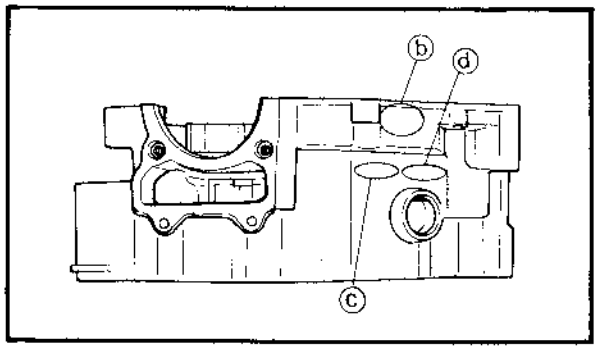
[A] = a – b
[B] = c – d – e – f
[C] = d – g – h – i
[D] = j + c – e – [B] – k – l – 0.25

① Crankcase (left)
② Drive pinion gear
③ Driven pinion gear
④ Middle driven shaft
⑤ Reverse gear
⑥ Bearing housing

NOTE:

- The gear back lash should be:
  0.1 mm ~ 0.2 mm forward
  0.1 mm ~ 0.25 mm rear
- Adjust the middle driven shaft in order to obtain the following thrust free play.
  0.1 mm ~ 0.4 mm





****

Middle gear shims selection steps:

Shim selection [A]

- When the crankcase and/or the drive pinion gear are replaced, be sure to adjust the drive pinion gear shim [A] .
- To find drive pinion gear shim thickness "A" use following formula:

Drive pinion gear shim thickness:
[A] = ⓐ − ⓑ

ⓐ = The stamped number on the drive pinion gear is either added to or substracted from "42".

ⓑ = The stamped number on the crankcase is added to from "41".

NOTE:

All stamped numbers are in hundredths of a mm.

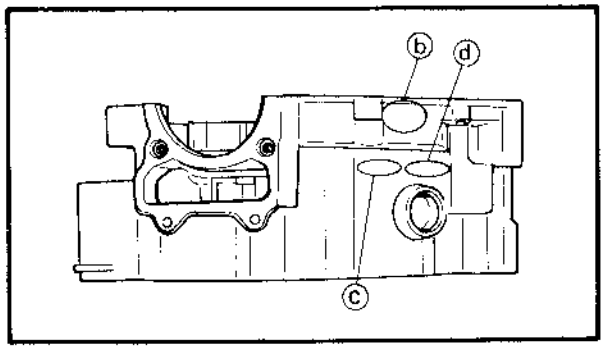
Example:

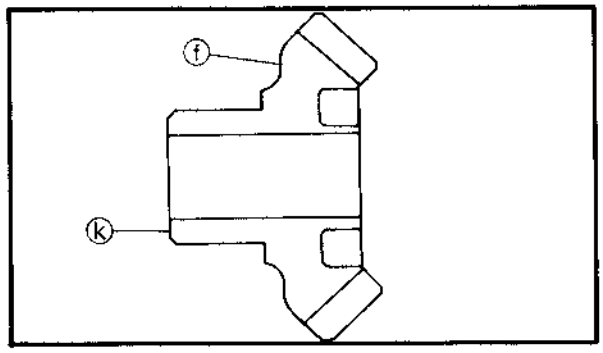
1) If the drive pinion gear is stamped "+02"
   .... ⓐ = 42 + 0.02 = 42.02
2) If the crankcase is stamped "45"
   ..... ⓑ is = 41 + 0.45 = 41.45
3) Therefore, shim thickness [A] is,
   [A] = 42.02 − 41.45 = 0.57 mm
4) Shim sizes are supplied in the following thickness:

	Drive pinion gear shim	
Thickness (mm)	0.15 0.20 0.30	0.40 0.50

Because shims can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim(s).

Hundredths	Round value
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	10





In the example above, the calculated shim thickness is 0.57 mm. The chart instructs you, however, to round off the 7 to 5, then shim thickness is 0.55 mm.

Shim selection [B]

- When the crankcase and/or the driven pinion gear are replaced, be sure to adjust the driven pinion gear shim [B] .
- To find driven pinion gear shim thickness "B" use following formula:

Driven pinion gear shim thickness:
[B] = ⓒ – ⓓ – ⓔ – ⓕ

ⓒ = The stamped number on the crankcase is added to from "110".
ⓓ = The stamped number on the crankcase is substracted from "59".
ⓔ = Bearing (driven pinion gear) thickness (considered constant) "13.00 mm".
ⓕ = The stamped number on the driven pinion gear is added to or substracted from "37.5".

Example:

1) If the drive pinion gear is stamped "45"
..... ⓒ = 110 + 0.45 = 110.45
2) If the crank case is stamped "–02"
..... ⓓ = 59 – 0.02 = 58.98
3) If the driven pinion gear is stamped "+02"
..... ⓕ = 37.5 + 0.02 = 37.52
4) Therefore, shim thickness [B] is,
[B] = 110.45 – 58.98 – 13.00 – 37.52 = 0.95 mm
5) Shim sizes are supplied in following thickness:

	Driven pinion gear shim	
Thickness (mm)	0.15 0.20 0.30	0.40 0.50

Because shims can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim(s).

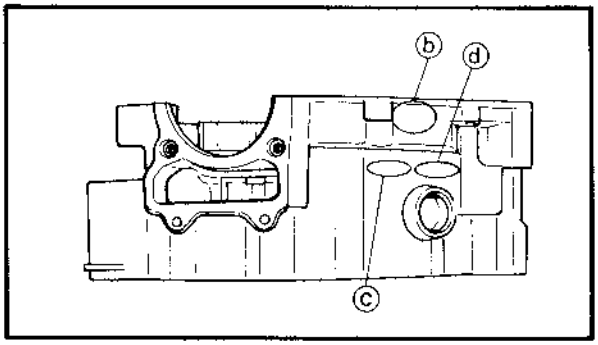
Hundredths	Round value
0, 1	0
2, 3	3
4, 5, 6	5
7, 8	8
9	10

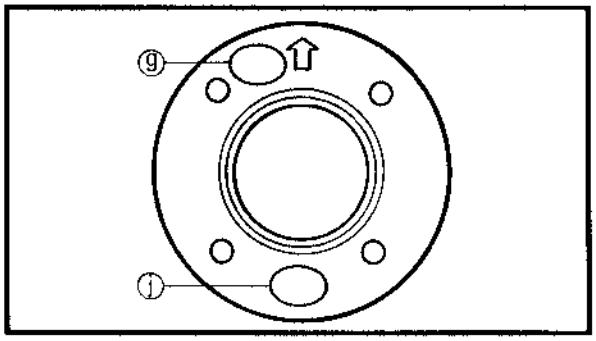
In the example above, the calculated shim thickness is 0.95 mm. The chart instructs you, however, to round off the 5 to 5, then shim thickness is 0.95 mm.

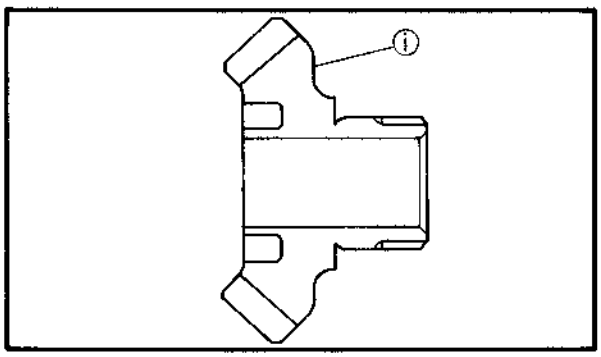
Shim selection [C]

- When the crankcase, reverse gear and/or bearing housing are replaced, be sure to adjust the reverse gear shim [C] .
- To find reverse gear shim thickness "C" use following formula:

Reverse gear shim thickness:
[C] = ⓓ − ⓖ − ⓗ − ⓘ







ⓓ = The stamped number on the crankcase is substracted from "59".
ⓖ = The stamped number on the bearing houging is substracted from "7.5".
ⓗ = Bearing (reverse gear) thickness (considered constant) "12.00 mm".
ⓘ = The stamped number on the reverse gear is added to or substracted from "39".

Example:

1) If the crank case is stamped "–02".
   ..... ⓓ = 59 − 0.02 = 58.98
2) If the bearing, hauging is stamped "–01".
   ..... ⓖ = 7.5 − 0.01 = 7.49
3) If the reverse gear is stamped "–02".
   ..... ⓘ = 39 − 0.02 = 38.98
4) Therefore, shim thickness [C] is,
   [C] = 58.98 − 7.49 − 12.00 − 38.98 = 0.51 mm
5) Shim sizes are supplied in following thickness:

	Reverse gear shim	
Thickness (mm)	0.15 0.20 0.30	0.40 0.50

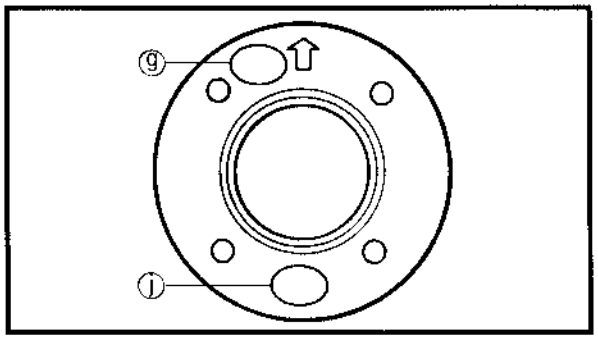
Because shims can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim(s).

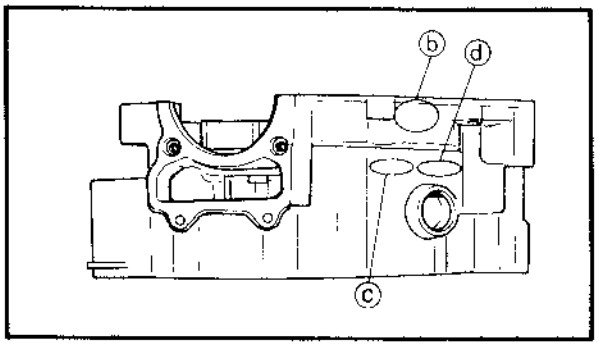
Hundredths	Round valve
0, 1	0
2, 3	3
4, 5, 6	5
7, 8	8
9	10

In the example above, the calculated shim thickness is 0.51 mm. The chart instructs you, however, to round off the 1 to 0, then shim thickness is 0.50 mm.

Shim selection [D]

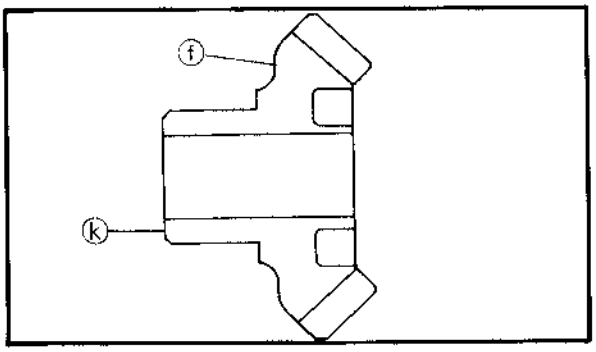
- When the crankcase, driven pinion gear, reverse gear, bearing housing and/or middle driven shaft are replaced, be sure to adjust the middle driven shaft shim [D] .
- To find reverse gear shim thickness "D" use following formula:

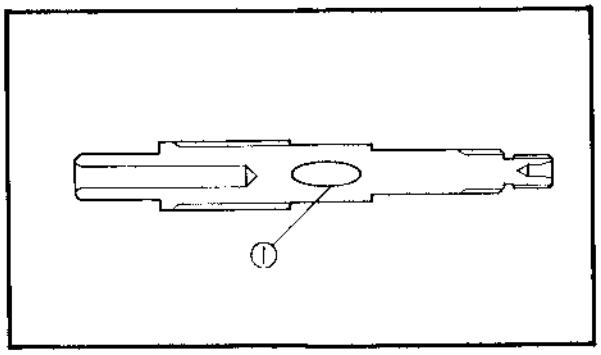




Middle driven gear thickness:
[D] = ⓙ + ⓒ − ⓔ − [B] − ⓚ − ⓛ − 0.25

ⓙ = The stamped number on the bearing hauging is substracted from "1".
ⓒ = The stamped number on the crankcase is added to from "110".
ⓔ = Bearing (driven pinion gear) width "13.00".
ⓚ = The stamped number on the driven pinion gear (forward gear) is substracted from "14.5".
ⓛ = The stamped number on the middle driven shaft is either added to or substracted from "80.5".





Example:

1) If the bearing hauging is stamped "–03".
   ..... Ⓙ = 1 – 0.03 = 0.7
2) If the crankcase is stamped "45"
   ..... Ⓒ = 110 + 0.45 = 110.45
3) If the pinion gear is stamped "–02"
   ..... Ⓚ = 14.5 – 0.02 = 14.48
4) If the middle drive shaft is stamped "03"
   ..... Ⓘ = 80.5 + 0.03 = 80.53
5) Therefore, shim thickness Ⓓ is,
   Ⓓ = 0.97 + 110.45 – 13.00 – 0.95 –
   14.48 – 80.53 – 0.25 = 2.21 mm
6) Shim sizes are supplied in following thickness:

	Middle driven gear shim	
Thickness (mm)	1.0	1.1
	1.2	1.3
	1.4	1.5
	1.6	1.7
	1.8	1.9

Because shims can only be selected in 0.10 mm increments, round off hundredths digit and select appropriate shim(s).

Hundredths	Round valve
0, 1, 2, 3, 4	0
5, 6, 7, 8, 9	10

If the example above, the calculated shim thickness 2.21 mm. The chart instructs you, however, to round off the 1 to 0, then shim thickness is 2.20 mm.

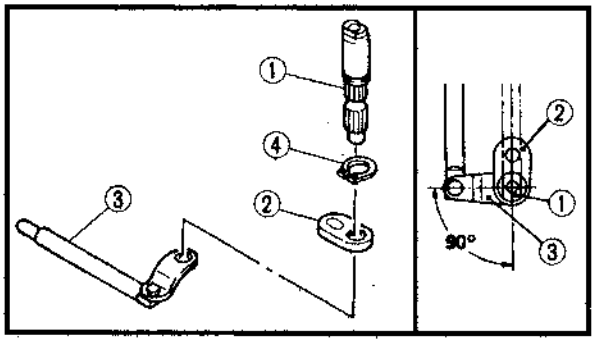
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ASSEMBLY

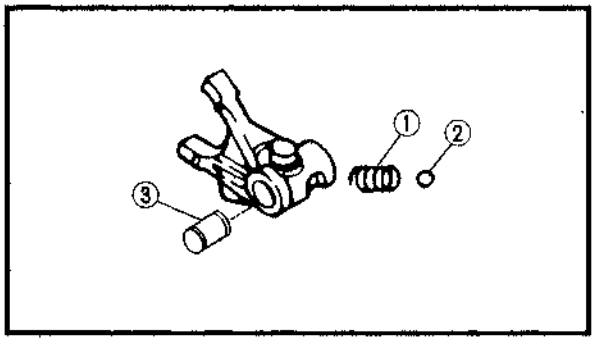
Reverse the "DISASSEMBLY" procedures.
Note the following points.

Middle driven shaft

1. Apply:
   - Lithium base grease
     To the oil seal and O-ring.



2. Install:
   - Shift lever shaft ①
   - Shift lever ②
   - Stopper shaft ③
   - Circlip ④



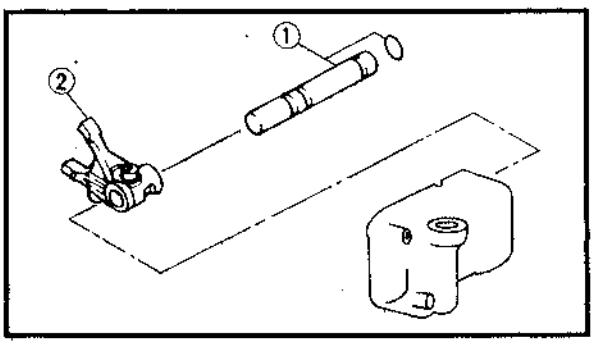
3. Install:
   - Spring ① (to shift fork 4)
   - Ball ②

NOTE:

When installing the shift fork 4 onto the shift fork guide bar, place a dowel pin ③ (used for a crank case cover) to hold the ball and spring in place.

4. Lubricate:
   - Apply the molybdenum disulfide oil to shift fork inner diameter and to the pin.

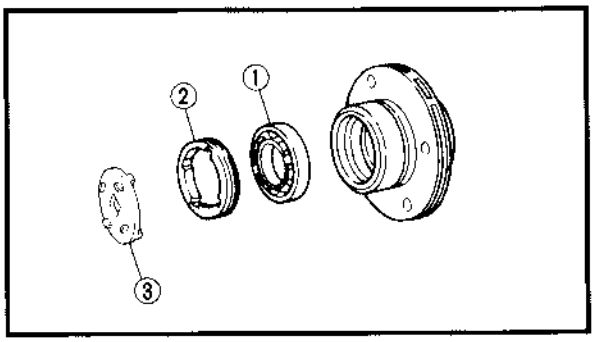
Molybdenum disulfide oil



5. Install:
   - Shift fork guide bar ① (with O-ring)
   - Shift fork 4 ②

NOTE:

- Remove the dowel pin from the shift fork 4.
- Make sure that the shift fork performs smoothly.



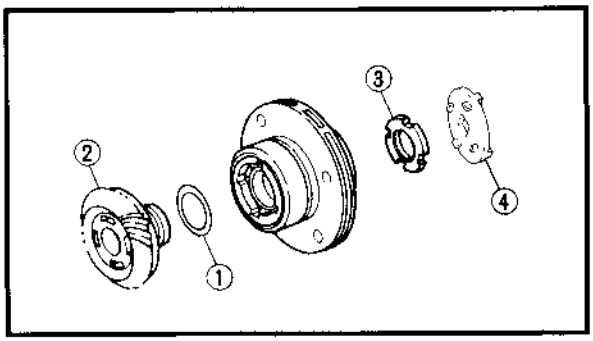
6. Install:
   - Bearing ① (to bearing housing)
   - Bearing retainer ②

NOTE:
- Use a Ring nut wrench ③.

Ring nut wrench:
P/N. YM-1391, 90890-01391

7. Tighten:
   - Bearing retainer

Bearing retainer:
60 Nm (6.0 m • kg, 43 ft • lb)



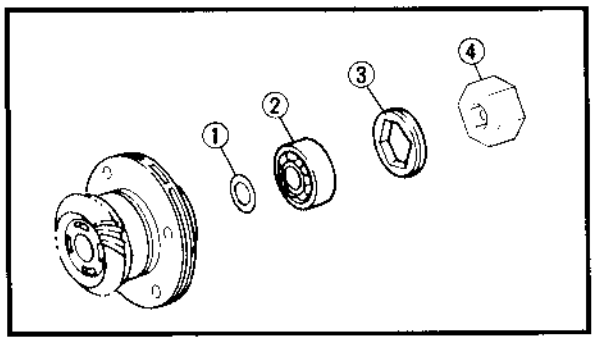
8. Install:
   - Shim(s) ①
   - Reverse gear ②
   - Reverse gear securing nut ③

NOTE:
- The reverse gear securing nut has left-hand threads, turn the nut counterclockwise to tighten it.
- Use a Ring nut wrench ④.

Ring nut wrench:
P/N. YM-1391, 90890-01391

9. Tighten:
   - Reverse gear securing nut

Reverse gear securing nut:
(LEFT-HAND-THREADS)
60 Nm (6.0 m • kg, 43 ft • lb)



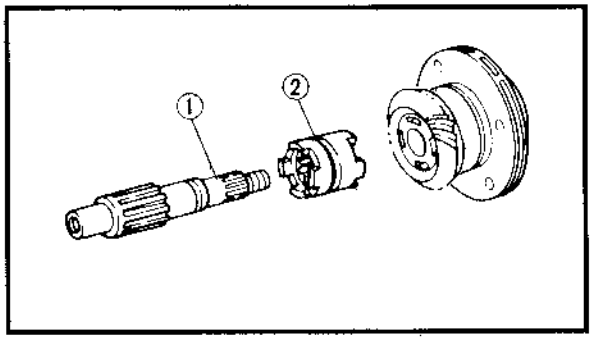
10. Install:
    - Shim(s) ①
    - Bearing ②
    - Bearing retainer ③

NOTE:
- Use a Bearing retainer wrench ④.

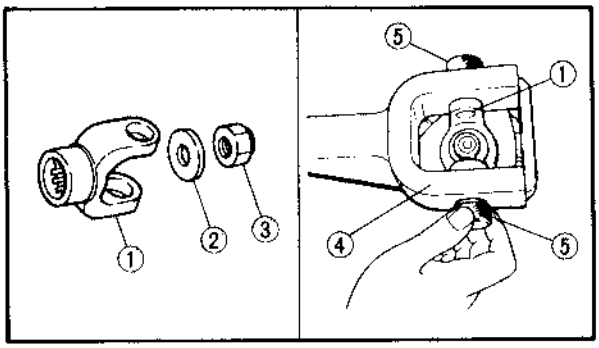
Bearing retainer wrench:
P/N. YM-33289, 90890-04104

11. Tighten:
- Bearing retainer

Bearing retainer:
60 Nm (6.0 m • kg, 43 ft • lb)
Use LOCTITE®



12. Install:
- Middle driven shaft ①
- Dog clutch ②

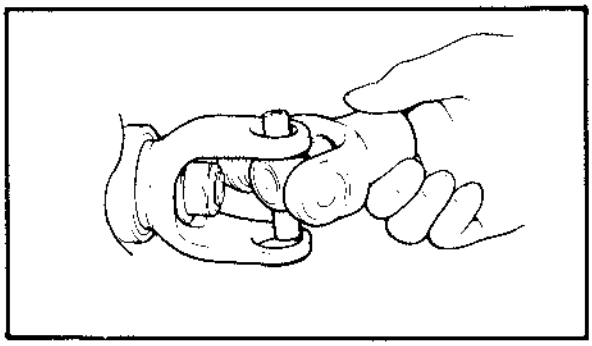


13. Install:
- U-joint ①
- Washer ②
- Nut ③ (U-joint)

NOTE:
Hold the U-join ① by the Universal Joint Holder ④ and Attachment ⑤ , and tighten the U-joint securing nut to specification.

Universal joint holder:
P/N. YM-04062, 90890-04062
Attachment:
P/N. YM-33291, 90890-04096

Nut (U-Joint):
60 Nm (6.0 m • kg, 43 ft • lb)
Use LOCTITE®

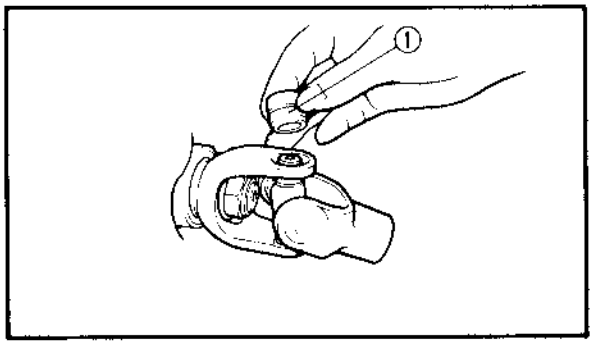


14. Install
    - Universal joint

****

Installation steps:

- Install the opposite yoke into the U-joint.
- Apply the "Wheel bearing grease" to the bearings.
- Install the bearing ① onto the yoke.



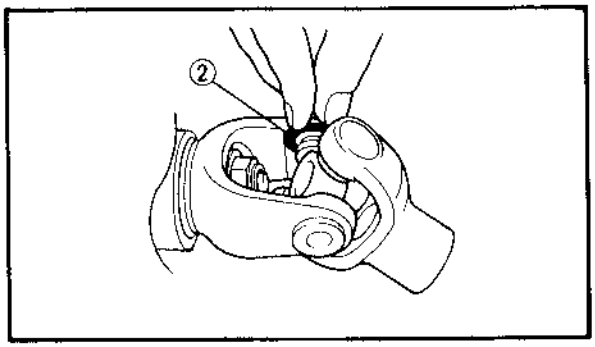
CAUTION:

Check each bearing. The needles can easily fall out of their races. Slide the yoke back and forth on the bearings; the yoke will not go all the way onto a bearing if a needle is out of place.

- Press each bearing into the U-joint using a suitable socket.

NOTE:

Bearing must be inserted far enough into U-joint so that circlip can be installed.

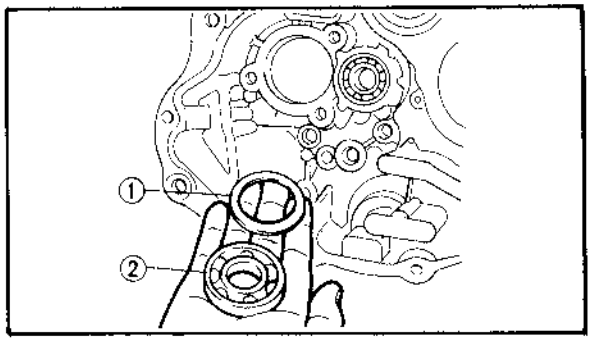


- Install the circlips ② into the groove of each bearing.

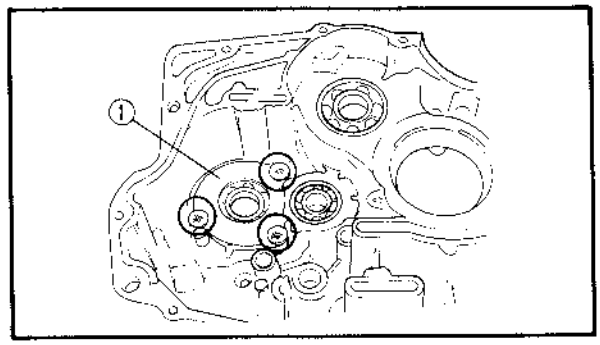
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Middle drive axle

1. Install:
    - Bearing ①
    - Shim ②

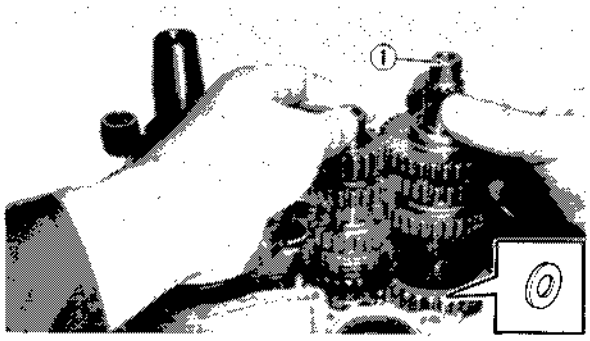


2. Install:
    - Bearing retainers ①
      Use a #40 Torx Driver.

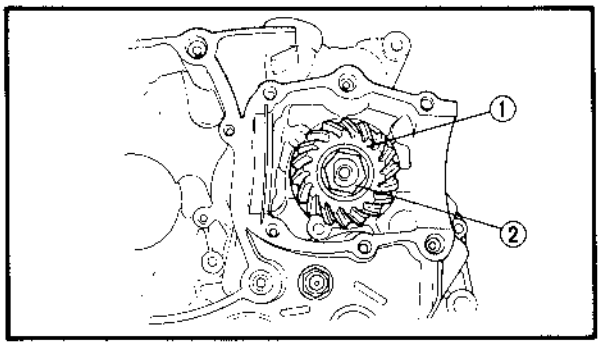




Bearing retainers:
25 Nm (2.5 m • kg, 18 ft • lb)
Use LOCTITE®



3. Install:
   - Middle drive axle assembly ①
     Refer to the "ENGINE ASSEMBLY AND ADJUSTMENT-CRANK SHAFT, TRANSMISSION AND BALANCER SHAFT" section in CHAPTER 4.



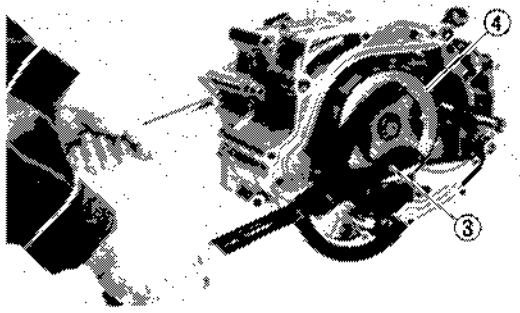
4. Install:
   - Middle drive pinion gear ①
   - Nut ②

	Nut (middle drive pinion gear): 60 Nm (6.0 m • kg, 43 ft • lb)

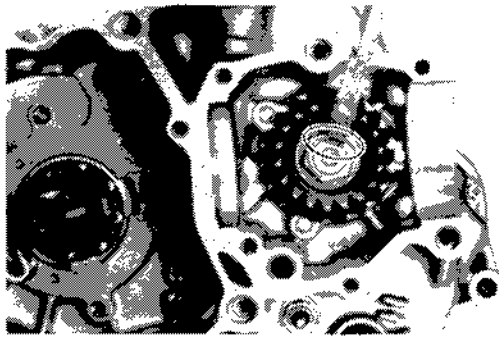
Use the Rotor Holder ③ to hold the clutch boss ④.

	Rotor holder: P/N. YU-01235, 90890-01235

NOTE:
Put the engine in 1st, and carry out the operation.



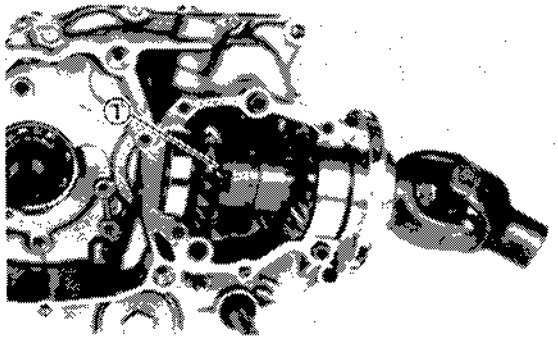
5. Check:
   - Middle drive axle, transmission and shifter operation
     Unsmooth operation → Repair.



6. Lock the thread with drift punch.

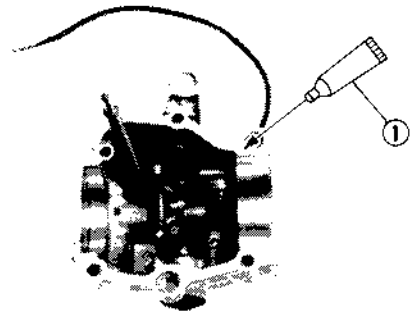
⚠ WARNING
Always use a new nut.

Refer to the "ENGINE ASSEMBLY AND ADJUSTMENT – PRIMARY AND SECONDARY CLUTCHES" section in CHAPTER 4.



Middle driven pinion gear

1. Install:
   - Middle driven pinion gear assembly ①
     Refer to the "ENGINE ASSEMBLY MIDDLE DRIVEN PINION GEAR" section in CHAPTER 4.

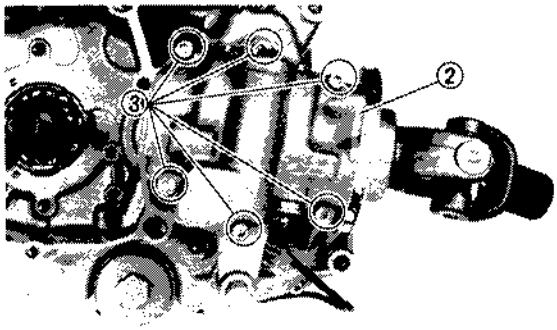


2. Apply:
   - Sealant ① (Quick gasket®)
     To the mating surface of both case halves.

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

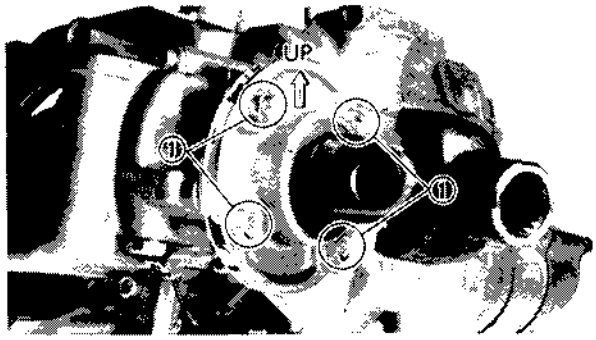
3. Install:
   - Dowel pins
   - Middle gear case cover ②

NOTE:
Before installing the middle gear case cover onto the crankcase, shift the gear into "FORWARD".



4. Tighten:
   - Bolts ③ (middle gear case)

	Bolts (middle gear case cover): **10 Nm (1.0 m • kg, 7.2 ft • lb)**



5. Tighten:
   - Bolts ① (bearing housing)

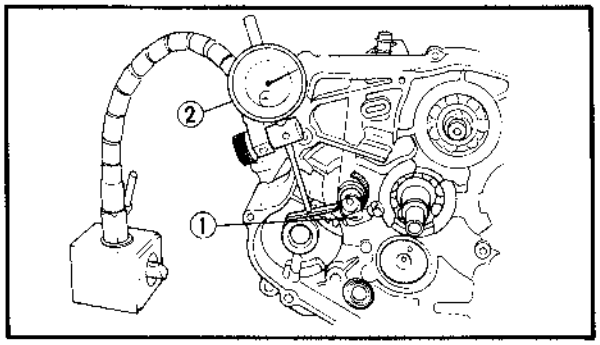
	Bolts (bearing housing): **25 Nm (2.5 m • kg, 18 ft • lb)**

NOTE:
When installing the bearing housing onto the crankcase, make sure that the arrow sign is facing upwards.

6. Check:
   - Middle driven shaft operation
     Unsmooth operation → Repair.

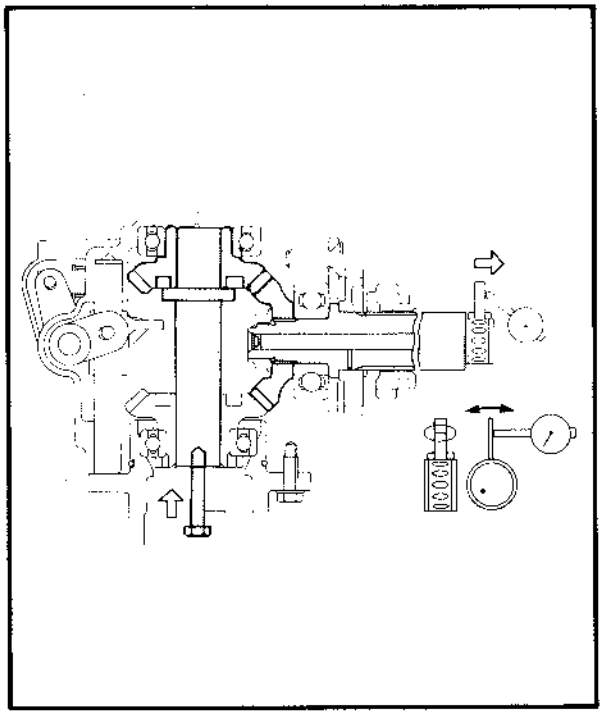
MIDDLE GEAR LASH ADJUSTMENT

NOTE:
When measuring backlash, tighten all securing bolts (middle gear case cover bearing housing) with specified torque.



1. Attach:
   - Gear lash measurement tool ①
   - Dial gauge ②

	Gear lash measurement tool: **P/N. YM-01231, 90890-01231** **Dial gauge:** **P/N. YM-03097, 90890-03097**

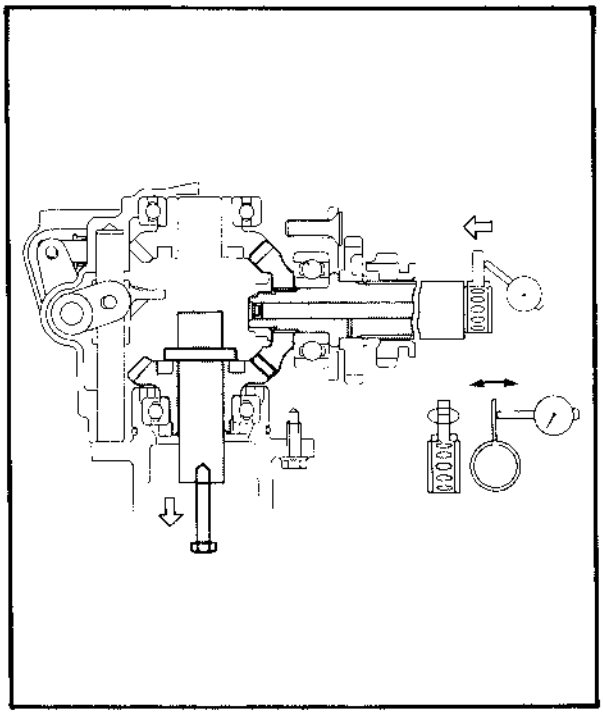


2. Shift:
   - Drive select lever
     For forward drive.

3. Measure:
   - Gear lash
     Gently rotate the middle drive axle from engagement to engagement.
     Over specified limit → Repair.

Middle driven gear lash:
(using measurement tool):
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

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



4. Shift:
   - Drive select lever
     For reverse drive

5. Repeat step 3.
   Over specified limit → Repair.

Reverse gear lash:
0.1 ~ 0.25 mm (0.004 ~ 0.010 in)

INSTALLATION

Revers the "REMOVAL" procedures.
Note the following points.

1. Remounting engine:
   Refer to the "ENGINE ASSEMBLY AND ADJUSTMENT – REMOUNTING ENGINE" section in CHAPTER 4.

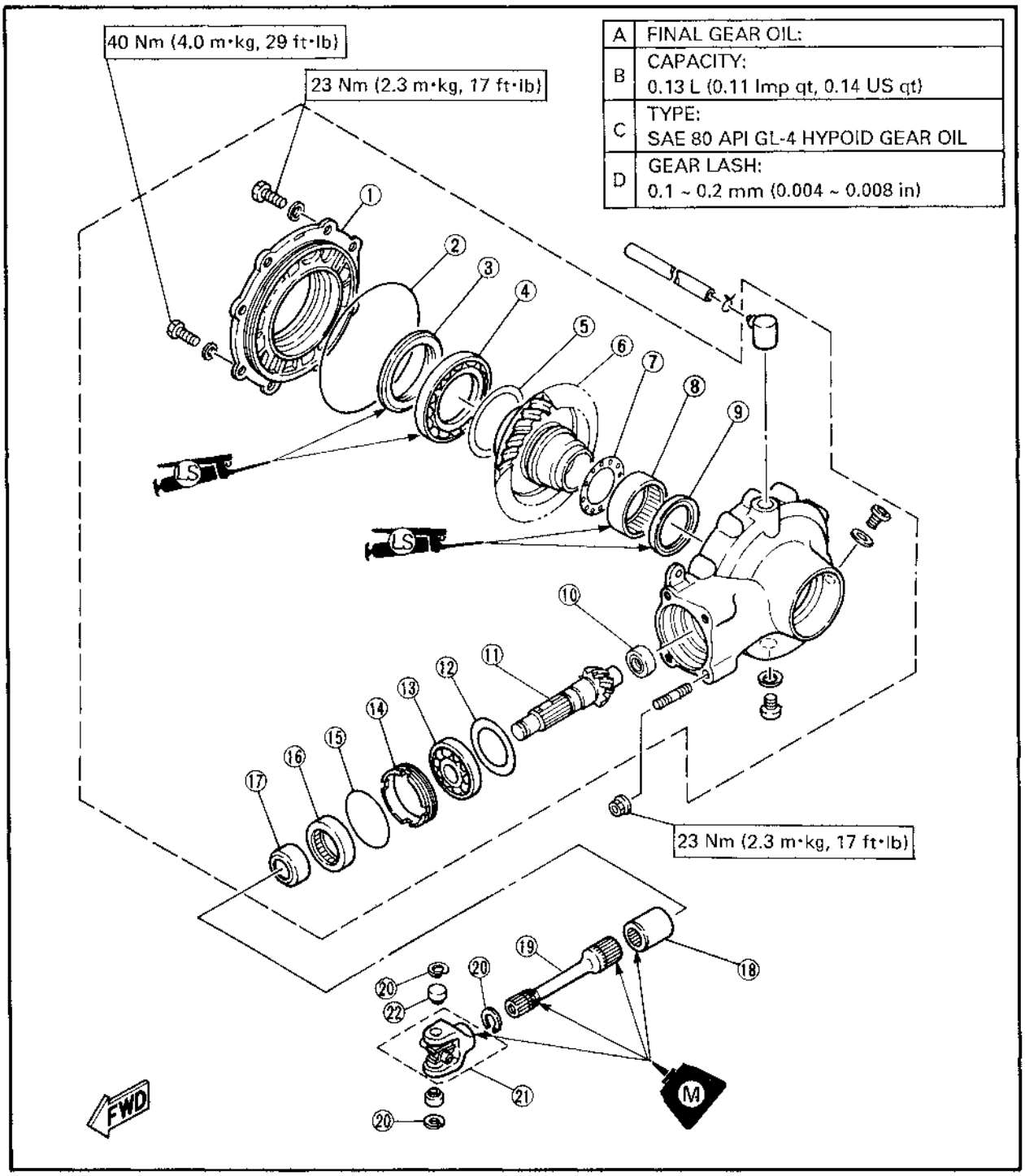
2. Install:
   - Rear wheel drive assembly and swingarm
     Refer to "REMOUNTING ENGINE" section in the CHAPTER 4.
3. Adjust:
   - Rear brake
     Refer to "REAR BRAKE LEVER AND PEDAL ADJUSTMENT" section in the CHAPTER 3.
4. Install:
   - Fuel tank
   - Fuel tank cover
   - Rear fender
   - Seat
   - Front fender
   - Front carrier (except for USA)
   - Rear carrier (except for USA)
     Refer to the "FENDERS AND FUEL TANK-Installation" section in CHAPTER 3.
5. Fill:
   - Crankcase

	Total amount: **1.8 L (1.6 Imp qt, 1.9 US qt)**

   Refer to the "ENGINE OIL REPLACEMENT" section in CHAPTER 3.
6. Check:
   - "REVERSE" indicator light operation
     Poor operation → Repair.

FINAL DRIVE GEAR AND DRIVE SHAFT

① Bearing housing
② O-ring
③ Oil seal
④ Bearing
⑤ Ring gear shim
⑥ Ring gear
⑦ Thrust washer
⑧ Bearing
⑨ Oil seal
⑩ Bearing
⑪ Drive pinion gear
⑫ Final drive gear shim
⑬ Bearing
⑭ Bearing retainer
⑮ O-ring
⑯ Oil seal
⑰ Collar
⑱ Coupling gear
⑲ Drive shaft
⑳ Circlip
㉑ Universal joint
㉒ Bearing



TROUBLESHOOTING

The following conditions may indicate damage drive train components:

Symptoms	Possible Causes
1. A pronounced hesitation or "jerky" movement during acceleration, deceleration, or sustained speed. (this must not be confused with engine surging or transmission characteristics.)	A. Bearing damage.
2. A "rolling rumble" noticeable at low speed; a high-pitched "whine"; a "clank" from a drive train component or area.	B. Improper gear lash.
3. A locked-up condition of the drive train mechanism, no power transmitted from engine to rear wheel.	C. Gear tooth damage.
	D. Broken drive shaft.
	E. Broken gear teeth.
	F. Seizure due to lack of lubrication.
	G. Small foreign object lodged between moving parts.

