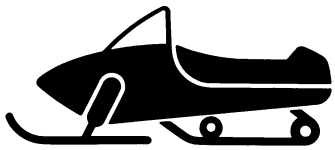
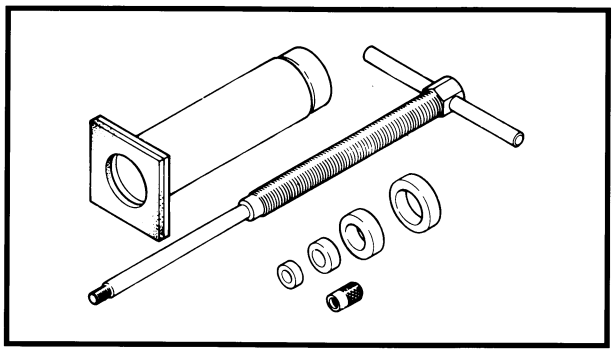
YAMAHA



SERVICE MANUAL

ET410TRS

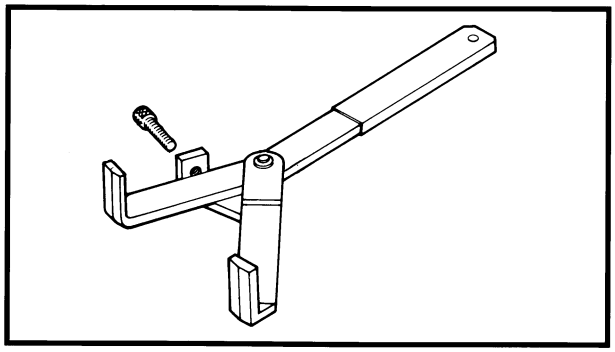
LIT-12618-01-34



FOR ENGINE SERVICE

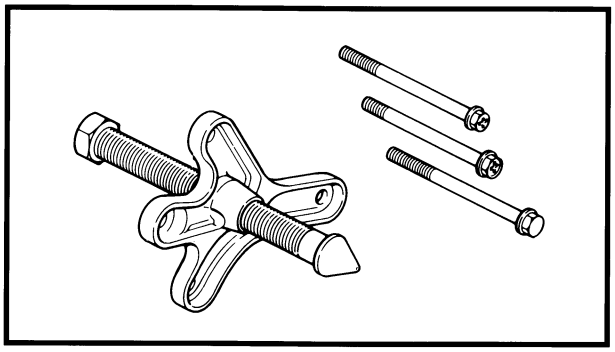
1. Piston Pin Puller
   P/N 90890-01304, YU-01304

This tool is used to remove the piston pin.



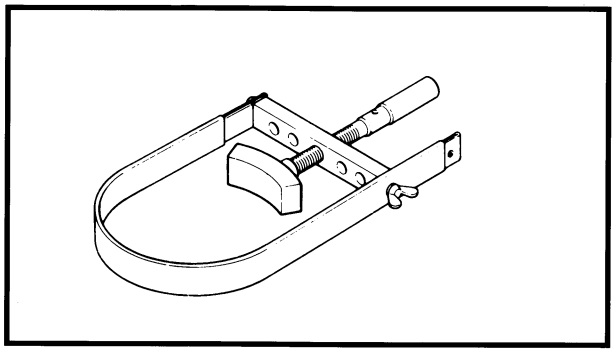
2. Universal Clutch Holder
   P/N 90890-04086, YU-91042

This tool is used to hold the CDI magneto.



3. Rotor Puller
   P/N 90890-01362, YU-33270

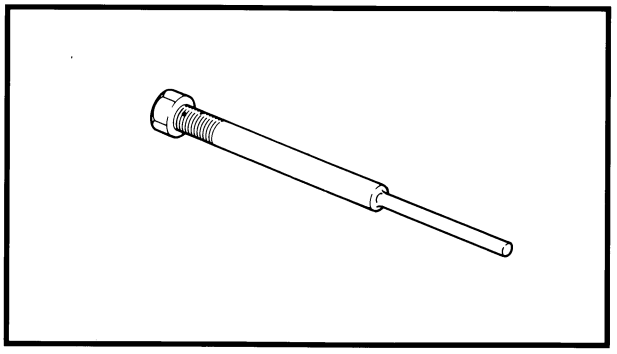
This tool is used to remove the magneto rotor.



FOR POWER TRAIN SERVICE

1. Primary Sheave Holder
   P/N 90890-01701, YU-01880

This tool is used to hold the primary sheave.



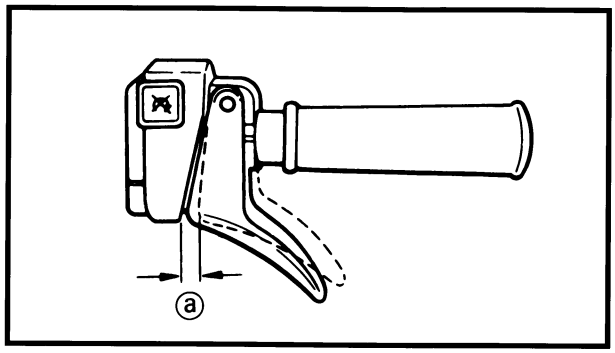
2. Primary Sheave Puller (18 mm)
   P/N 90890-01898, YS-01882-A,

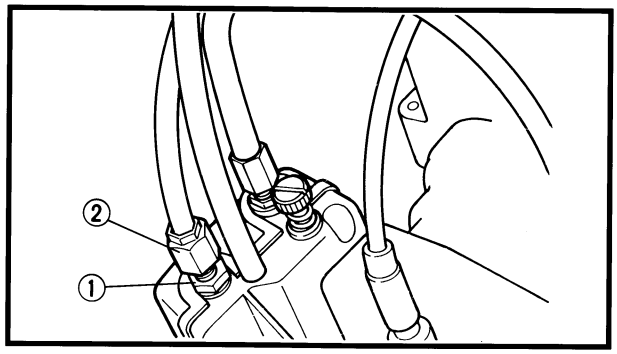
This tool is used for removing the primary sheave.

Turning in	Idle speed becomes higher.
Turning out	Idle speed becomes lower.