NOTE:

Areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from normal machine operating noise. If there is reason to believe these components are damaged, remove the components for specific inspection.

Inspection Notes

1. Inrestigate any unusual noises

****

The following "Noises" may indicate a machanical defect:

- A "rolling rumble" noise during coasting, acceleration, or deceleration. The noise increases with rear wheel speed, but it does not increase with higher engine or transmission speeds.
  Diagnosis: Possible wheel bearing damage.
- A "whining" noise that varies with acceleration and deceleration.
  Diagnosis: Possible incorrect reassembly, too-little gear lash.

CAUTION:

Too-little gear lash is extremely destructive to the gear teeth. If a test ride following reassembly indicates this condition, stop riding immediately to minimize gear damage.

- A slight "thunk" evident at low speed opration. This noise must be distinguished from normal machine operation.
  Diagnosis: Possible broken gear teeth.

⚠ WARNING

Stop riding immediately if broken gear teeth are suspected. This condition could result in a locking-up of the shaft drive assembly, causing loss of control of the dike and possible injury to the rider.

****

2. Inspect:
   - Drained oil
     Drain plug shows large amount of metal. Particles → Check bearing fur seizure.

NOTE:

A small amount of metal particles in the oil is normal.

3. Inspect:
   • Oil leakage
   By the following inspection steps.

****

Oil leakage inspection steps:

- Clean the entire machine thoroughly, then dry it.
- Apply a leak-localizing compound or dry powder spray to the shaft drive.
- Road test the machine long enough to locate the leak.

Leakage → Inspect component housing, gasket, and/or seal for damage.
Damage → Replace component.

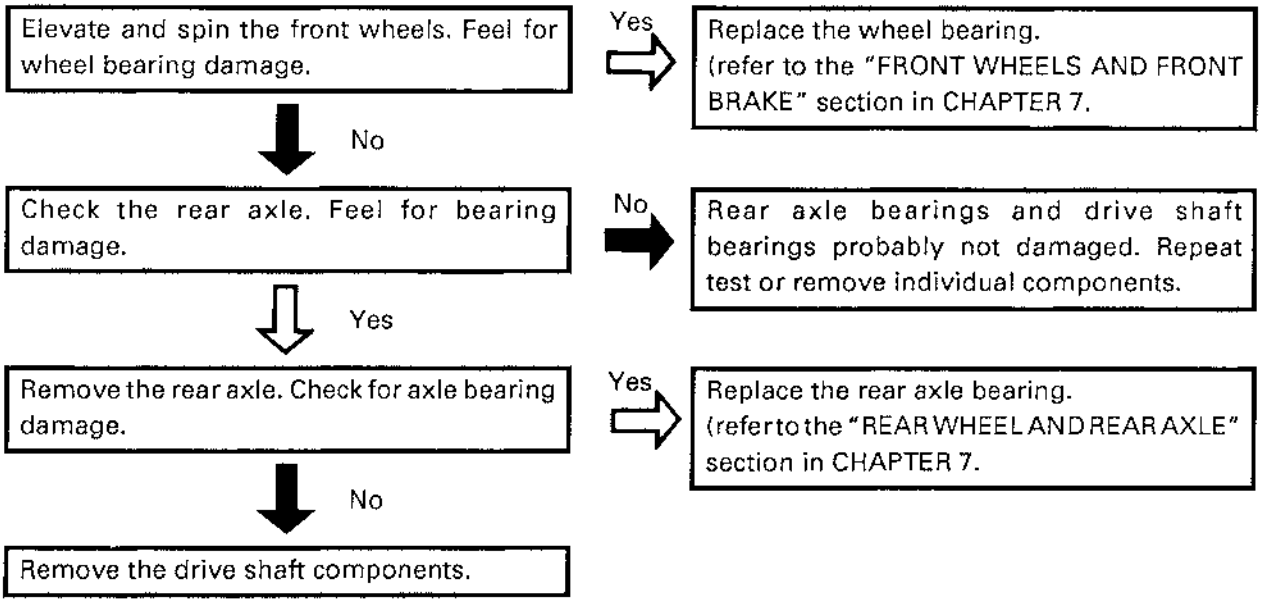
NOTE:

- An apparent oil leak on a new or nearly new machine may be the result of a restpreventative coating or excessive seal lubrication.
- Always clean the machine and recheck the suspected location of an apparent leakage.

****

Troubleshooting chart

When basic condition "a" and "b" above exist, check the following points:

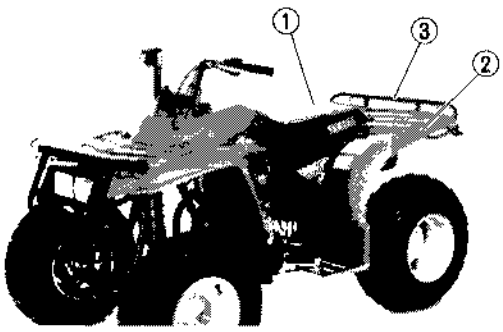


REMOVAL

⚠ WARNING

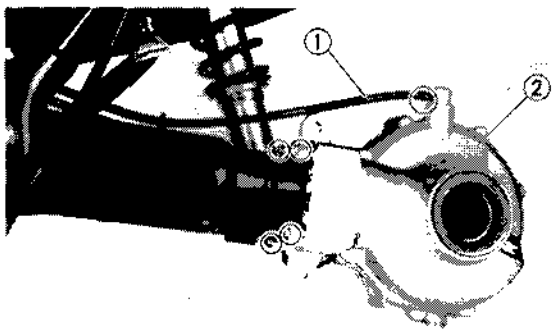
Securely support the machine so there is no danger of it falling over.

1. Drain:
   - Final gear oil
     Refer to the "FINAL GEAR OIL REPLACEMENT" section in CHAPTER 3.

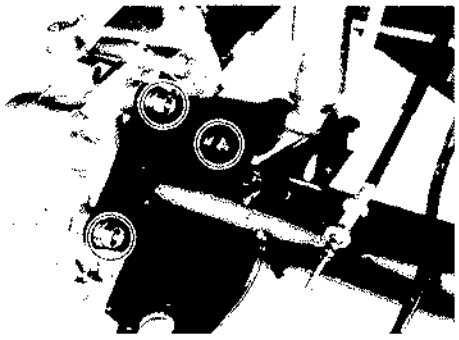


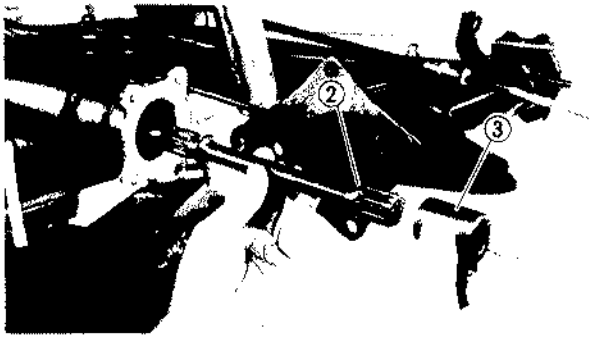
2. Remove:
   - Seat ①
   - Rear fender ②
   - Rear bumper ③
   - Rear carrier (except for USA)
     Refer to the "FENDERS AND FUEL TANK-REAR FENDER-Removal" section in CHAPTER 3.

3. Remove:
   - Rear wheel (left)
   - Wheel hub
   - Rear wheel (right)
   - Brake drum
   - Baking plate
   - Final gear case under cover
   - Rear axle
     Refer to "REAR WHEEL/REAR BRAKE AND REAR AXLE–Removal" section in CHAPTER 7.

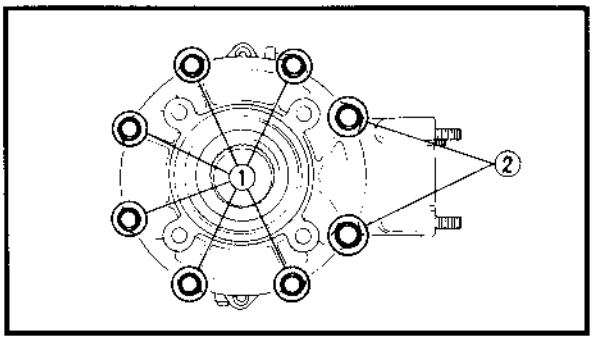


4. Disconnect:
   - Breather hose ① (final gear case)
5. Remove:
   - Final gear case unit ②





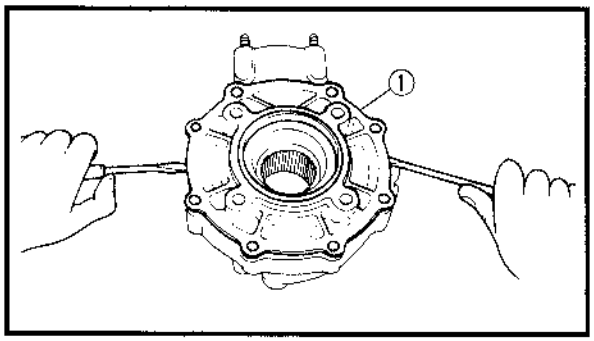
NOTE:
- When the final gear case until is removed from the swingarm, the drive shaft ② and coupling gear ③ may fall off.
- Be careful not to lose these parts.



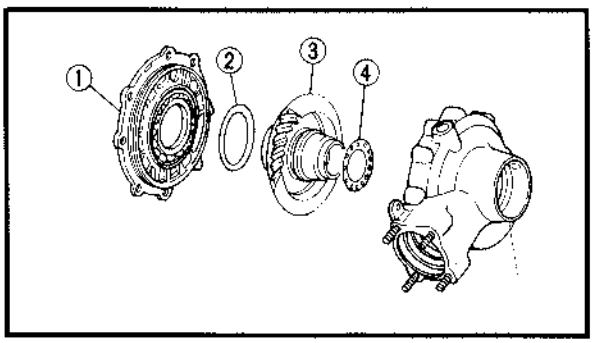
DISASSEMBLY

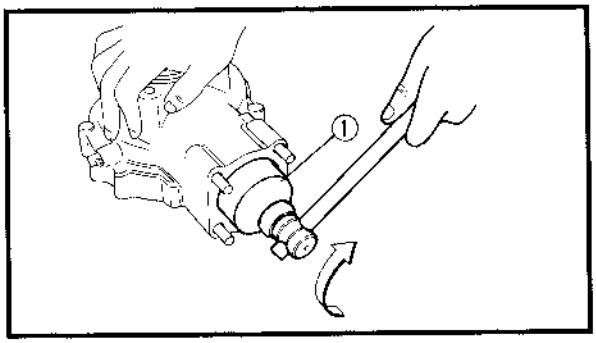
1. Remove:
   - Bolts ① (8 mm)
   - Bolts ② (10 mm)

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



2. Remove:
   - Bearing housing ①
   - Shim(s) ②
   - Ring gear ③
   - Thrust washer ④



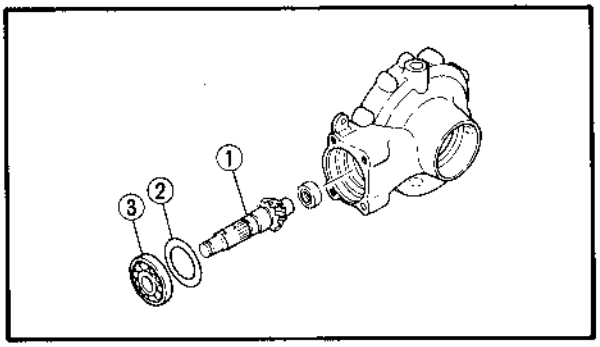


3. Remove:
   - Bearing retainer (drive shaft – final)

NOTE:
Final-drive-shaft-bearing-retainer has left-hand threads. Turn retainer clockwise to loosen it.

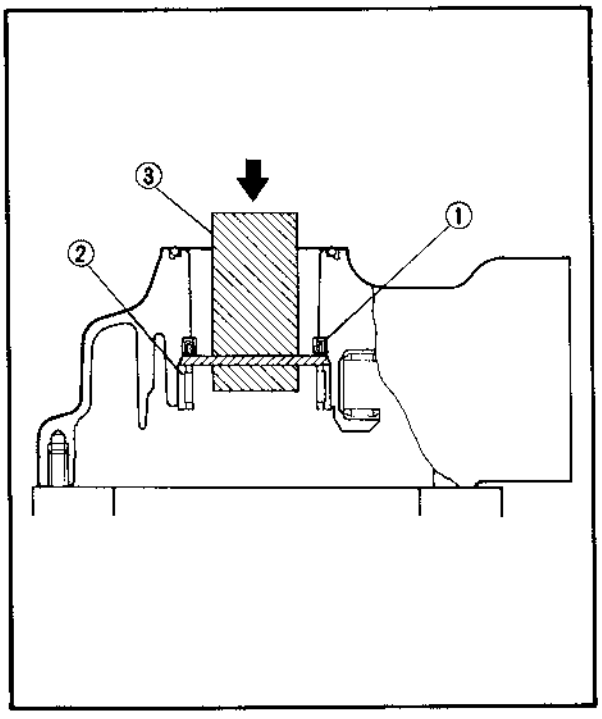
NOTE:
When remounting the bearing retainer, use the Bearing Retainer Wrench ① .

Bearing retainer wrench:
P/N. YM-04050, 90890-04050

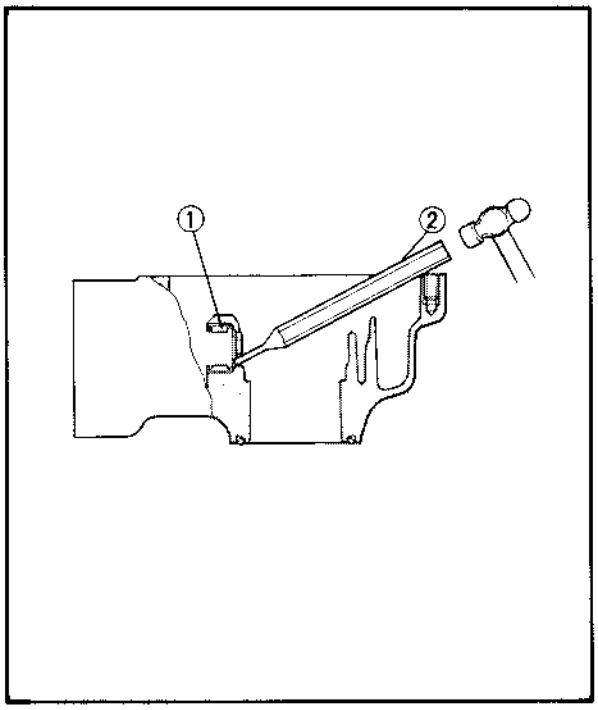


4. Remove:
   - Drive pinion gear ①
     (together with the shim(s) ② and bearing ③)
     Tap lightly on the final drive pinion gear end with a soft hammer.

CAUTION:
Final drive pinion gear removal should be performed only if gearing replacement is necessary. Do not reuse bearings or races after removal.



5. Remove:
   - Oil seal ①
   - Roller bearing ② (ring gear)
     Use a suitable press tool ③ and an appropriate support for the main housing.



6. Remove:
   - Roller bearing ① (drive pinion gear)

****

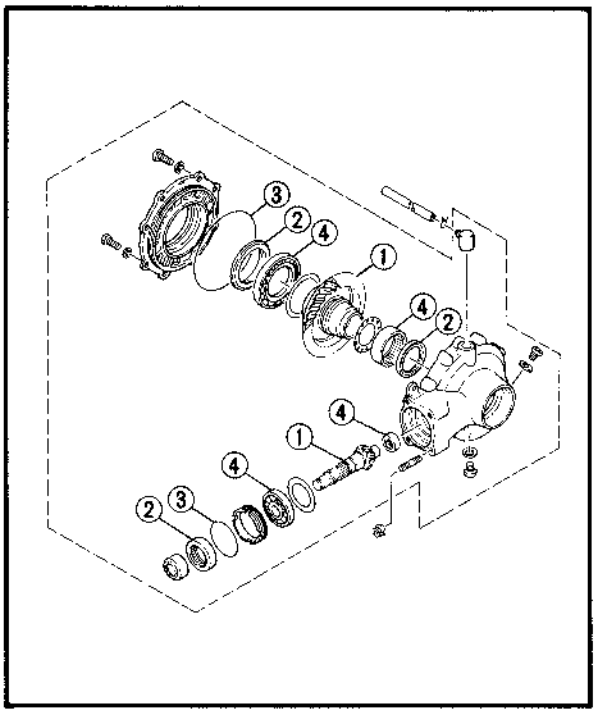
Removal steps:

- Heat the main housing only to 150°C (302°F).
- Remove the roller bearing outer race with an appropriately shaped punch ② .
- Remove the inner race from the final drive shaft.

NOTE:

The removal of the final drive shaft roller bearing is difficult and seldom necessary.

****

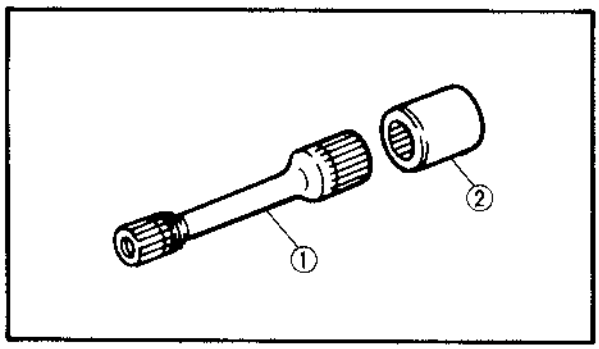


INSPECTION

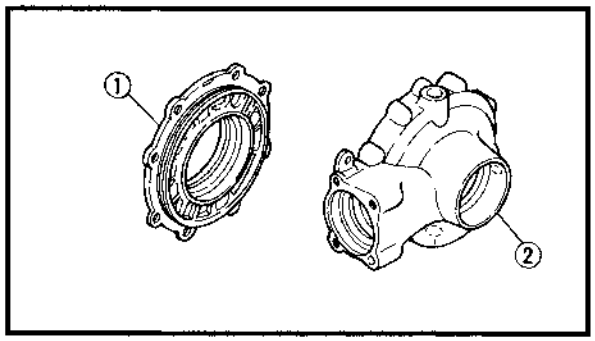
1. Inspect:
   - Gear teeth ①
     Pitting/Galling/Wear → Replace drive pinion gear and ring gear as a set.
   - Oil seal ②
   - O-ring ③
     Damage → Replace.
2. Inspect:
   - Bearings ④
     Damage → Replace.

NOTE:

- Reuse of roller bearing OK, but Yamaha recommends installation of new bearing. Do not reuse the oil seal.
- When the final drive pinion gear and/or ring gear are replaced, be sure to adjust the shim of the final drive pinion gear and/or ring gear, refer to the "FINAL DRIVE GEAR AND RING GEAR SHIM SELECTION" section.



3. Inspect:
   - Drive shaft ① (splines)
   - Coupling gear ② (spline)
     Wear/Damage → Replace.

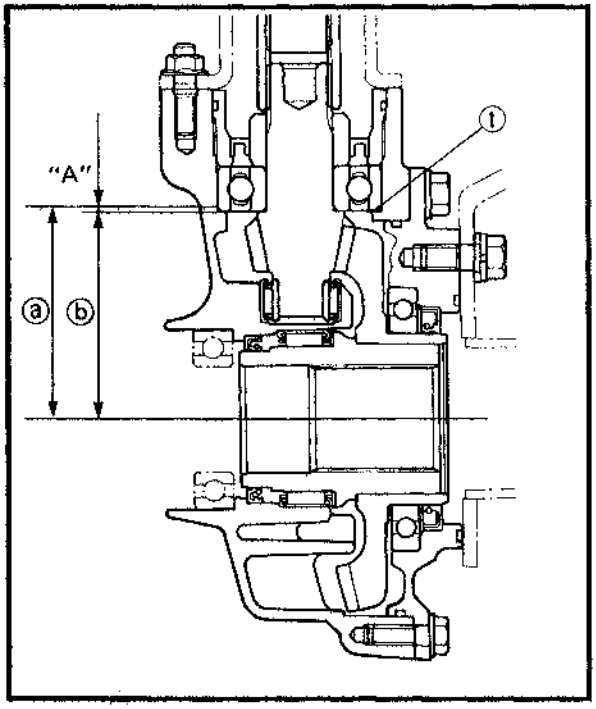


4. Inspect:
   - Final gear case ①
   - Bearing housing ② (ring gear)
     Cracks/Damage → Replace.

NOTE:
When the final gear case and/or ring gear bearing housing are replaced, be sure to adjust the shim of the final drive pinion gear and/or ring gear, refer to the "FINAL DRIVE GEAR AND RING GEAR SHIM SELECTION" section.

FINAL DRIVE PINION GEAR AND RING GEAR SHIM SELECTION

When the final drive pinion gear, ring gear, final gearcase and/or ring gear bearing housing are replaced, be sure to adjust the positions for the final drive pinion gear and ring gear by the shim(s).



Final drive pinion gear shim(s) selection

1. Select:
   - Final drive pinion gear shim(s) ①

****

Shim selection steps:

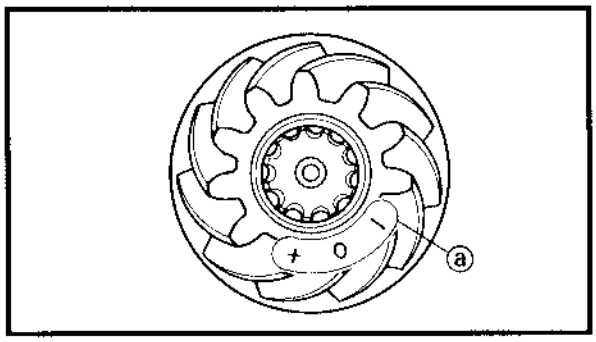
- To find final drive pinion gear shim thickness "A", use the following formula.

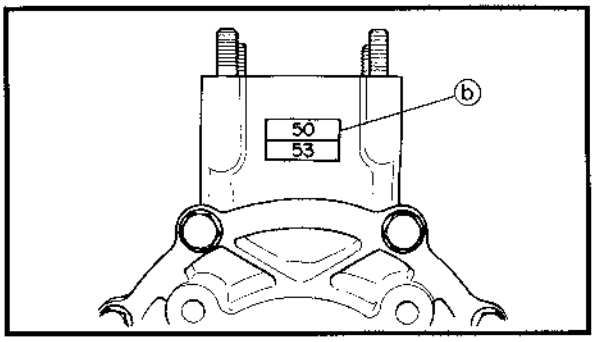
Final drive pinion gear shim thickness:
"A" = ⓐ − ⓑ

ⓐ = The stamped number on the final drive pinion gear is either added to or subtracted from "79".

ⓑ = The stamped number on the final gear case is either added to or subtracted from "78".

NOTE:
All stamped numbers are in hundredths of a mm.





Example:

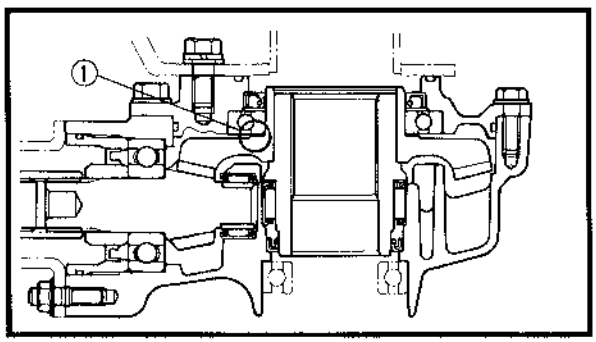
1) If the "+01" is stamped on the final drive pinion gear,
   ⓐ = 79 + 0.01 = 79.01
2) If the "50" is stamped on the final gear case,
   ⓑ = 78 + 0.50 = 78.50
3) Therefore, "A" is,
   "A" = 79.01 – 78.50 = 0.51 mm
4) Round off hundredths digit and select appropriate shim(s).
   In the example above, the calculated number is 0.51. The chart instructs you to round off 1 to 0 at the hundredth place.
   Thus, the shim thickness is 0.50 mm.

Hundredths	Round value
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	10

Shim sizes are supplied in the following thickness.

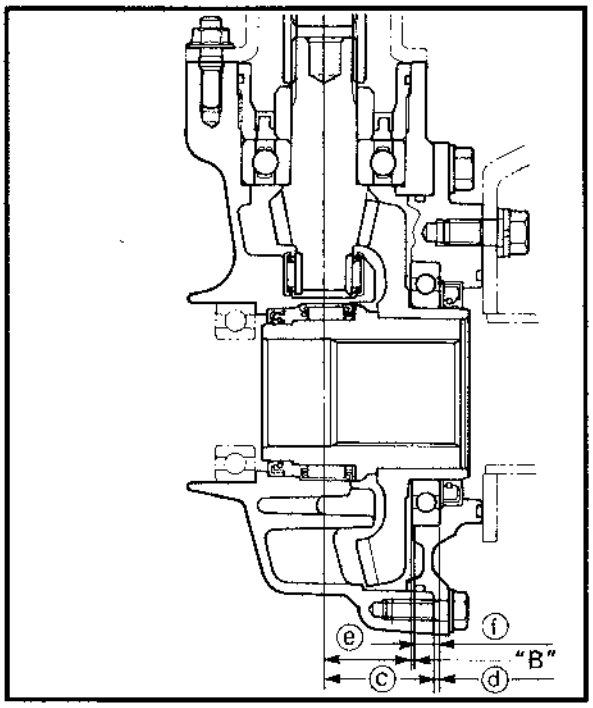
	Final drive pinion gear shim	
Thickness (mm)	0.15 0.30 0.40	0.50 0.60

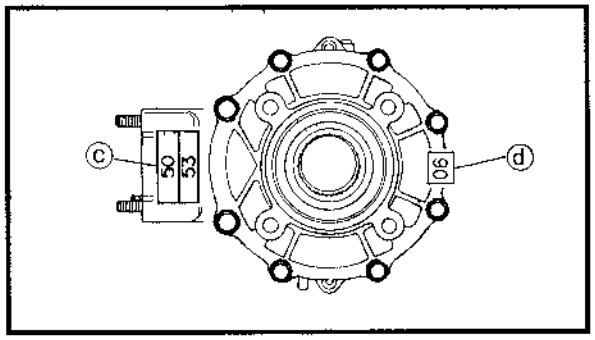
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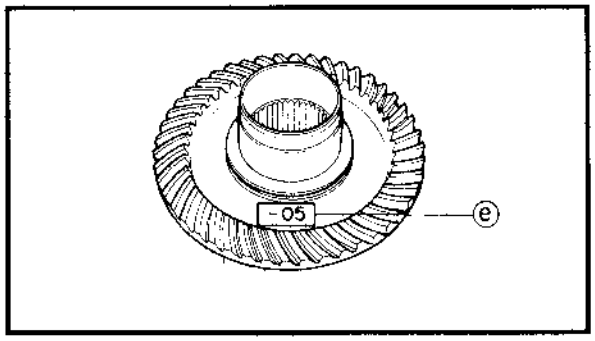


Ring gear shim(s) selection

1. Select:
   • Ring gear shim(s) ①







****

Shim selection steps:

- To find ring gear shim thickness "B", use the following formula.

Ring gear shim thickness:
"B" = ⓒ + ⓓ − (ⓔ + ⓕ)

ⓒ = The stamped number on the final gear case is either added to or subtracted from "42".
ⓓ = The stamped number on outside of ring gear bearing housing and added to "2".
ⓔ = The stamped number on inside of ring gear either added to or subtracted from "33".
ⓕ = Bearing thickness (considered constant) "11.00 mm".

Example:

1) If the "53" is stamped on the final gear case,
   ⓒ = 42 + 0.53 = 42.53
2) If the "06" is stamped on the ring gear bearing housing,
   ⓓ = 2 + 0.06 = 2.06 mm
3) If the "–05" is stamped on the ring gear,
   ⓔ = 33 – 0.05 = 32.95 mm
4) ⓕ = is 11.00.
5) Therefore, shim thickness "B" is,
   "B" = 42.53 + 2.06 – (32.95 + 11.00)
   = 44.58 - 43.95 = 0.64 mm
6) Round off hundredths digit and select appropriate shim(s).
   In the example above, the calculated number is 0.64. The chart instructs you to round off the 4 to 5 at the hundredth place.
   Thus, the shim thickness is 0.65 mm.

Hundredths	Round value
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	10

Shim sizes are supplied in the following thickness.

	Ring gear shim	
Thickness (mm)	0.25 0.30	0.40 0.50

****

ASSEMBLY

Reverse the "DISASSEMBLY" procedures.
Note the following points.

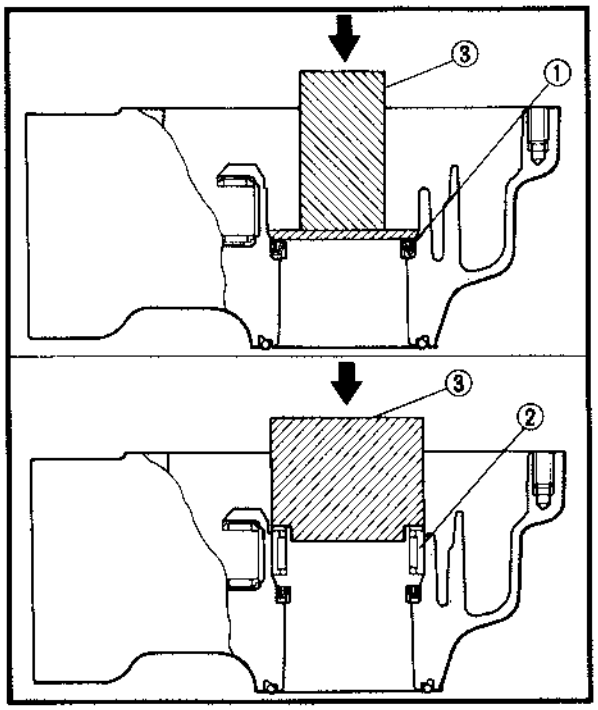
1. Install:
   - Roller bearing (drive pinion gear)

****

Installation steps:

- Heat the main housing only to 150°C (302°F)
- Install the roller bearing outer race using the proper adapted.
- Install the inner race onto the drive shaft.

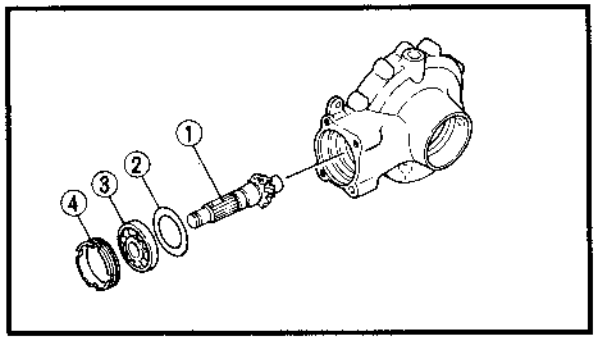
****



2. Install:
   - Oil seal ①
   - Roller bearing ② (outer race)
     Use a suitable press tool ③ and a press to install the above components into the main housing.

⚠ WARNING

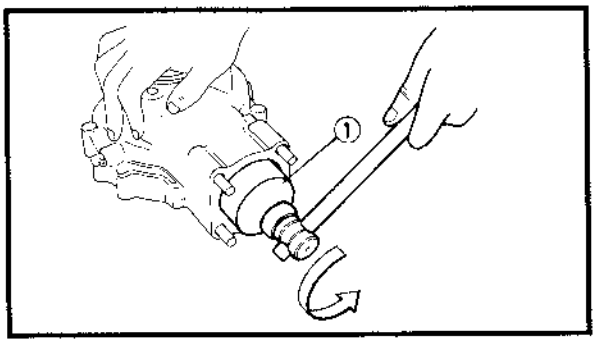
Always use a new oil seal.



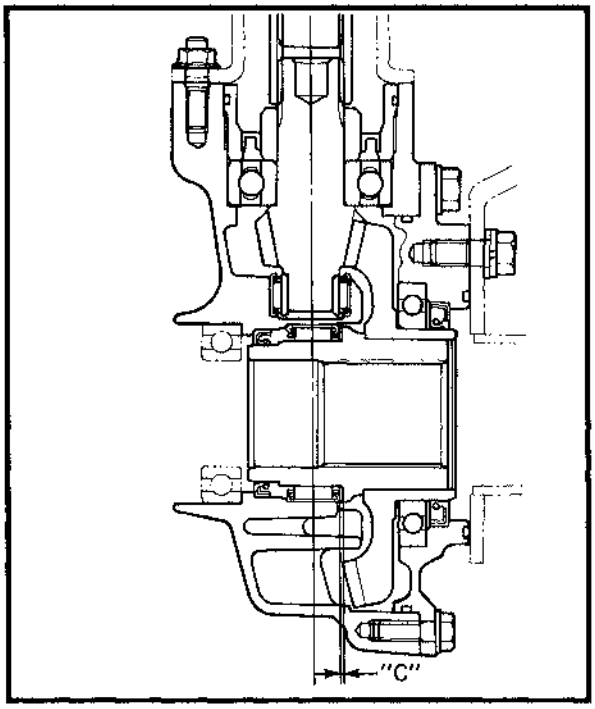
3. Install:
   - Drive pinion gear ① (with shim(s) ② and bearing ③)
     Shim(s) → (proper size as calculated)
   - Bearing retainer ④ (drive pinion gear)

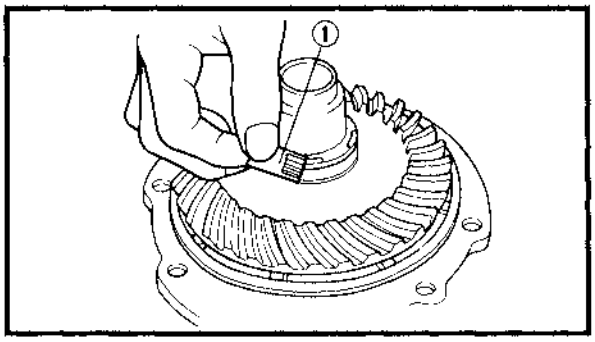
NOTE:

- The bearing retainer has left-hand threads; turn retainer counterclockwise to tighten it.
- Before installing the bearing retainer, apply the grease to the O-ring.
- When installing the bearing retainer, use the Bearing Retainer Wrench ① .



	**Bearing retainer wrench:** **P/N. YM-04050, 90890-04050**
	**Bearing retainer:** **100 Nm (10.0 m • kg, 72 ft • lb)**





Thrust washer selection

1. Measure/Select:
   - Ring gear thrust clearance "C"

****

Thrust clearance measurement steps:

- Place four pieces of Plastigage® between originally fitted thrust washer and ring gear.
- Install the ring gear assembly and tighten the bolts to specification.

10 mm Bolts (bearing housing):
40 Nm (4.0 m • kg, 29 ft • lb)
8 mm Bolts (bearing housing):
23 Nm (2.3 m • kg, 17 ft • lb)

NOTE:
Do not turn the shaft drive and ring gear when measuring clearance with Plastigage®.

- Remove the ring gear assembly.
- Measure the thrust clearance. Calculate width of flattened Plastigage® ①.

Ring gear thrust clearance:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

- If the out of specification, select the correct washer.

Thrust washer selection steps:

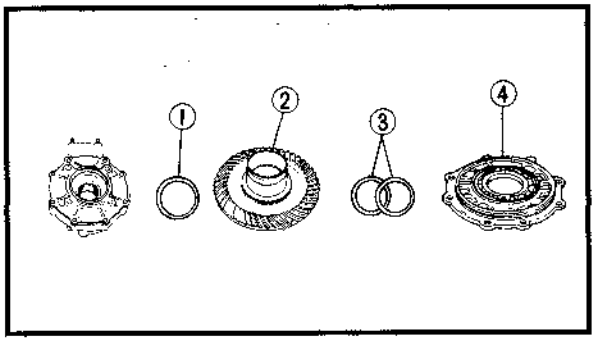
- Select the suitable thrust washer by the following chart.

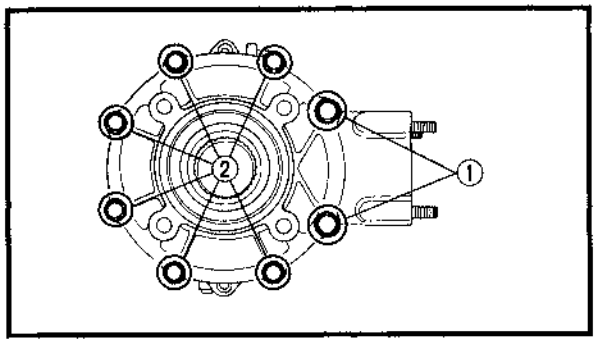
	Thrust washer		
Thickness (mm)	1.2	1.7	2.0
	1.4	1.8	2.1
	1.6	1.9	

- Repeat measurement steps until the ring gear thrust clearance is within the specified limits.

Ring gear thrust clearance:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

****





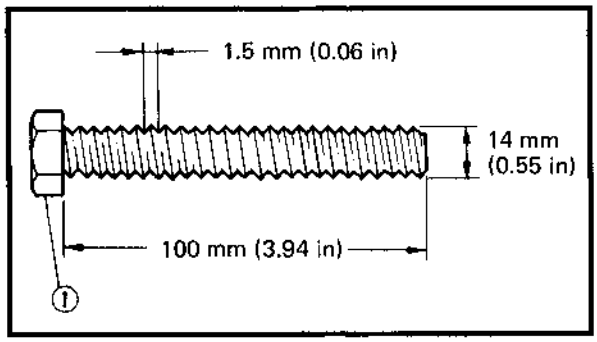
4. Install:
   - Thrust washer ①
   - Ring gear ②
   - Shim(s) ③ (proper size as calculated)
   - Bearing housing ④

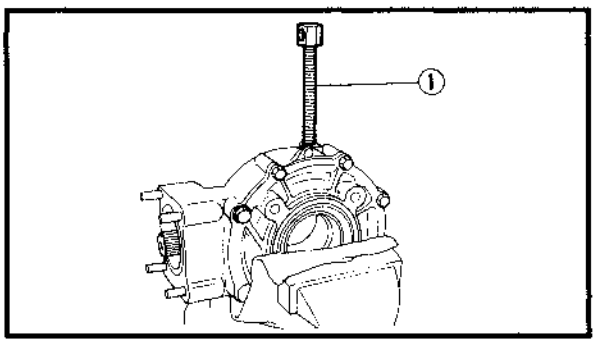
NOTE:
- Before installing the ring gear, apply the grease to the oil seal rips.
- Before installing the bearing housing, apply the grease to the O-ring.

5. Install:
   - 10 mm bolts ① (bearing housing)
   - 8 mm bolts ② (bearing housing)

NOTE:
Tighten the bolts in stage, using a crisscross pattern.

10 mm Bolts (bearing housing):
40 Nm (4.0 m • kg, 29 ft • lb)
8 mm Bolts (bearing housing):
23 Nm (2.3 m • kg, 17 ft • lb)



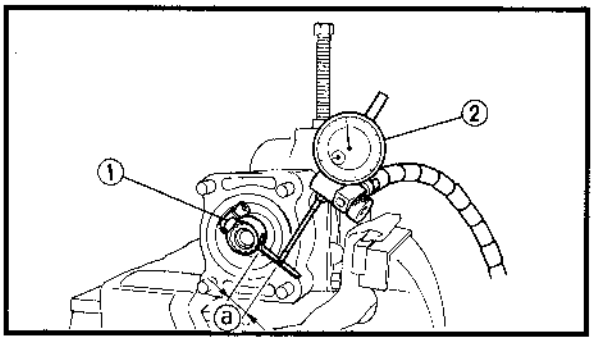


FINAL GEAR GEAR LASH MEASUREMENT AND ADJUSTMENT

Final gear gear lash measurement

1. Secure the gear case in a vise or other support.
2. Remove:
   - Drian plug
   - Gasket
3. Install:
   - A bolt of the specified size ①
     Into the drain plug hole.

CAUTION:
Finger tighten the bolt until it holds the ring gear. Otherwise, the ring gear will be damage.



4. Attach:
   - Gear lash measurement tool ①
   - Dial gauge ②

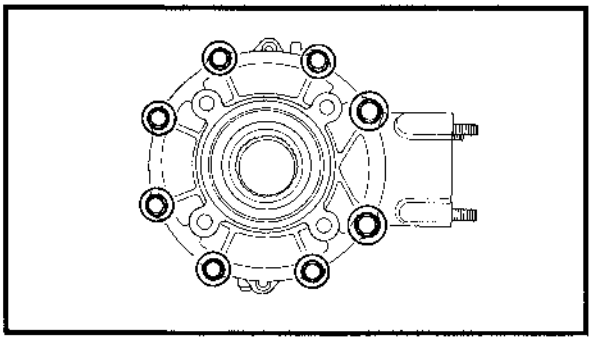
Gear lash measurement tool:
P/N. YM-01231, 90890-01231
Dial gauge:
P/N. YU-03097, 90890-03097

ⓐ Measuring point

5. Measure:
   - Gear lash
     Gently rotate the gear coupling from engagement to engagement.
     If the measured value in step 5 is different than that of the calculated value for shim size on page 6-32, repeat the following steps using the measured value in step 5.

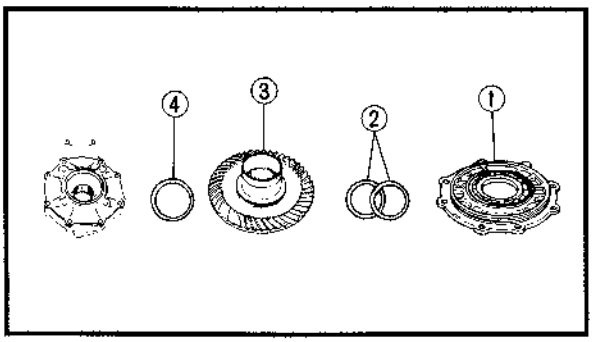
Final gear gear lash:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

NOTE:
Measure the gear lash at 4 positions rotate the shaft 90° each time.



Final gear lash adjustment

1. Remove:
   - 8 mm bolts (bearing housing)
   - 10 mm bolts (bearing housing)
     Refer to the "FINAL DRIVE GEAR AND DRIVE SHAFT – DISASSEMBLY" section.



2. Remove:
   - Bearing housing ①
   - Shim(s) ②
   - Ring gear ③
   - Thrust washer ④
     Refer to the "FINAL DRIVE GEAR AND DRIVE SHAFT–DISASSEMBLY" section.

3. Adjust:
   - Gear lash

****

Gear lash adjustment steps:

● Select the suitable shims and thrust washer by the following chart.

Too-little gear lash →
Reduce shim thickness.

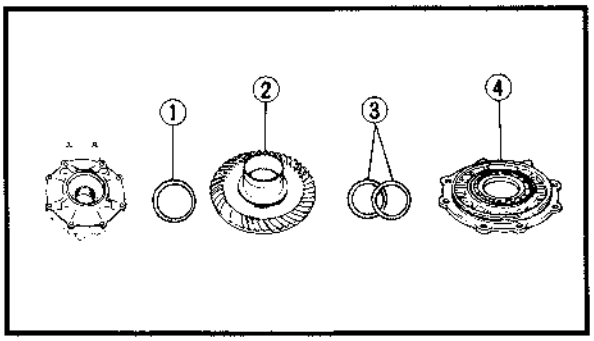
Too-large gear lash →
Increase shim thickness.

To add or reduce ring gear shim thickness	
Increase by more than 0.1 mm (0.004 in)	Reduce by more than 0.1 mm (0.004 in)
↓	↓
Reduce thrust washer thickness by 0.1 mm (0.004 in) for every 0.1 mm of ring gear shim increase. →	Reverse procedure

Ring gear shim			
Thickness (mm)	0.25 0.40	0.30 0.45	0.35 0.50

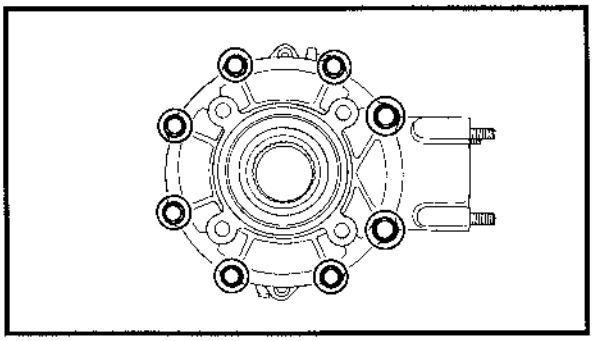
Thrust washer			
Thickness (mm)	1.2 1.4 1.6	1.7 1.8 1.9	2.0 2.1

****



4. Install:
   - Thrust washer ①
   - Ring gear ②
   - Shim(s) ③
   - Bearing housing ④

   Refer to the "FINAL DRIVE GEAR AND DRIVE SHAFT – ASSEMBLY" section.



5. Install:
   - 10 mm bolts (bearing housing)
   - 8 mm bolts (bearing housing)

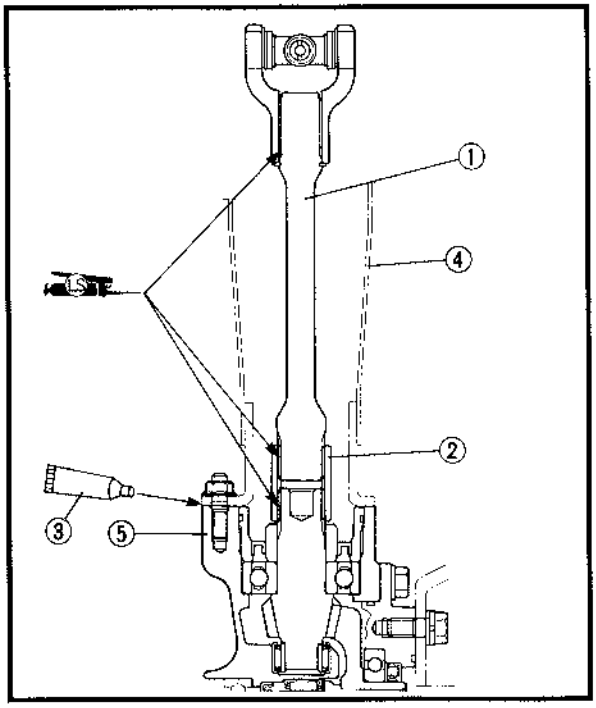
10 mm Bolts (bearing housing):
40 Nm (4.0 m • kg, 29 ft • lb)
8 mm Bolts (bearing housing):
23 Nm (2.3 m • kg, 17 ft • lb)

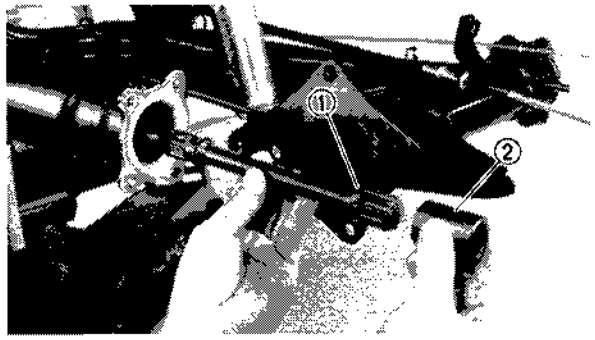
Refer to the "FINAL DRIVE GEAR AND DRIVE SHAFT – ASSEMBLY" section.

6. Measure:
   - Gear lash

   If the gear lash is incorrect ‣ Repeat.

Final gear lash:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)





INSTALLATION

Reverse the "REMOVAL" procedures. Note the following points.

1. Lubricate:
   - Drive shaft ① (splines)
   - Coupling gear ② (spline)

Lightweight lithium – soap base grease

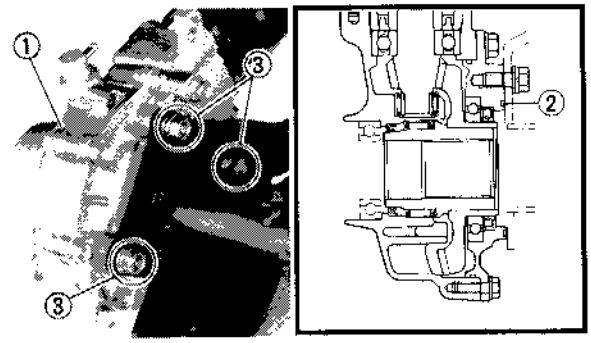
2. Apply:
   - Sealant ③

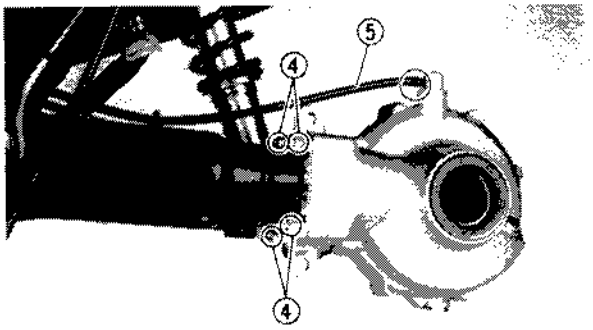
   (to matching surfaces of swingarm ④ and final gear case ⑤)

Sealant (Quick gasket®)
P/N. ACC-11001-05-01
Yamaha Bond No. 1215®:
P/N. 90890-85505

3. Install:
   - Drive shaft ①
   - Coupling gear ②

   (to universal joint)





4. Install:
   - Final gear case unit ①

NOTE:
Before instaling the final gear case unit, apply the grease to the O-ring ② .

Bolt (bearing housing – swing arm) ③ :
45 Nm (4.5 m • kg, 32 ft • lb)
Nut (gear housing – swing arm) ④ :
23 Nm (2.3 m • kg, 17 ft • lb)

5. Connect:
   - Breather hose ⑤ (final gear case)

CAUTION:
Make sure the final gear case breather hose is routed correctly.

6. Install:
   - Rear axle
   - Final gear case under cover
   - Baking plate
   - Brake drum
   - Rear wheel (right)
   - Wheel hub
   - Rear wheel (left)

   Refer to the "REAR WHEEL/REAR BRAKE AND REAR AXLE – Installation" section in CHAPTER 7.

7. Fill:
   - Final gear case

Recommended oil:
SAE 80 API "GL-4" hypoid gear oil
If desired, and SAE 80W90 hypoid gear oil may be used for all condition.
Oil quantity:
0.13 L (0.11 Imp qt, 0.14 US qt)

Refer to the "FINAL GEAR OIL PEPLACEMENT" section in CHAPTER 3.

8. Install:
   - Rear bumper
   - Rear fender
   - Seat
   - Rear carrier (except for USA)

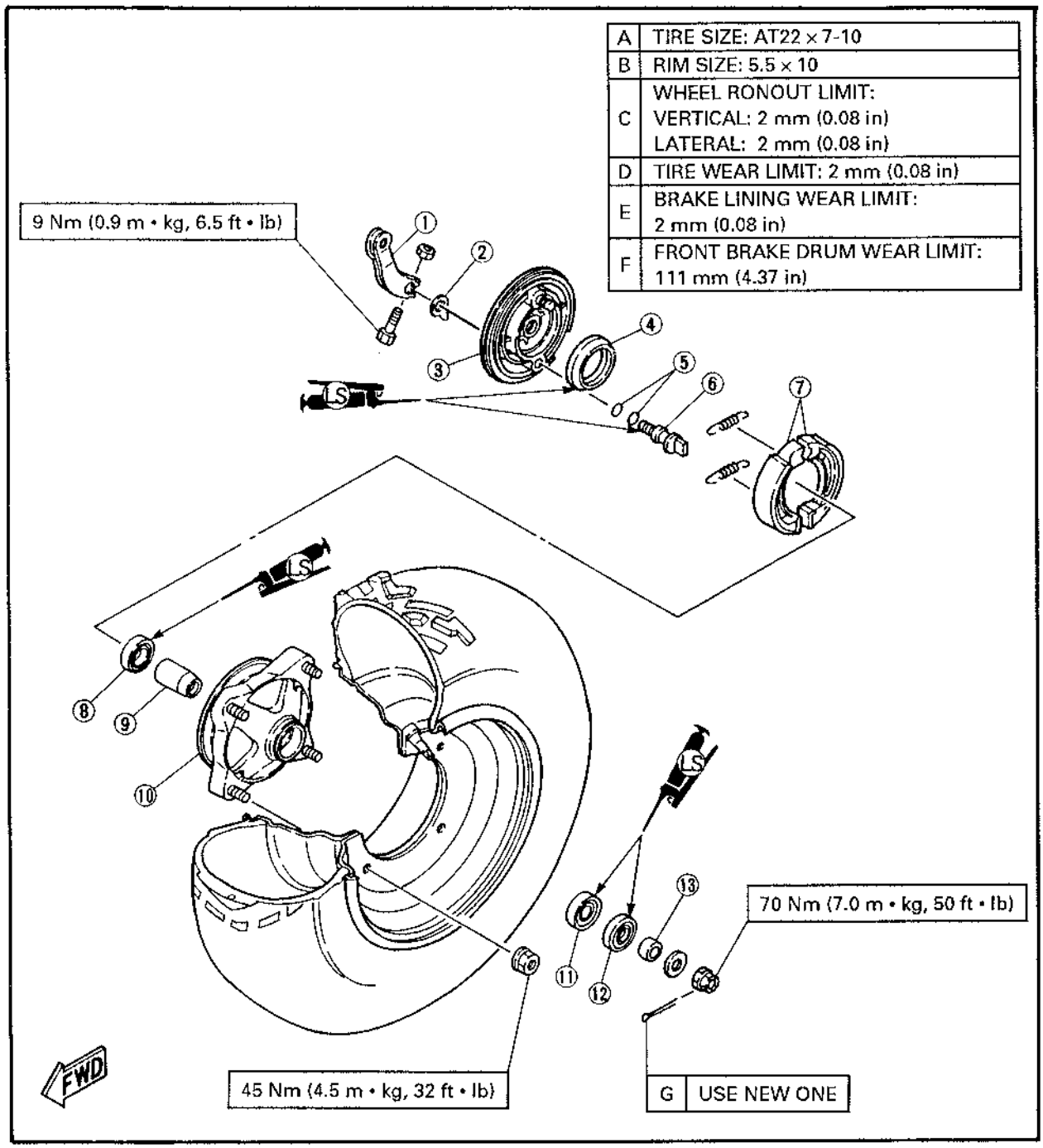
   Refer to the "FENDERS AND FUEL TANK-REAR FENDER-Installation" section in CHAPTER 3.

CHASSIS

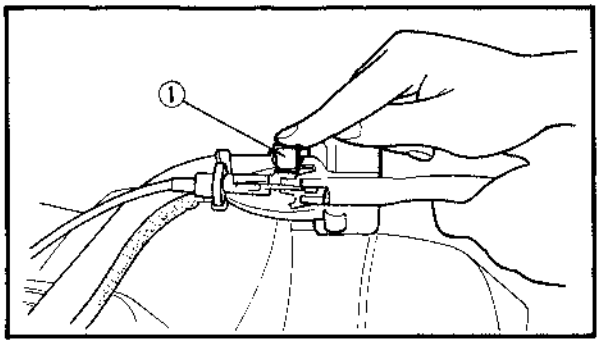
FRONT WHEELS AND FRONT BRAKE

① Cam lever
② Wear indicator plate
③ Brake shoe plate
④ Oil seal
⑤ O-ring
⑥ Camshaft
⑦ Brake shoe complete
⑧ Bearing
⑨ Bearing spacer
⑩ Front brake drum
⑪ Bearing
⑫ Oil seal
⑬ Collar

TIRE AIR PRESSURE		
Cold tire pressure	Front	Rear
Standard	20 kPa (0.2 kg/cm², 2.8 psi)	25 kPa (0.25 kg/cm², 3.6 psi)
Minimum	17 kPa (0.17 kg/cm², 2.4 psi)	22 kPa (0.22 kg/cm², 3.1 psi)
Maximum	23 kPa (0.23 kg/cm², 3.2 psi)	28 kPa (0.28 kg/cm², 4.0 psi)



7

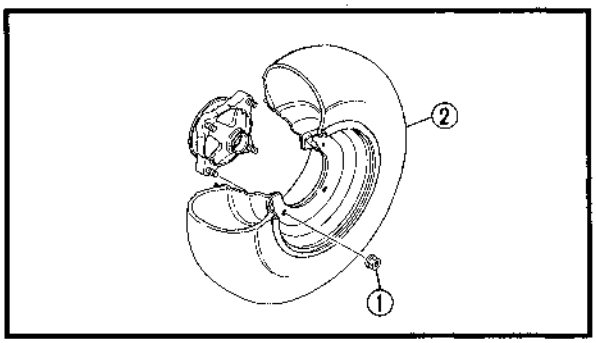


REMOVAL

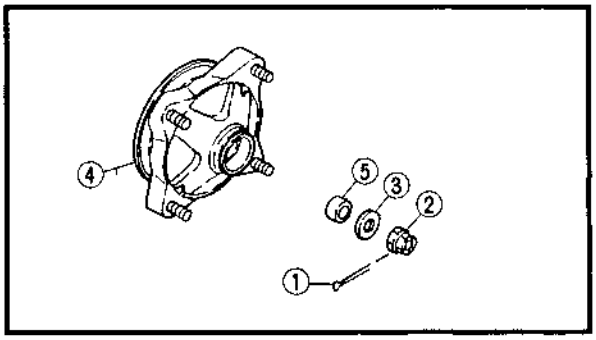
1. Place the machine on a level place.
2. Loosen:
   - Nuts (front wheel)
     Apply the parking brake ① .
3. Elevate the front wheels by placing the suitable stand under the frame.

⚠ WARNING

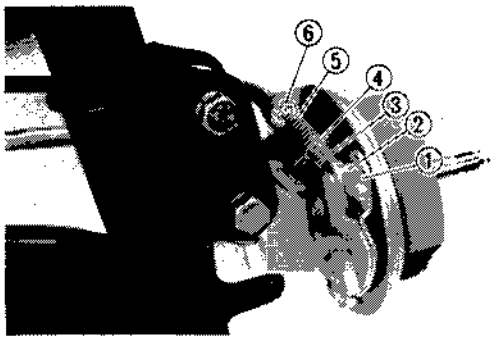
Securaly support the machine there is no danger of falling over.



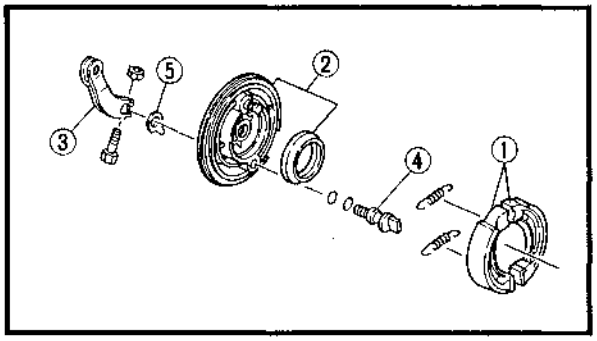
4. Remove:
   - Nuts ① (front wheel)
   - Front wheel ②



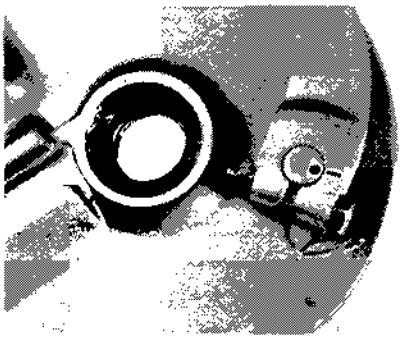
5. Remove:
   - Cotter pin ①
   - Axle nut ②
   - Plain washer ③
   - Brake drum ④
   - Spacer collar ⑤



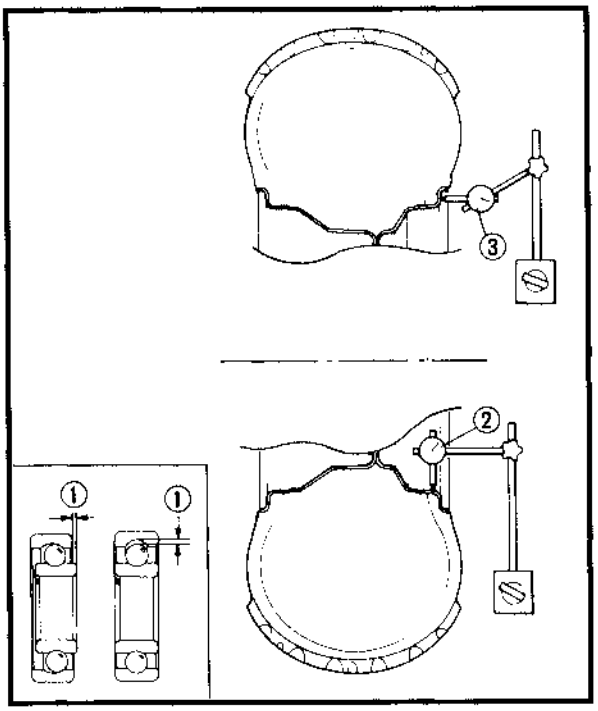
6. Remove:
   - Adjuster ①
   - Pin ②
   - Spring ③
   - Washer ④
   - Spring ⑤
   - Circlip ⑥
7. Disconnect:
   - Brake cable (from brake shoe plate)



8. Remove:
   - Brake shoes ①
   - Brake shoe plate ②
   - Cam lever ③
   - Camshaft ④
   - Wear indicator ⑤



NOTE:
Before removing the cam lever, put a match mark (punches) on the cam lever and camshaft to indicate their positions for easy assembly.

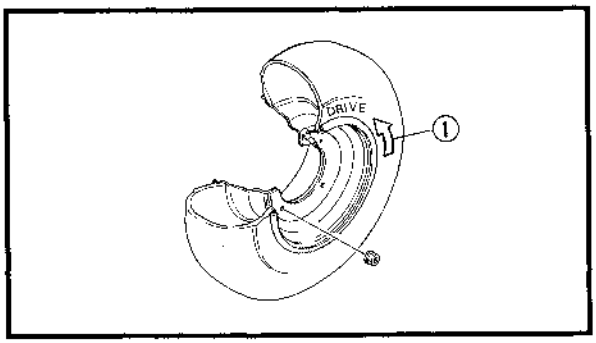


INSPECTION

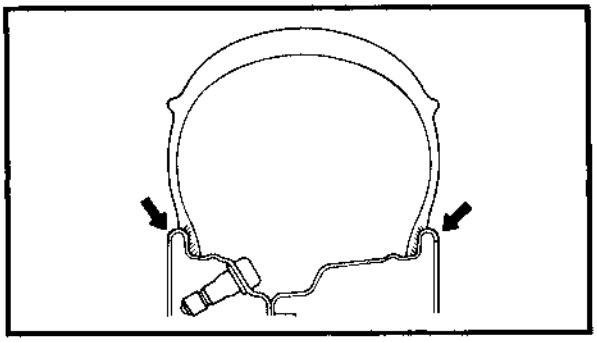
1. Inspect:
   - Wheel
     Refer to the "WHEEL INSPECTION" section in CHAPTER 3.
2. Measure:
   - Wheel runout
     Over specified limit → Replace wheel or check bearing play ①.

Rim runout limits:
Vertical ②: 2.0 mm (0.08 in)
Lateral ③: 2.0 mm (0.08 in)

3. Inspect:
   - Tire surfaces
     Wear/Damage → Replace.
     Refer to the "TIRE INSPECTION" section in CHAPTER 3.

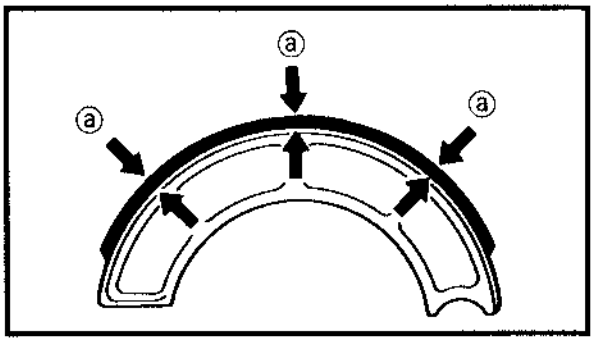


NOTE:
Install the tire with the "DRIVE" mark ① to the rotating direction.



⚠ WARNING

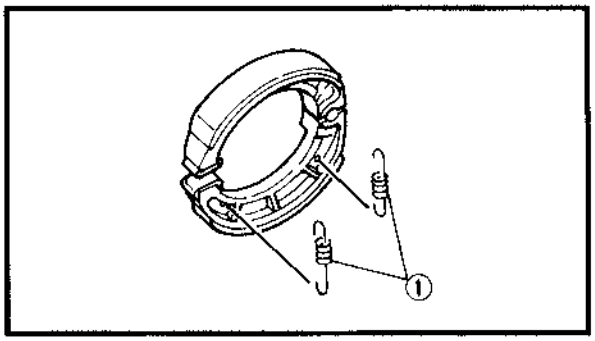
After replacing the tire, ride conservatively to allow the tire to be properly seated in the rim. Failure to do so may cause an accident resulting in machine damage and possible operator injury.



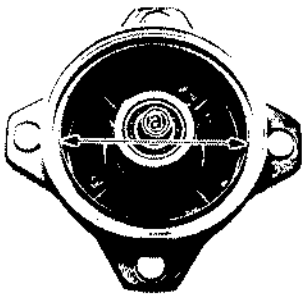
4. Inspect:
   - Brake linings
     Glazed parts → Sand with coarse sandpaper.
5. Measure:
   - Brake lining thickness ⓐ
     Out of specification → Replace.

Brake lining thickness:
4.0 mm (0.16 in)
<Wear limit>:
2.0 mm (0.08 in)

NOTE:
Replace the brake shoes as a set (with shoe springs) if either is found to be worn to the wear limit.

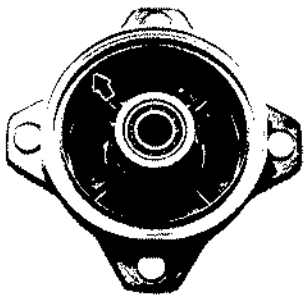


6. Inspect:
   - Shoe springs ①
     Wear/Damage → Replace.



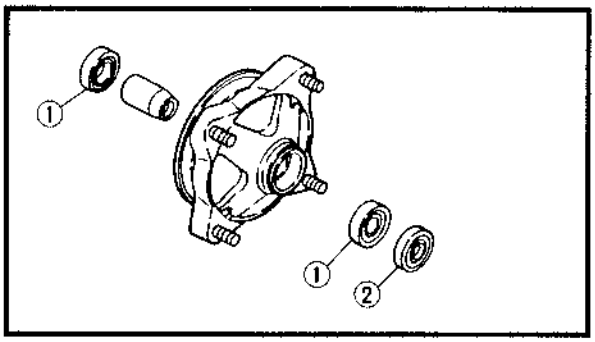
7. Measure:
   - Brake drum inside diameter ⓐ
     Out of specification → Replace.

Front brake drum inside diameter:
110 mm (4.3 in)
<Wear limit>:
111 mm (4.37 in)

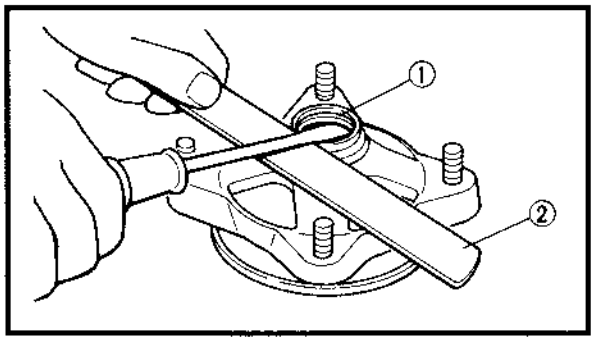


8. Inspect:
   - Brake drum inner surface
     Oil/Scratches → Remove.

Oil	**Use a rag soaked in lacquer thinner or solvent.**
Scratches	**Use a emery cloth (lightly and evenly polishing)**



9. Inspect:
   - Bearings ① (brake drum)
     Bearings allow play in the brake drum or the wheel tuns roughly → Replace.
   - Oil seal ②
     Wear/Damage → Replace.



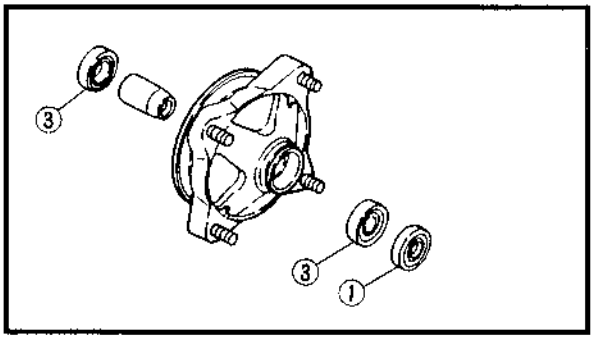
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Wheel bearing and oil seal replacement steps:

- Clean the outside of the brake drum.
- Remove the oil seal ① use a flat-head screw driver.

NOTE:

Place a wood block ② on the outer edge to protect this edge.



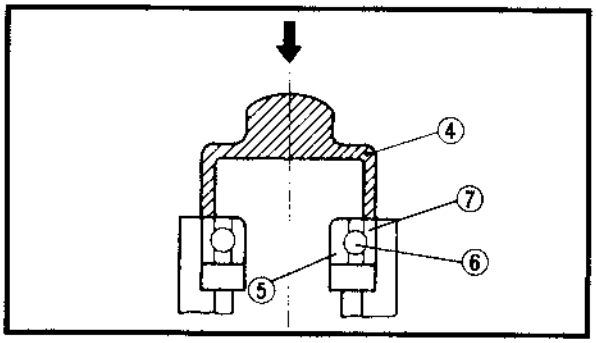
- Remove the bearings ③ using a general bearing puller.
- Install the new bearings and oil seal by reversing the previous steps.

NOTE:

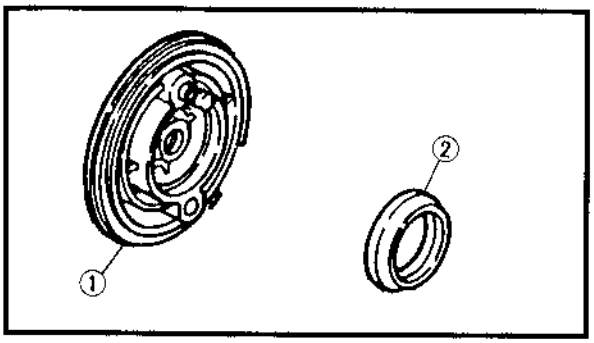
Use a socket ④ that matches the outside diameter of the race of the bearing and oil seal.

CAUTION:

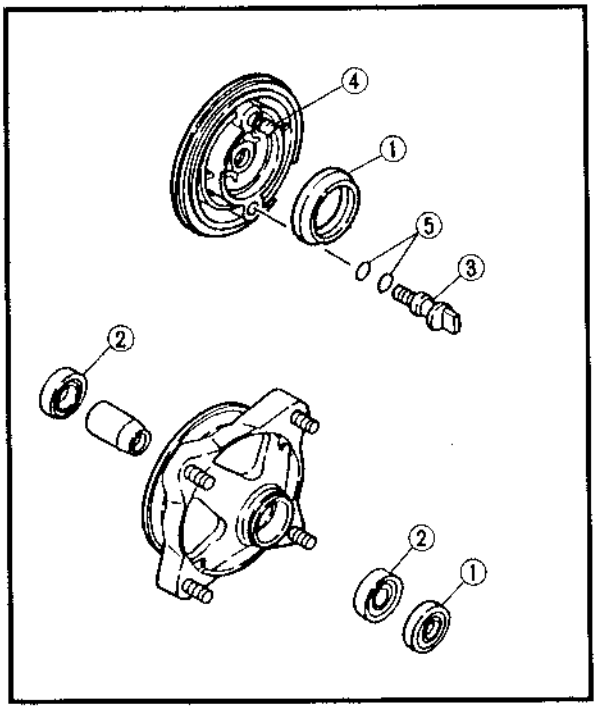
Do not strike the center race ⑤ or balls ⑥ of the bearing. Contact should be made only with the outer race ⑦ .



****



10. Inspect:
    - Brake shoe plate ①
      Cracks/Damage → Replace.
    - Oil seal ②
      Wear/Damage → Replace.

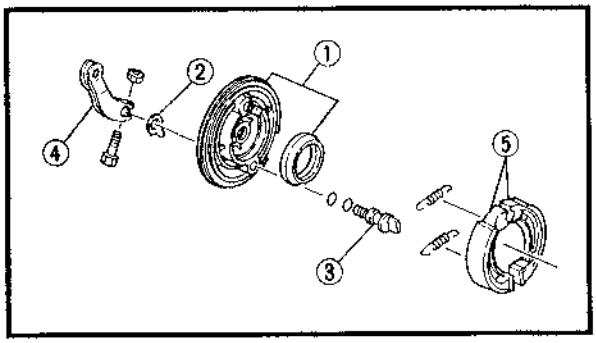


INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Lubricate:
   - Oil seal lips ①
   - Bearings ②
   - Camshaft ③
   - Pivot pin ④ (brake shoe plate)
   - O-rings ⑤

Lithium-soap base grease



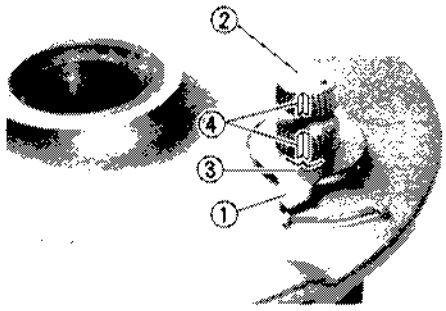
2. Install:
   - Brake shoe plate ①
   - Wear indicator ②
   - Camshaft ③
   - Cam lever ④
   - Brake shoes ⑤

CAUTION:

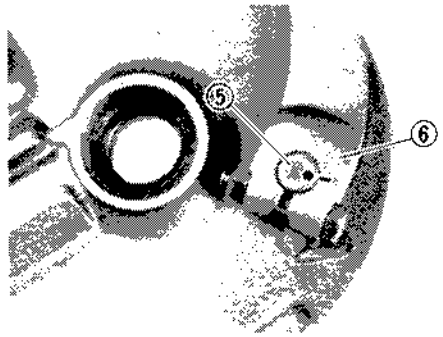
Do not apply grease to the brake shoe linings.

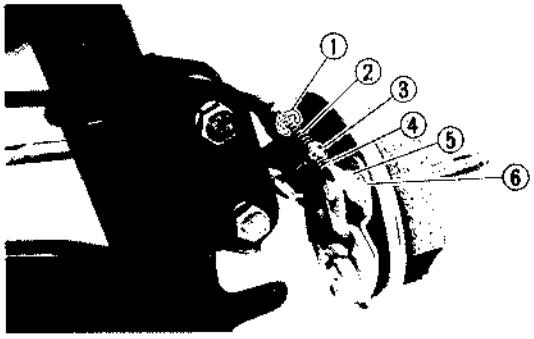
NOTE:

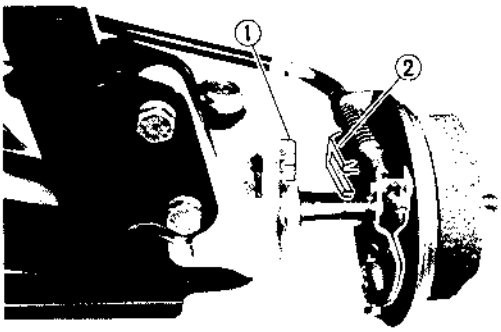
- When installing the wear indicator ① to the camshaft ② align the projection ③ on the wear indicator with the slot ④ on the camshaft.
- Align the punched mark on the camshaft ⑤ with the punched mark on the camshaft lever ⑥.



Camshaft lever:
9 Nm (0.9 m • kg, 6.5 ft • lb)



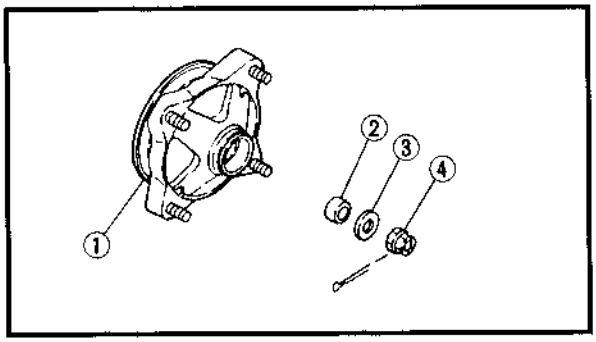




3. Connect:
   - Brake cable (to brake shoe plate)
4. Install:
   - Circlip ①
   - Spring ②
   - Washer ③
   - Spring ④
   - Pin ⑤
   - Adjuster ⑥

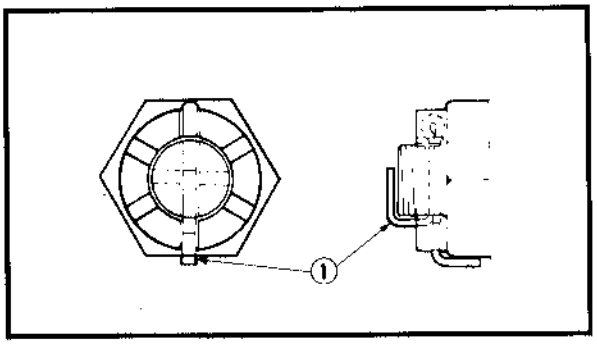
NOTE:

Be sure the boss ① on the steering knuckle correctly engages with the projecting portion (torque stopper) ② on the brake shoe plate.



5. Install:
   - Brake drum ①
   - Spacer collar ②
   - Plain washer ③
   - Axle nut ④

Axle nut:
70 Nm (7.0 m • kg, 50 ft • lb)



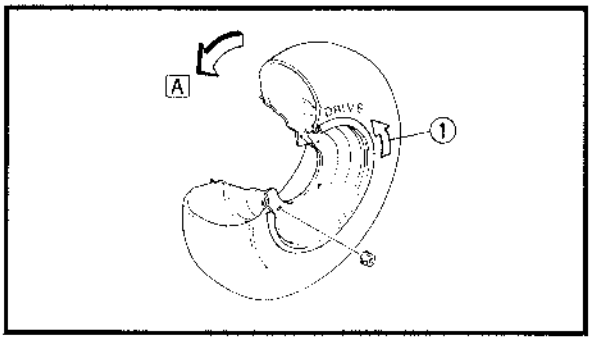
6. Install:
   - Cotter pin ①

NOTE:

Do not loosen the wheel hub nut after torque tightening. If the wheel hub nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the wheel hub nut.

⚠ WARNING

Always use a new cotter pin.



7. Install:
   - Front wheel

	Nut (front wheel): **45 Nm (4.5 in • kg, 32 ft • lb)**

NOTE:

Arrow mark ① on the tire must point toward the rotating direction [A] of the wheel.

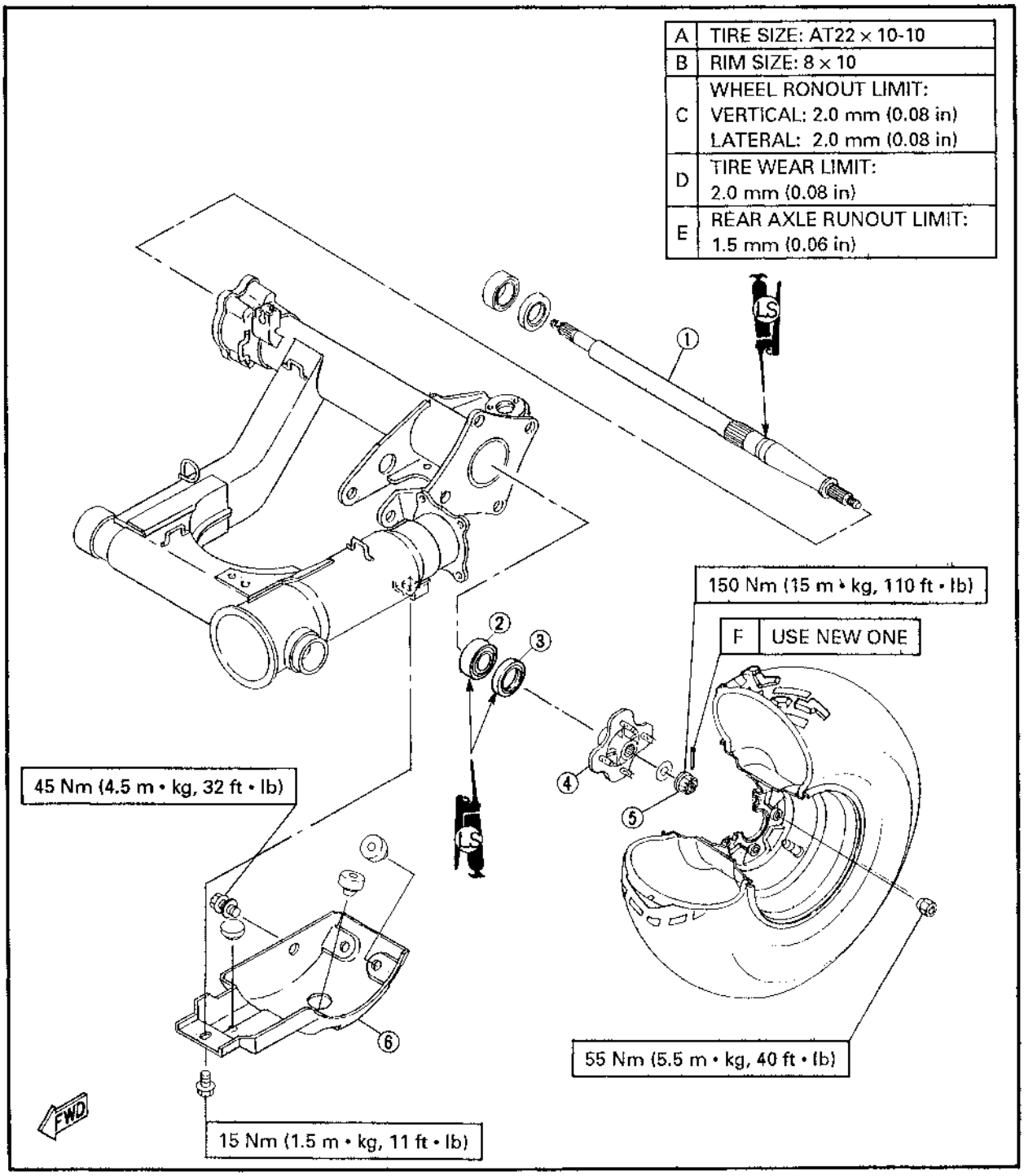
8. Adjust:
   - Front brake cable free play
     Refer to the "FRONT BRAKE ADJUSTMENT" section in CHAPTER 3.

	Front brake free play: **5.0 ~ 8.0 mm (0.20 ~ 0.31 in) at lever pivot**

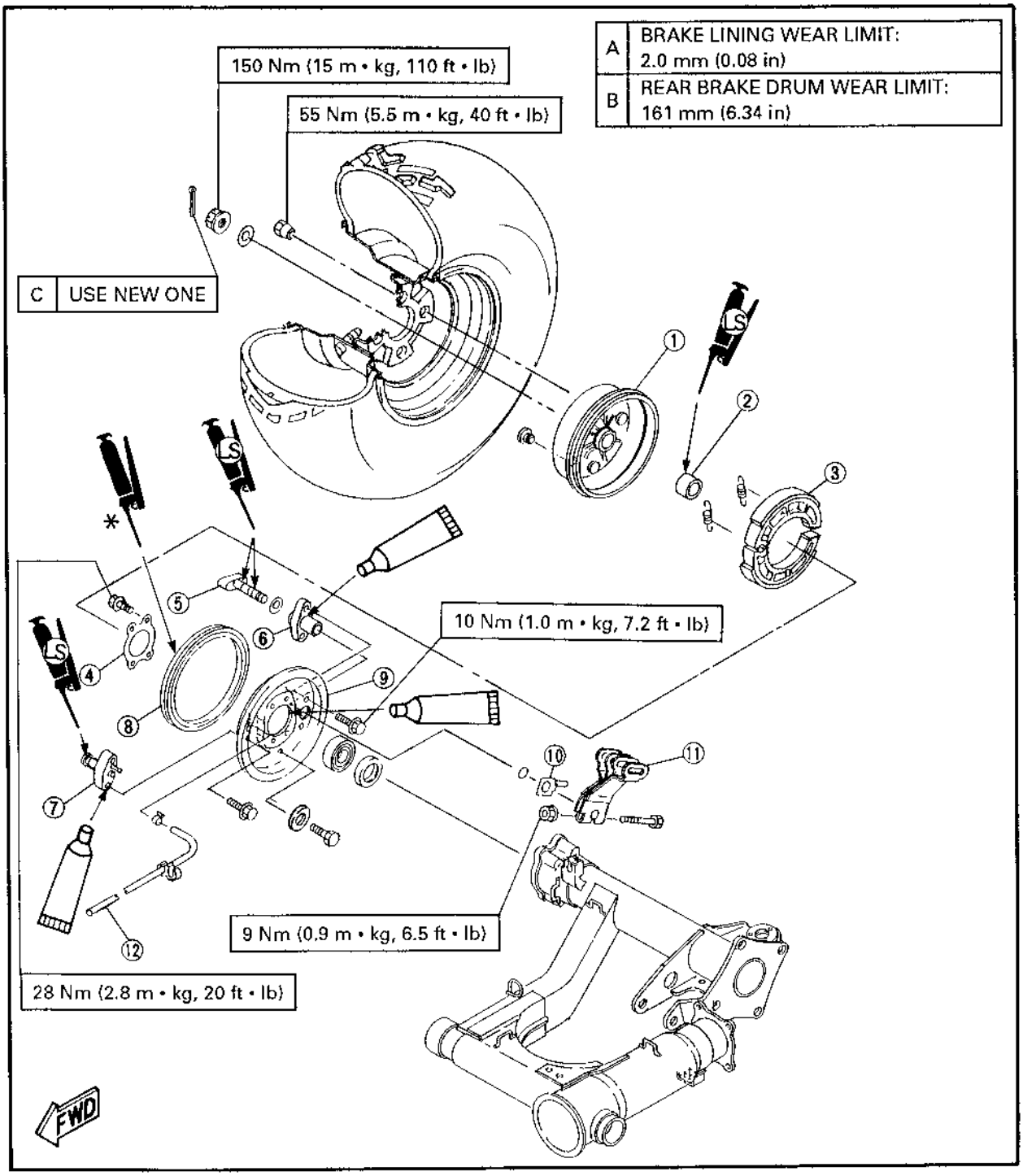
9. Release the parking brake.