Engine idle speed:
1,800 ~ 2,000 r/min

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





THROTTLE CABLE ADJUSTMENT

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

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

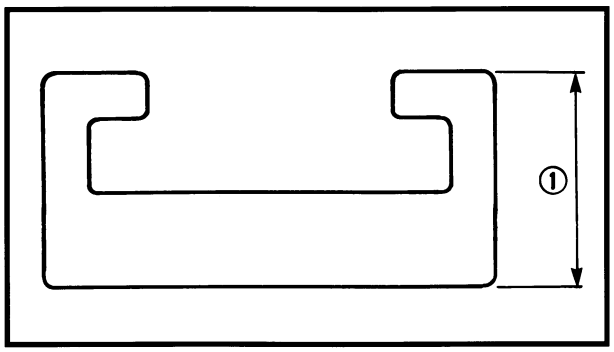
Throttle cable free play:
1.0 ~ 2.0 mm (0.04 ~ 0.08 in)

2. Adjust:
   - Throttle cable free play

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

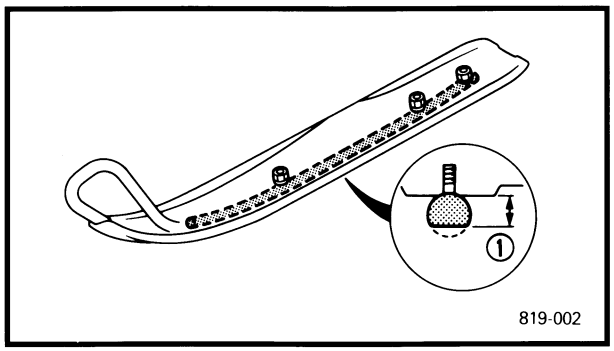
Turning in	Free play is increased.
Turning out	Free play is decreased.

- Tighten the locknut.



2. Measure:
   - Slide runner thickness ①
     Out of specification→Replace.
     (See page 4-34)

Wear limit:
10 mm (0.39 in)

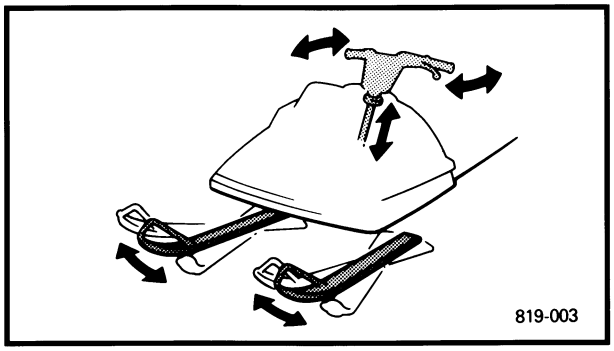


CHASSIS

SKI/SKI RUNNER

1. Check:
   - Ski
   - Ski runner
     Wear/Damage→Replace.

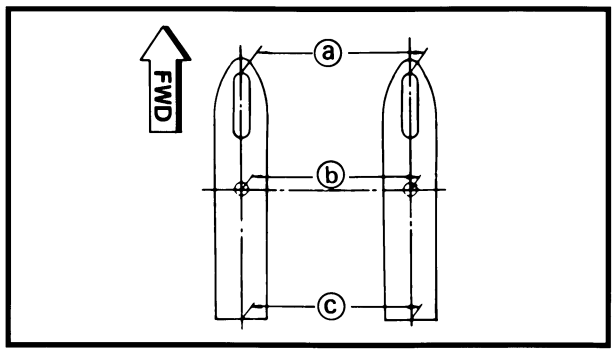
Ski runner wear limit ① :
4.5 mm (0.18 in)



STEERING SYSTEM

Free Play check

1. Check:
   - Steering system free play
     Push the handlebar up and down and back and forth.
     Turn the handlebar slightly to the right and left.
     Excessive free play→check to be sure the handlebar, tie rod ends and relay rod ends are installed securely in position. If free play still exists, check the steering bearing front suspension links and ski mounting area for wear, and replace if necessary.
     (See page 3-4)

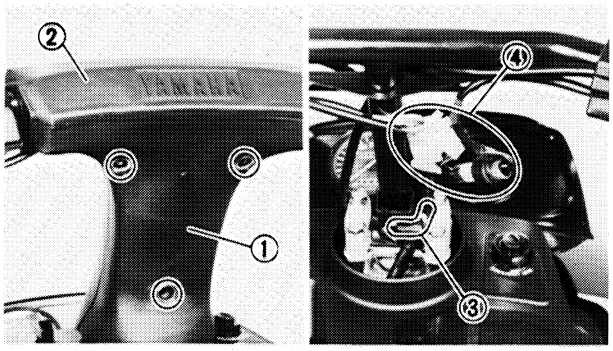


Toe-Out Adjustment

1. Place the machine on a level surface.
2. Check:
   - Ski toe-out
     Direct the skis straight forward.
     Out of specification→Adjust.