REAR WHEELS/REAR BRAKE AND REAR AXLE

① Rear axle
② Bearing
③ Oil seal
④ Wheel hub
⑤ Axle nut
⑥ Final gear case under cover

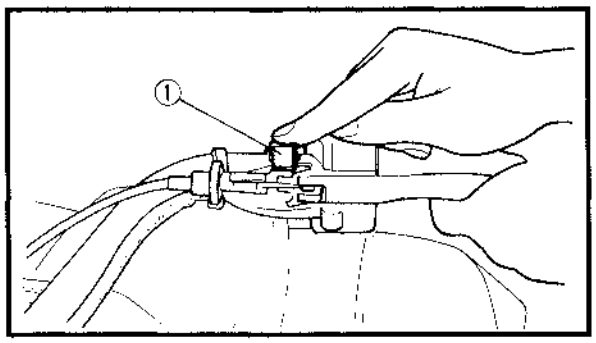


① Brake drum
② Spacer collar
③ Brake shoe complete
④ Plate
⑤ Camshaft
⑥ Camshaft brakcet
⑦ Brake shoe brakcet
⑧ Dust seal
⑨ Backing plate
⑩ Wear indicator
⑪ Cam lever
⑫ Breather hose
* Yamaha brake grease



REMOVAL

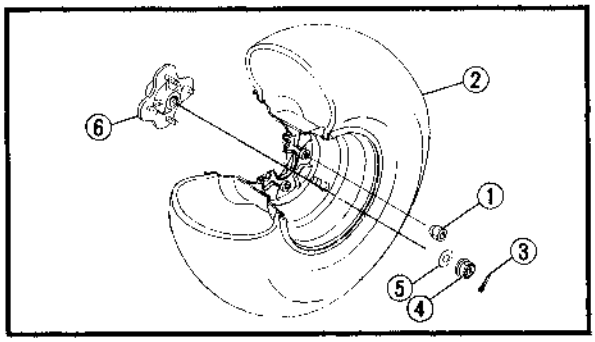
1. Place the machine on a level place.
2. Remove:
   - Seat
   - Rear fender
   - Rear bumper
   - Rear carrier (except for USA)
   Refer to the "FENDERS AND FUEL TANK-REAR FENDER -Removal" section in CHAPTER 3.



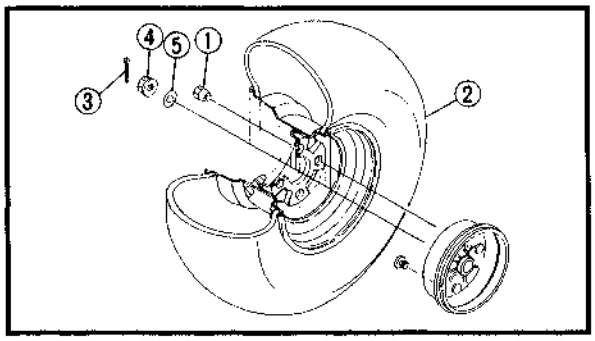
3. Loosen:
   - Nuts (rear wheel)
   Apply the parking brake ①.
4. Block the front wheels, and elevate the rear wheels by placing the suitable stand under the frame.

⚠ WARNING

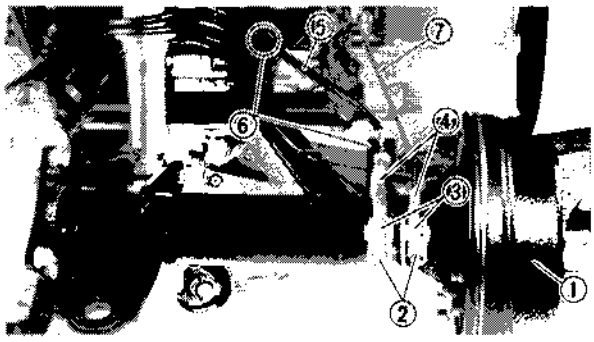
Securaly support the machine there is no danger of falling over.



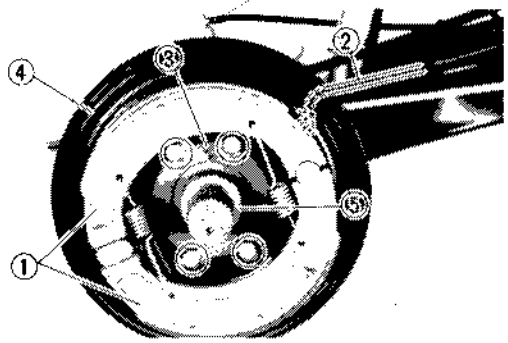
5. Remove:
   - Nuts ① (rear wheel)
   - Rear wheel ② (left)
   - Cotter pin ③
   - Nut ④
   - Washer ⑤
   - Wheel hub ⑥



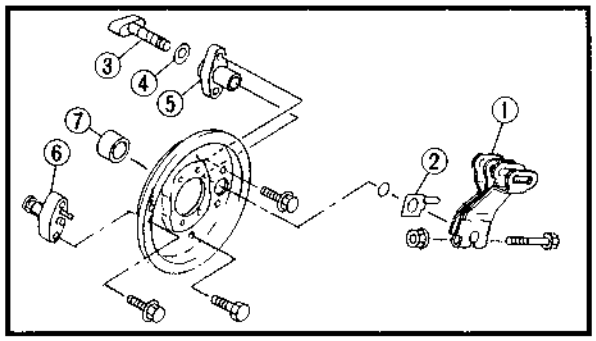
6. Remove:
   - Nuts ① (rear wheel)
   - Rear wheel ② (right)
   - Cotter pin ③
   - Axle nut ④
   - Washer ⑤
7. Release the parking brake.



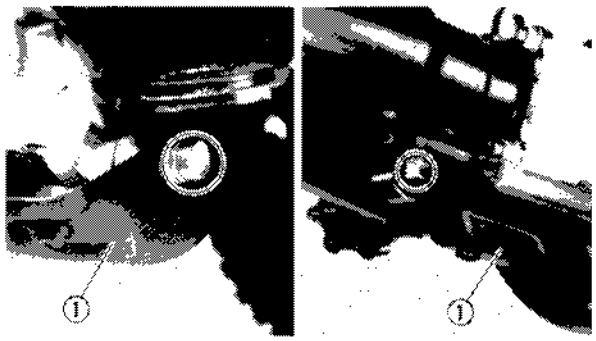
8. Remove:
   - Brake drum ①
9. Remove:
   - Adjusters ② (brake lever and brake pedal)
   - Pins ③
   - Springs ④
10. Disconnect:
    - Brake cable ⑤
    (from brake cable bracket ⑥)
    - Brake pedal rod ⑦



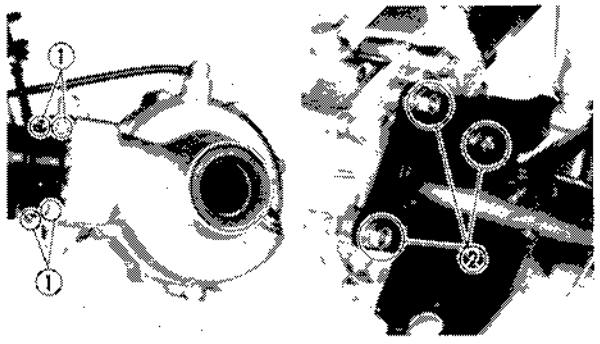
11. Remove:
- Brake shoes ①
- Breather hose ②
- Plate ③
- Backing plate ④
- Spacer collar ⑤



12. Remove:
- Cam lever ①
- Wear indicator ②
- Camshaft ③
- Washer ④
- Bracket ⑤ (camshaft)
- Bracket ⑥ (brake shoe)



13. Remove:
- Final gear case under cover ①

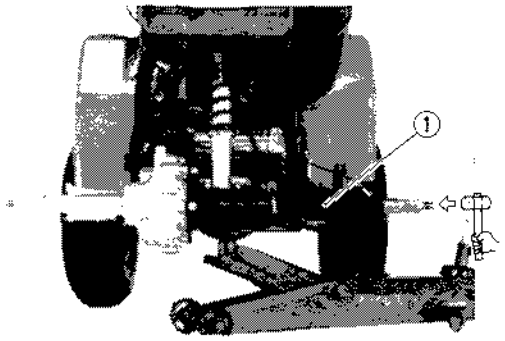


14. Loosen:
- Nuts ① (final gear case)
- Bolts ② (final gear case)

15. Remove:
- Rear axle ①
  (from left side)

N.B.:

When removing the rear axle from the swingarm and final gear case, use a soft hammer.

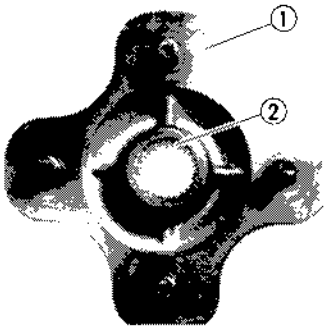


CAUTION:

Never directly tap the axle and with a hammer, this will result in damage to the axle thread and spline.

INSPECTION

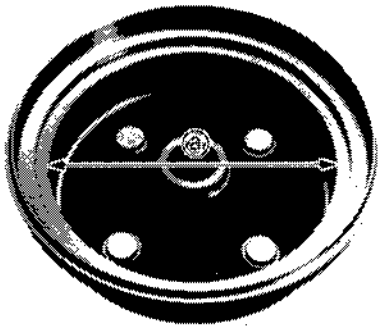
1. Inspect:
   - Wheel
   Refer to the "WHEEL INSPECTION" section in CHAPTER 3.
2. Measure:
   - Wheel runout
   - Tire surfaces
   Refer to the "FRONT WHEEL AND FRONT BRAKE-INSPECTION" section.



3. Inspect:
   - Wheel hub ①
   Cracks/Damage → Replace.
   - Splines ② (wheel hub)
   Wear/Damage → Replace.
4. Inspect:
   - Brake linings
5. Measure:
   - Brake lining thickness
   Refer to the "FRONT WHEEL AND FRONT BRAKE-INSPECTION" section.

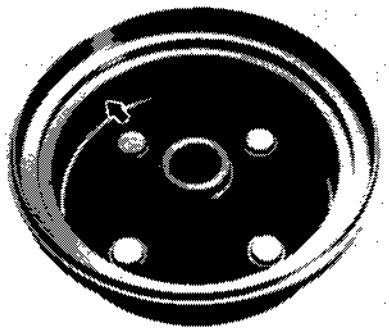
Brake lining thickness:
4.0 mm (0.16 in)
<Wear limit>:
2.0 mm (0.8 in)

6. Inspect:
   - Shoe springs
   Refer to the "FRONT WHEEL AND FRONT BRAKE-INSPECTION" section.



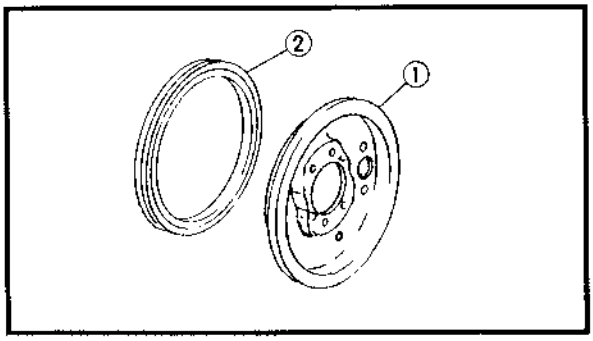
7. Measure:
   - Brake drum inside diameter ⓐ
   Out of specification → Replace.

Front brake drum inside diameter:
160 mm (6.30 in)
<Wear limit>:
161 mm (6.34 in)

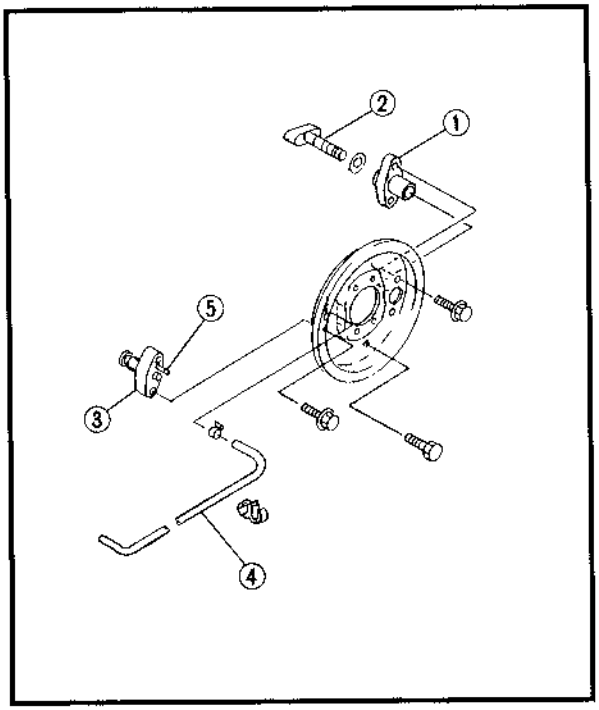


8. Inspect:
   - Brake drum inner surface
     Oil/Scratches → Remove.

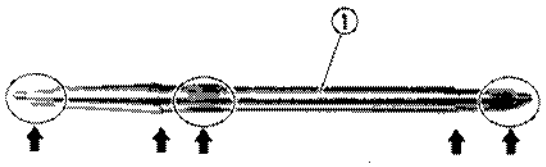
Oil	**Use a rag soaked in lacquer thinner or solvent.**
Scratches	**Use a emery cloth (lightly and evenly polishing)**



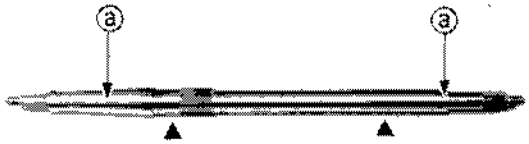
9. Inspect:
   - Backing plate ①
     Cracks/Bends/Damage → Replace.
   - Dust seal ②
     Wear/Damage → Replace.



10. Inspect:
    - Bracket ① (camshaft)
    - Camshaft ②
    - Bracket ③ (brake shoe)
      Wear/Scratches/Damage → Replace.
    - Breather hose ④
      Obstruction → Remove.
      Damage → Replace.
11. Clean and blow out the bleather hole ⑤ of the brake shoe bracket with compressed air.



12. Inspect:
    - Rear axle ①
      Scratched (excessively)/Damage → Replace.
    - Splines/Threads (rear axle)
      Wear/Damage → Replace.

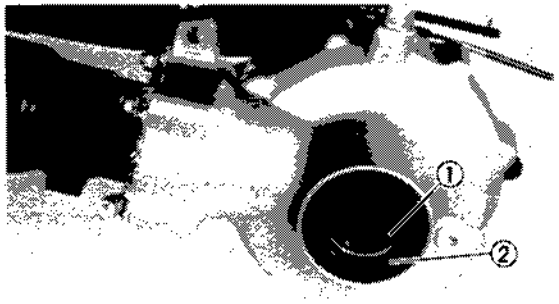


13. Measure:
- Rear axle runout ⓐ
  Out of specification → Replace.

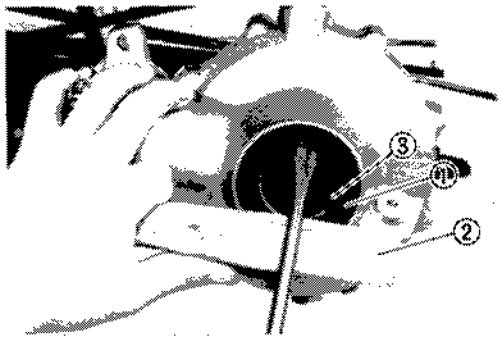
Rear axle runout limit:
1.5 mm (0.06 in)

⚠ WARNING

Do not attempt to straighten a bent axle.



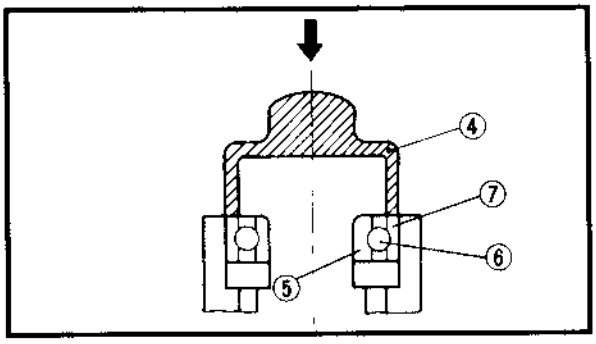
14. Inspect:
- Bearing ① (rear axle)
  Bearing allow play in the axle hub or the bearing turns roughly → Replace.
- Oil seal ②
  Wear/Damage → Replace.



****

Bearing and oil seal replacement steps:
- Clean the area around the bearing on the final gear case.
- Remove the oil seal ① use a flat-head screw driver.

NOTE:
Place a wood block ② on the outer edge to protect this edge.



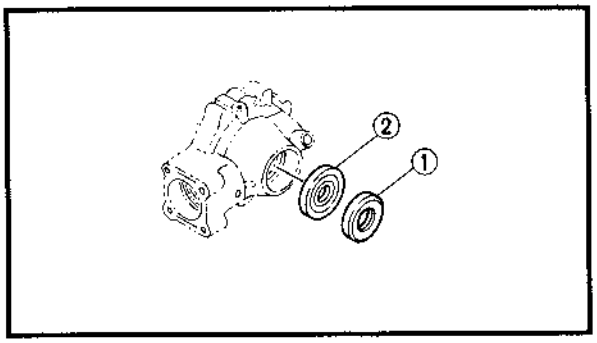
- Remove the bearing ③ using a general bearing puller.
- Install the new bearing and oil seal by reversing the previous steps.

NOTE:
Use a socket ④ that matches the outside diameter of the race of the bearing and oil seal.

CAUTION:

Do not strike the center race ⑤ or balls ⑥ of the bearing. Contact should be made only with the outer race ⑦.

****

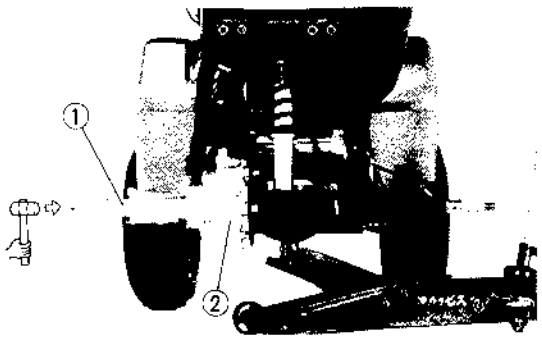


INSTALLATION

Reverse the "REMOVAL" procedures.
Note the following points.

1. Lubricate:
   - Oil seal lip ① (rear axle)
   - Bearings ② (rear axle)

Lithium-soap base grease



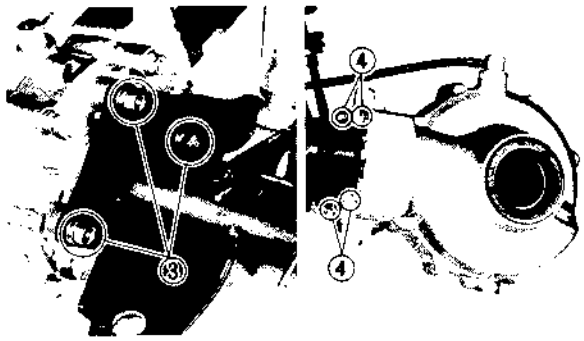
2. Install:
   - Rear axle ①

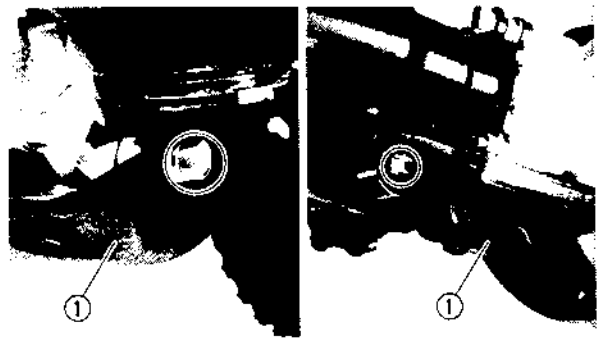
NOTE:

Before installing the rear axle, loosen all the bolts on the final gear case ②. Hold the rear axle ① with your hand, and slide it into the ring gear spline on the final gear case. Tap lightly on the left end rear axle with a soft hammer.

CAUTION:

Never directly tap the axle end with a hammer, this will result in damage to the axle thread and spline.





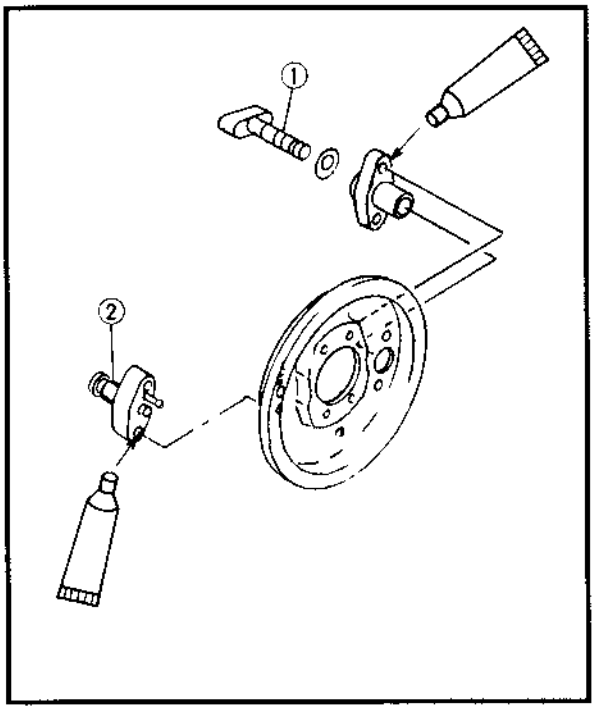
3. Tighten:
   - Bolts ③ (final gear case)
   - Nuts ④ (final gear case)

Bolts (bearing housing-swingarm):
45 Nm (4.5 m • kg, 32 ft • lb)
Nuts (final gear case – swingarm):
23 Nm (2.3 m • kg, 17 ft • lb)

Refer to the "DRIVE TRAIN–FINAL DRIVE GEAR AND DRIVE SHAFT–INSTALLATION" section in CHAPTER 6.

4. Install:
   - Final gear case under cover ①

Bolt (final gear case under cover):
10 mm:
45 Nm (4.5 m • kg, 32 ft • lb)
8 mm:
15 Nm (1.5 m • kg, 11 ft • lb)

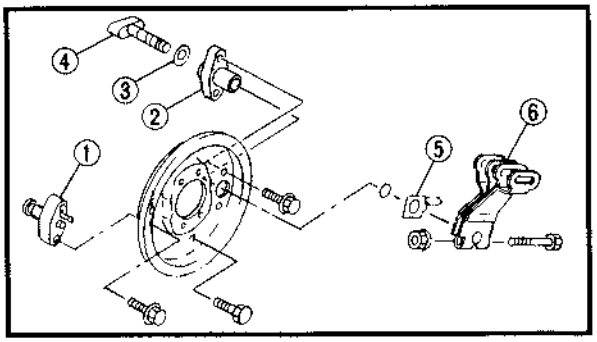


5. Lubricate:
   - Brake camshaft ①
   - Pivot pin ② (brake shoe-bracket)

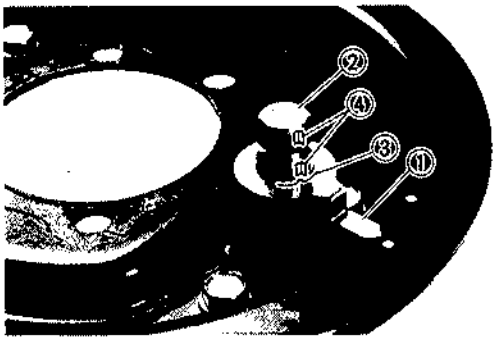
Lithium-soap base grease

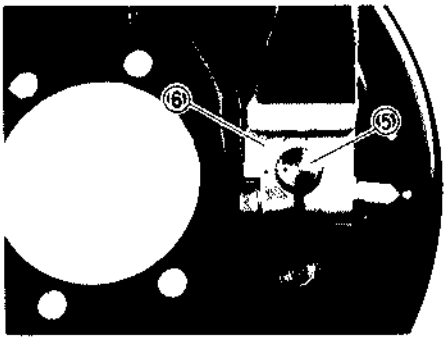
6. Apply:
   - Sealant
     (to the mating surfaces of both brackets)

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



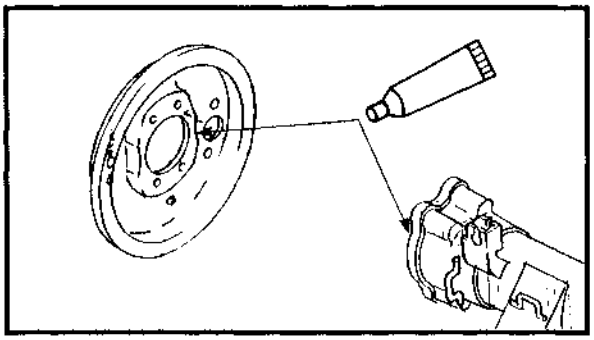
7. Install:
   - Bracket ① (brake shoe)
   - Bracket ② (camshaft)
   - Washer ③
   - Camshaft ④
   - Wear indicator ⑤
   - Cam lever ⑥





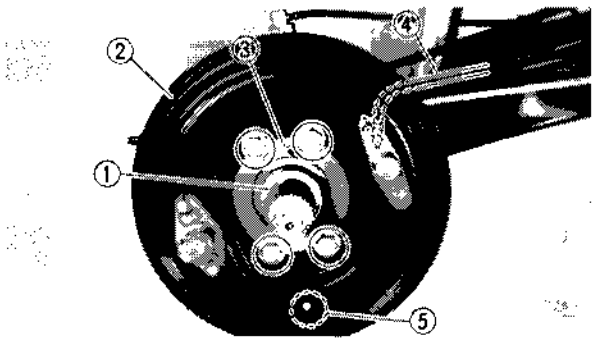
NOTE:
- When installing the wear indicator ① to the camshaft ② align the projection ③ on the wear indicator with the slot ④ on the camshaft.
- Align the punched mark on the camshaft ⑤ with the punched mark on the cam lever ⑥ .

Bracket (camshaft/brake shoe):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Cam Lever:
9 Nm (0.9 m • kg, 6.5 ft • lb)



8. Apply:
   - Sealant
     (to matching surface of backing plate and swingarm)

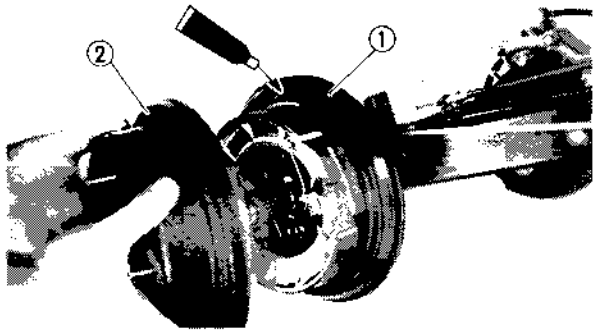
	Sealant (Quick gasket®) **P/N. ACC-11001-05-01** **Yamaha bond No. 1215** **P/N. 90890-85505**



9. Install:
   - Spacer collar ①
   - Backing plate ②
   - Plate ③
   - Breather hose ④

NOTE:
The backing plate should be installed with the drain bolt ⑤ downward.

	Bolt (backing plate): **28 Nm (2.8 m • kg, 20 ft • lb)**

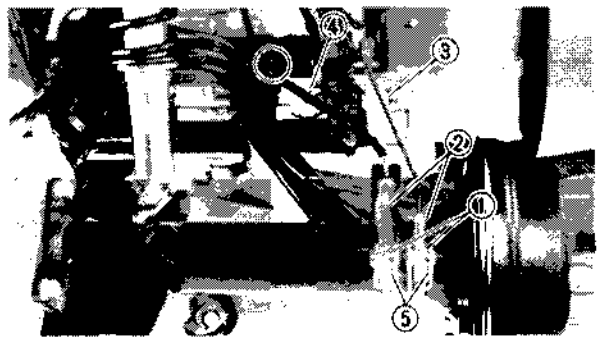


10. Install:
    - Brake shoes
11. Lubricate:
    - Dust seal ① (backing plate)

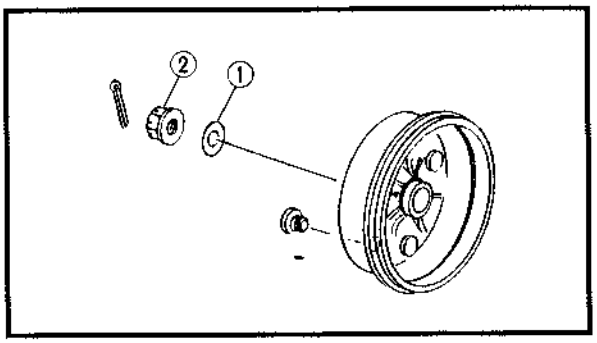
	Yamaha brake grease

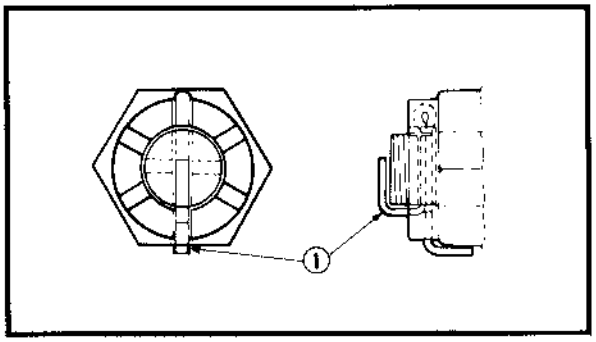
CAUTION:
Do not apply greace to the brake shoe linings.

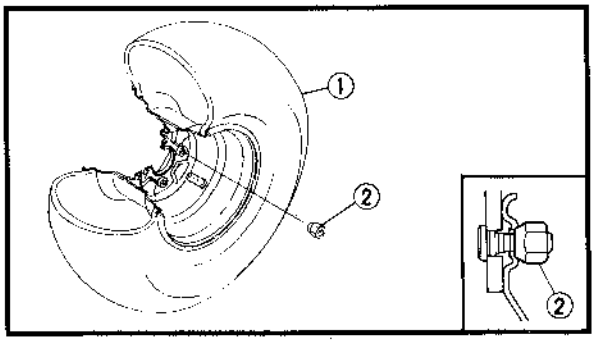
12. Install:
    - Brake drum ②

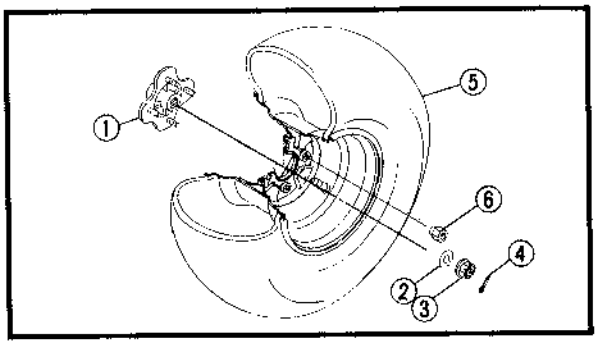


13. Install:
    - Pins ①
    - Springs ②
14. Connect:
    - Brake pedal rod ③
    - Brake cable ④
    - Adjusters ⑤ (brake lever and pedal)









15. Install:
    - Washer ①
    - Nut ②
16. Apply the parking brake.
17. Tighten
    - Nut ②

	Nut (wheel hub): **150 Nm (15 m • kg, 110 ft • lb)**

18. Install
    - Cotter pin ①

NOTE:

Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.

⚠ WARNING

Always use a new cotter pin.

19. Install:
    - Rear wheel ① (right)
    - Nuts ②

	Nuts (wheel panel): **55 Nm (5.5 m • kg, 40 ft • lb)**

NOTE:

Arrow mark on the tire must point toward the rotating direction of the wheel. Refer to the "FRONT WHEEL AND FRONT BRAKE – INSTALLATION" section.

⚠ WARNING

Tapered wheel nuts ② are used for rear wheels. Install the nuts with its tapered side facing the wheel.

20. Install:
    - Wheel hub ①
    - Washer ②
    - Nut ③
    - Cotter pin ④
    - Rear wheel ⑤ (left)
    - Nuts ⑥ (wheel panel)

      Refer to the "Rear wheel (right)" section.

21. Adjust:
    - Rear brake pedal free play
    - Rear brake cable free play

    Refer to the "REAR BRAKE AND PEDAL ADJUSTMENT" section in CHAPTER 3.



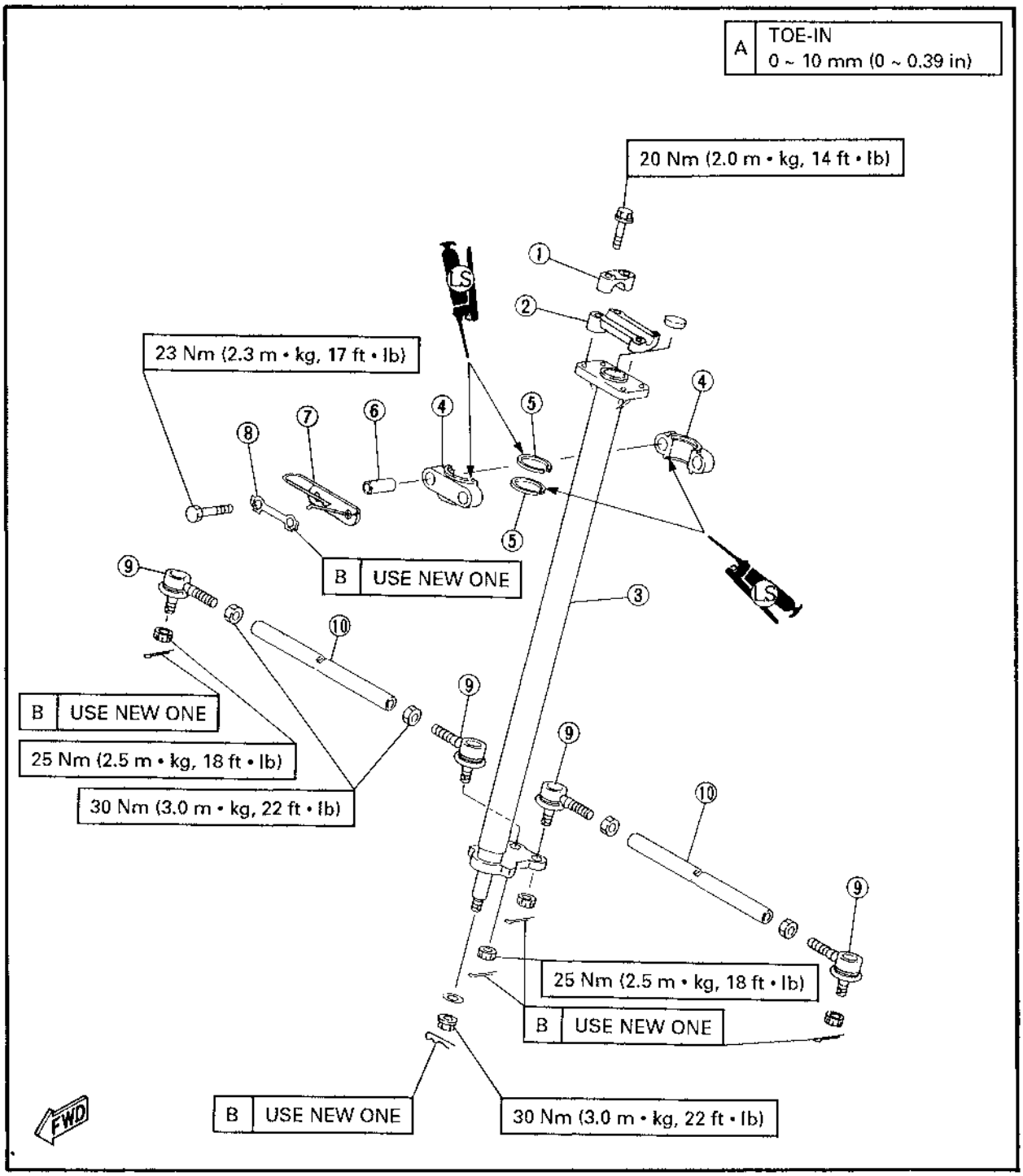
Rear brake pedal free play:
20 ~ 30 mm (0.78 ~ 1.18 in)
Rear brake lever free play:
5.0 ~ 8.0 mm (0.20 ~ 0.31 in) at lever pivot

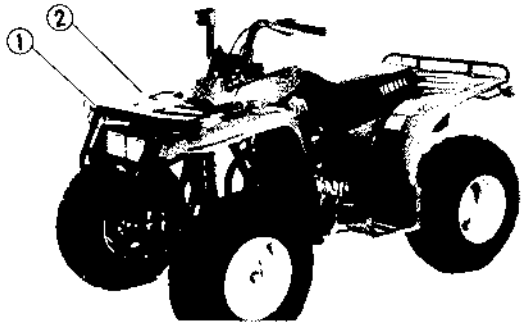
22. Install:
    - Rear bumper
    - Rear fender
    - Seat
    - Rear carrier (except for USA)

    Refer to the "FENDERS AND FUEL TANK-REAR FENDER-Installation" section in CHAPTER 3.

STEERING SYSTEM

① Handlebar holder (upper)
② Handlebar holder (lower)
③ Steering shaft
④ Steering bearing
⑤ Oil seal
⑥ Collar
⑦ Cable guide
⑧ Lock washer
⑨ Rod end
⑩ Tie-rod



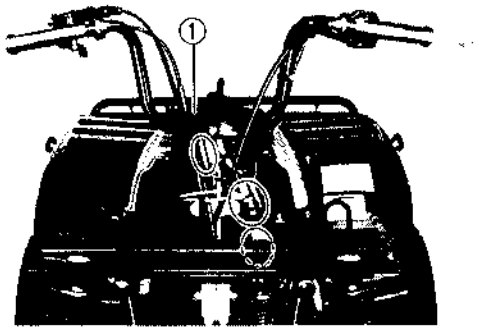


REMOVAL

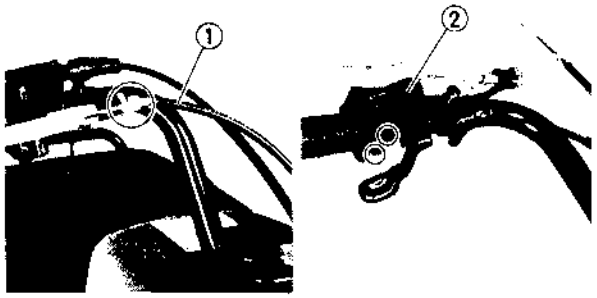
Handlebar

1. Remove:
   - Front bumper ①
   - Front fender ②
   - Front carrier (except for USA)

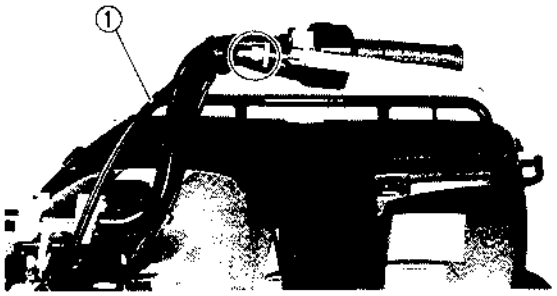
   Refer to "FENDERS AND FUEL TANK-FRONT FENDER Removal" section in CHAPTER 3.