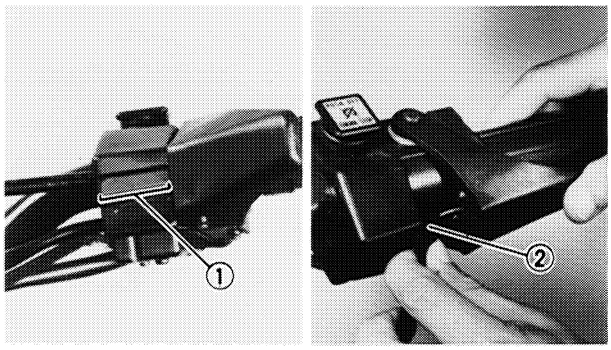
Troubleshooting

Trouble	Check point	Remedy	Adjustment
Hard starting	Insufficient fuel	Add gasoline	
	Excessive use of starter (Excessively opened choke)	Clean spark plug	Return starter level to its seated position.
	Fuel passage is clogged or frozen	Clean	Parts other than carburetor. • Clogged fuel tank air vent, clogged fuel filter, or clogged fuel passage Carburetor • Clogged or frozen air vent clogged valve. • If water collects in float chamber, clean. (Also check for ice)
	Overflow	Correct	
Poor idling (Related symptoms) • Poor performance at low speeds • Poor acceleration • Slow response to throttle • Engine tends to stall	Improper idling speed adjustment • Pilot screw	Adjust idling speed	Tighten pilot screw lightly, and check throttle opening. If incorrect, back it out to specification. Start the engine and turn pilot screw in or out 1/4 turn each time. When the engine runs faster, back out throttle stop screw so the engine idles at specified speed.
	• Throttle stop screw	Adjust	Tightened too much – Engine speed is higher. Backed out too much – Engine does not idle.
	Damaged pilot screw	Replace pilot screw	
	Clogged bypass hole	Clean	
	Clogged or loose pilot jet	Clean and retighten	Remove pilot jet, and blow it out with compressed air.
	Air leaking into carburetor joint	Retighten clamp screws	
	Defective starter valve seat	Clean or replace	
	Overflow	Correct	
Poor performance at mid-range speeds (Related symptoms) • Momentary slow response to throttle • Poor acceleration	Clogged or loose pilot jet	Clean and retighten	Remove pilot jet, and blow it out with compressed air.
	Lean mixtures	Overhaul carburetor	
Poor performance at normal speeds (Related symptoms) • Excess fuel consumption • Poor acceleration	Clogged air vent	Clean	Remove the air vent pipe, and clean.
	Clogged or loose main jet	Clean and retighten	Remove main jet, and blow it out with compressed air.
	Overflow	Check float and float valve and clean	

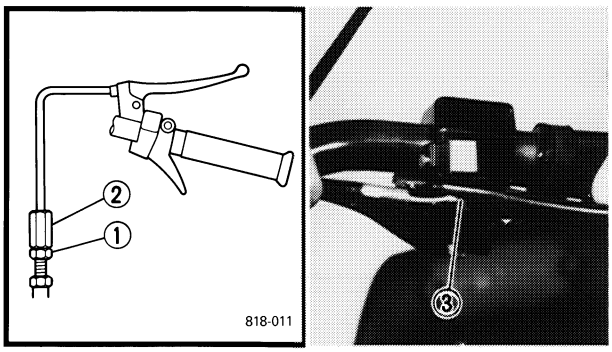


REMOVAL

1. Remove:
   - Handlebar cover ① (rear)
   - Handlebar cover ② (front)
2. Disconnect:
   - Band ③
   - Leads ④

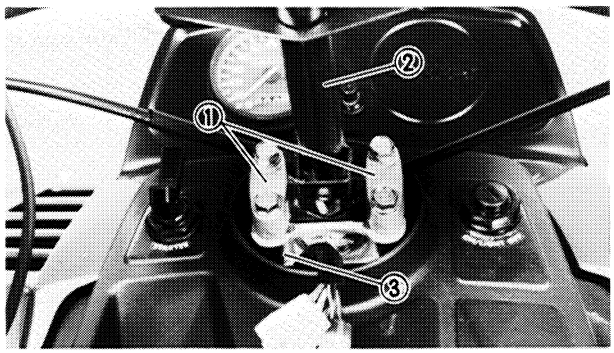


3. Remove:
   - Holder ① (throttle cable)
4. Disconnect:
   - Throttle cable ②
     (from throttle lever)

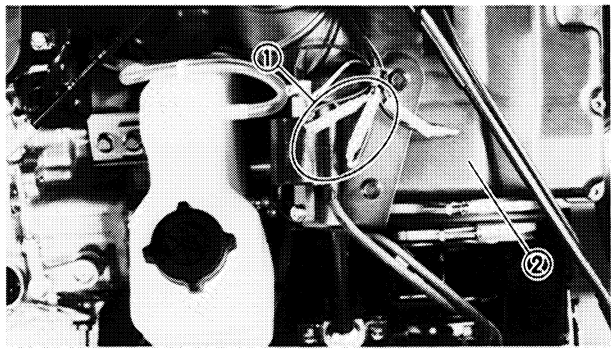


5. Remove:
   - Brake cable

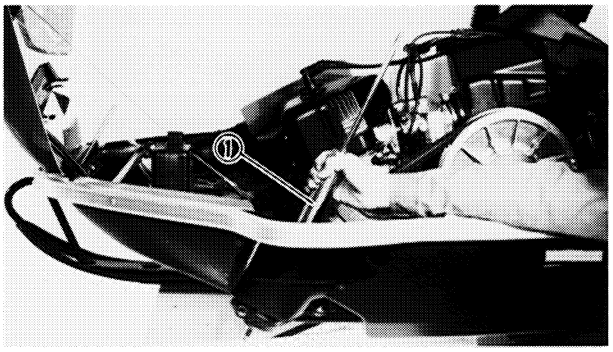
Removal steps:
- Loosen the locknut ①.
- Turn in the adjuster fully ②.
- Disconnect the brake cable end ③ from the brake lever.



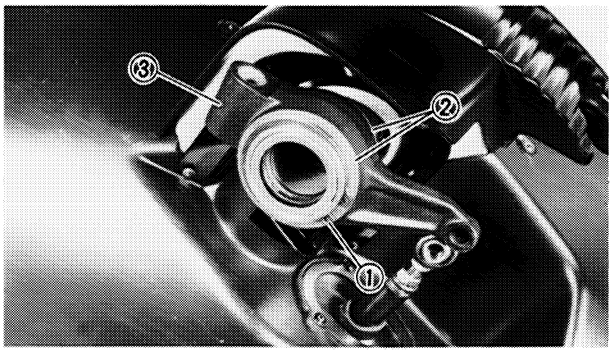
6. Remove:
   - Handlebar holders ① (upper)
   - Handlebar ②
   - Handlebar holders ③ (lower)
7. Remove
   - Carburetors (See page 6-2)
   - Engine assembly (See page 5-1)



8. Disconnect:
   - Ignition coil leads ①
9. Remove:
   - Intake silencer ②

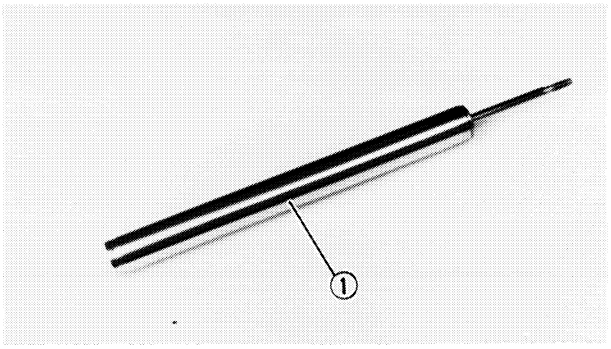


7. Remove:
   - Shock absorber ①

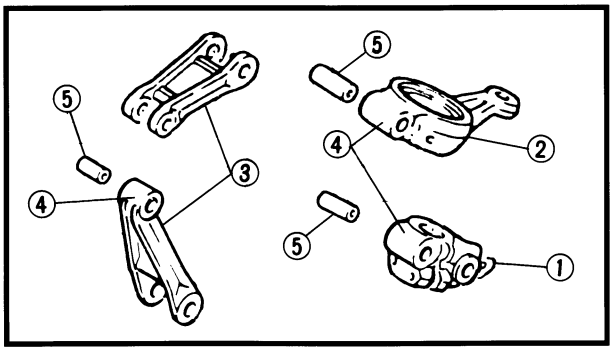


8. Remove:
   - Circlip ①
   - Washer ②
   - Suspension arm ③

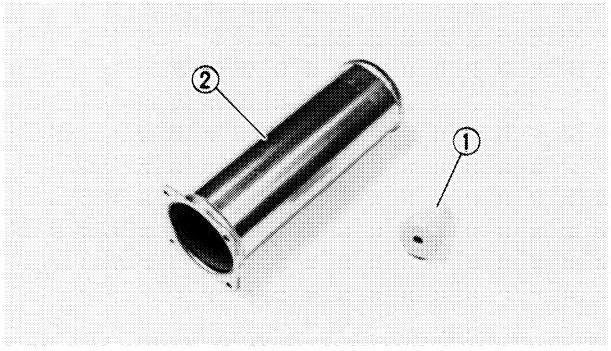
INSPECTION



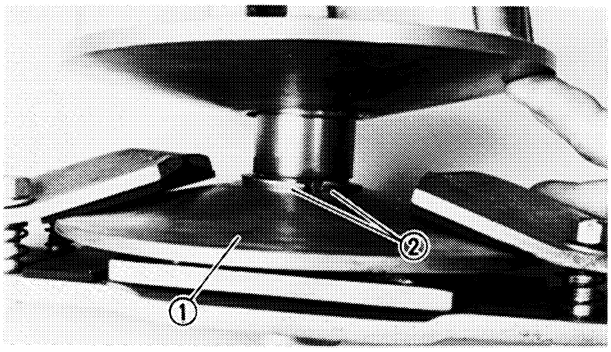
1. Inspect:
   - Shock absorber ①
     Oil leaks/Bending/Damage → Replace.



2. Inspect:
   - Suspension brackets ①
   - Suspension arm ②
   - Front arms ③
     Cracks/Wear/Damage → Replace.
   - Bushings ④
   - Collars ⑤
     Wear/Scratches/Damage → Replace.

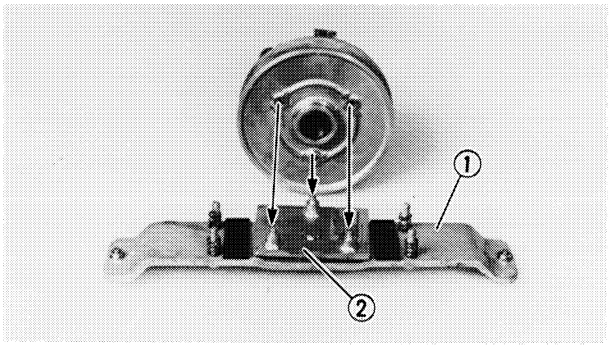


3. Inspect:
   - Bump rubber ①
     Wear/Damage → Replace.
   - Absorber holder ②
     Cracks/Bending/Damage → Replace.



3. Install:
   - Fixed sheave ①
   - Fixed sheave stoppers ②

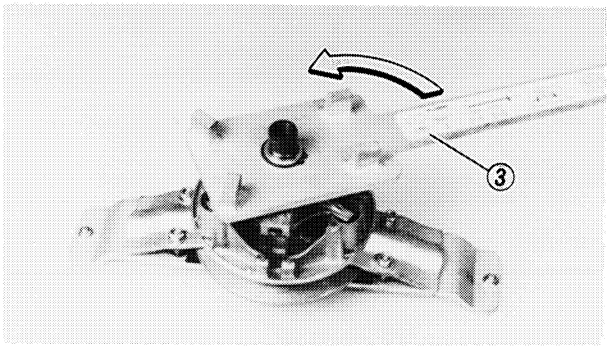
NOTE:
The tapered portion of the stopper should face the fixed sheave.



4. Tighten:
   - Spider

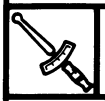
Tightening steps:
- Finger-tighten the spider until it is stopped by the fixed sheave stopper.
- Hold the fixed sheave with the clutch spider separator ① .

NOTE:
Securely fit the projections of the adapter ② into the fixed sheave holes.



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

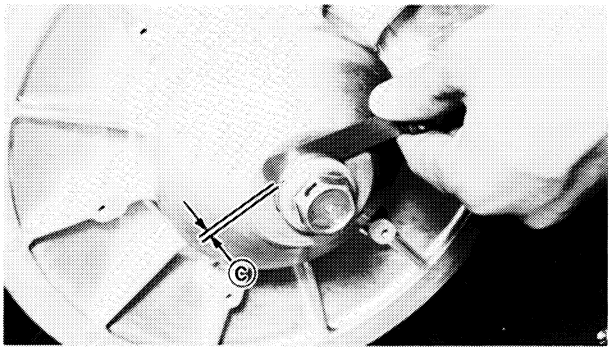
- Tighten the spider to specification using the bar wrench ③ .