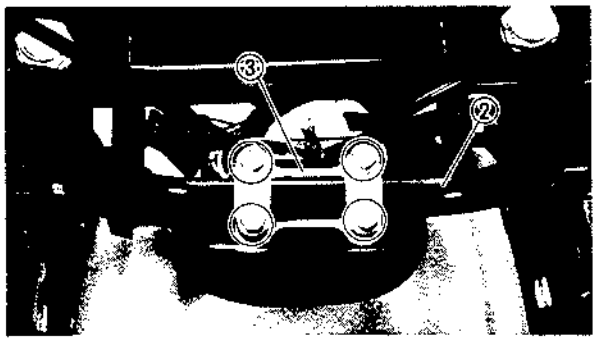
2. Disconnect:
   - Main switch leads
   - "NEUTRAL" indicator light leads
   - "REVERSE" indicator light leads
   - Handlebar switch (left) leads
   - Brake switch leads.
3. Remove:
   - Handle protector ①



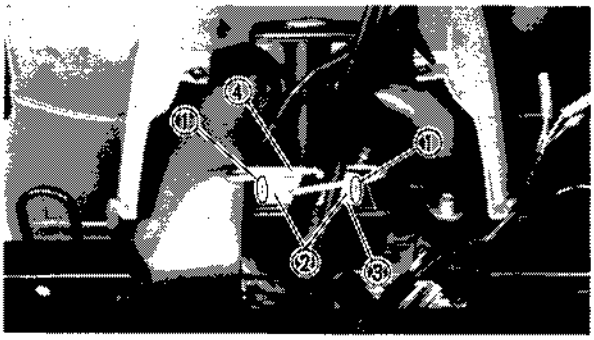
4. Disconnect:
   - Front brake cable ①
5. Remove:
   - Throttle lever assembly ②



6. Disconnect:
   - Brake cable ① (parking)

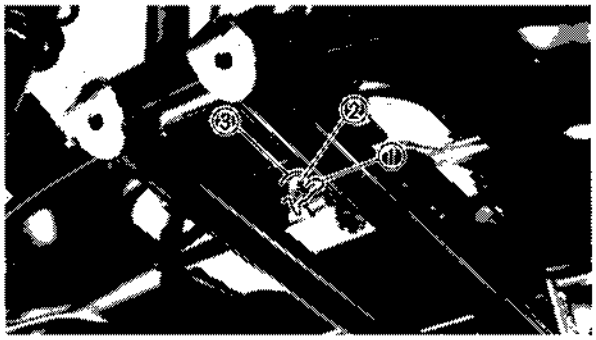


7. Remove:
   - Handlebar ②
   - Handlebar holder ③ (lower)

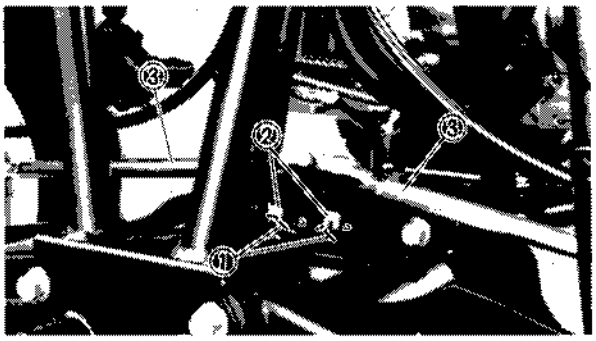


Steering shaft

1. Straighten:
   - Lock washer tabs ①
2. Remove:
   - Bolts ②
   - Lock washer ③
   - Cable guide ④



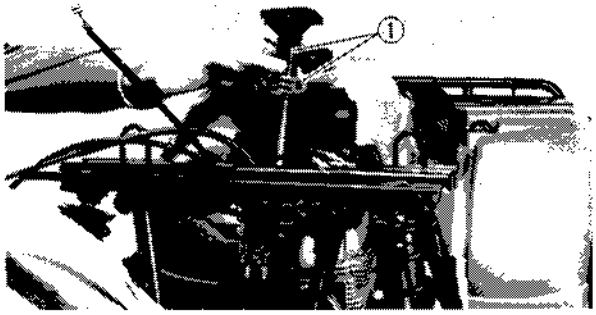
3. Remove:
   - Clip ① (steering shaft)
   - Nut ②
   - Washer ③



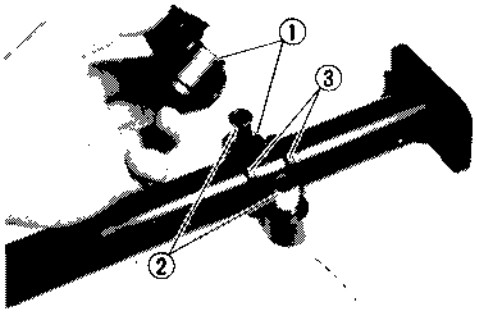
4. Remove:
   - Cotter pins ①
   - Nuts ②
   - Tie-rods ③

NOTE:

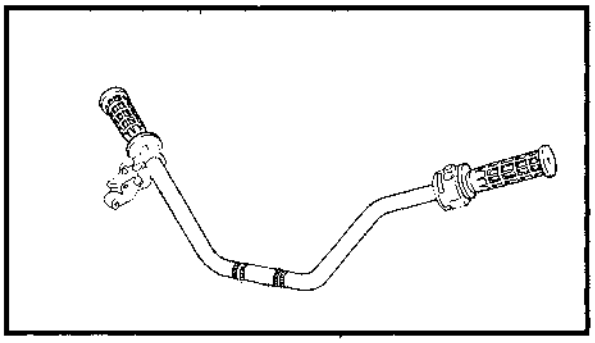
When removing the rod ends from the steering shaft and knuckle arm, use a General Bearing Puller.



5. Remove:
   - Steering shaft ① (with steering bearings) (from upside)

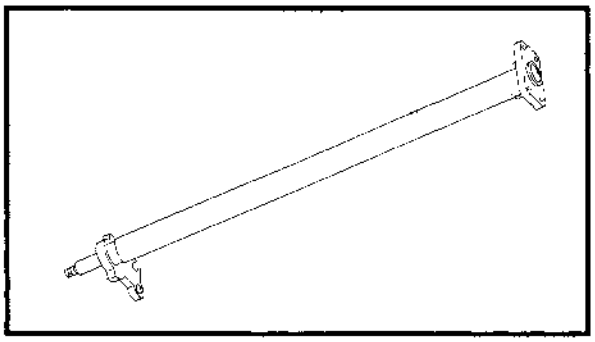


6. Remove:
   - Steering bearings ①
   - Collars ②
   - Oil seals ③



INSPECTION

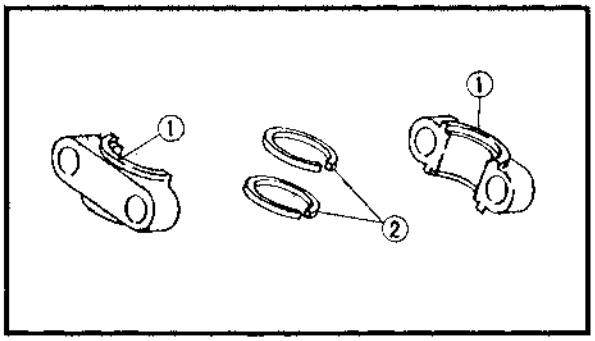
1. Inspect:
   - Handlebar
     Cracks/Bends/Damage → Replace.



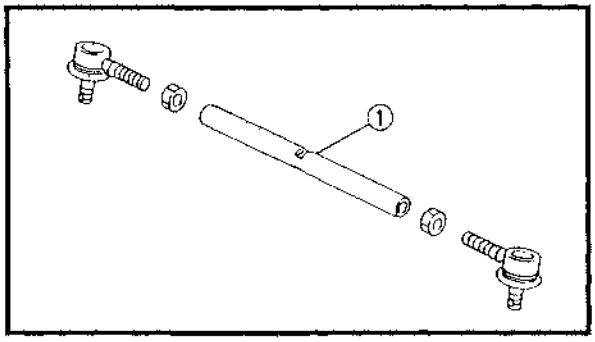
2. Inspect:
   - Steering shaft
     Bends/Damage → Replace.

⚠ WARNING

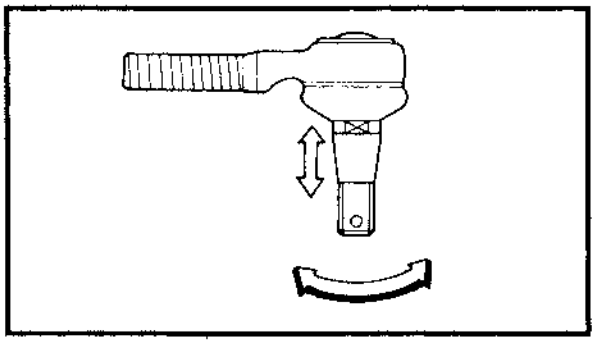
Do not attempt to straighten a bent shaft; this may dangerously weaken the shaft.



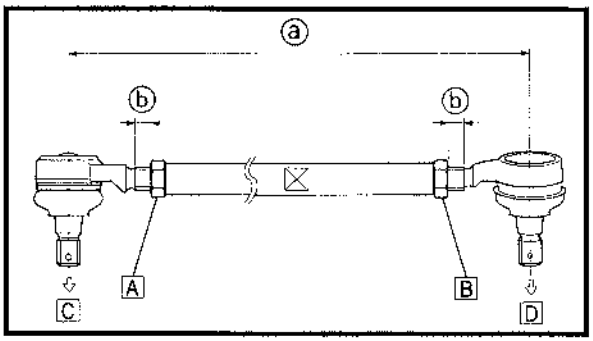
3. Inspect:
   - Steering bearings ①
   - Oil seals ②
     Wear/Damage → Replace.



4. Inspect:
   - Tie-rod ①
     Bend/Damage → Replace.



5. Check:
   - Rod end movement
     Rod end exists free play → Replace.
     Rod end tuns roughly → Replace.
   - Tapered surface (rod end)
     Pitting/Wear/Damage → Replace.



6. Adjust:
   - Tie-rod assembly length

****

Tie-rod assembly length adjustment steps:

- Loosen the locknuts.
- Adjust the tie-rod assembly length a by turning both tie-rod ends.

Tie-rod assembly length ⓐ :
296 mm (11.7 in)

A Right-hand-threads
B Left-hand-threads
C To steering shaft
D To knuckle

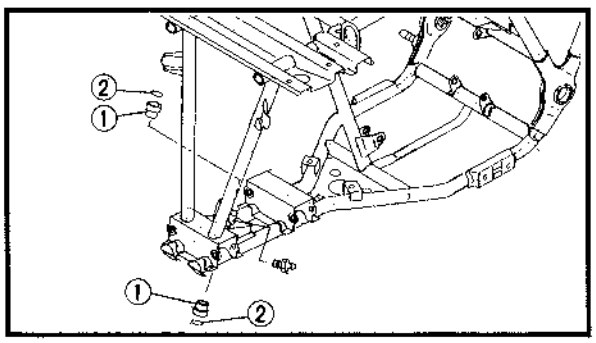
NOTE:

The threads ⓑ on both tie-rod ends must be of the same length.

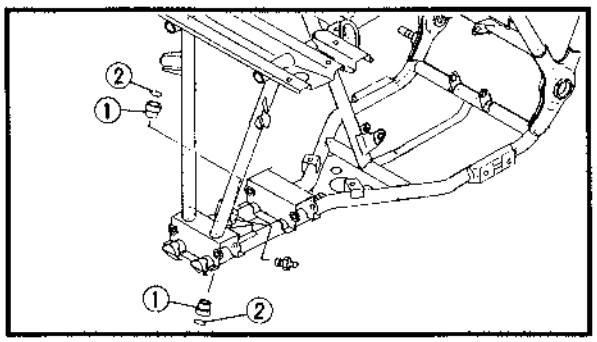
- Tighten the locknuts.

Locknut (tie-rod):
30 Nm (3.0 m • kg, 22 ft • lb)

****



7. Inspect:
   - Bushings ① (steering shaft lower)
   - O-rings ②
     Wear/Damage → Replace.



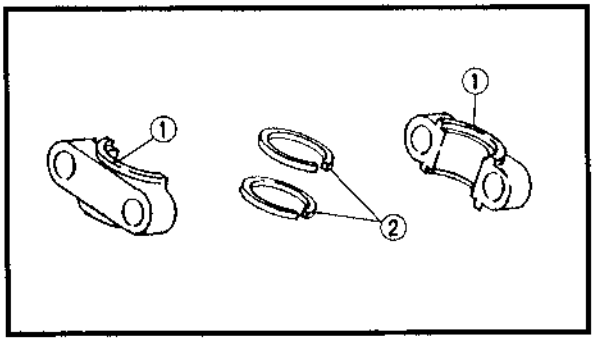
INSTALLATION

Reverse the "REMOVAL" procedures.
Note the following points.

Steering shaft

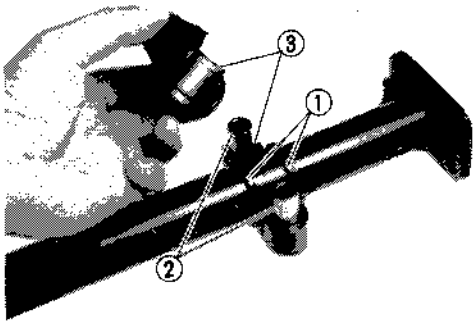
1. Lubricate:
   - Busings ① (steering shaft lower)
   - O-rings ②

Lithium-soap base grease



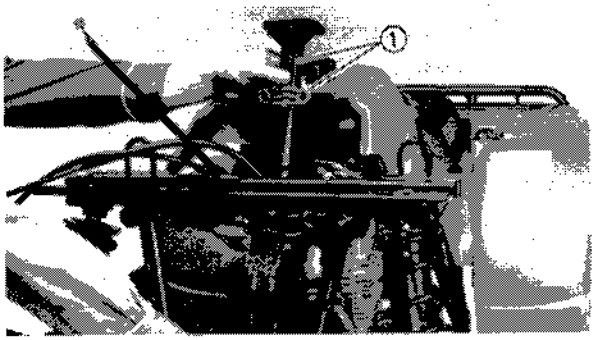
2. Lubricate:
   - Steering bearings ①
   - Oil seals ②

Lithium-soap base grease



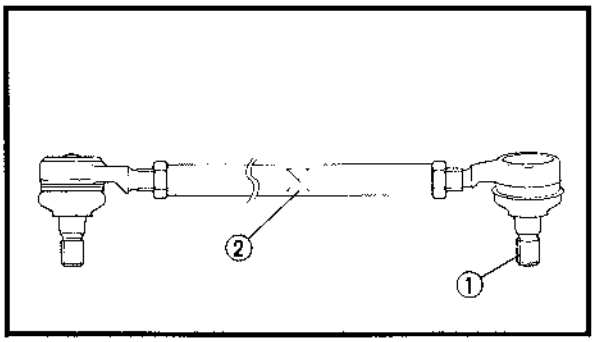
3. Install:
   - Oil seals ① (to steering shaft)
   - Collars ②
   - Steering bearings ③

NOTE:
Be careful not to damage the oil seals during installation.



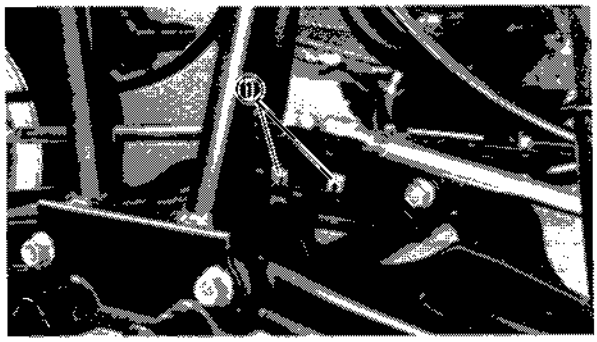
4. Install:
   - Steering shaft ① (with steering bearings)

⚠ WARNING
Make sure the brake cables and leads are properly routed, and are not damaged or twisted.



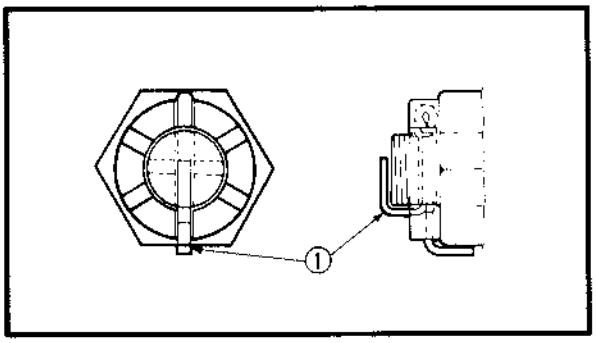
5. Install:
   - Tie-rods (left and right)

NOTE:
Be sure that the rod-end ① on the identation ② side is connected to the knuckle arm.



6. Tighten:
   - Nuts ① (tie-rod end)

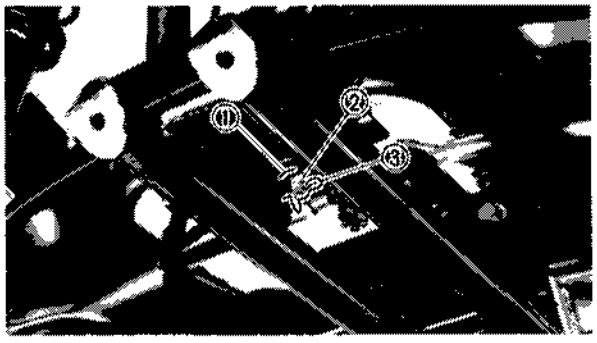
Nut (tie-rod):
25 Nm (2.5 m • kg, 18 ft • lb)



7. Install:
   - Cotter pin ①

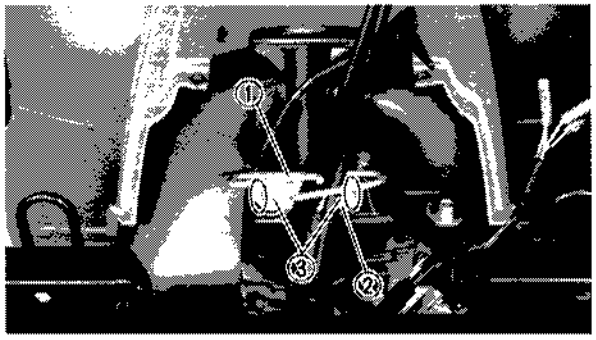
NOTE:
Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.

⚠ WARNING
Always use a new cotter pin.



8. Tighten:
   - Washer ①
   - Nut ②
   - Clip ③

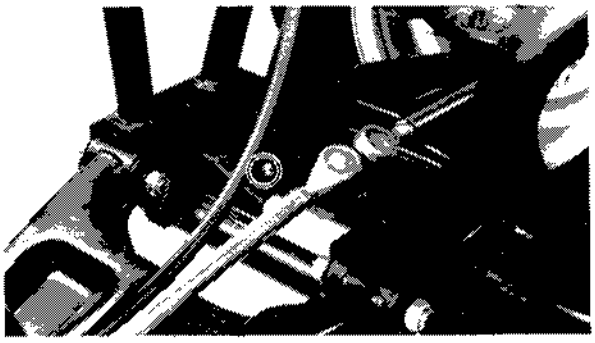
	Nut (steering shaft): **30 Nm (3.0 m • kg, 22 ft • lb)**



9. Install:
   - Cable guide ①
   - Lock washer ②
   - Bolts ③

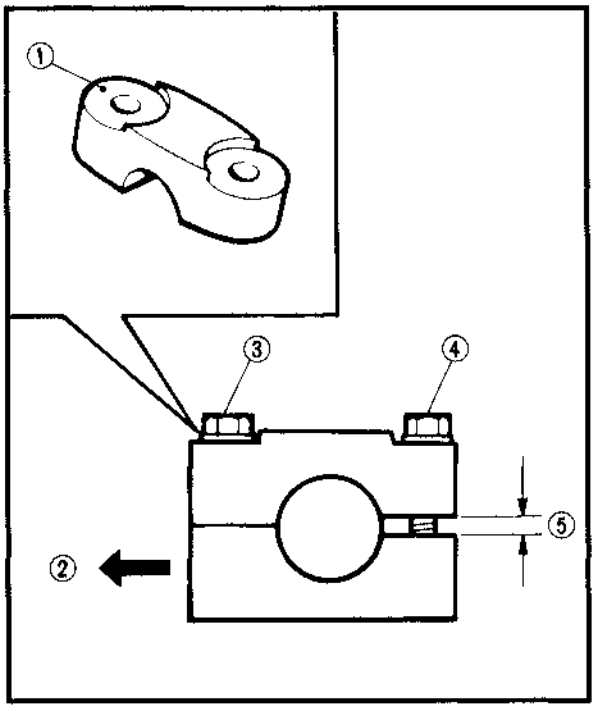
	Bolt (bearing holder): **23 Nm (2.3 m • kg, 17 ft • lb)**

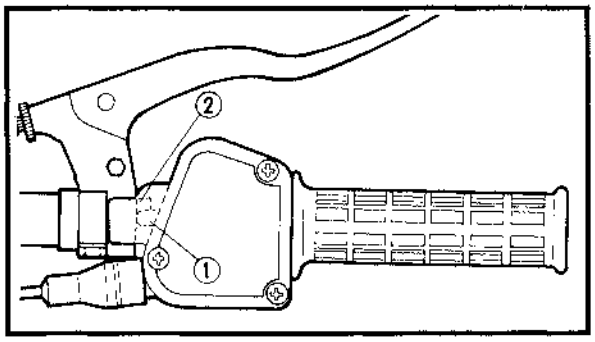
⚠ WARNING
Always use a new lock washer.



10. Bend the lock washer tabs.
11. Lubricate:
    - Bushing (steering shaft)

	Lithium-soap base grease





Handlebar

1. Install
   - Handlebar holder (lower)
   - Handlebar
   - Handlebar holders (upper)

NOTE:

The upper handlebar holder should be installed with the punched mark ① forward ② .

CAUTION:

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

③ 1st ④ 2nd ⑤ Gap

Handlebar holder (upper):
20 Nm (2.0 m • kg, 14 ft • lb)

2. Install:
   - Throttle lever assembly

NOTE:

Fit the throttle housing projection ① onto the indent ② on the front brake lever holder.

⚠ WARNING

Proper cable and lead routing is essential to assure safe machine operation. Refer to the "CABLE ROUTING" section in CHAPTER 2.

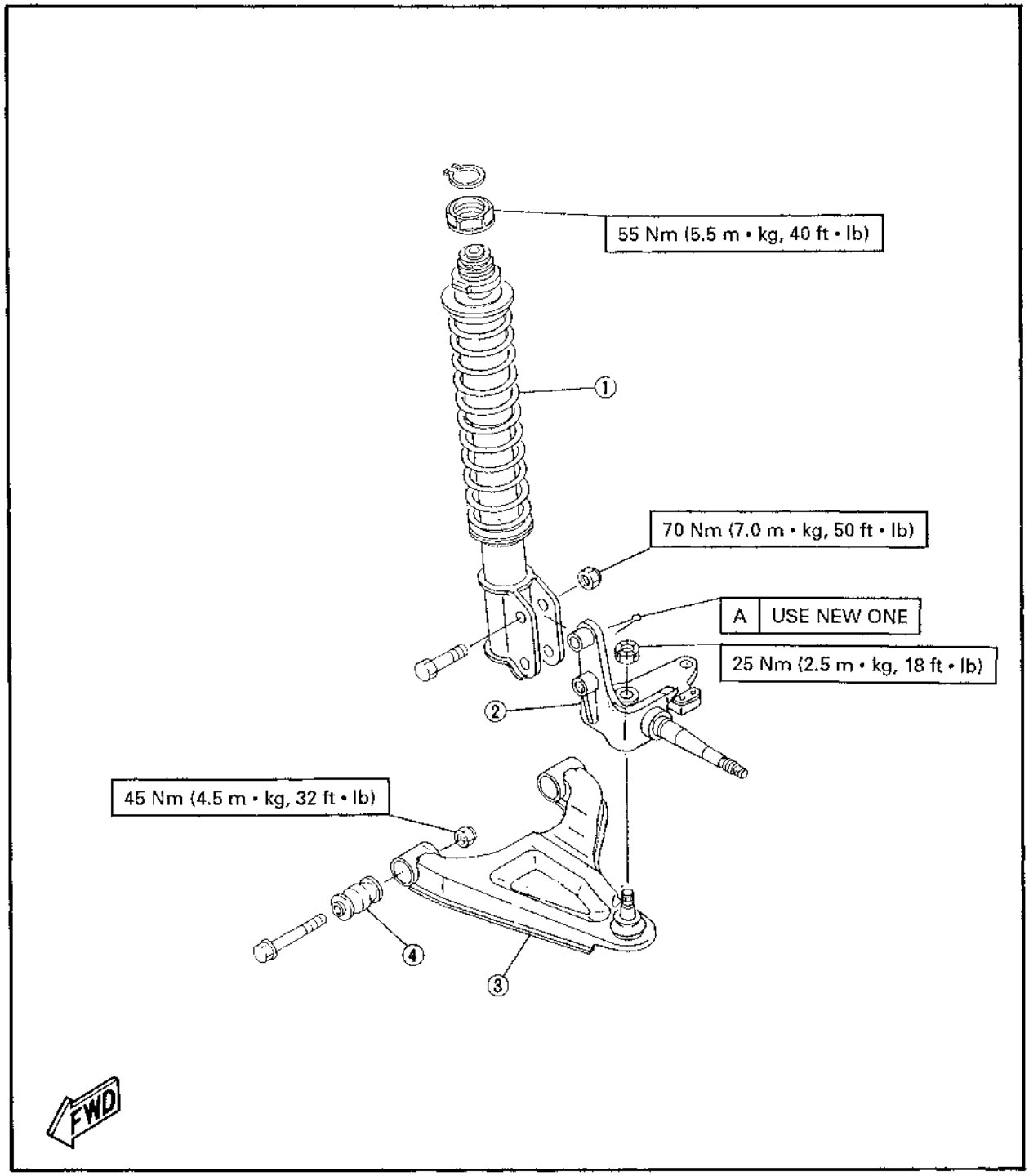
3. Adjust:
   - Brake cable free play
     Refer to the "FRONT BRAKE ADJUSTMENT" and "REAR BRAKE LEVER AND PEDAL ADJUSTMENT" section in CHAPTER 3.

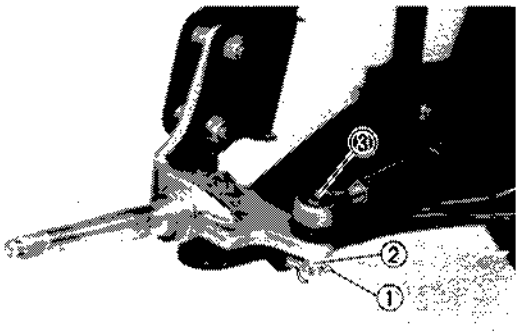
4. Adjust:
   - Toe-in
     Refer to the "TOE-IN ADJUSTMENT" section in CHAPTER 3.

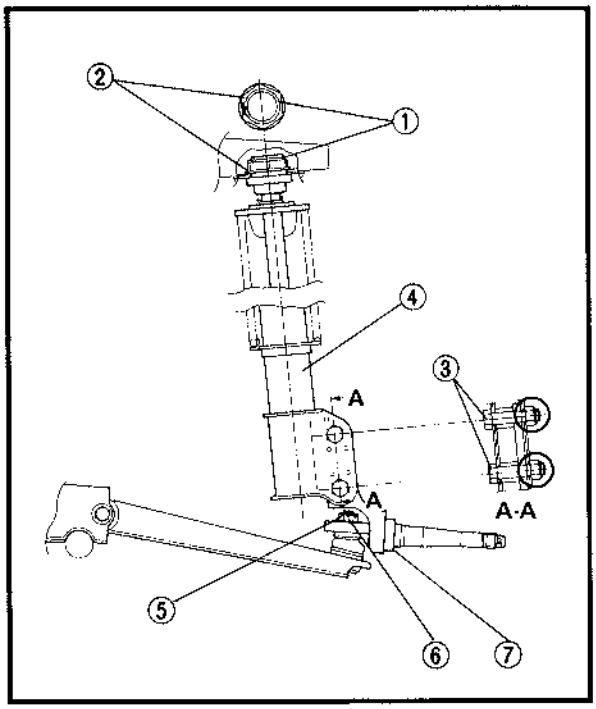
5. Install:
   - Front fender
   - Front bumper
   - Front carrier (except for USA)
     Refer to the "FENDERS AND FUEL TANK — FRONT FENDER-Installation" section in CHAPTER 3.

FRONT SHOCK ABSORBER AND LOWER ARM

① Front shock absorber
② Steering knuckle
③ Lower arm
④ Bushing





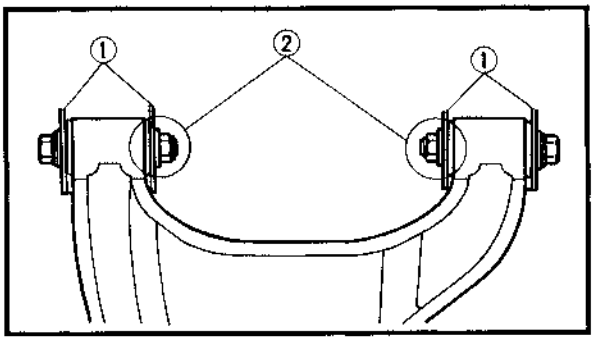


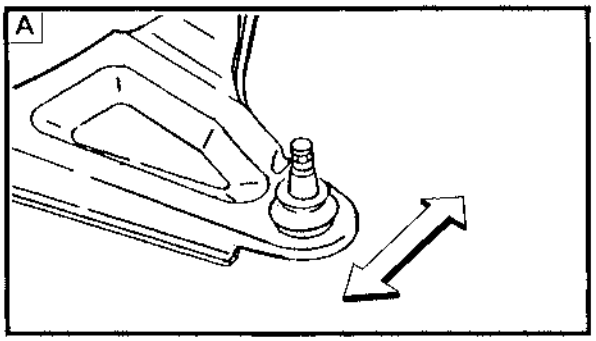
REMOVAL

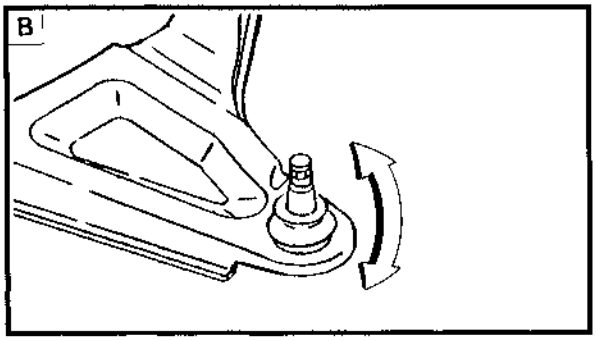
1. Remove:
   - Front bumper
   - Front fender
   - Front carrier (except for USA)
     Refer to the "FENDERS AND FUEL TANK-FRONT FENDER – Removal" section in CHAPTER 3.
   - Front wheel
   - Brake drum
   - Brake shoe plate
     Refer to "FRONT WHEELS AND FRONT BRAKE – Removal"section.
2. Remove:
   - Cotter pin ①
   - Nut ②
   - Tie-rod end ③

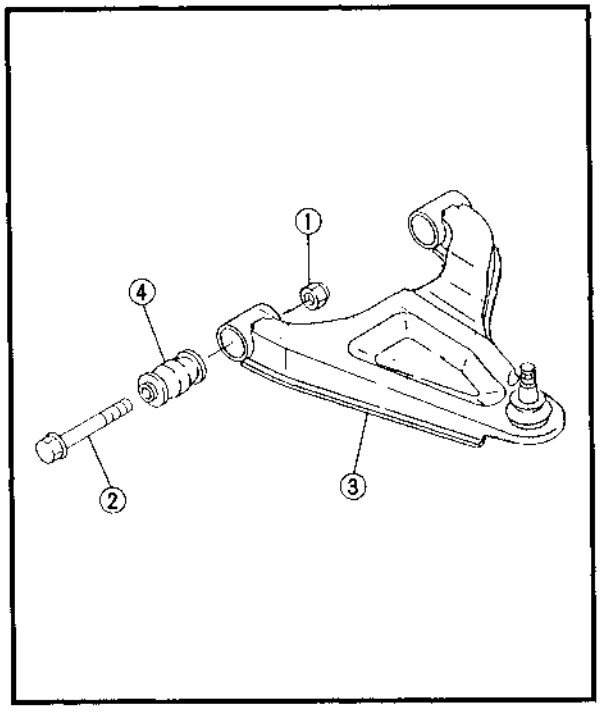
NOTE:
When removing the rod end from the knuckle arm, use a general bearing puller.

3. Remove:
   - Circlip (shock absorber upper) ①
4. Loosen:
   - Flange nut ②
     41 mm (1.6 in)
5. Remove:
   - Bolts (shock absorber lower) ③
   - Flange nut ②
   - Shock absorber ④ (front)
6. Remove:
   - Cotter pin ⑤
   - Nut ⑥ (steering knuckle)
   - Steering knuckle ⑦









7. Inspect:
   - Lower arms free play

****

Inspection steps:

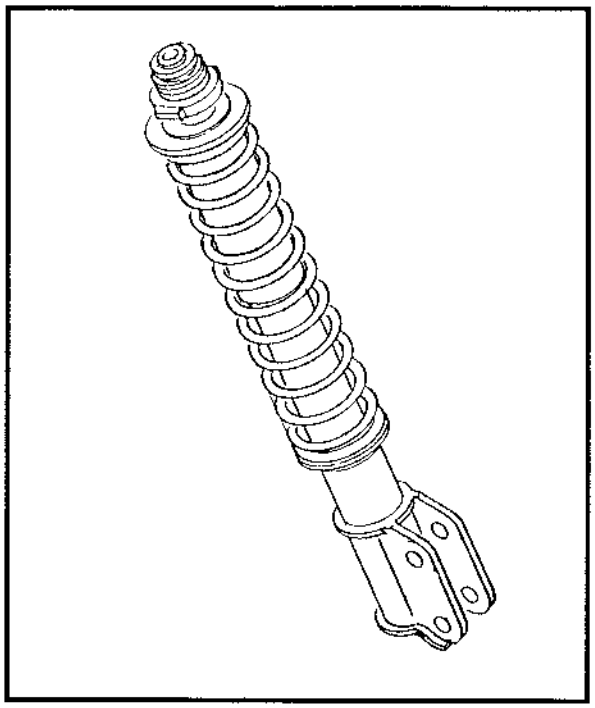
- Inspect the lower arm brackets ① of the frame. If bent, cracked or damaged, repair or replace the frame.
- Check the tightening torque of the lower arm securing nuts ② .

	Nut (lower arm): **45 Nm (4.5 m • kg, 32 ft • lb)**

- Check the lower arm side play [A] by moving it from side to side. If side play noticeable, replace the bushings or lower arm as a set.
- Check the lower arm vertical movement [B] by moving it up and down.
  If vertical movement is tight, binding or rough, replace the bushings or lower arm as a set.

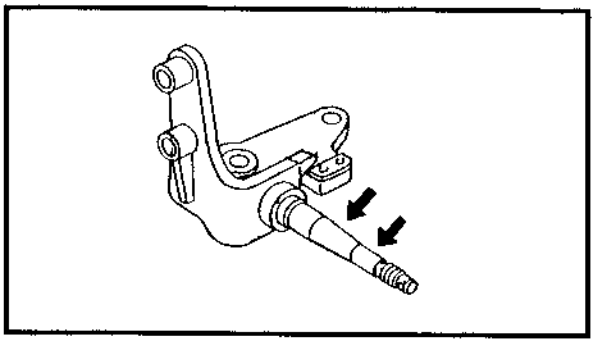
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8. Remove:
   - Nuts ①
   - Bolts ②
   - Lower arm ③
   - Bushings ④



INSPECTION

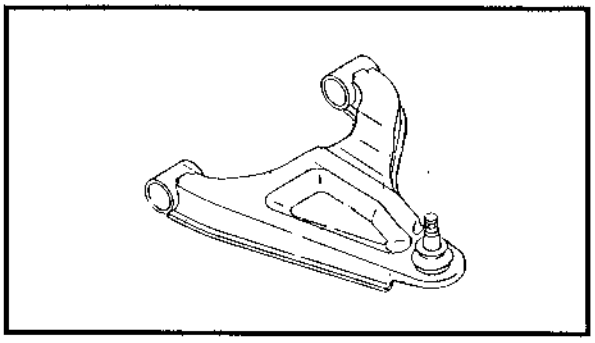
1. Inspect:
   - Shock absorber
     Oil leaks → Replace the shock absorber assembly.
   - Ball joint
     Cracks/Damage → Replace the shock absorber assembly.
   - Spring
     Fatigue/Damage → Replace the shock absorber assembly.
     Move the spring up and down.



2. Inspect:
   - Steering knuckle
     Cracks/Pitting/Damage → Replace.

⚠ WARNING

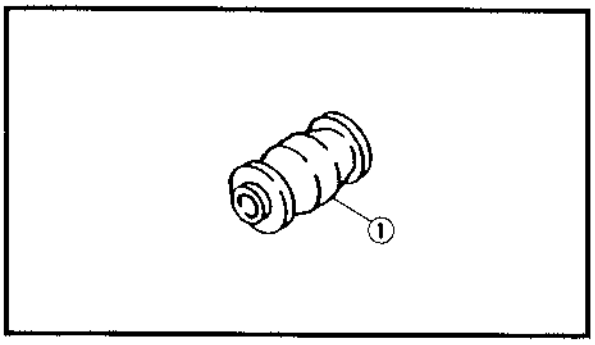
Do not attempt to straighten a bent shaft; this may dangerously weaken the shaft.



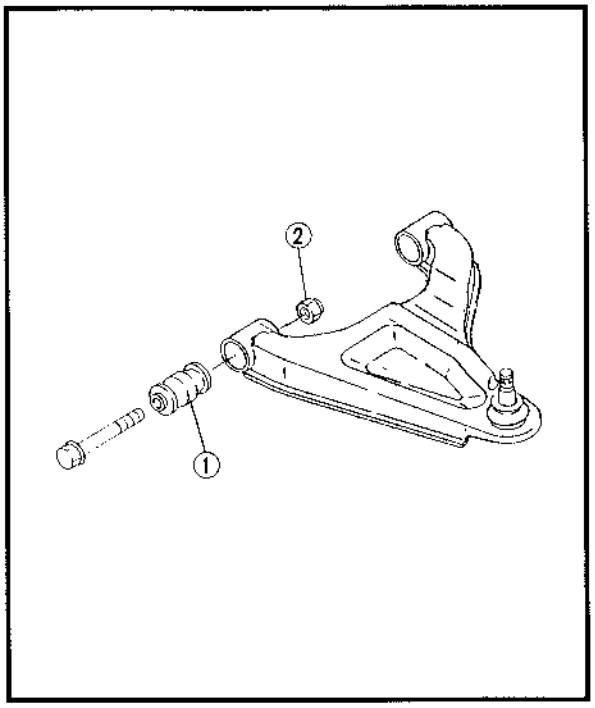
3. Inspect:
   - Lower arm
     Cracks/Bends/Damage → Replace.

⚠ WARNING

Do not attempt to straighten a bent arm; this may dangerously weaken the arm.



5. Inspect:
   - Bushings ①
     Wear/Damage → Replace as a set.



INSTALLATION

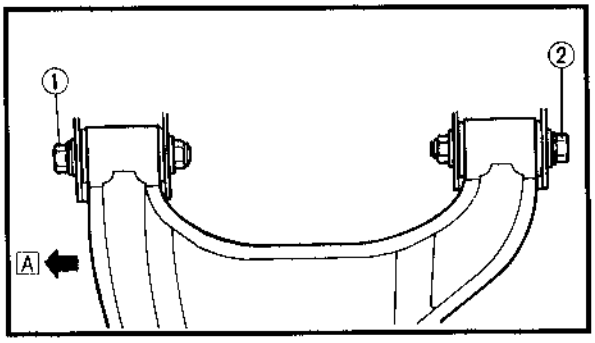
Reverse the "REMOVAL" procedures.
Note the following points.

1. Lubricate:
   - Bushings ① (inner surface)

	Lithium-soap base grease

2. Tighten:
   - Nut ② (lower arm)

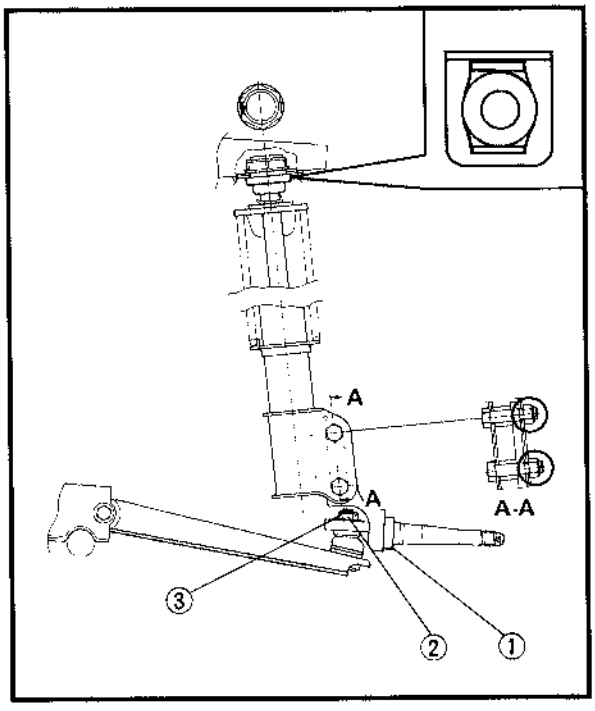
	Nut (lower arm): **45 Nm (4.5 m • kg, 32 ft • lb)**



NOTE:

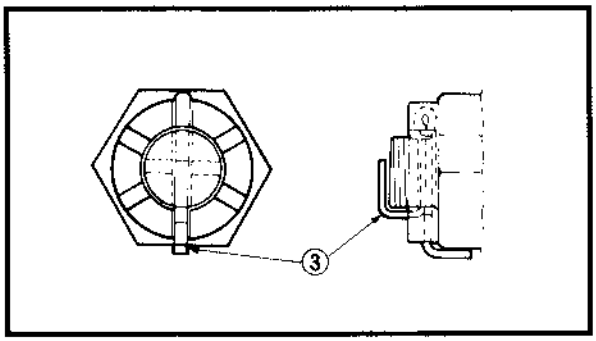
Be sure to position the front arm securing bolts (front ① and rear ②) so that the bolt heads will face outward.

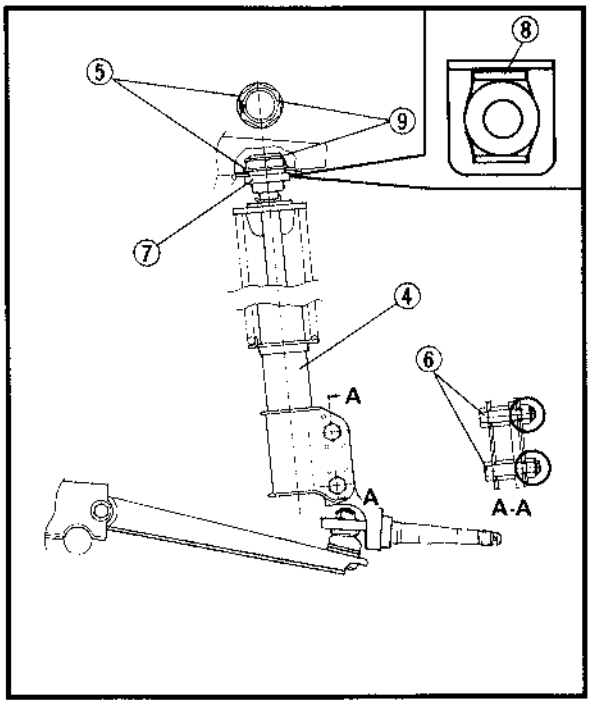
A Forward



3. Install:
   - Steering knuckle ①
4. Tighten:
   - Nut ② (steering knuckle)

	Nut (steering knuckle): **25 Nm (2.5 m • kg, 18 ft • lb)**





5. Install:
   - Cotter pin ③

NOTE:
Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.

⚠ WARNING
Always use a new cotter pin.