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

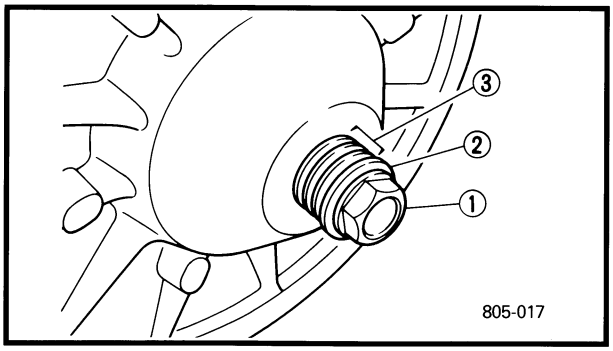
CAUTION:
- **The spider has a left-hand thread.**
- **Do not operate the primary sheave until the Loctite® has dried completely. Wait 24 hours before operating the primary sheave.**
- **Since the tightening torque is high, make sure the spider, fixed sheave, and special tool are placed securely. Tighten the spider carefully to prevent cracks and/or damage to the sheaves and spider.**

5. Install:
   - Weight
   - Washers
   - Weight pins



5. Measure:
   - Secondary sheave free play (clearance) Ⓒ
     Use a feeler gauge.
     Out of specification → Adjust.

Secondary sheave free play (clearance):
0.5 ~ 1.0 mm (0.02 ~ 0.04 in)



6. Adjust:
   - Secondary sheave free play (clearance)

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

Adding shim	**Free play is decreased.**
Removing shim	**Free play is increased.**

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

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

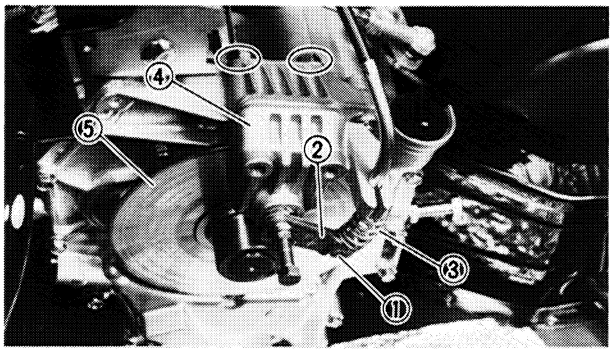
Bolt (secondary sheave):
60 Nm (6.0 m·kg, 43 ft·lb)

- Recheck the secondary sheave free play (clearance). If out of specification, repeat the above steps.

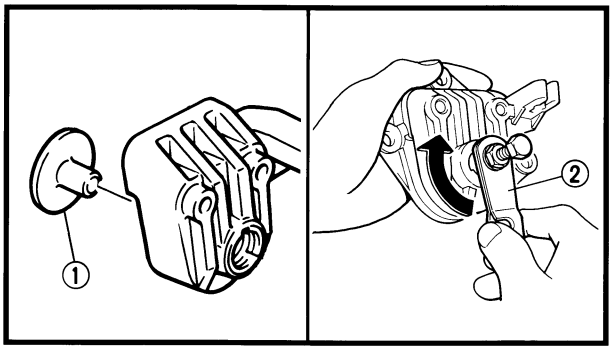
4

REMOVAL

1. Remove:
   - Muffler
   - Brake cable
     (from the brake lever) (See page 3-2)

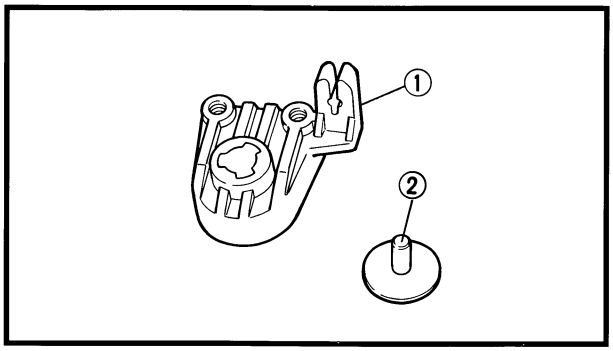


2. Remove:
   - Brake cable ①
     (from the brake cam lever ② side)
   - Spring ③
   - Brake caliper ④
   - Brake pads
   - Brake disk ⑤
   - Straight key