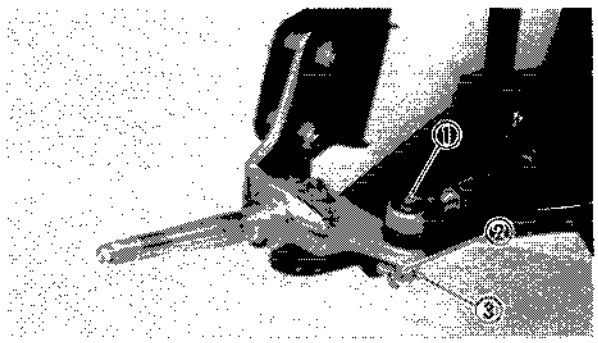
6. Install:
   - Shock absorber ④ (front)
   - Flange nut ⑤ (shock absorver upper)
   - Bolts ⑥ (shock absorber lower)

NOTE:
- **Make sure the flat sides ⑧ of the ball joint ⑦ are firmly held by the frame before tightening the flange nut ⑤.**
- **Be sure to position the souck absorver securing bolts (lower ⑥) so that the bolts head will face forward.**

7. Tighten:
   - Flange nut ⑤
   - Bolts ⑥

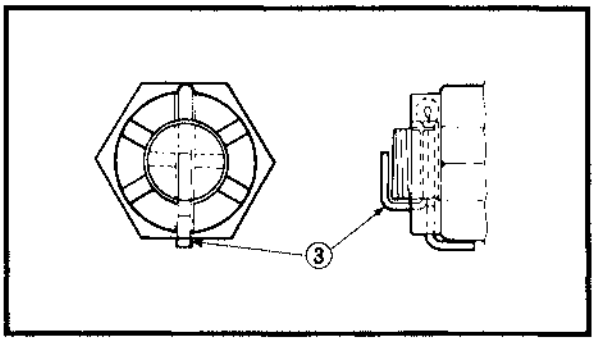
Flange nut:
55 Nm (5.5 m • kg, 50 ft • lb)
Bolts:
70 Nm (7.0 m • kg, 50 ft • lb)

8. Install
   - Circlip ⑨



9. Install:
   - Tie-rod end ①
   - Nut ② (tie-rod end)
   - Cotter pin ③

Nut (tie-rod):
25 Nm (2.5 m • kg, 18 ft • lb)



NOTE:

Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.

⚠ WARNING

Always use a new cotter pin.

10. Install:
    - Brake shoe plate
    - Brake drum
    - Front wheel

    Refer to the "FRONT WHEELS AND FRONT BRAKE-INSTALLATION" section.

11. Adjust:
    - Toe-in

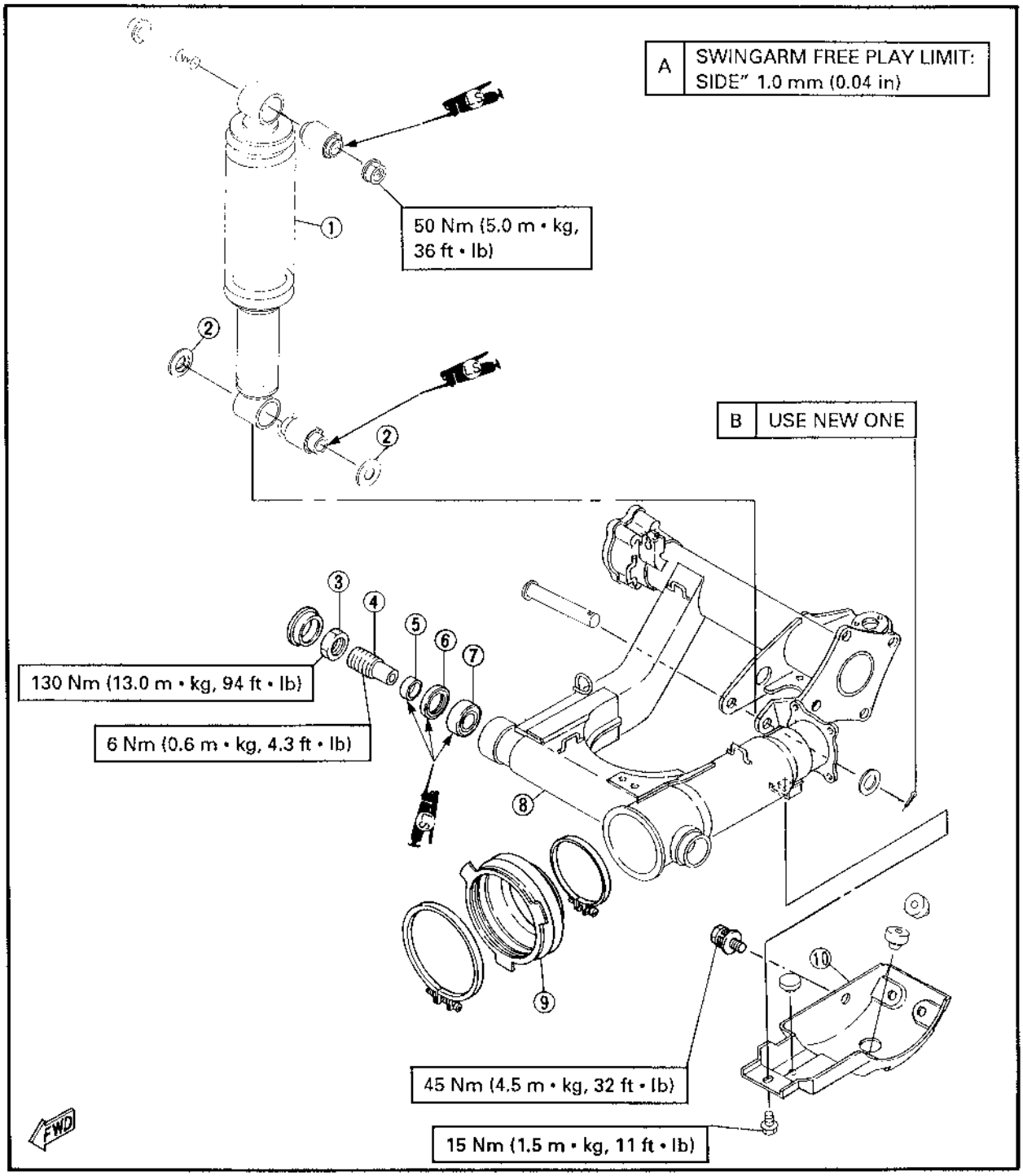
    Refer to the "TOE-IN ADJUSTMENT" section in CHAPTER 3.

12. Install:
    - Front fender
    - Front bumper
    - Front carrier (except for USA)

    Refer to the "FENDERS AND FUEL TANK-FRONT FENDER – Installation" section in CHAPTER 3.

REAR SHOCK ABSORBER AND SWINGARM

① Rear shock absorber
② Thrust cover
③ Locknut
④ Pivot shaft
⑤ Collar
⑥ Oil seal
⑦ Taper roller bearing
⑧ Swingarm
⑨ Rubber boot
⑩ Final gear case under cover

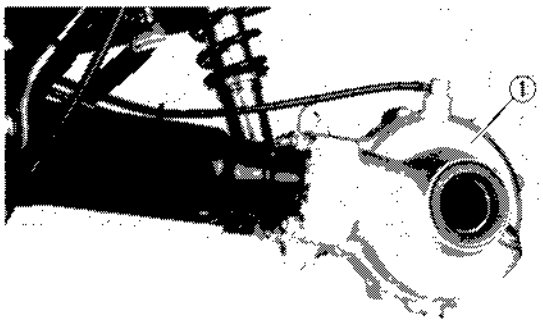


REMOVAL

1. Remove:
   - Seat
   - Rear fender
   - Rear bumper
   - Rear carrier (except for USA)

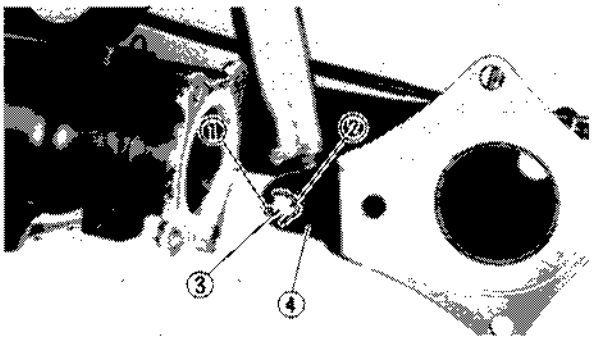
   Refer to "FENDERS AND FUEL TANK-REAR FENDER-Removal" section in CHAPTER 3.
2. Remove:
   - Rear wheel (left)
   - Wheel hub
   - Rear wheel (right)
   - Brake drum
   - Baking plate
   - Final gear case under cover
   - Rear axle

   Refer to the "REAR WHEEL/REAR BRAKE AND REAR AXLE – REMOVAL" section.



3. Removal:
   - Final gear case unit ①

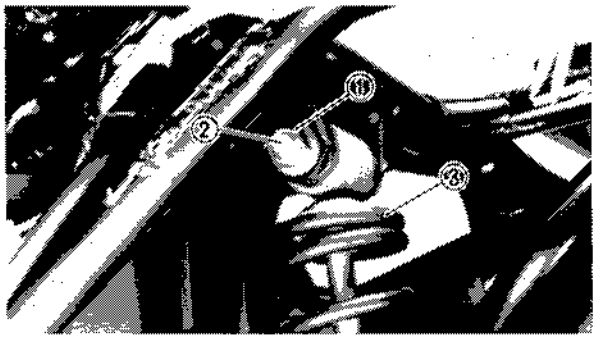
   Refer to the "FINAL DRIVE GEAR AND DRIVE SHAFT – REMOVAL" section in CHAPTER 6.



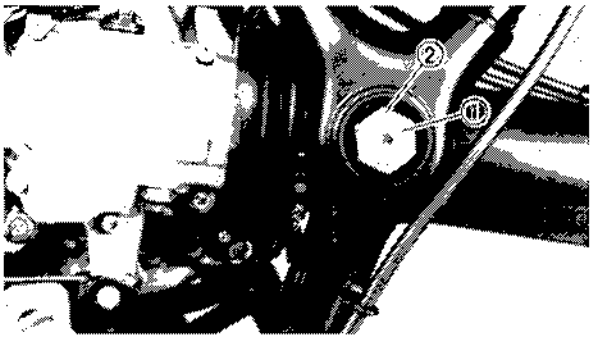
4. Remove:
   - Cotter pin ①
   - Washer ②
   - Shaft ③ (shock absorber – lower)
   - Thrust cover

NOTE:

When removing the lower shaft ③ , hold the swingarm ④ so that it does not drop downwards when the shaft is removed.



5. Remove:
   - Nut ① (shock absorber – upper)
   - Bolt ②
   - Shock absorber ③



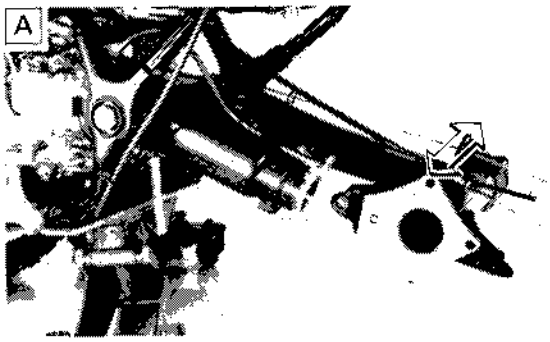
6. Remove:
   - Caps (pivot shaft)
7. Inspect:
   - Swingarm free play

****

Free play inspection steps:

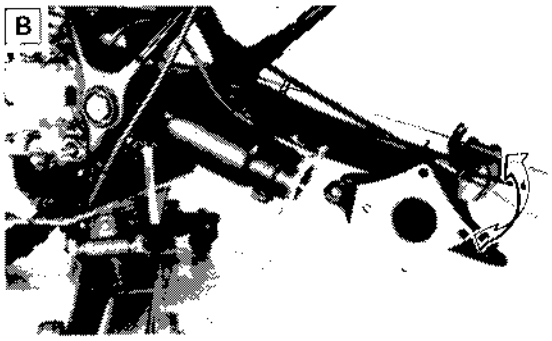
- Check the tightening torque of the pivot shafts ① (swingarm) and locknuts ② (pivot shaft).

	Pivot shaft (swingarm): **6 Nm (0.6 m • kg, 4.3 ft • lb)** **Locknut (pivot shaft):** **130 Nm (13 m • kg, 94 ft • lb)**



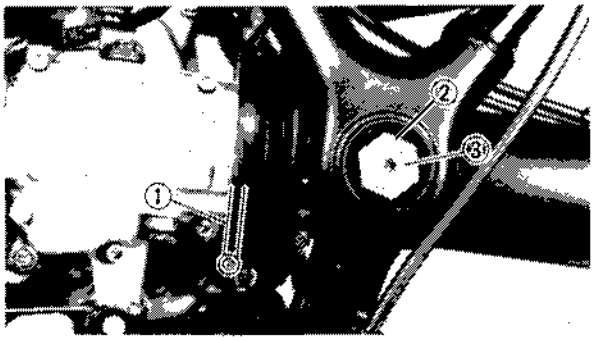
- Check the swingarm side play [A] by moving it from side to side.
  If side play noticeable, check the spacer collar, bearing and frame pivot.

	Free play limit: **1.0 mm (0.04 in)**

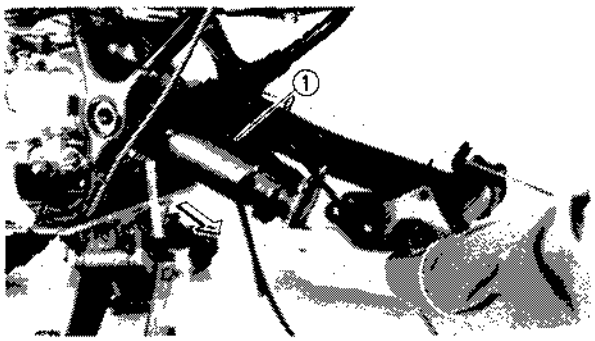


- Check the swingarm vertical movement [B] by moving it up and down.
  If vertical movement is tight, binding or rough, check the spacer collar, bearing and fram pivot.

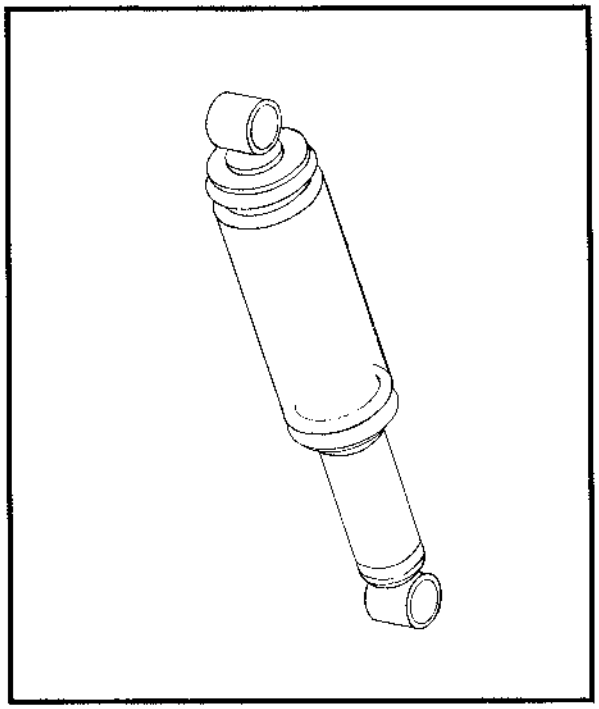
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8. Remove:
   - Clamp ① (rubber boot)
   - Locknuts ② (pivot shaft)
   - Pivot shafts ③ (swingarm)

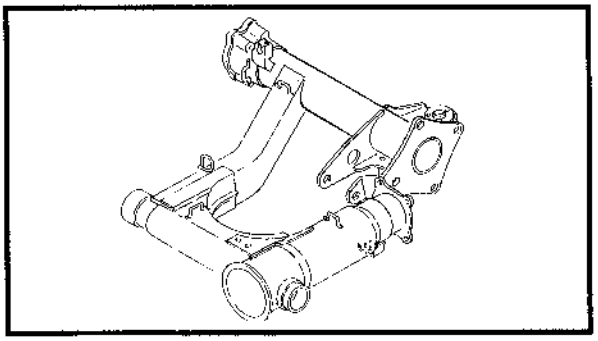


9. Remove:
   - Swingarm ①

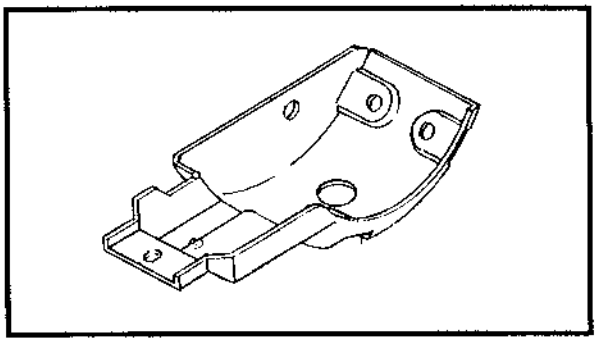


INSPECTION

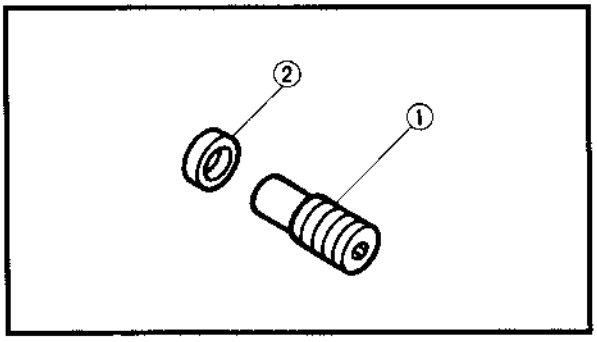
1. Inspect:
   - Shock absorber
     Oil leakes → Replace the shock absorber assembly.
   - Shock absorber rod
     Bends/Damage → Replace the shock absorber assembly.
   - Spring
     Fatigue/Damage → Replace the shock absorber assembly.
     Move the spring up and down.



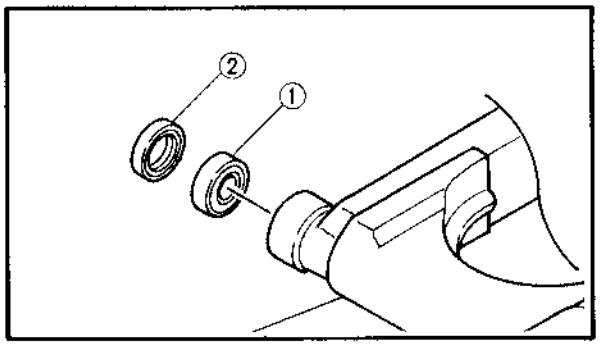
2. Inspect:
   - Swingarm
     Cracks/Bends/Damage → Replace.



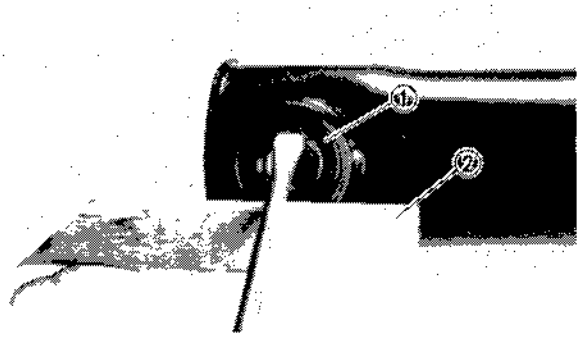
3. Inspect:
   - Final gear case under cover
     Cracks/Bends/Damage → Replace.



4. Inspect:
   - Pivot shaft ① (swingarm)
   - Spacer collar ②
     Wear/Damage → Replace.



5. Inspect:
   - Bearings ① (swingarm)
     Bearings allow play in the swingarm or to the bearing turns roughly → Replace.
   - Oil seals ②
     Wear/Damage → Replace.



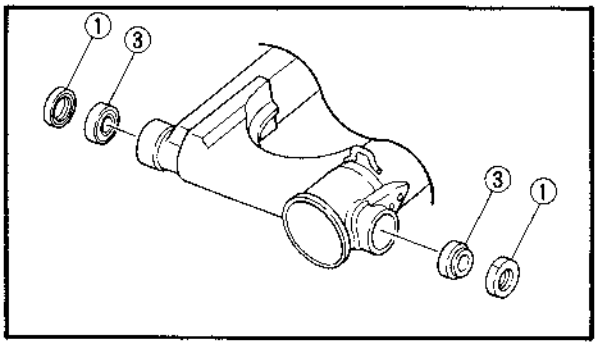
****

Swingarm bearing and oil seal replacement steps:

- Clean the area around the bearings on the swingarm.
- Remove the oil seals ① use a flat-head screw driver.

NOTE:

Place a wood block ② on the outer edge to protect this edge.



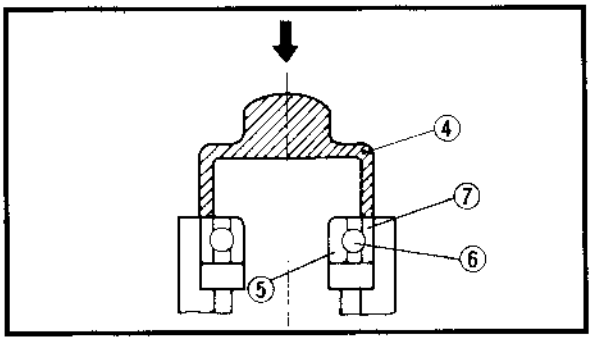
- Remove the bearings ③ using a general bearing puller.
- Install the new bearings and oil seal by reversing the previous steps.

NOTE:

Use a socket ④ that matches the outside diameter of the race of the bearing and oil seal.

CAUTION:

Do not strike the center race ⑤ or balls ⑥ of the bearing. Contact should be made only with the outer race ⑦.

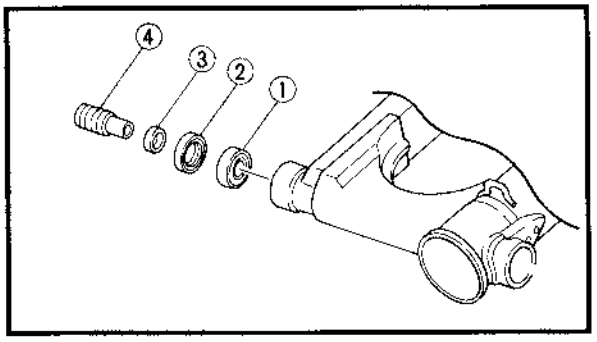


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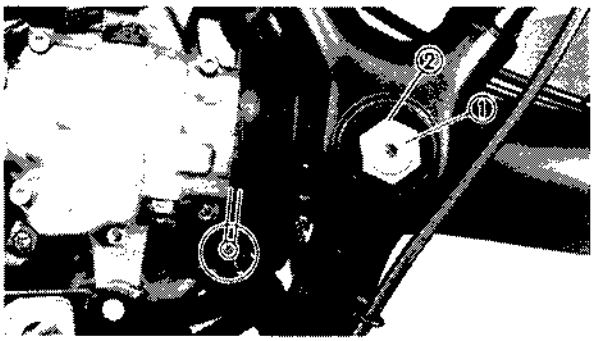
INSTALLATION

Reverse the "REMOVAL" procedures.
Note the following points.

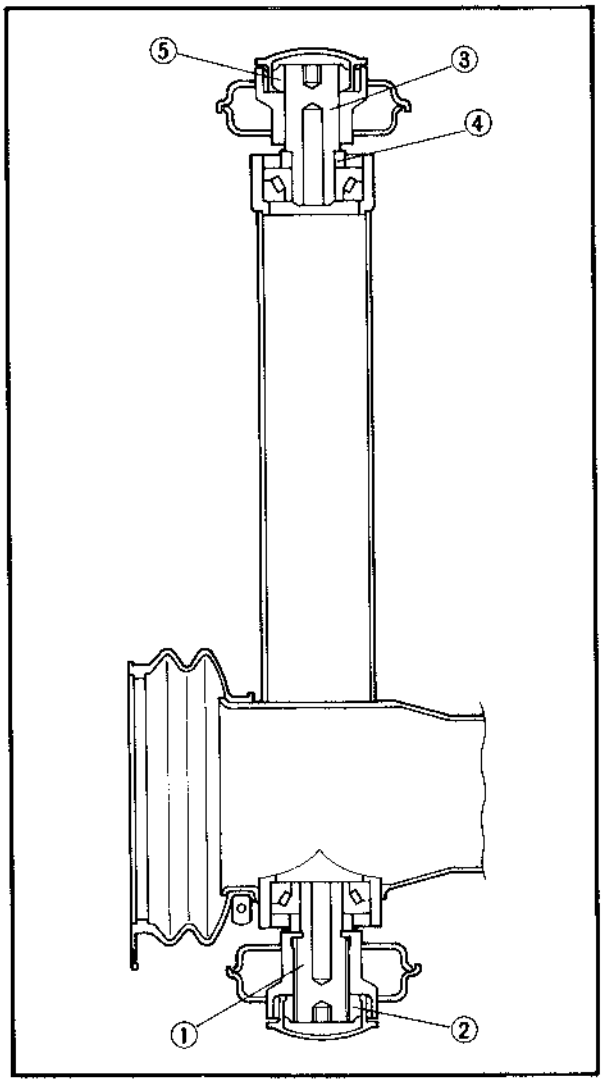
1. Lubricate:
   - Bearings ①
   - Oil seals ②
   - Collars ③
   - Pivot shafts ④



	Lithium-soap base grease



2. Install:
   - Swingarm
   - Pivot shafts (swingarm)
3. Tighten:
   - Pivot shafts ① (swingarm)
   - Locknuts ② (pivot shaft)



****

Pivot shaft tightening steps:

- Tighten the pivot shaft ① (left) to specification.

	Pivot shaft (left): **6 Nm (0.6 m • kg, 4.3 ft • lb)**

- Tighten the locknut (left) ② to specification.

	Locknut (left): **130 Nm (13.0 m • kg, 94 ft • lb)**

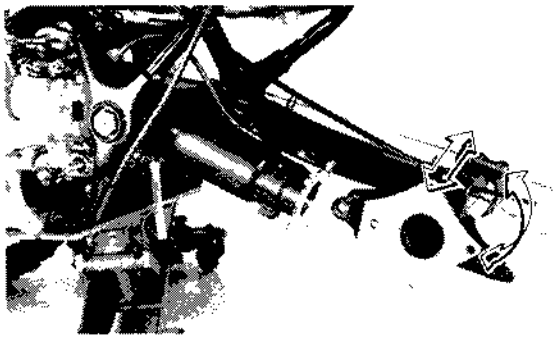
- Tighten the pivot shaft ③ (right) until it contacts the collar ④.

	Pivot shaft (right): **6 Nm (0.6 m • kg, 4.3 ft • lb)**

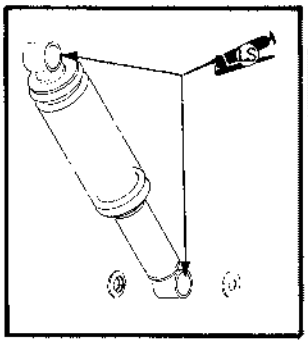
- Tighten the locknut ⑤ (right) to specification.

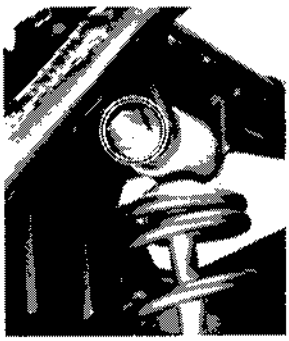
	Locknut (right): **130 Nm (13.0 m • kg, 94 ft • lb)**

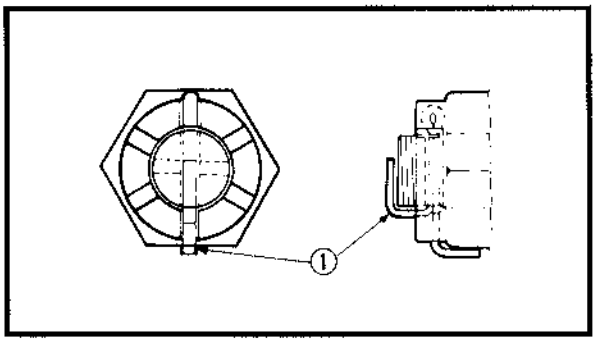
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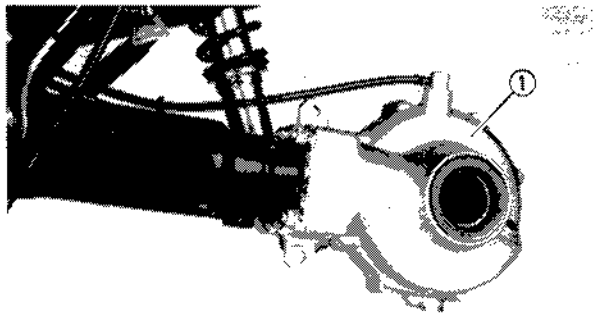


4. Inspect:
   - Swingarm free play
     Refer to the step 7. in the "REMOVAL" section.









5. Lubricate:
   - Bushings (shock absorber–upper and lower)

	Lithium-soap base grease

6. Install:
   - Shock absorber

	Nut (shock absorber – upper): 50 Nm (5.0 m • kg, 36 ft • lb)

7. Install:
   - Cotter pin ①

NOTE:

Do not loosen the wheel hub nut after torque tightening. If the wheel hub nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the wheel hub nut.

⚠ WARNING

Always use a new cotter pin.

8. Install:
   - Final gear assembly ①

   Refer to the "FINAL DRIVE GEAR AND DRIVE SHAFT – ASSEMBLY – INSTALLTION" section in CHAPTER 6.

9. Install:
   - Rear axle
   - Final gear case under cover
   - Baking plate (right)
   - Brake drum
   - Rear wheel (right)
   - Wheel hub (left)
   - Rear wheel (left)

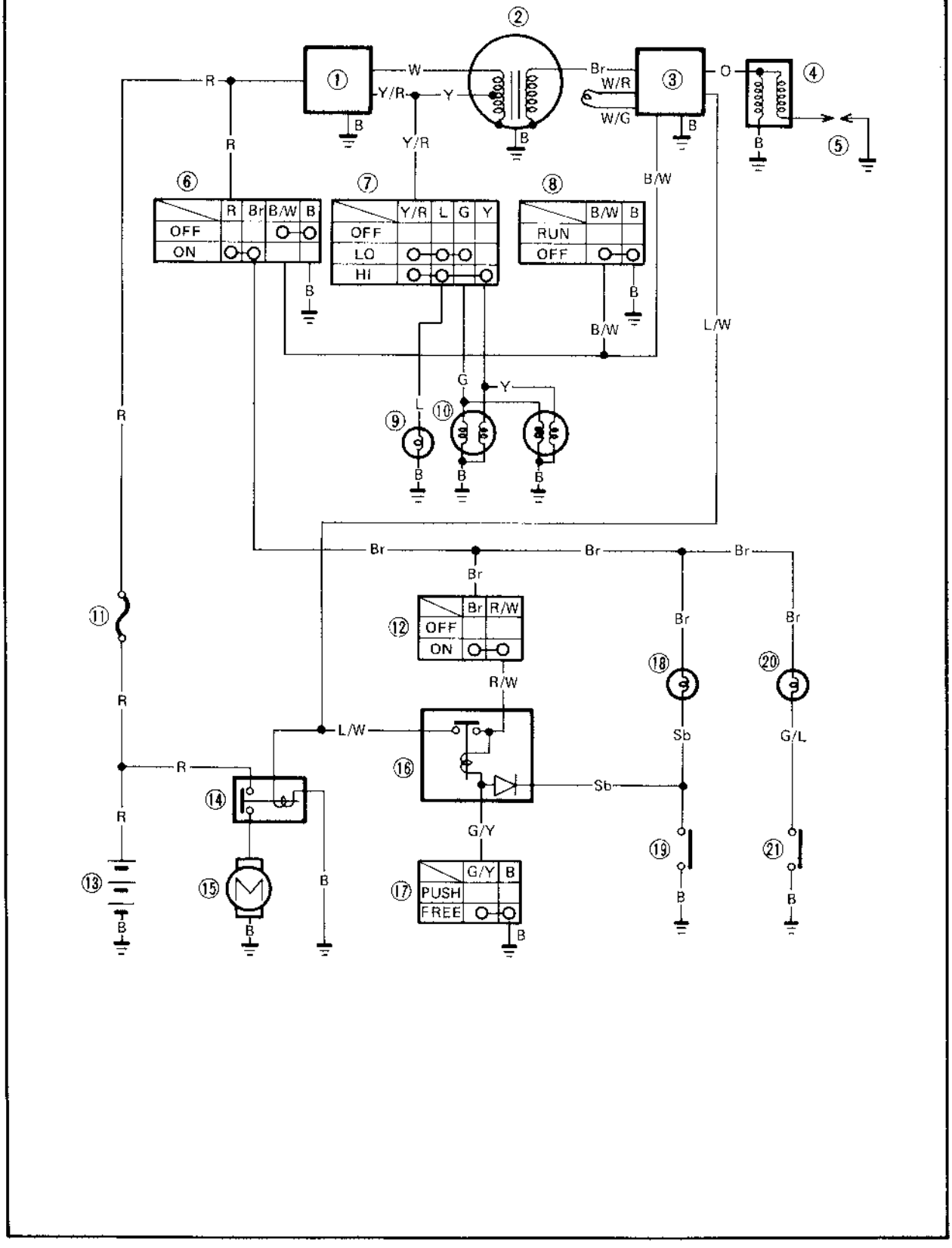
   Refer to the "REAR WHEEL/REAR BRAKE AND REAR AXLE–INSTALLATION" section.

10. Install:
    - Rear bumper
    - Rear fender
    - Seat
    - Rear carrier (except for USA)

    Refer to the "SEAT, FUEL TANK AND COVERS–INSTALLATION" section in CHAPTER 3.

ELECTRICAL

YFB250(D) '92 CIRCUIT DIAGRAM



① Rectifier/Regulator
② CDI magneto
③ CDI unit
④ Ignition coil
⑤ Spark plug
⑥ Main switch
⑦ "LIGHTS" switch
⑧ "ENGINE STOP" switch
⑨ Taillight
⑩ Headlight
⑪ Fuse
⑫ "START" switch
⑬ Battery
⑭ Starter relay
⑮ Starter motor
⑯ Starting circuit cut-off relay
⑰ Brake switch
⑱ "NEUTRAL" indicator light
⑲ Neutral switch
⑳ "REVERSE" indicator light
㉑ Reverse switch

NOTE:

- "START" switch is closed while the button (switch) is pushed.
- Brake switch is closed while the brake lever is pulled.
- Neutral switch is closed while the transmission is in neutral.
- Reverse switch is closed while the dirve select lever is in reverse.

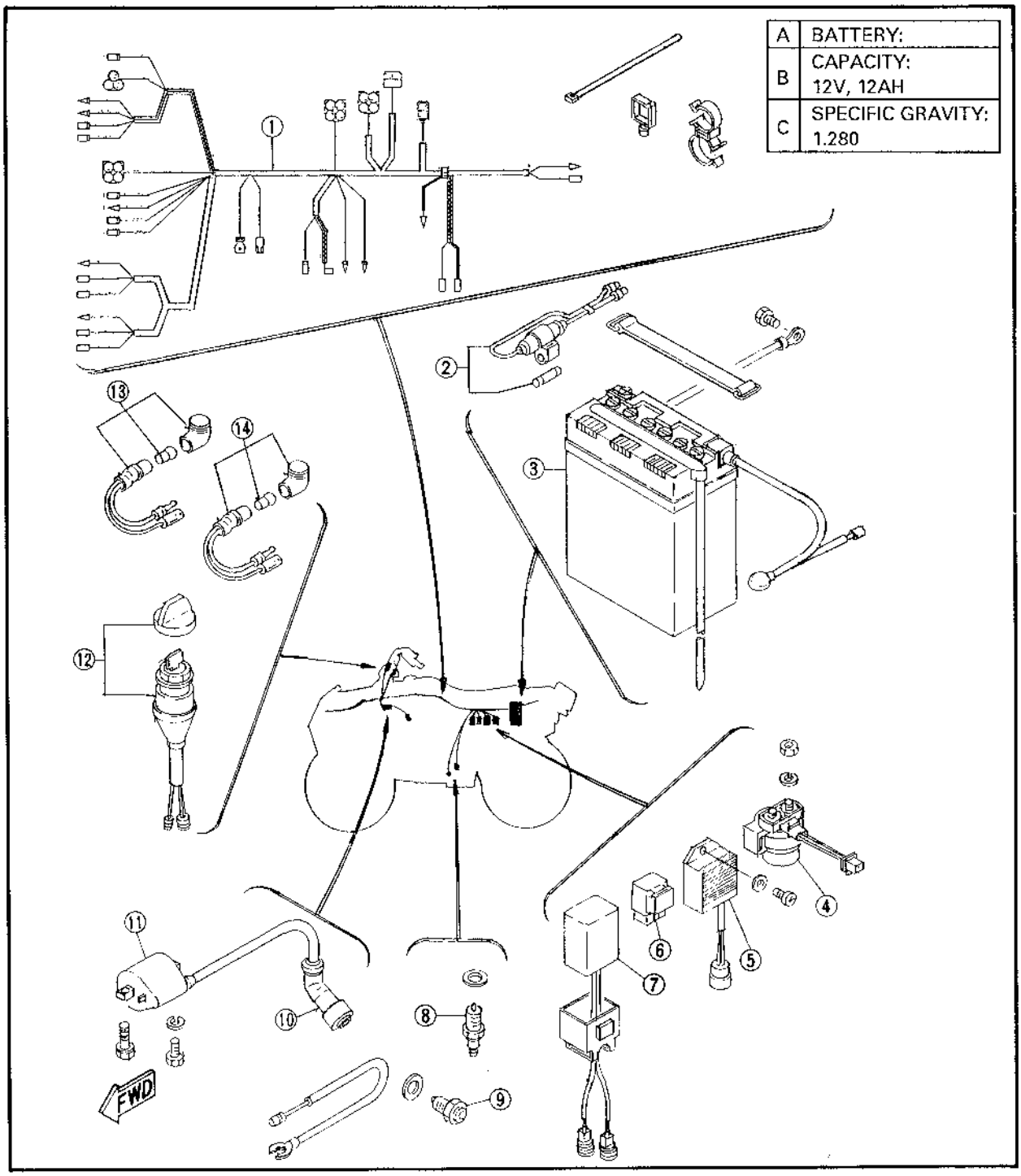
COLOR CODE

B	Black	B/W	Black/White
Br	Brown	G/L	Green/Blue
G	Green	G/Y	Green/Yellow
L	Blue	L/W	Blue/White
O	Orange	R/W	Red/White
R	Red	W/G	White/Green
Sb	Sky blue	W/R	White/Red
W	White	Y/R	Yellow/Red
Y	Yellow		

ELECTRICAL COMPONENTS

① Wireharness
② Fuse
③ Battery
④ Starter relay
⑤ Rectifier/Regulator
⑥ Starting circuit cut-off relay
⑦ CDI unit
⑧ Reverse switch
⑨ Neutral switch
⑩ Plug cap
⑪ Ignition coil
⑫ Main switch
⑬ "NEUTRAL" indicator light
⑭ "REVERSE" indicator light

SPECIFICATIONS	RESISTANCE
IGNITION COIL:	
PRIMARY	0.36 ~ 0.48Ω
SECONDARY	5.4 ~ 7.4 kΩ
PICK-UP COIL	189 ~ 231 Ω
SOURCE COIL	428 ~ 523 Ω
CHARGING COIL	0.72 ~ 0.88 Ω
LIGHTING COIL	0.48 ~ 0.58 Ω



CHECKING OF SWITCHES

NOTE:
This section is written based on a general model.

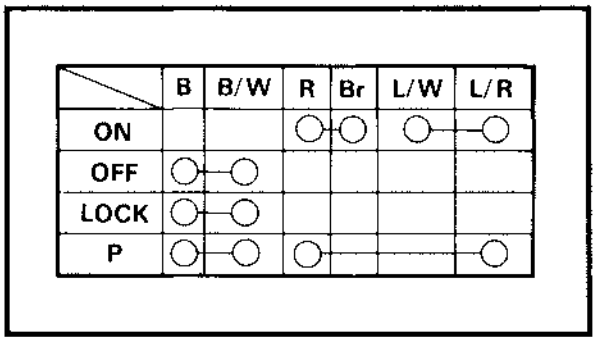
Check the switches for the continuity between the terminals to determine correct connection.

Read the following for switch inspection.

SWITCH CONNECTION AS SHOWN IN MANUAL

The manual contains a connection chart as shown on the left showing the terminal connections of the switches (e.g., main switch, handlebar switch, brake switch, lighting switch etc.)

The extreme left column indicates the switch positions and the top line indicates the colors of leads connected with the terminals in the switch component.



" ○—○ " indicates the terminals between which there is a continuity of electricity; i.e., a closed circuit at the respective switch positions.

In this chart:
"R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

"B and B/W" is continuous with the "OFF" switch position.

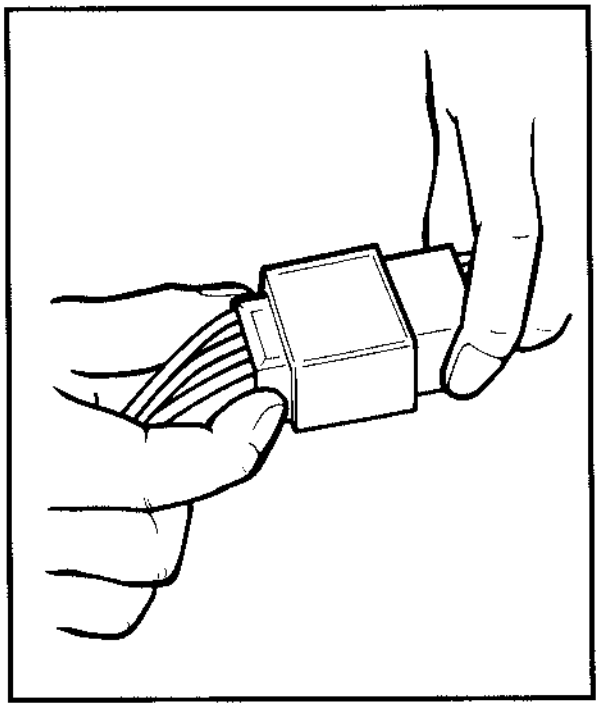
"B and B/W" is continuous with the "LOCK" switch position.

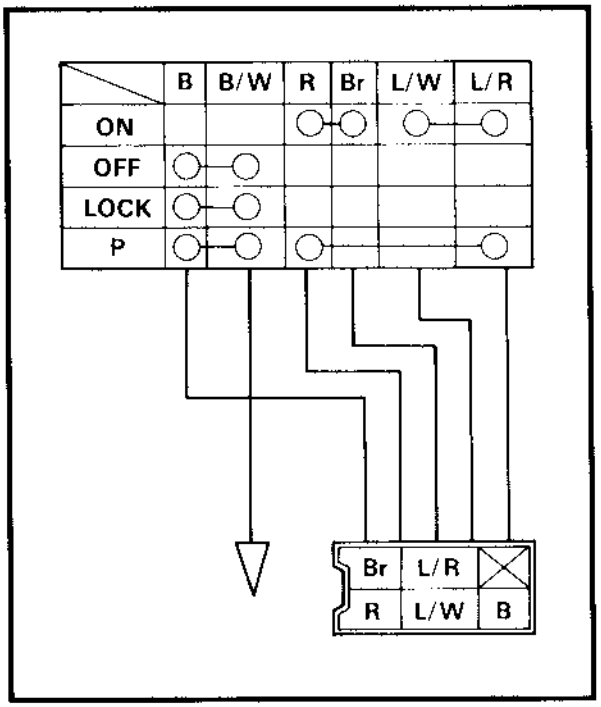
"B and B/W" and "R and L/R" are continuous with the "P" switch position.

CHECKING SWITCH FOR TERMINAL CONNECTION

Before checking the switch, refer to the connection chart as shown above and check for the correct terminal connection (closed circuit) by the color combination.

To explain how to check a switch, the main switch is taken as an example in the following.





1. Disconnect the main switch coupler from the wire harness.

CAUTION:

Never disconnect the main switch coupler by pulling the leads. Otherwise, leads may be pulled off the terminals inside the coupler.

2. Inspect whether any lead is off the terminal inside the coupler. If it is, repair it.

NOTE:

If the coupler is clogged with mud or dust, blow it off by compressed air.

3. Use the connection chart to check the color combination for continuity (a closed circuit). In this example, the continuity is as follows.

   "R and Br" and L/W and L/R" are continuous with the "ON" switch position.

   "B and B/W" is continuous with the "OFF" switch position.

   "B and B/W" is continuous with the "LOCK" switch position.

   "B and B/W" and "R and L/R" are continuous with the "P" switch position.

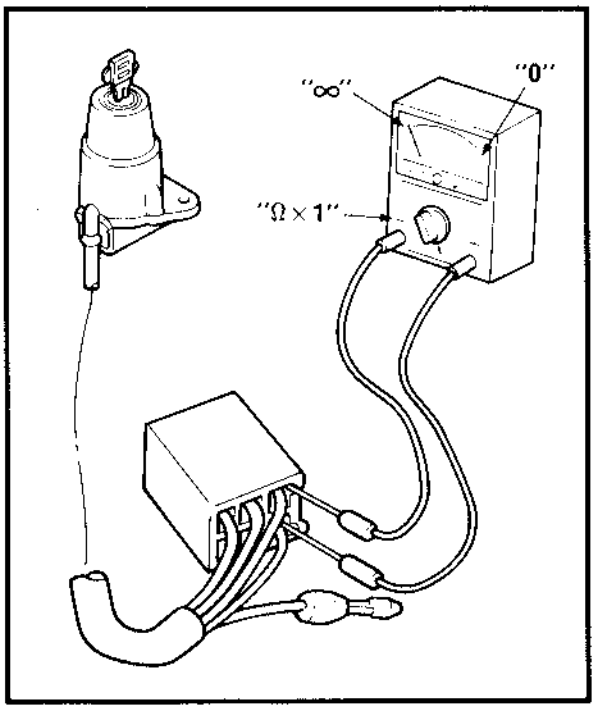
   Please note that there is no continuity (an open circuit) at all for the color combinations other than the above.

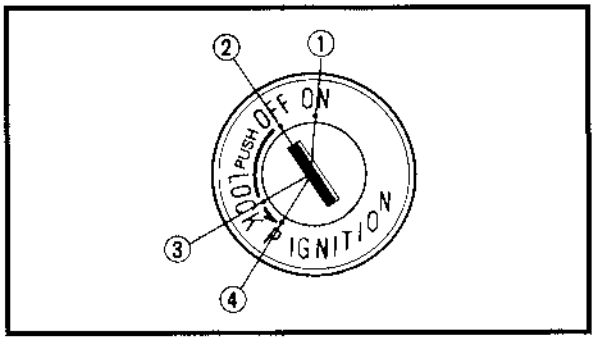
4. Check the switch component for the continuity between "R and Br".

****

Checking steps:

- Turn the switch key to the "ON", "OFF", "LOCK", and "P" several times.
- Set the pocket tester selector to the "Ω x 1".
- Connect the tester (+) lead to the "R" lead terminal in the coupler and the (–) lead to the "Br" lead terminal.





NOTE:

Use thin probes for checking the continuity. Otherwise, the probes may contact other terminals inside the coupler.

- Check the continuity between "R" and "Br" at the respective switch positions of "ON" ① , "OFF" ② , "LOCK" ③ , and "P" ④ . There must be continuity (the tester indicating "0") at the "ON" switch position, and there must be no continuity (the tester indicating "∞") at "OFF", "LOCK", or "P". There is something wrong between "R" and "Br" if there is no continuity at the "ON" position or if there is some continuity either at the "OFF" or "LOCK" or "P".

NOTE:

Check the switch for continuity several times.

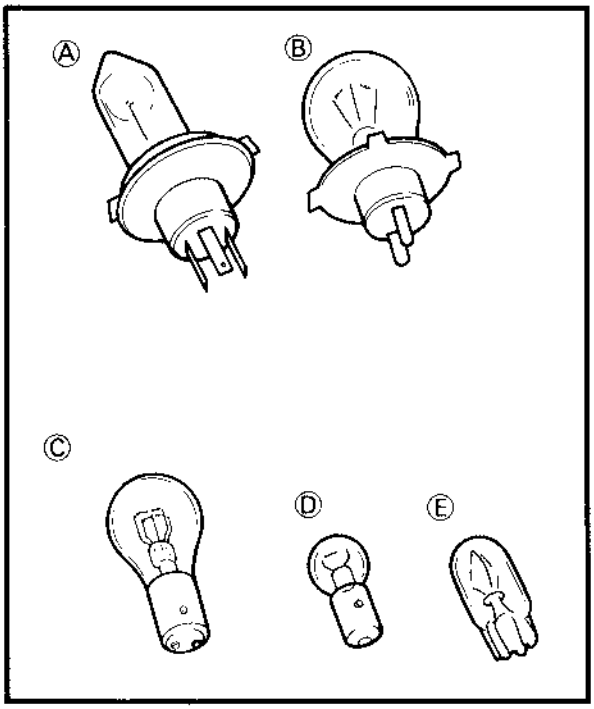
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5. Next, go on to check the continuity between "B and B/W", "L/W and L/R", and "R and L/R" at the respective switch positions, as in the same manner as mentioned above.

6. If there is something wrong with any one of the combinations, replace the switch component.

CHECKING OF BULBS (FOR HEADLIGHT, TAIL/BRAKE LIGHT, FLASHER LIGHT, METER LIGHT, ETC.)

Check the bulb terminal continuity for the condition of the bulb.



KINDS OF BULBS

The bulbs used in the machine are classified as shown on the left by the shape of the bulb socket.

Ⓐ and Ⓑ are mainly used for the headlight.

Ⓒ is mainly used for the flasher light and tail/brake light.

Ⓓ and Ⓔ are mainly used for the meter light and other indicator lights.

CHECKING BULBS CONDITION

1. Remove the bulb.

NOTE:

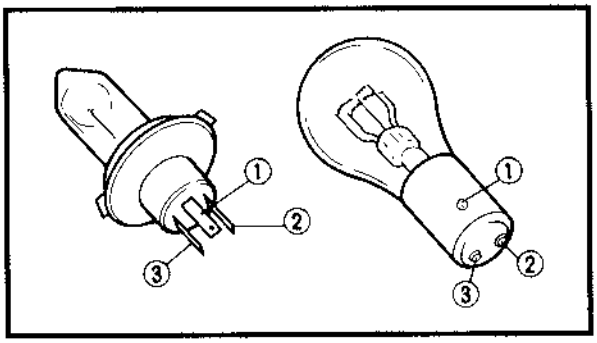
- Bulbs types Ⓐ and Ⓑ require a bulb holder. Remove the bulb holder before removing the bulb itself. Most of the bulb holders for this type can be removed by turning them counterclockwise.
- Most Ⓒ and Ⓓ type bulbs can be removed from the bulb sockets by pushing and turning them counterclockwise.
- Ⓔ type Bulbs can be removed from the bulb sockets by simply pulling them out.

CAUTION:

Be sure to hold the socket firmly when removing the bulb. Never pull the lead. Otherwise, the lead may be pulled off the terminal in the coupler.

⚠ WARNING

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



2. Check the bulb terminals for continuity.

****

Checking steps:

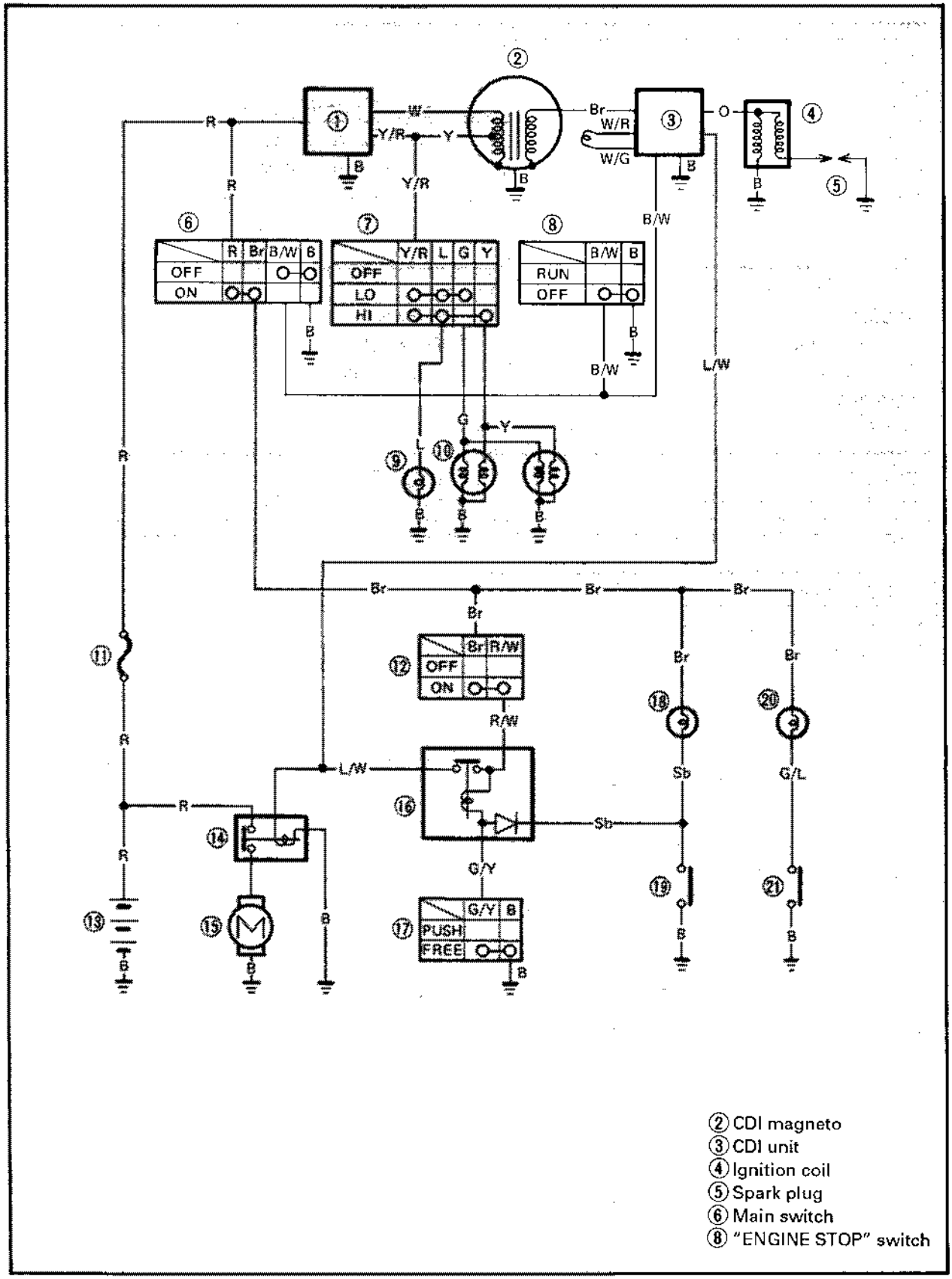
- Set the pocket tester selector to the "Ω x 1".
- Connect the tester leads to the respective bulb terminals.
  First check the continuity between terminals ① and ② by connecting the tester (+) lead to terminal ① and the tester (–) lead to terminal ② . Then check the continuity between terminals ① and ③ by connecting the tester (+) lead still to terminal ① and the tester (–) lead to terminal ③ . If the tester shows "∞" in either case, replace the bulb.

****

3. Check the bulb socket by installing a proven bulb to it. As in the checking of bulbs, connect the pocket tester leads to the respective leads of the socket and check for continuity in the same manner as mentioned above.

IGNITION SYSTEM

CIRCUIT DIAGRAM



② CDI magneto
③ CDI unit
④ Ignition coil
⑤ Spark plug
⑥ Main switch
⑧ "ENGINE STOP" switch

TROUBLESHOOTING

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK)

Procedure

Check;

1. Spark plug
2. Ignition spark gap
3. Spark plug cap resistance
4. Ignition coil resistance
5. Main switch
6. "ENGINE STOP" switch
7. Source coil resistance
8. Pickup coil resistance
9. Wiring connection (ignition system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Fuel tank cover
  3) Fuel tank
  4) Rear carrier (except for USA)
  5) Battery
  6) Fuse holder
  7) Rear fender
- Use the following special tools in this troubleshooting.

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

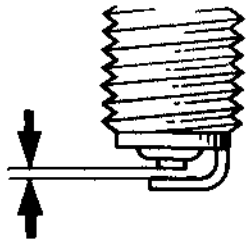
Dynamic coil tester:
P/N. YM-34487, 90890-03144

1. Spark plug

- Check the spark plug type condition and gap. Refer to the "SPARK PLUG INSPECTION" section in the CHAPTER 3.

Standard spark plug:
For USA and Oceania:
D7EA (NGK) or X22ES-U (NIPPONDENSO)
For CDN, Europe and ZA:
DR7ES (NGK)

Spark plug gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)



INCORRECT → Repair or replace spark plug.

CORRECT ↓

*

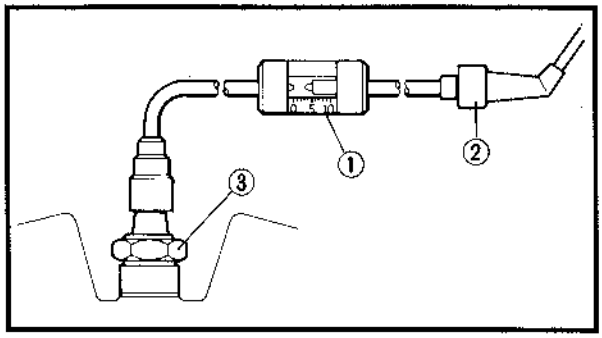
*

2. Ignition spark gap

- Securely connect the battery leads (positive and negative) to a fully charged battery.
- Disconnect the spark plug cap from the spark plug.
- Connect the Dynamic Spark Tester ① between the spark plug ② and spark plug cap ③, and set the specified spark gap.

- Turn the main switch to "ON" and "ENGINE STOP" switch to "RUN" then, shift the gear in neutral.
- Start the engine.
- Check the ignition spark condition.

Minimum spark gap:
6 mm (0.24 in)



SPARK

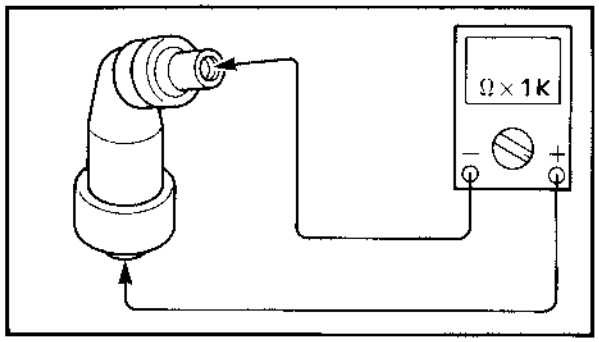
Ignition circuit is good.

OUT OF SPECIFICATION

3. Spark plug cap resistance

- Remove the spark plug cap.
- Connect the Pocket Tester (Ω × 1k) to the spark plug cap.
- Check the spark plug cap for specificated resistance.

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



OUT OF SPECIFICATION

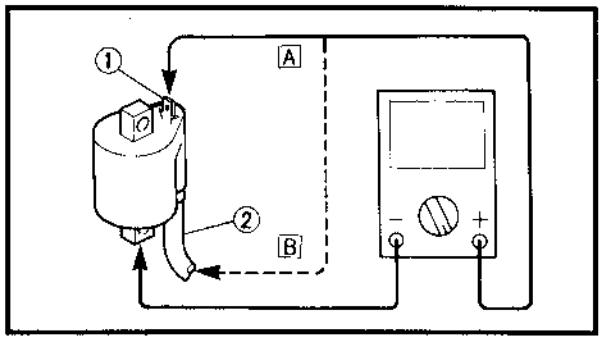
MEETS SPECIFICATION

Replace spark plug cap.

4. Ignition coil resistance

- Disconnect the ignition coil lead (Orange) from the wireharness.
- Connect the Pocket Tester to the ignition coil.

Primary coil [A] : (Ω × 1)
Tester (+) lead → Terminal ①
Tester (–) lead → Ignition coil base
Secondary coil [B] : (Ω × 1k)
Tester (+) lead → Spark plug lead ②
Tester (–) lead → Ignition coil base



- Measure the primary and secondary coil resistances.

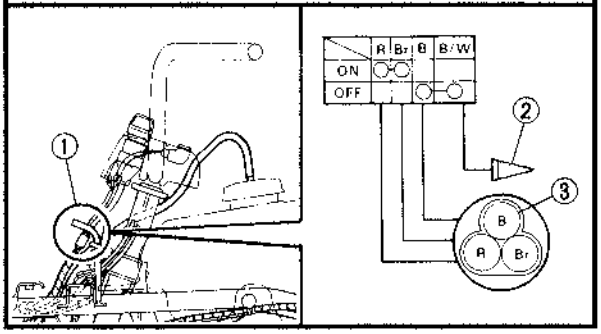
Primary coil resistance [A] :
0.36 ~ 0.48 Ω at 20°C (68°F)
Secondary coil resistance [B] :
5.4 ~ 7.4 kΩ at 20°C (68°F)

OUT OF SPECIFICATION → Replace ignition coil.

MEETS BOTH SPECIFICATIONS ↓

5. Main switch

- Disconnect the main switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Black/White ② and Black ③ ". Refer to the "CHECKING OF SWITCHES" section.

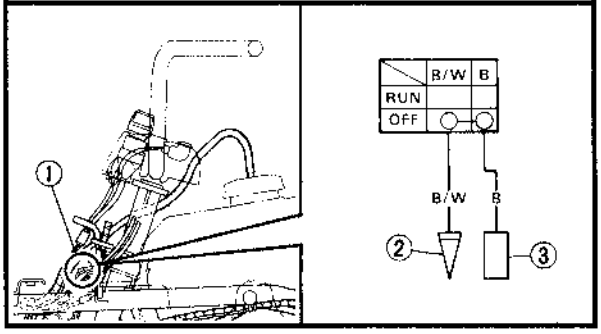


INCORRECT → Replace main switch.

CORRECT ↓

6. "ENGINE STOP" switch

- Disconnect the "ENGINE STOP" switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Black/White ② and Black ③ ".
  Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace handlebar switch.

CORRECT ↓

*

*

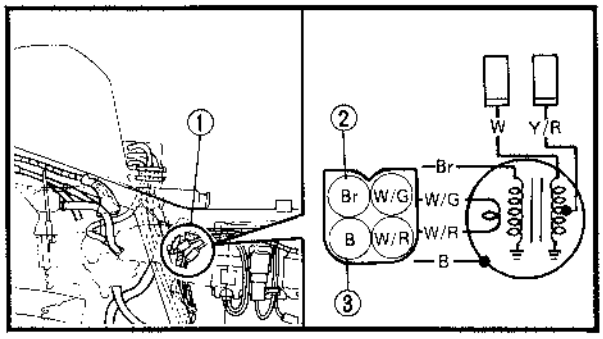
7. Source coil resistance

- Disconnect the CDI magneto coupler ① from the wireharness.
- Connect the Pocket Tester (Ω × 100) to the source coil.

Tester (+) lead → Brown ② terminal
Tester (–) lead → Black ③ terminal

- Measure the source coil resistance.

Source coil resistance:
428 ~ 523 Ω at 20°C (68°F)



OUT OF SPECIFICATION

Replace source coil.

MEETS SPECIFICATION

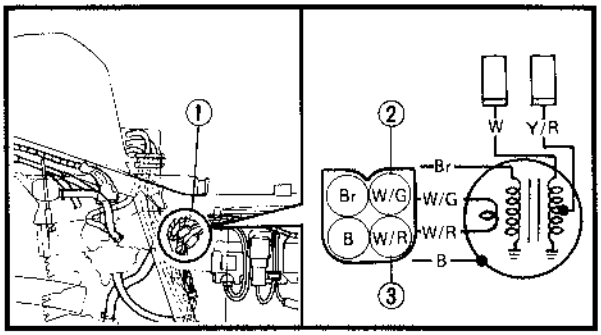
8. Pickup coil resistance

- Disconnect the CDI magneto coupler ① from the wireharness.
- Connect the Pocket Tester (Ω × 100) to the pickup coil.

Tester (+) lead → White/Green ② terminal
Tester (–) lead → White/Red ③ terminal

- Measure the pickup coil resistance.

Pickup coil resistance:
189 ~ 231 Ω at 20°C (68°F)



OUT OF SPECIFICATION

Replace pickup coil.

MEETS SPECIFICATION

9. Wiring connection

- Check the entire ignition system for connections.
- Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

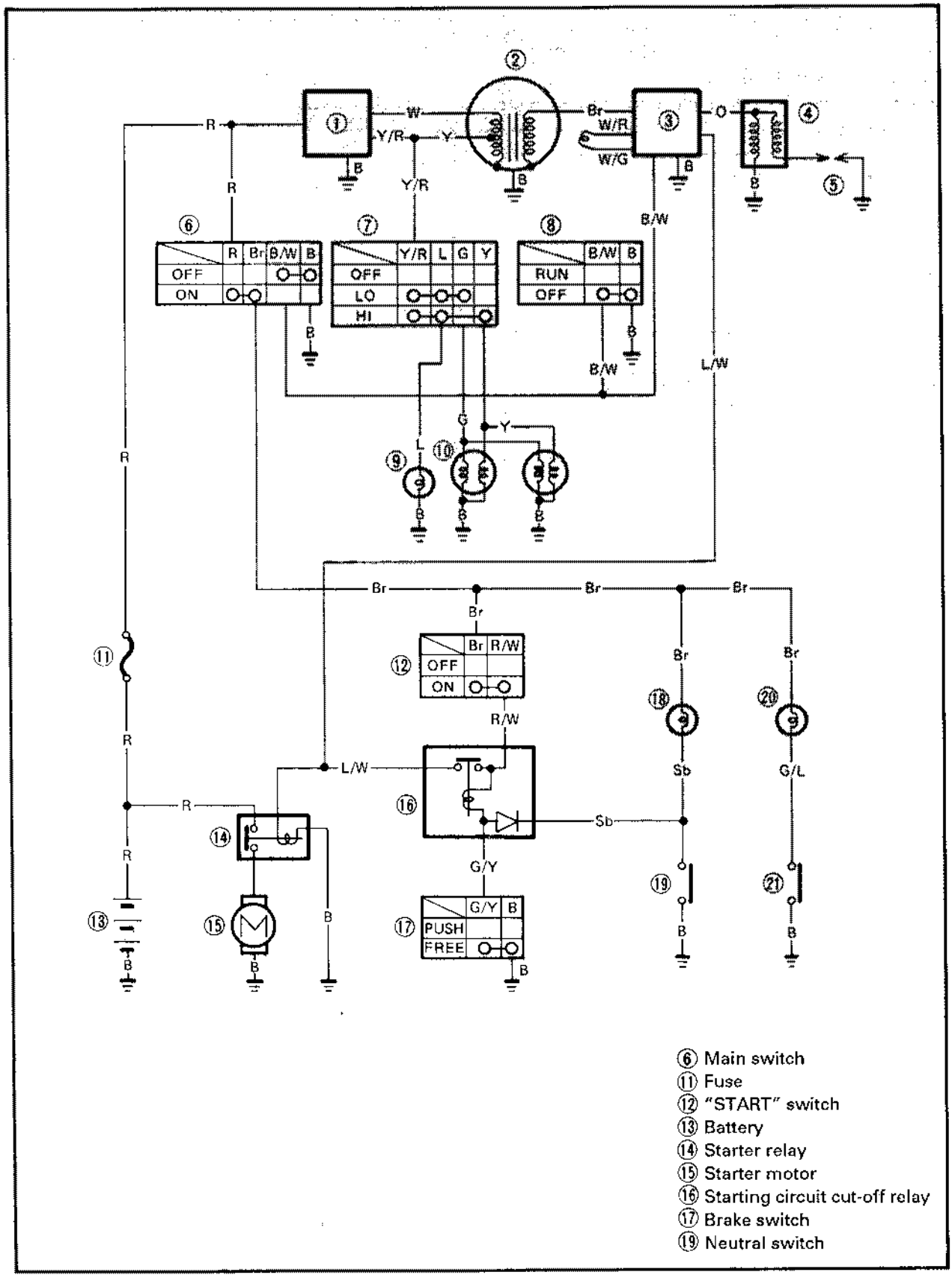
Correct.

CORRECT

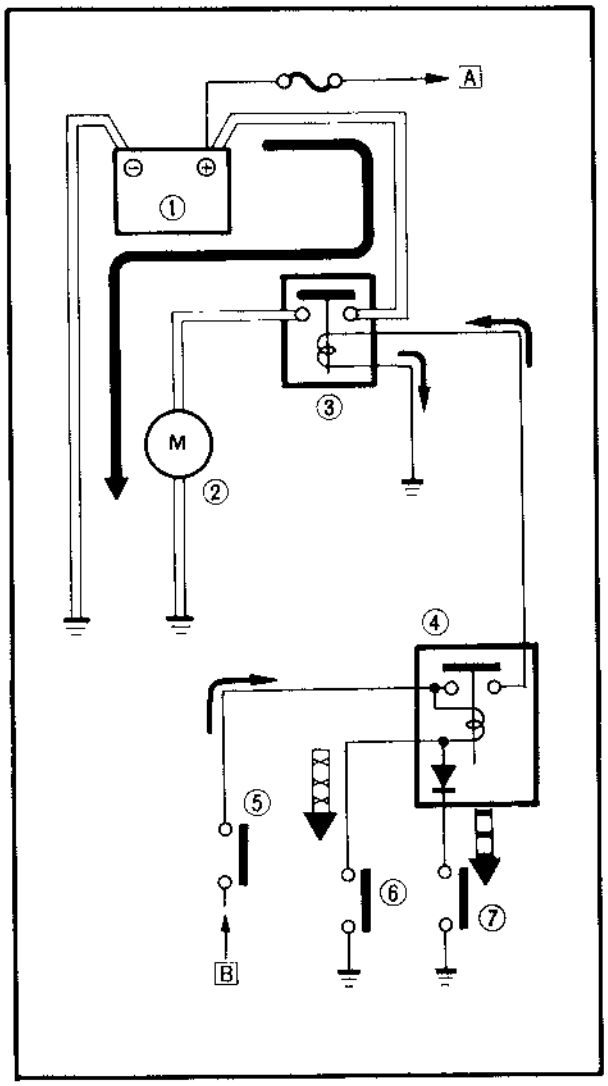
CDI unit is faulty. Replace it.

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM



⑥ Main switch
⑪ Fuse
⑫ "START" switch
⑬ Battery
⑭ Starter relay
⑮ Starter motor
⑯ Starting circuit cut-off relay
⑰ Brake switch
⑲ Neutral switch



STARTING CIRCUIT OPERATION

The starting circuit on this model consist of the starter motor, starter relay, and the relay unit (starting circuit cut-off relay). If the engine stop switch and the main switch are both closed, the starter motor can operated only if:

The transmission is in neutral (the neutral switch is closed).
or if
The brake lever is pulled on the left handlebar (the brake switch is closed).

The starting circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor.

When one of both of the above conditions have been met, however, the starting circuit cut-off relay is closed, and the engine can be started by pressing the starter switch.

◀□□□ WHEN THE TRANSMISSION IS IN NEUTRAL
◀XXX WHEN THE BRAKE LEVER IS PULLED IN

① Battery
② Starter motor
③ Starter relay
④ Starting circuit cut-off relay (relay assembly)
⑤ Starter switch
⑥ Brake switch
⑦ Neutral switch
A To main switch
B From main switch

TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE

Procedure

Check;

1. Battery
2. Fuse
3. Starter motor
4. Starter relay
5. Starting circuit cut-off relay
6. Main switch
7. Starter switch
8. Neutral switch
9. Brake switch
10. Wiring connection (starting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Fuel tank cover
  3) Fuel tank
  4) Rear carrier (except for USA)
  5) Battery
  6) Fuse holder
  7) Rear fender
- Use the following special tool in this troubleshooting.



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

1. Battery
   - Check the battery condition.
   - Check the battery fluid level, battery terminals and specific gravity.
     Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

   Specific gravity:
   1.280 at 20°C (68°F)

INCORRECT →
- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

↓ CORRECT

2. Fuse
   - Connect the Pocket Tester "Ω × 1" to the fuse.
   - Check the fuse for continuity.

NOCONTINUITY →
Replace fuse.

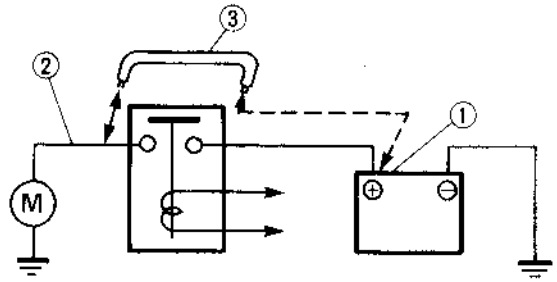
↓ CONTINUITY

*

*

3. Starter motor

- Securely connect the battery leads (positive and negative) to the battery.
- Connect the battery positive terminal ① and starter motor cable ② using the jumper lead ③*.
- Check the starter motor for operation.



*

⚠ WARNING

- **A wire for the jumper lead 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.**

DOES NOT MOVES

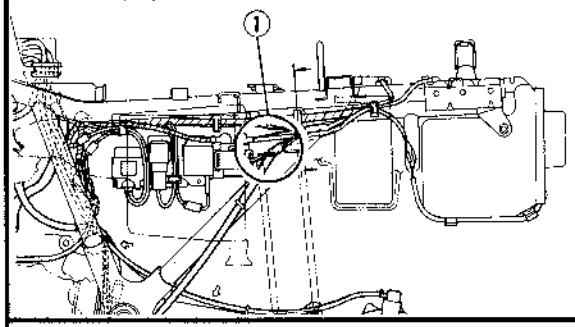
Repair or replace starter motor.

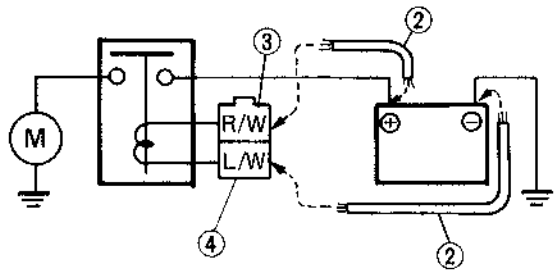
MOVES

4. Starter relay

- Disconnect the starter relay coupler ① from the wire harness.
- Connect the battery (12V) to the starter relay terminals, using the jumper leads ②*.

Battery (+) lead → Red/White ③ terminal
Battery (–) lead → Blue/White ④ terminal





- Check the starter motor for operation.

*

⚠ WARNING

- **A wire for the jumper lead 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.**

DOES NOT MOVES

Replace starter relay.

MOVES

*

*

5. Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay coupler ① from the wire harness.
- Connect the Pocket Tester (Ω × 1) and battery (12V) ② to the relay terminals.

Tester (+) lead → Red/White ③ terminal
Tester (–) lead → Blue/White ④ terminal

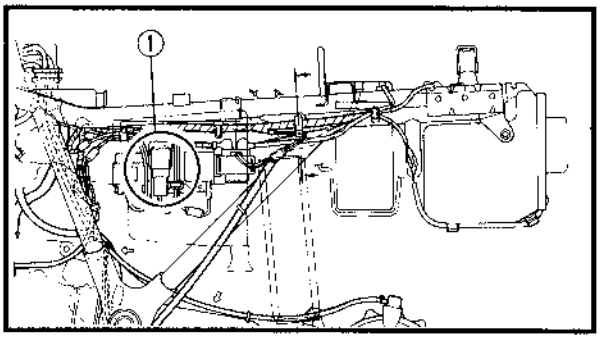
Battery (+) lead → Red/White ③ terminal
Battery (–) lead → Sky blue ⑤ terminal

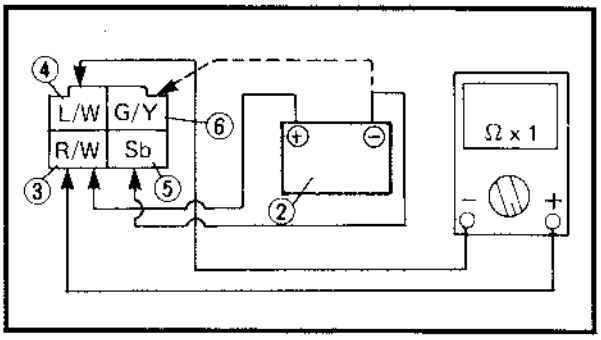
Battery (+) lead → Red/White ③ terminal
Battery (–) lead → Green/Yellow ⑥ terminal

	Good condition	Bad Condition		
Battery Connected	○	○	×	×
Battery Disconnected	×	○	×	○

○: Continuity ×: Nocontinuity

- Check the relay for continuity.





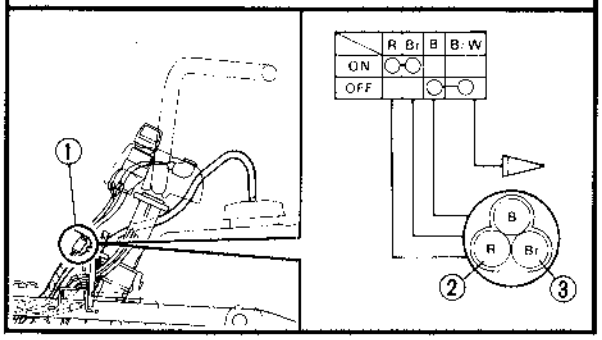
BAD CONDITION

Replace relay assembly.

OK

6. Main switch

- Disconnect the main switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Red ② and Brown ③ ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace main switch.

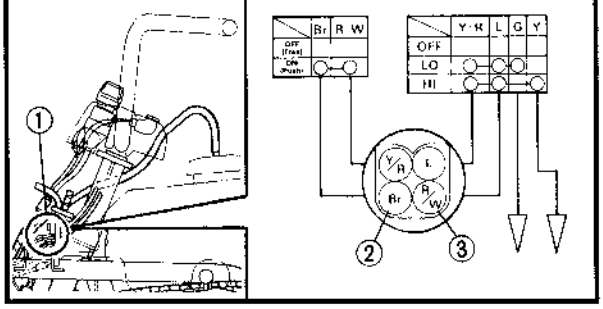
CORRECT

*

*

7. "START" switch

- Disconnect the "START" switch couplers ① from the wireharness.
- Check the switch component for the continuity between "Brown ② and Red/White ③ ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

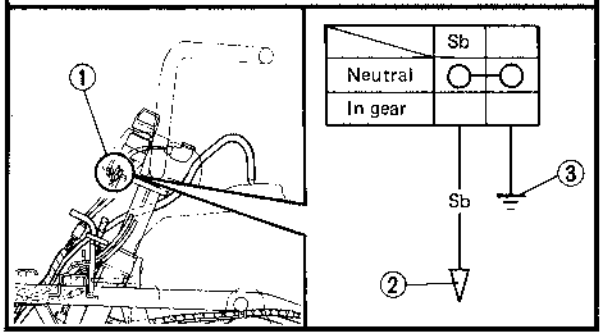
Replace handlebar switch.

CORRECT

8. Neutral switch

- Disconnect the neutral switch lead ① from the wireharness.
- Check the switch component for the continuity between "Sky blue ② and Ground ③ ".

Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace neutral switch.

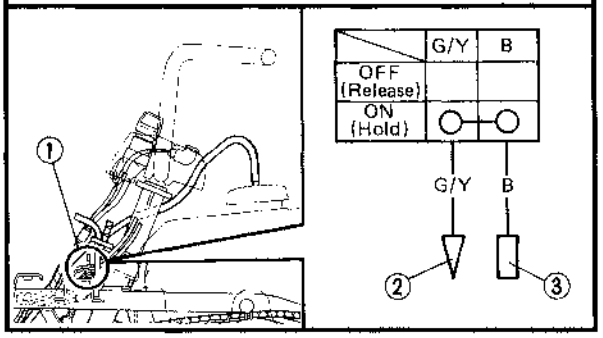
CORRECT

*

*

9. Brake switch

- Disconnect the brake switch leads ① from the wireharness.
- Check the switch component for the continuity between "Green/Yellow ② and Black ③ ".
  Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace brake switch.

CORRECT

10. Wiring connection

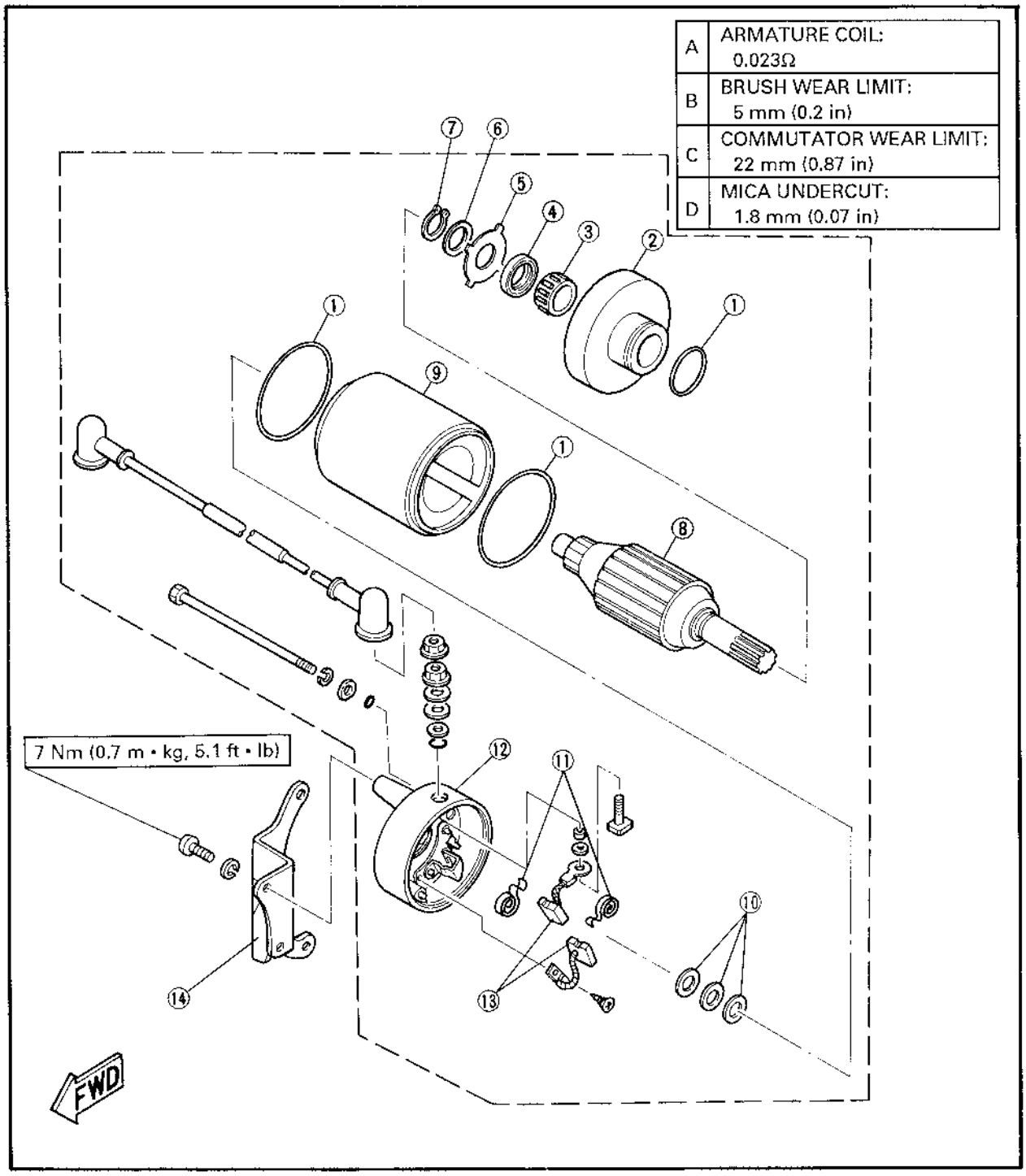
- Check the entire electrical starting system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

STARTER MOTOR TEST

① O-ring
② Front bracket
③ Bearing
④ Oil seal
⑤ Washer
⑥ Shim
⑦ Circlip
⑧ Armature
⑨ Yoke
⑩ Shim
⑪ Brush spring
⑫ Rear bracket
⑬ Brush
⑭ Bracket

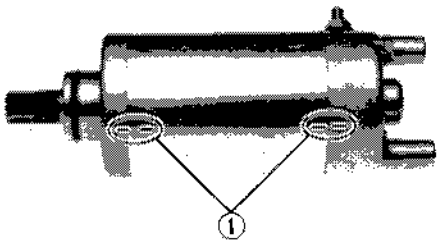


Removal

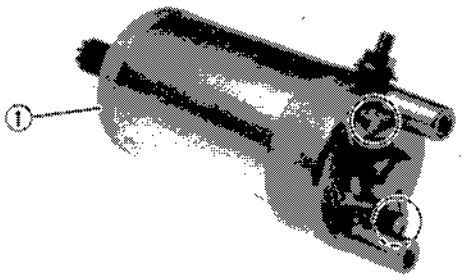
1. Disconnect:
   - Battery negative lead
     Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.
2. Remove:
   - Starter motor
     Refer to "ENGINE OVERHAUL – ENGINE REMOVAL" section in the CHAPTER 4.

Disassembly

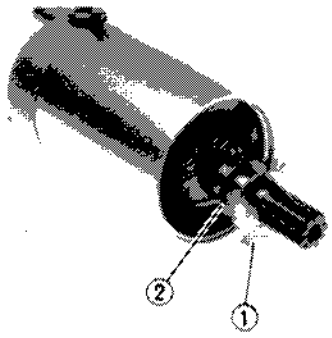
1. Put identifying marks ① on the brackets for reassembly as shown.