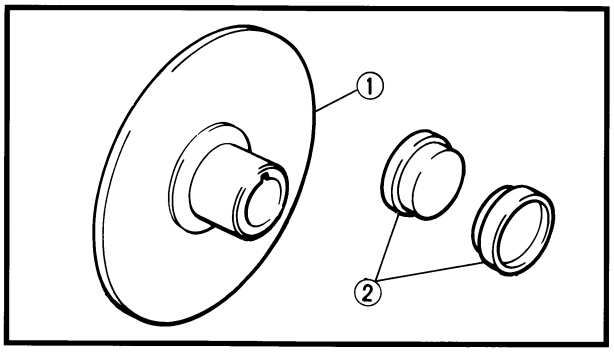


3. Remove:
   - Back up plate ①
   - Brake cam lever assembly ②

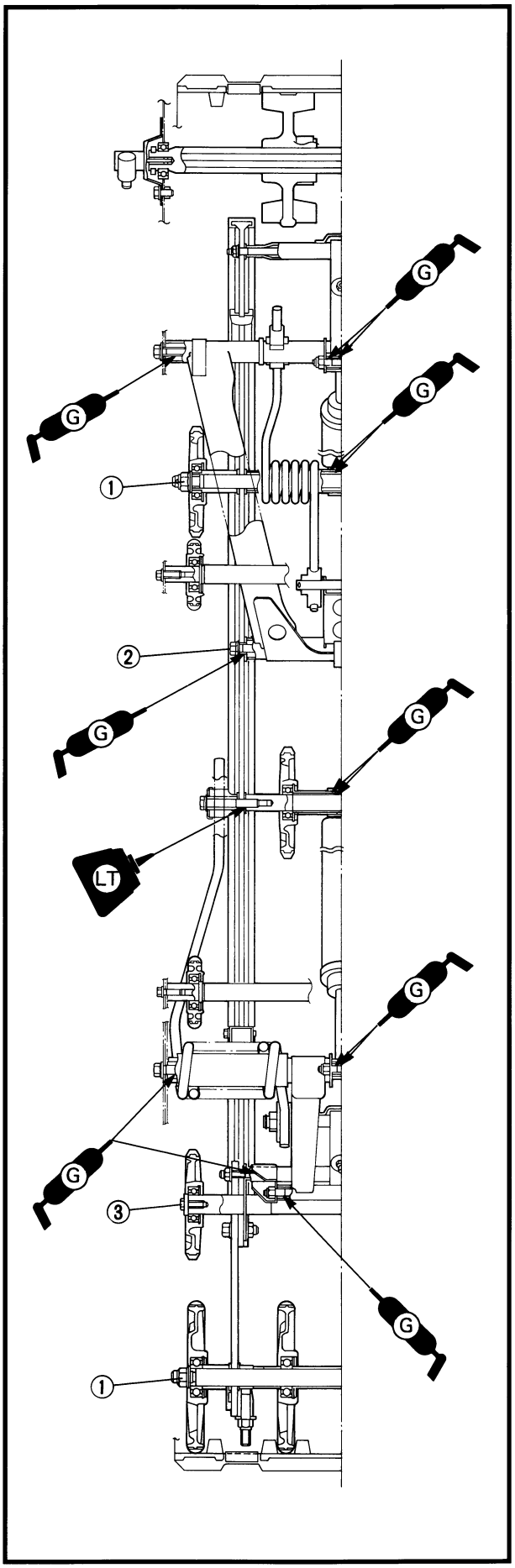
INSPECTION



1. Inspect:
   - Brake caliper ①
   - Back up plate ②
     Cracks/Damage → Replace.



2. Inspect:
   - Brake disc ①
     Bend/Crack/Damage → Replace.
   - Brake pads ② (See page 2-11)



3. Apply:
   - Low temperature lithium soap base grease (to "G" mark points in the illustration)
   - LOCTITE®
     (to "LT" mark points in the illustration)
4. Tighten:
   - Bolts
   - Nuts

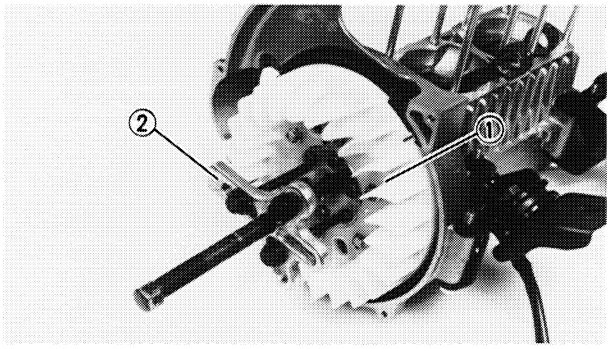
Nuts ①:
75 Nm (7.5 m • kg, 54 ft • lb)
Bolt ②:
64 Nm (6.4 m • kg, 46 ft • lb)
Bolt ③:
16 Nm (1.6 m • kg, 11 ft • lb)

5. Install:
   - Stopper bands (front and rear)

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

6. Install:
   - Cotter pins

CAUTION:
Always use a new cotter pin.

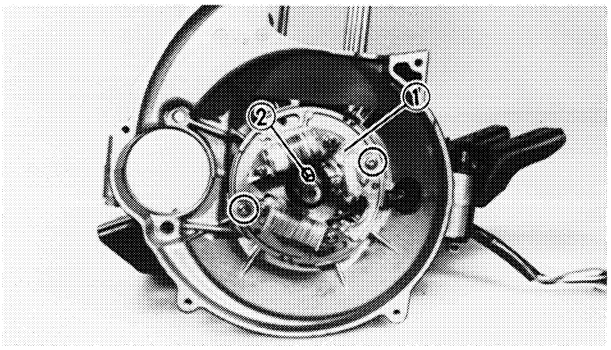


2. Remove:
   - Rotor ①

NOTE:

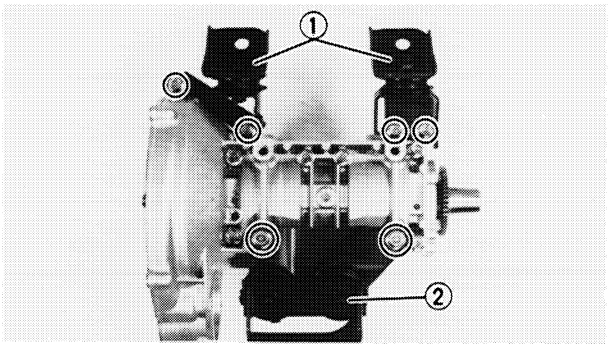
When removing the rotor, use the Rotor Puller ②.

Rotor puller:
90890-01362, YU-33270

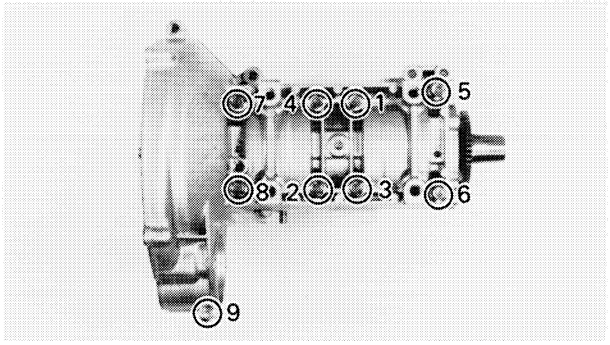


3. Remove:
   - Stator assembly ①
   - Woodruff key ②

CRANKCASE AND CRANKSHAFT



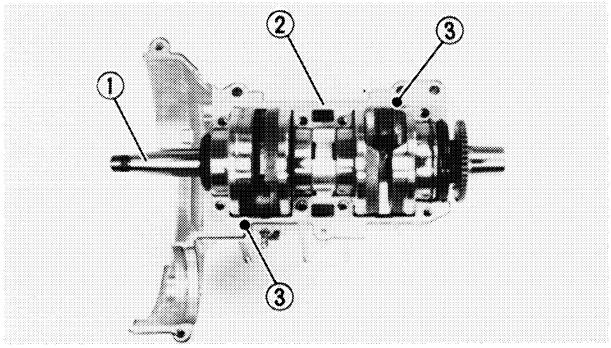
1. Remove:
   - Engine bracket ① (front)
   - Engine bracket ② (rear)



2. Remove:
   - Crankcase (lower)

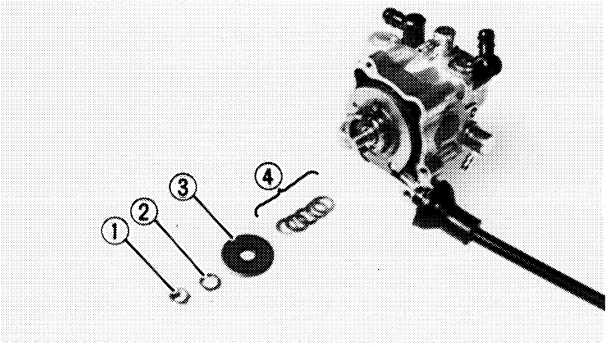
NOTE:

- Remove the bolts starting with the highest numbered one.
- Loosen each bolt 1/4 turn, and remove them after all bolts have been loosened.
- If they are tightly stuck together, tap the crankcase lightly at the indicated points with a soft-head hammer.



3. Remove:
   - Crankshaft ①
   - Crankcase (upper) ②
   - Knock pins ③

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



6. Adjust:
   - Oil pump stroke

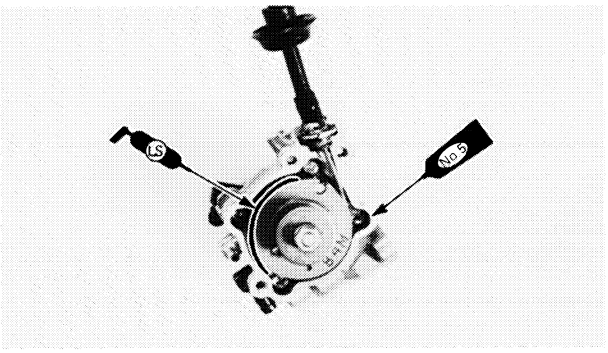
Adjustment steps:
- Remove the locknut ① , spring washer ② and adjusting plate ③ .
- Adjust the pump stroke by adding or removing a shim(s) ④ .

Adding shim	**Pump stroke is increased.**
Removing shim	**Pump stroke is decreased.**

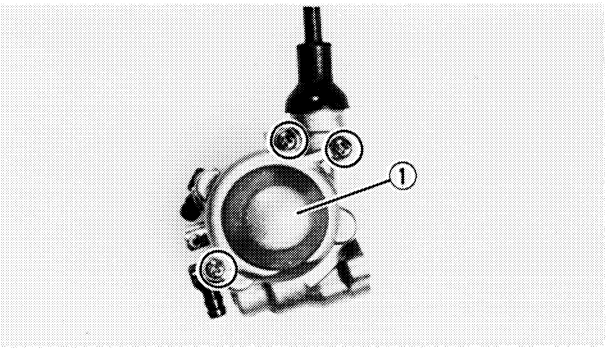
- Re-install the adjusting plate, spring washer and locknut.

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

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



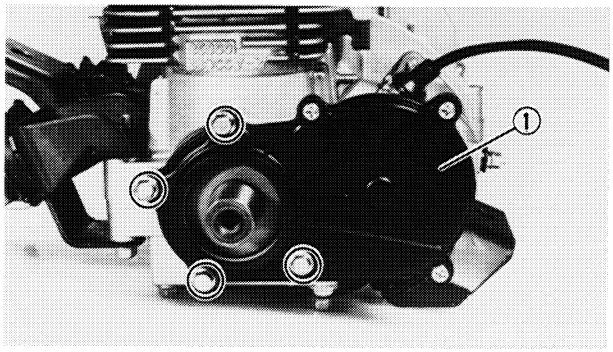
7. Apply:
   - Lithium soap base grease
     (to outside of pump pulley)
   - Yamaha Bond No.5® (ACC-11001-31-00)
     (to mating surface of oil pump cover)



8. Install:
   - Oil pump cover ①

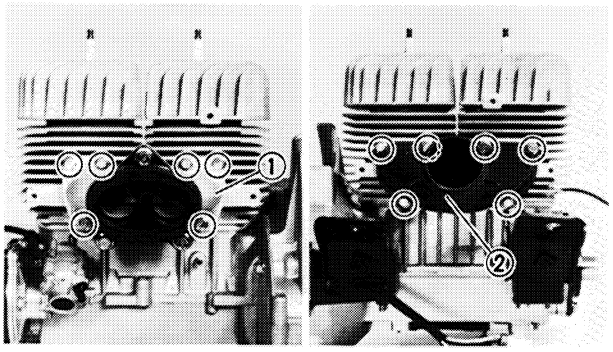
Screw (oil pump cover):
3 Nm (0.3 m • kg, 2.2 ft • lb)

9. Install:
   - Oil pump assembly
     (to drive gear housing)



OIL PUMP

1. Install:
   - Oil pump with drive gear housing ①

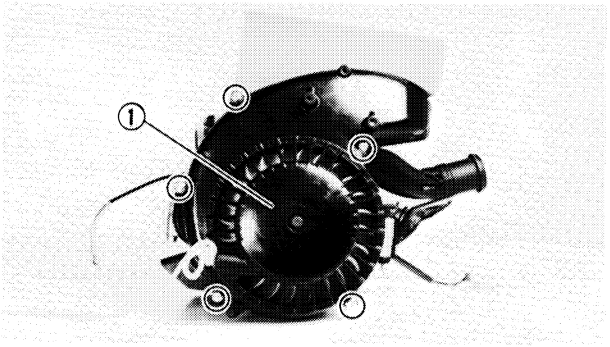


INTAKE AND EXHAUST MANIFOLD

1. Install:
   - Gaskets (intake manifold)
   - Intake manifold ①
   - Gaskets (exhaust manifold)
   - Exhaust manifold ②

NOTE:

Apply LOCTITE® to the holding bolts.