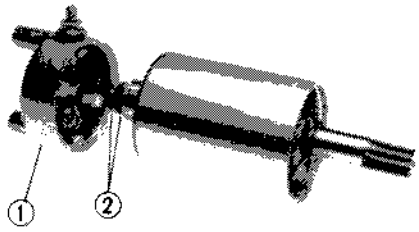
2. Remove:
   - Front bracket ①

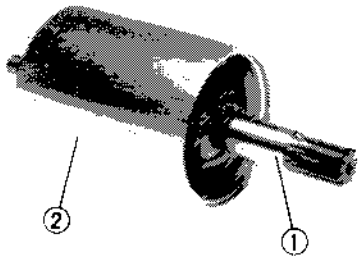


3. Remove:
   - Washer ①
   - Shim ②



4. Remove:
   - Rear bracket ①
   - Shim ②

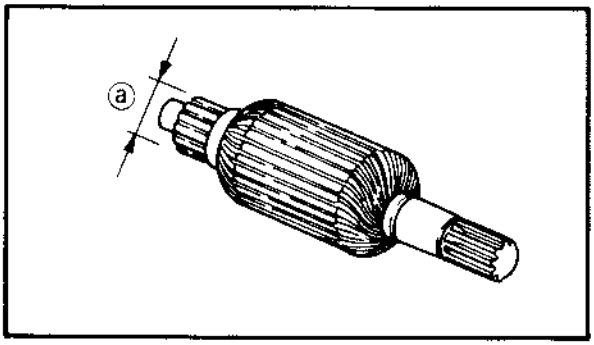


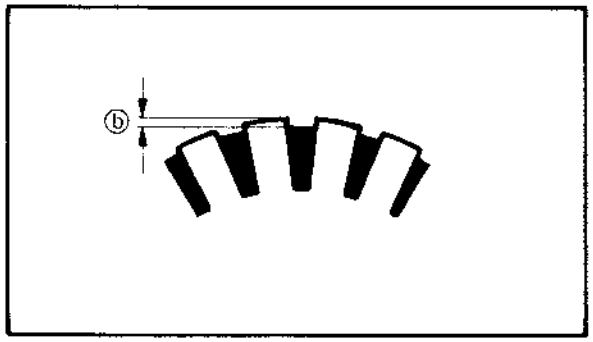


5. Remove:
   - Armature assembly ①
   - Yoke ②



6. Remove:
   - Brush ①
   - Brush spring ②





Inspection and Repair

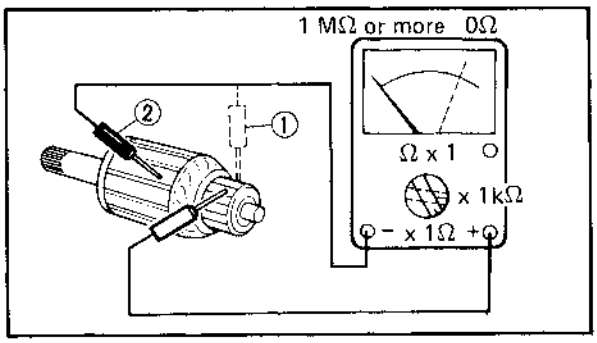
1. Inspect:
   - Commutator
     Dirty → Clean it with #600 grit sandpaper.
2. Measure:
   - Commutator diameter ⓐ
     Out of specification → Replace starter motor.

Commutator wear limit:
22 mm (0.87 in)

3. Measure:
   - Mica undercut ⓑ
     Out of specification → Scrape the mica to proper value use a hacksaw blade can be ground to fit.

Mica undercut:
1.8 mm (0.07 in)

NOTE:
The mica insulation of the commutator must be undercut to ensure proper operation of commutator.



4. Inspect:
   - Armature coil (insulation/continuity)
     Defects → Replace starter motor.

****

Inspecting steps:

- Connect the pocket tester for continuity check ① and insulation check ② .

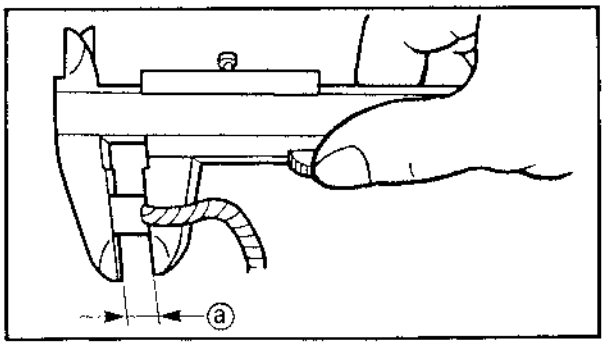
Pocket tester:
P/N. YU-03112, 90890-03112

- Measure the armature resistances.

Armature coil resistance:
Continuity check ① :
0.023Ω at 20°C (68°F)
Insulation check ② :
More than 1MΩ at 20°C (68°F)

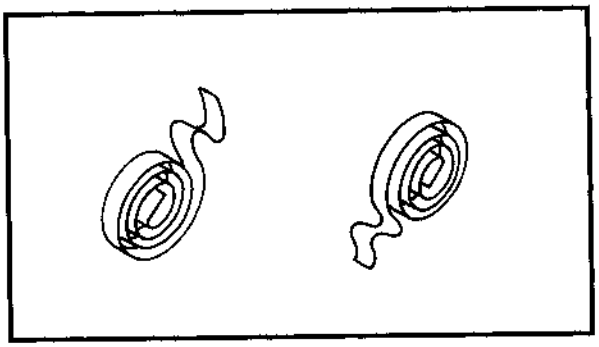
- If the resistance is incorrect, replace the starter motor.

****



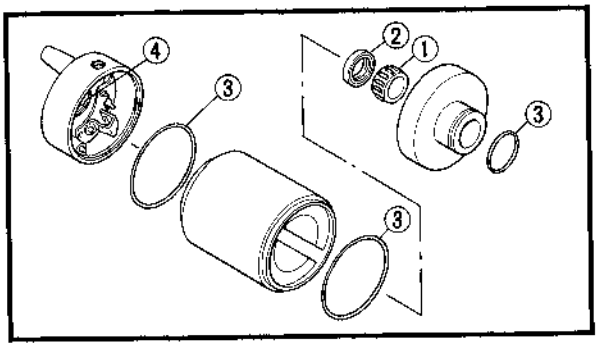
5. Measure:
   - Brush length ⓐ
     Out of specification → Replace as a set.

Brush length limit:
5 mm (0.2 in)

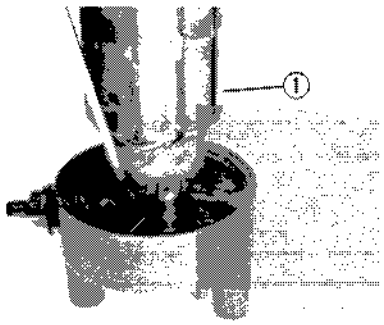


6. Measure:
   - Brush spring pressure
     Fatigue/Out of specification → Replace as a set.

Brush spring pressure:
400 ~ 660 g (14.1 ~ 23.3 oz)



7. Inspect:
   - Bearing ①
   - Oil seal ②
   - O-rings ③
   - Bush ④
     Wear/Damage → Replace.



Assembly

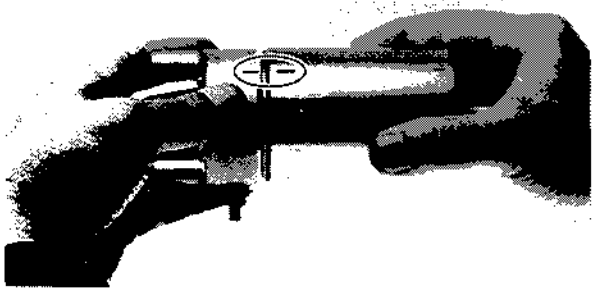
Reverse the "Removal" procedure.

Note the following points.

1. Install:
   - Armature ①

NOTE:

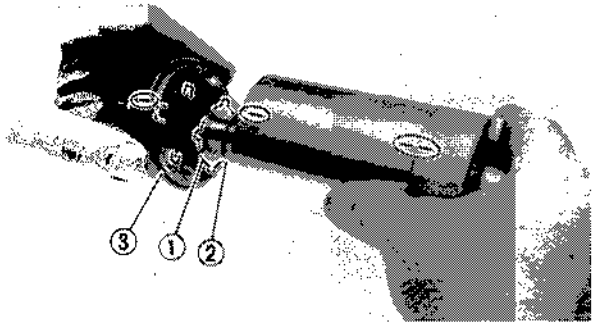
When installing the armature, press the brush with thin screwdriver, etc. to avoid damage to the brush and install.



2. Install:
   - Yoke

NOTE:

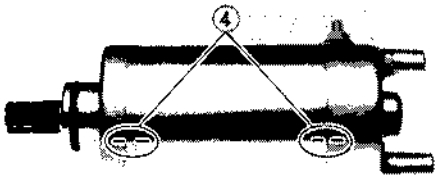
- When installing the yoke, hold the armature in place to avoid if from being pulled out of the rear bracket.
- Align the match mark on the yoke with the match mark on the rear bracket.



3. Install:
   - Washer ①
   - Shim ②
   - Front bracket ③

NOTE:

- Align the projection of the washer ① with the slot of the front bracket ③ and install.
- Align the match marks ④ on the yoke with the match marks on the brackets.



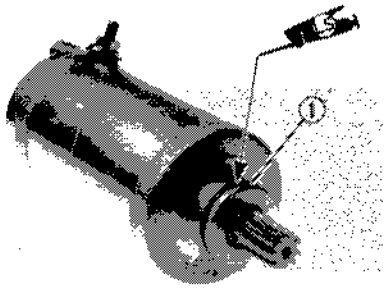
	Bolt: **5 Nm (0.5 m • kg, 3.6 ft • lb)**

Installation

1. Apply:
   - Starter motor

NOTE:

Apply a lightly grease to the O-ring ① .



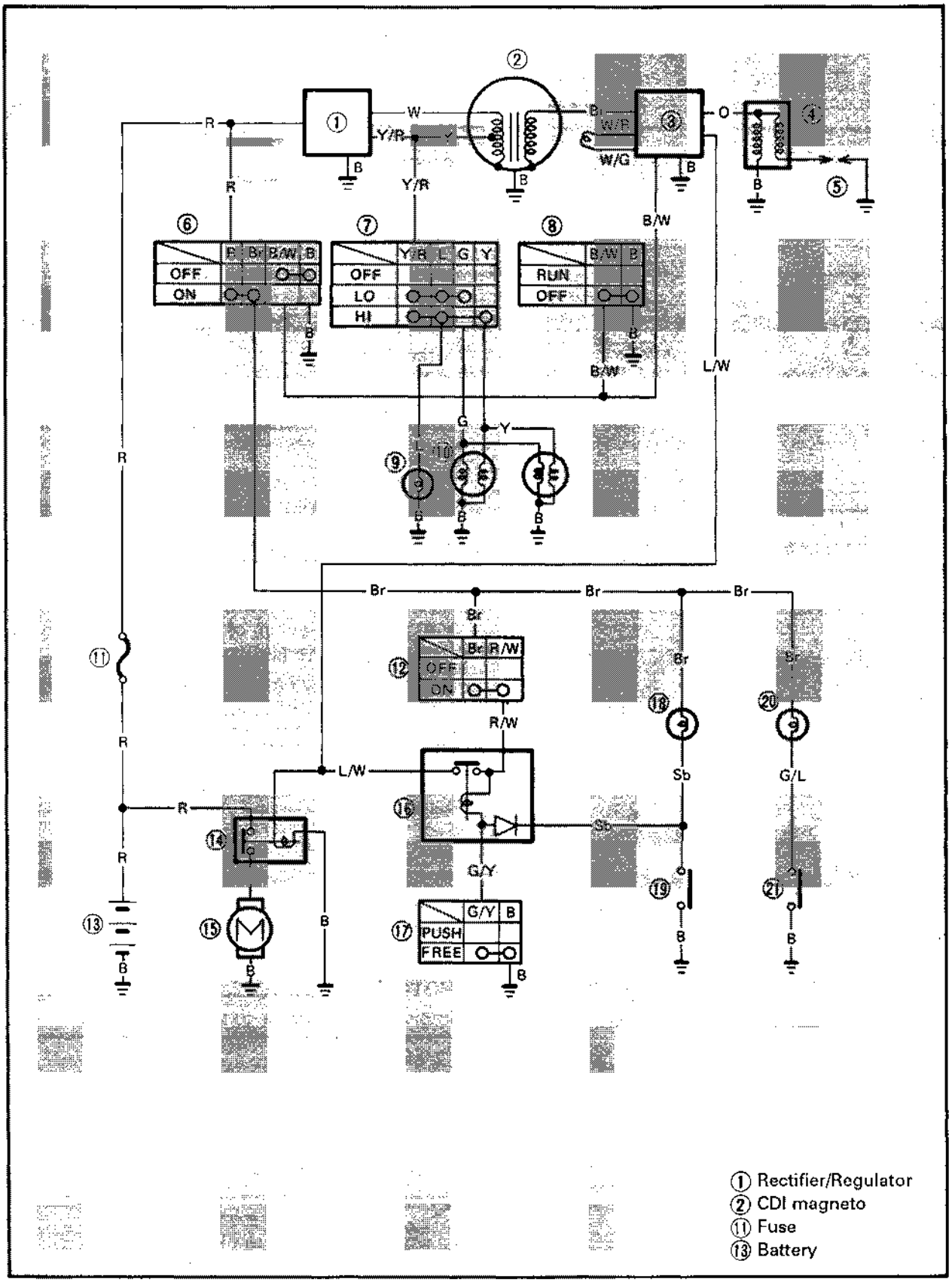
2. Install:
   - Starter motor

   Refer to the "ENGINE OVERHAUL-ENGINE ASSEMBLY AND ADJUSTMENT" section in CHAPTER 4.

	Bolt (starter motor): **7 Nm (0.7 m • kg, 5.1 ft • lb)**

CHARGING SYSTEM

CIRCUIT DIAGRAM



TROUBLESHOOTING

THE BATTERY IS NOT CHARGED

Procedure

Check;

1. Fuse
2. Battery
3. Charging voltage
4. Charging coil resistance
5. Wiring connection (charging system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Rear carrier (except for USA)
  2) Seat
  3) Battery
  4) Fuse holder
  5) Rear fender
- Use the following special tools in this troubleshooting.



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



Inductive tachometer:
P/N. YU-08036, 90890-03113

1. Fuse
   - Connect the Pocket Tester "Ω × 1" to the fuse.
   - Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY ↓

2. Battery
   - Check the battery condition.
   - Check the battery fluid level, battery terminals and specific gravity. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific gravity:
1.280 at 20°C (68°F)

INCORRECT →
- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓

*

*

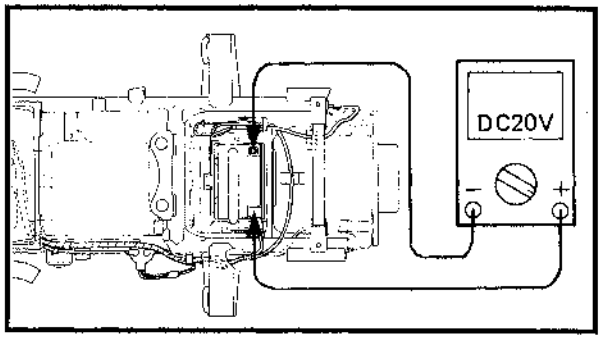
3. Charging voltage

- Securely connect the battery leads (positive and negative) to the battery.
- Connect the Inductive Tachometer to spark plug lead.
- Connect the Pocket Tester (DC20V) to the battery.

Tester (+) lead → Battery (+) terminal
Tester (–) lead → Battery (–) terminal

- Start the engine and accelerate to about 2,000 r/min.
- Measure the charging voltage.

Charging voltage:
14 ~ 15V at 2,000 r/min



MEETS SPECIFICATION

Replace battery.

OUT OF SPECIFICATION

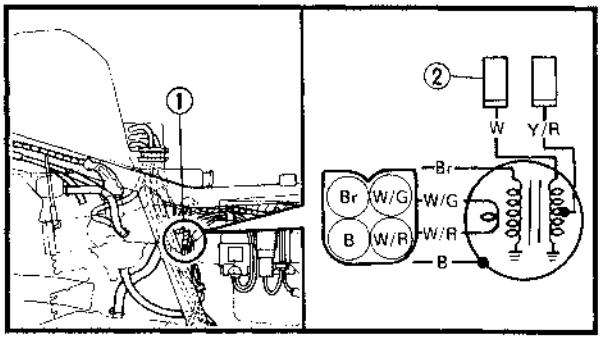
4. Charge coil resistance

- Disconnect the CDI magneto White lead ① from the wireharness.
- Connect the Pocket Tester (Ω × 1) to the charge coil.

Tester (+) lead → White lead ②
Tester (–) lead → Ground

- Measure the charge coil resistance.

Charge coil resistance:
0.72 ~ 0.88Ω at 20°C (68°F)



OUT OF SPECIFICATION

Replace stator assembly.

MEETS SPECIFICATION

5. Wiring connection

- Check the entire charging system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

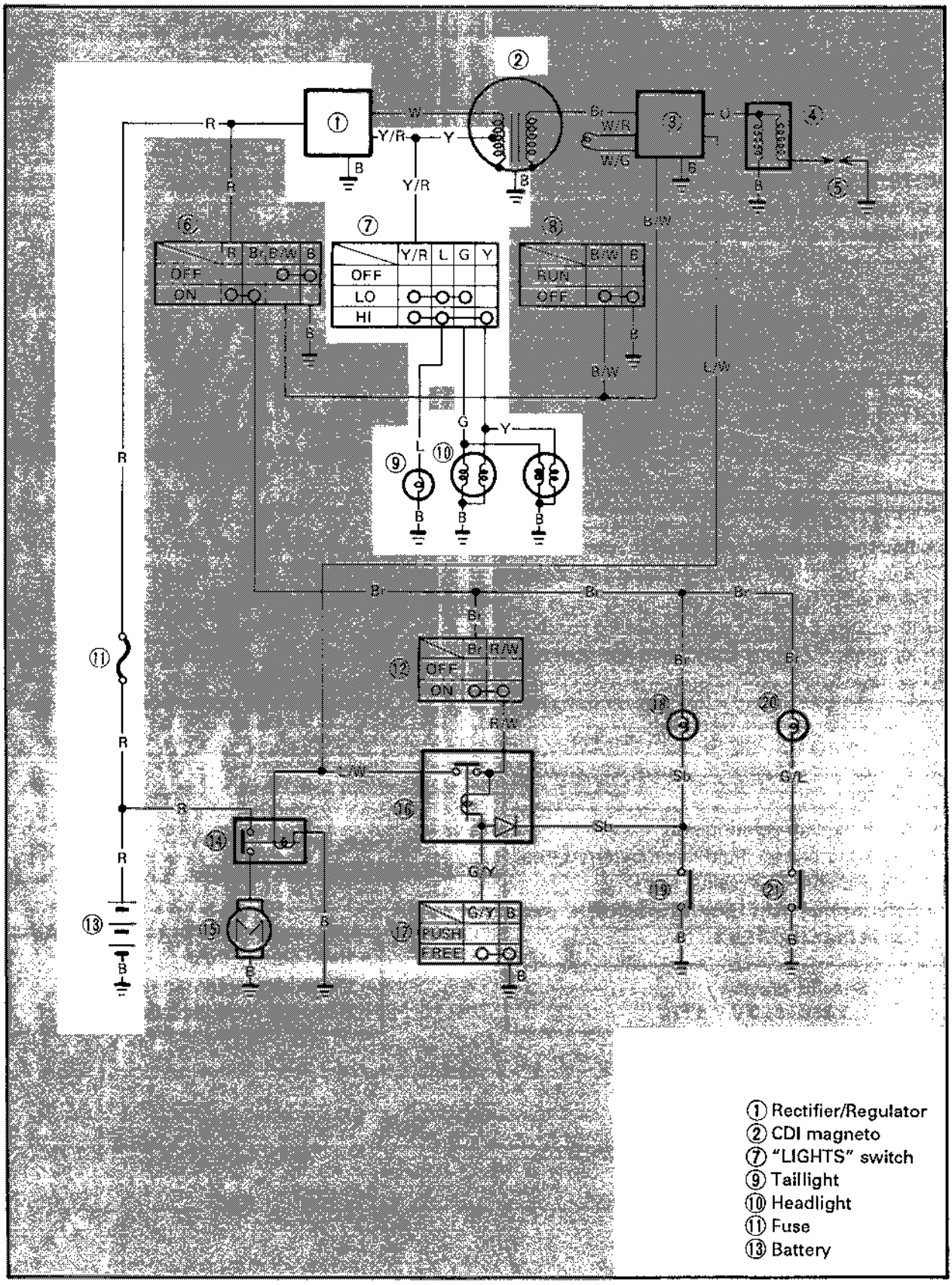
Correct.

CORRECT

Replace rectifier/regulator.

LIGHTING SYSTEM

CIRCUIT DIAGRAM



TROUBLESHOOTING

HEADLIGHT, TAIL LIGHT DO NOT COME ON

Procedure

Check;

1. Bulb and bulb socket
2. Battery
3. Fuse
4. "LIGHTS" switch
5. Wiring connection (lighting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Fuel tank cover
  3) Fuel tank
  4) Rear carrier (except for USA)
  5) Battery
  6) Fuse holder
  7) Rear fender
- Use the following special tool in this troubleshooting.



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

1. Bulb and bulb socket
   - Remove the bulb.
     Refer to "CHAPTER 3. HEADLIGHT BULB REPLACEMENT".
   - Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Replace bulb.

CONTINUITY ↓

2. Battery
   - Check the battery condition.
   - Check the battery fluid level, battery terminals and specific gravity.
     Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific gravity:
1.280 at 20°C (68°F)

INCORRECT →
- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓

*

*

3. Fuse

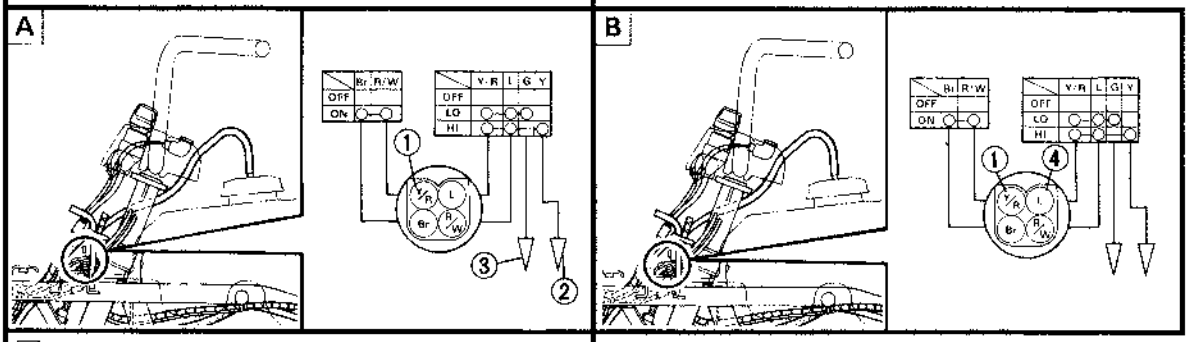
- Connect the Pocket Tester "Ω × 1" to the fuse.
- Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY

4. "LIGHTS" switch

- Check the switch component for the continuity between "Yellow/Red ① and Yellow ② ", "Yellow/Red ① and Green ③ " and, "Yellow/Red ① and Blue ④ ". Refer to the "CHECKING OF SWITCHES" section.



A Headlight
B Tail light

INCORRECT → Replace handlebar switch.

CORRECT

5. Wiring connection

- Check entire lighting system for connections. Refer to "WIRING DIAGRAM" section.

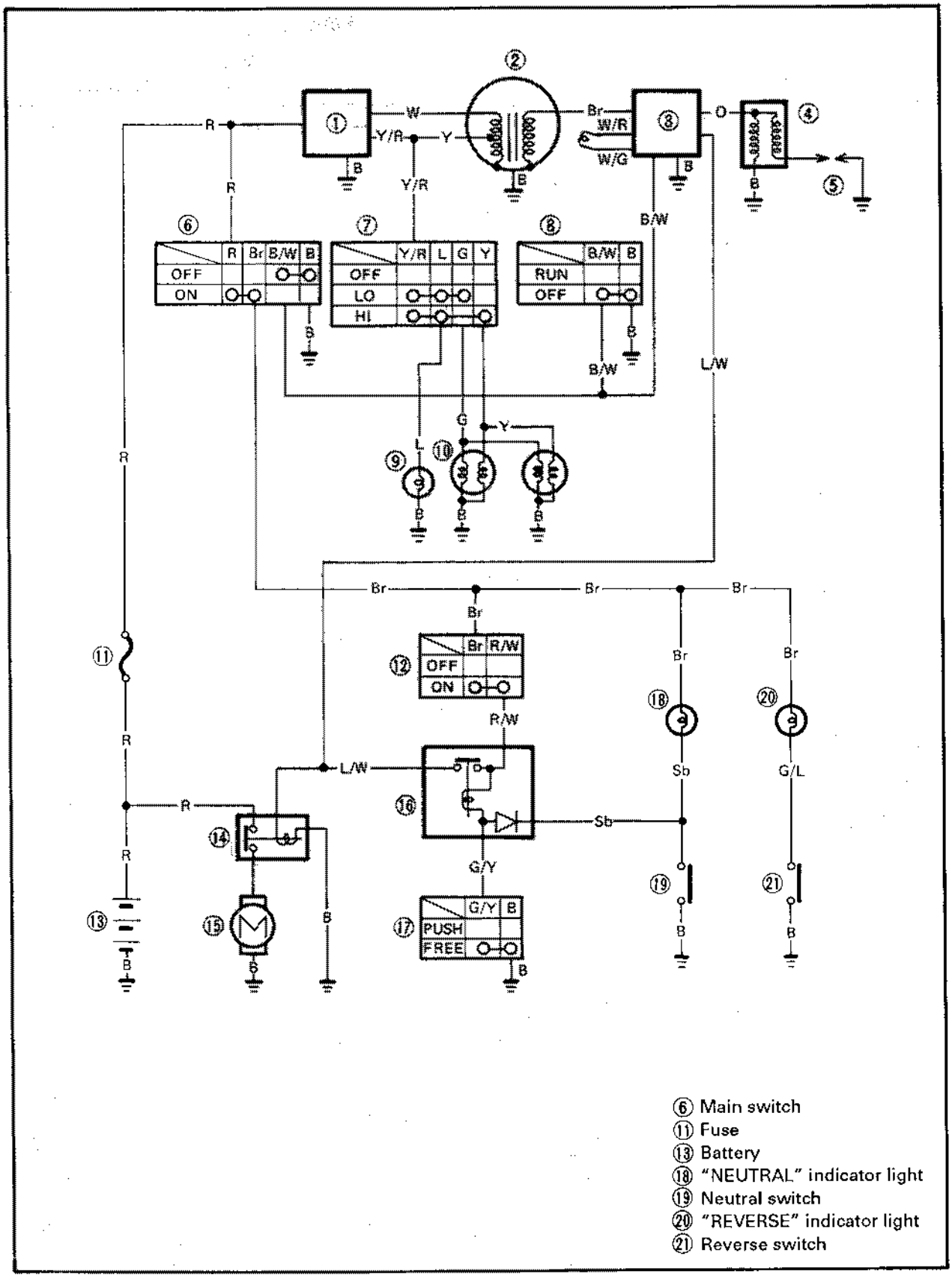
POOR CONNECTION → Correct.

CORRECT

Replace rectifier/regulator.

SIGNAL SYSTEM

CIRCUIT DIAGRAM



TROUBLESHOOTING

"NEUTRAL" AND "REVERSE" INDICATOR LIGHT DO NOT COME ON

Procedure

Check;

1. Fuse
2. Battery
3. Main switch
4. Wiring connection (signal system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Fuel tank cover
  3) Fuel tank
- Use the following special tool in this troubleshooting.



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

1. Fuse

- Connect the Pocket Tester "Ω × 1" to the fuse.
- Check the fuse for continuity.

NOCONTINUITY → Replace fuse.

CONTINUITY ↓

2. Battery

- Check the battery condition.
- Check the battery fluid level, battery terminals and specific gravity.
  Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific gravity:
1.280 at 20°C (68°F)

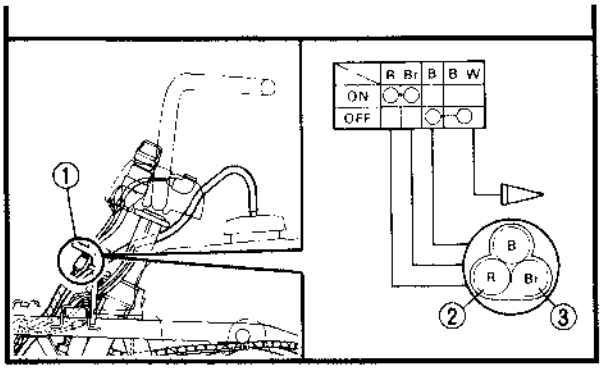
INCORRECT →

- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT ↓

3. Main switch

- Disconnect the main switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Red ② and Brown ③".
  Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace main switch.

CORRECT

4. Wiring connection

- Check the entire signal system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

Go to the "SIGNAL SYSTEM TEST AND CHECK" section.

SIGNAL SYSTEM TEST AND CHECK

"NEUTRAL" INDICATOR LIGHT DOES NOT COME ON

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

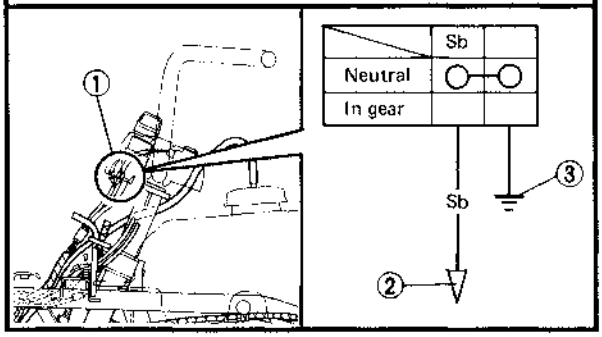
NOCONTINUITY → Bulb and/or bulb socket are faulty, replace.

NOTE:
Remove the handlebar cover.

CONTINUITY ↓

2. Neutral switch

- Disconnect the neutral switch lead ① from the wireharness.
- Check the switch component for continuity between "Sky blue ② and Ground ③ ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace neutral switch.

CORRECT ↓

3. Wiring connection

- Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

"REVERSE" INDICATOR LIGHT DOES NOT COME ON

1. Bulb and bulb socket

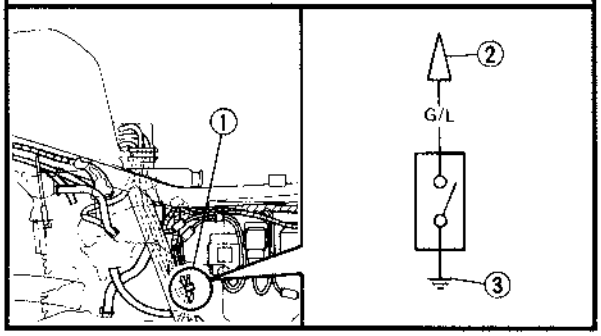
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Bulb and/or bulb socket are faulty, replace.

CONTINUITY ↓

2. Reverse switch

- Disconnect the reverse switch lead ① from the wireharness.
- Check the switch component for continuity between "Green/Blue ② and Ground ③ ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace reverse switch.

CORRECT ↓

3. Wiring connection

- Check the entire signal system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

NOTE:
Remove the handlebar cover.

TROUBLESHOOTING

NOTE:

The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING

FUEL SYSTEM

Fuel tank
- Empty
- Clogged fuel filter
- Clogged fuel breather hose
- Deteriorated fuel or fuel containing water or foreign material

Fuel cock
- Clogged fuel hose

Air cleaner
- Clogged air filter

Carburetor
- Deteriorated fuel, fuel containing water or foreign material
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Deformed float
- Groove-worn needle valve
- Improperly sealed valve seat
- Improperly adjusted fuel level
- Improperly set pilot jet
- Clogged starter jet
- Starter plunger malfunction

ELECTRICAL SYSTEM

Spark plug
- Improper plug gap
- Worn electrodes
- Wire between terminals broken
- Improper heat range
- Faulty spark plug cap

Ignition coil
- Broken or shorted primary/secondary
- Faulty spark plug lead
- Broken body

CDI unit system
- Faulty CDI unit
- Faulty source coil
- Faulty pick-up coil
- Broken woodruff key

Switches and wiring
- Faulty main switch
- Faulty "START" switch
- Faulty "ENGINE STOP" switch
- Faulty "NEUTRAL" switch
- Faulty "REVERSE" switch
- Faulty front stop switch
- Broken or shorted wiring

Starter motor
- Faulty starter motor
- Faulty starter relay
- Faulty circuit out-off relay

COMPRESSION SYSTEM

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Broken cylinder gasket
- Worn, damaged or seized cylinder
- Improperly sealed valve
- Improperly contacted valve and valve seat
- Improper valve timing
- Broken valve spring

Piston and piston rings
- Improperly installed piston ring
- Worn, fatigued or broke piston ring
- Seized piston ring
- Seized or damaged piston

Crankcase and crankshaft
- Improperly seated crankcase
- Seized crankshaft

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor
- Improperly returned starter plunger
- Clogged or loose pilot jet
- Clogged pilot air jet
- Improperly adjusted idle speed (Throttle stop screw)
- Improper throttle cable play
- Flooded carburetor

Air cleaner
- Clogged air filter

Electrical system
- Faulty battery
- Faulty spark plug
- Faulty CDI unit
- Faulty pickup coil
- Faulty ignition coil

Valve train
- Improperly adjusted valve clearance

POOR MEDIUM AND HIGH SPEED PERFORMANCE

POOR MEDIUM AND HIGH SPEED PERFORMANCE

Refer to "Starting failure/Hard starting."
(Fuel system, electrical system, compression system and valve train)

Carburetor
- Improper jet needle clip position
- Improperly adjusted fuel level
- Clogged or loose main jet

Air cleaner
- Clogged air filter

FAULTY DRIVE TRAIN

The following conditions may indicate damage drive train components:

Symptoms	Possible causes
1. A pronounced hesitation or "jerky" movement during acceleration, deceleration, or sustained speed. (This must not be confused with engine surging or transmission characteristics.)	A. Bearing damage.
2. A "rolling rumble" noticeable at low speed; a high-piched whine; a "clank" from a drive train component or area.	B. Improper gear lash.
3. A locked-up condition of the drive train mechanism, no power transmitted from engine to rear wheel.	C. Gear tooth damage.
	D. Broken drive shaft.
	E. Broken gear teeth.
	F. Seizure due to lack of lubrication.
	G. Small foreign object lodged between moving parts.

NOTE:

Areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from normal machine operating noise. If there is reason to believe these components are damaged, remove the components for specific inspection.

FAULTY GEAR SHIFTING

HARD SHIFTING

Clutch
- Improperly adjusted clutch release lever free play
- Broken one way clutch of primary clutch
- Broken primary clutch carrier
- Broken clutch damper of secondary clutch housing
- Warped clutch plate
- Swollen friction plate
- Broken clutch plate
- Improperly adjusted drive select lever position

Engine oil
- High oil level
- Improper quality (high viscosity)
- Deterioration

SHIFT PEDAL DOES NOT MOVE

Shift shaft
- Bent shift shaft

Shift cam and shift fork
- Groove jammed with impurities
- Seized shift fork
- Bent shift fork guide bar

Transmission
- Seized transmission gear
- Jammed impurities
- Incorrectly assembled transmission

Shift guide
- Broken shift guide

JUMP-OUT GEAR

Shift shaft
- Improperly adjusted shift lever position
- Improperly returned stopper lever

Shift fork
- Worn shift fork

Shift cam
- Improper thrust play
- Worn shift cam groove

Transmission
- Worn gear dog

CLUTCH SLIPPING

CLUTCH SLIPPING

Clutch
- Improperly adjusted clutch release lever free play
- Loose clutch spring (primary and/or secondary)
- Fatigued clutch spring (primary and/or secondary)
- Worn friction plate
- Worn clutch plate
- Worn clutch shoe (primary)

Engine oil
- Low oil level
- Improper quality (low viscosity)
- Deterioration

CLUTCH DRAGGING

CLUTCH DRAGGING

Clutch
- Improperly adjusted clutch release lever free play
- Improper engagement of release lever and push rod
- Warped clutch plate
- Swollen friction plate
- Broken clutch boss

Engine oil
- High oil level
- Improper quality (high viscosity)
- Deterioration

OVERHEATING

OVERHEATING

Ignition system
- Improper spark plug gap
- Improper spark plug heat range
- Faulty CDI unit

Fuel system
- Improper carburetor main jet (improper setting)
- Improperly adjusted fuel height
- Clogged air cleaner element

Compression system
- Heavy carbon build-up

Engine oil
- Incorrect oil level
- Improper oil viscosity
- Inferior oil quality

Brake
- Dragging brake

FAULTY BRAKE

POOR BRAKING EFFECT

Drum brake
- Worn brake shoe
- Worn or rusty brake drum
- Improperly adjusted brake free play
- Improper brake cam lever position
- Improper brake shoe position
- Fatigue/Damaged return spring
- Oily or greasy brake shoe
- Oily or greasy brake drum
- Broken brake cable

SHOCK ABSORBER MALFUNCTION

MALFUNCTION

- Bent or damaged damper rod
- Damaged oil seal lip
- Fatigued shock absorber spring

INSTABLE HANDLING

INSTABLE HANDLING

Handlebars
- Improperly installed or bent

Steering
- Incorrect toe-in
- Bent steering shaft
- Improperly installed steering shaft
- Damaged bearing or bearing race
- Bent tie-rods
- Deformed steering knuckles

Tires
- Uneven tire pressures on both sides
- Incorrect tire pressure
- Unevenly worn tires

Wheels
- Deformed wheel
- Loose bearing
- Bent or loose wheel axle
- Excessive wheel run-out

Frame
- Twisted
- Damaged frame
- Improperly installed bearing race

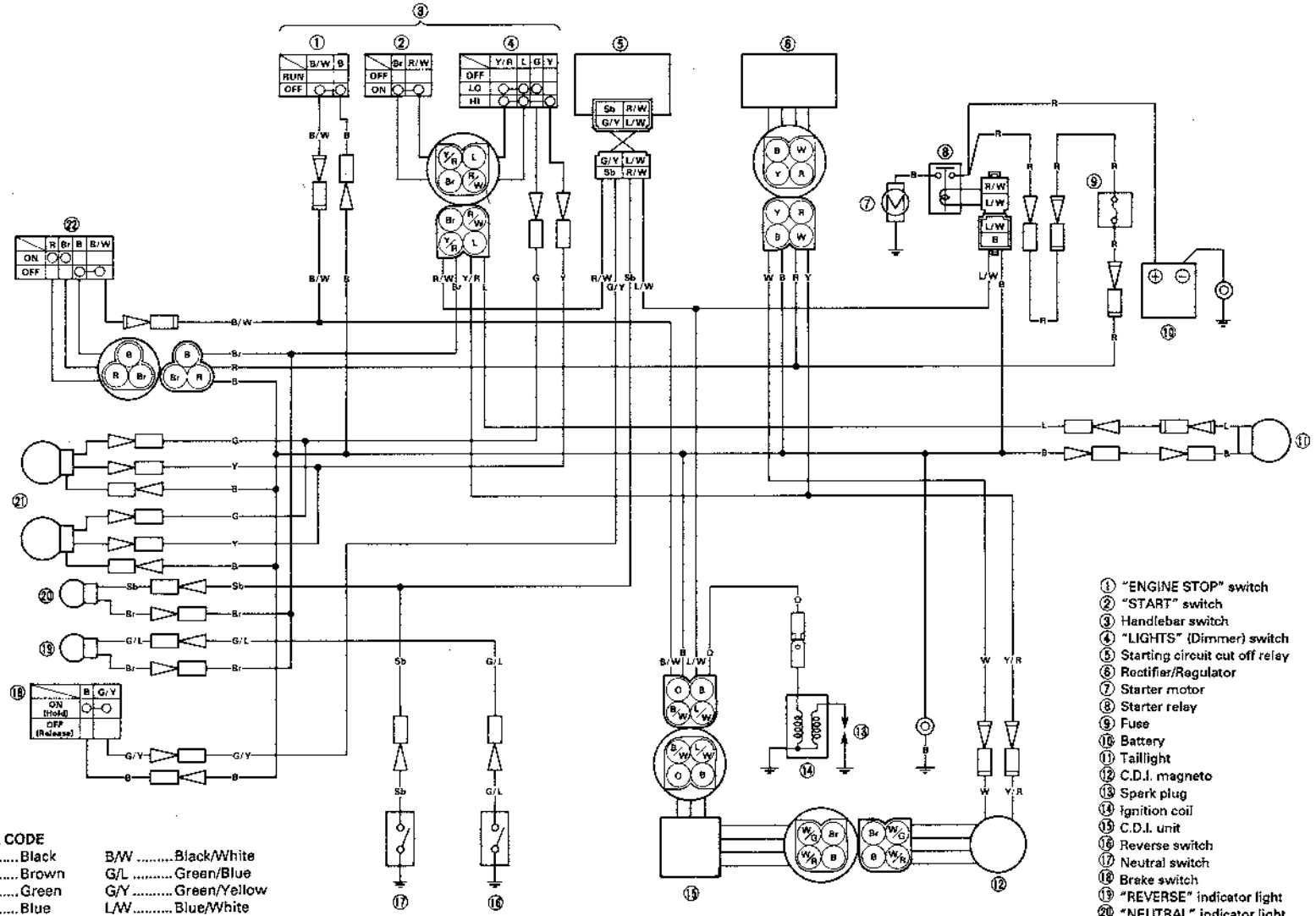
Swingarm
- Worn bearing or bush
- Bent or damaged

FAULTY LIGHTING SYSTEM

HEADLIGHT DARK
- Improper bulb
- Too many electric accessories
- Hard charging (broken charging coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expired

BULB BURNT OUT
- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expired

YFB250(D) '92 WIRING DIAGRAM



COLOR CODE

B	Black	B/W	Black/White
Br	Brown	G/L	Green/Blue
G	Green	G/Y	Green/Yellow
L	Blue	L/W	Blue/White
O	Orange	R/W	Red/White
R	Red	W/G	White/Green
Sb	Sky blue	W/R	White/Red
W	White	Y/R	Yellow/Red
Y	Yellow		

① "ENGINE STOP" switch
② "START" switch
③ Handlebar switch
④ "LIGHTS" (Dimmer) switch
⑤ Starting circuit cut off relay
⑥ Rectifier/Regulator
⑦ Starter motor
⑧ Starter relay
⑨ Fuse
⑩ Battery
⑪ Taillight
⑫ C.D.I. magneto
⑬ Spark plug
⑭ Ignition coil
⑮ C.D.I. unit
⑯ Reverse switch
⑰ Neutral switch
⑱ Brake switch
⑲ "REVERSE" indicator light
⑳ "NEUTRAL" indicator light
㉑ Headlight
㉒ Main switch

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