CAUTION:

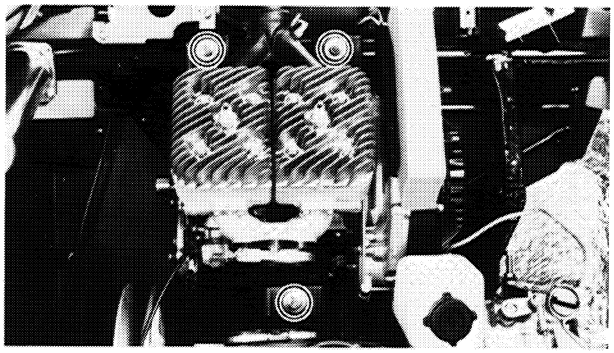
Always use new gaskets.

RECOIL STARTER

1. Install:
   - Recoil starter ①

NOTE:

Apply LOCTITE® to the holding bolts.



REMOUNTING ENGINE

Reverse the "ENGINE REMOVAL" procedure.
Note the following points.

1. Temporarily tighten the nuts (engine mounting bracket).
2. Install:
   - Primary sheave (See page 4-9)
3. Adjust:
   - Sheave distance and offset (See page 4-15)

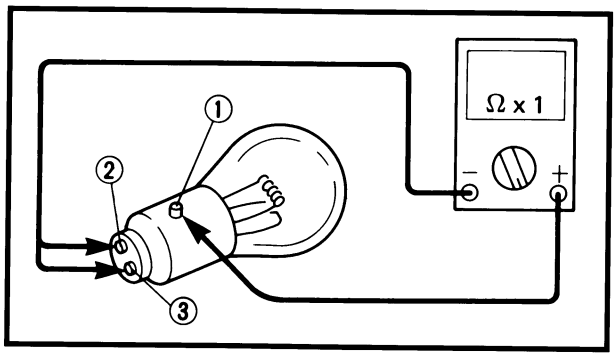
5

CHAPTER 7.
ELECTRICAL

— MEMO —

TAIL/BRAKE LIGHT BULB

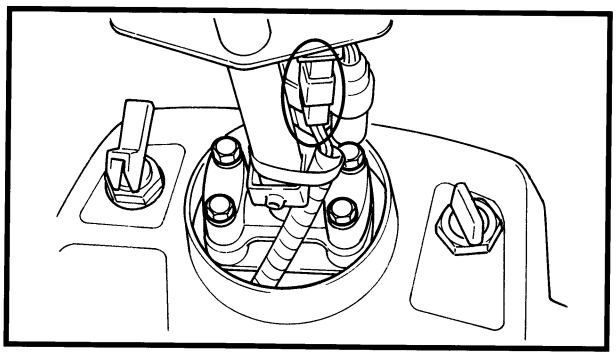
1. Remove:
   - Tail/brake light bulb
2. Connect:
   - Pocket tester
     (to bulb terminals)



3. Check:
   - Tail/brake light bulb

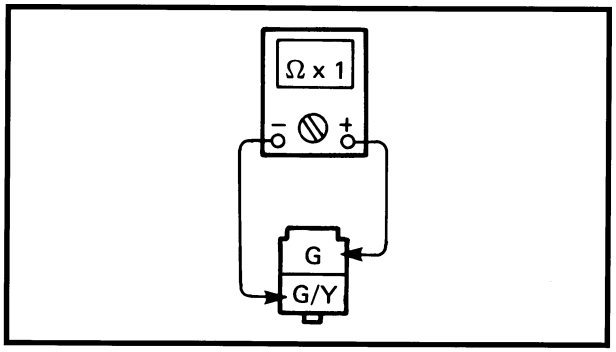
Terminal	Good condition
① – ②	O
① – ③	O

O : Continuity



BRAKE LIGHT SWITCH

1. Disconnect:
   - Brake light switch coupler
2. Connect:
   - Pocket tester
     (to brake light switch coupler)



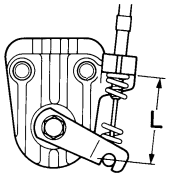
3. Check:
   - Brake light switch continuity
     Faulty→Replace.

Switch position	Good condition
Brake lever is opetate	O
Brake lever is not operate	x

O : Continuity x : No continuity

REVERSE SWITCH

1. Disconnect:
   - Reverse switch leads
2. Connect:
   - Pocket tester
     (to reverse switch terminal)

Model	ET410TR
Shock Absorber:	
Damping Force (Extension)	
Front	143 kg/0.3 m/s
Rear	205 kg/0.3 m/s
Damping Force (Compression)	
Front	75 kg/0.3 m/s
Rear	65 kg/0.3 m/s
Slide Runner:	
Thickness	18 mm (0.71 in)
Wear Limit	10 mm (0.39 in)
Track Sprocket Wheel:	
Material	Polyethylene
Number of Teeth	7 T
Rear Guide Wheel:	
Material	Aluminum with rubber
Outside Diameter	178 mm (7.01 in)
Brake:	
Pad Thickness	15.5 mm (0.61 in)
Pad Wear Limit	9.5 mm (0.37 in)
Pad to Disc Clearance	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
Disc Outside Diameter	168 mm (6.61 in)
Disc Thickness	4.0 mm (0.15 in)
Distance "L" 	57 mm (2.24 in)

High Altitude Setting:	~4000 ft/1200 m (STD)	4000 ft ~ 6500 ft (MA)	6500 ft/2000 m (HA)
Clutch Engagement RPM:	Approx 3,000 rpm	Approx 3,500 rpm	Approx 3,700 rpm
Shift RPM:	Approx 6,500 rpm	←	←
Primary Sheave Weight Arm:			
Part Number	83R-17632-00	8V0-17632-00	←
Weight	53.3 g	46.1 g	←
Quantity	3 pcs.	←	←
Primary Sheave Spring:			
Part Number	90501-527H0	90501-55485	90501-55791
Color Code	Yellow-Yellow	Brown-White	White
Pre-load/Sheave Spring:	20 kg	25 kg	30 kg
Spring Rate	2.25 kg/mm	2.5 kg/mm	2.25 kg/mm
Free Length	70.4 mm	71.5 mm	74.8 mm
Secondary Sheave Spring:			
Part Number	90508-50571	←	←
Color Code	Pink	←	←
Twist Angle	40°	50°	←
Hole Position			
Sheave Side	C	A	←
Spring Seat Side	2	2	←
Free Length	85.0 mm	←	←