



# YAMAHA

## SNOWMOBILE

# ET300D

## SUPPLEMENTARY SERVICE MANUAL



[ Frame serial number: 8K0-009101 ~ 8K0-019999  
Engine serial number: E294-009101 ~ E294-019999 ]

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### 1. NEW SERVICE PROCEDURE

(New service procedure applied to the 1980 ET300D)

There are no particular new service procedure.

## 2. MAINTENANCE INTERVALS

### [PERIODIC MAINTENANCE]

Check point	Every			When necessary	Seasonally
	20 hrs. or 400 km (250 mi)	40 hrs. or 800 km (500 mi)	80 hrs or 1600 km (1000 mi)		
<b>ENGINE:</b>					
Tightness of bolts and nuts	<input type="radio"/>				<input type="radio"/>
Bends, cracks and wear	<input type="radio"/>				<input type="radio"/>
Abnormal noise	<input type="radio"/>				<input type="radio"/>
Loose connection and breaks of fuel and pulse pipes	<input type="radio"/>				<input type="radio"/>
Loose connection and breaks of oil pipes	<input type="radio"/>				<input type="radio"/>
Loose connection and breaks of oil delivery pipe	<input type="radio"/>				<input type="radio"/>
Manual rope starter system		<input type="radio"/>			<input type="radio"/>
<b>Carburetor</b>					
● Operation of starter jet		<input type="radio"/>			<input type="radio"/>
● Mixing adjuster (pilot screw)				<input type="radio"/>	<input type="radio"/>
● Idling speed adjustment				<input type="radio"/>	<input type="radio"/>
Operation and adjustment of oil pump		<input type="radio"/>			<input type="radio"/>
Ignition timing					<input type="radio"/>
Cylinder compressions			<input type="radio"/>		<input type="radio"/>
Cylinder head/exhaust pipe decarbonize					<input type="radio"/>
Spark plug condition, gap and cleaning	<input type="radio"/>				<input type="radio"/>
Tightening of the cylinder head**					<input type="radio"/>
<b>DRIVE:</b>					
Tightness of bolts and nuts	<input type="radio"/>				<input type="radio"/>
Wear on slide runners	<input type="radio"/>				<input type="radio"/>
Primary drive system		<input type="radio"/>			<input type="radio"/>
V-belt	<input type="radio"/>				<input type="radio"/>
Secondary drive system		<input type="radio"/>			<input type="radio"/>
Sheave distance		<input type="radio"/>			<input type="radio"/>
Sheave offset		<input type="radio"/>			<input type="radio"/>
Brake pad wear		<input type="radio"/>			<input type="radio"/>
Brake operation and adjustment		<input type="radio"/>			<input type="radio"/>
Guide wheel rubber		<input type="radio"/>			<input type="radio"/>
Wear of drive track wheel sprocket		<input type="radio"/>			<input type="radio"/>
Drive track adjustment	Initial 100 km (60 mi) & 300 km (200 mi)	<input type="radio"/>			<input type="radio"/>
Breaks in drive track		<input type="radio"/>			<input type="radio"/>
Bends in front and rear axles		<input type="radio"/>			<input type="radio"/>
Checking of lock washers		<input type="radio"/>			<input type="radio"/>
Drive chain adjustment		<input type="radio"/>			<input type="radio"/>
Drive chain oil level		<input type="radio"/>			<input type="radio"/>
<b>BODY:</b>					
Tightness of bolts and nuts	<input type="radio"/>				<input type="radio"/>
Bends and cracks	<input type="radio"/>				<input type="radio"/>
Welded riveted, joints	<input type="radio"/>				<input type="radio"/>
Ski adjustment		<input type="radio"/>			<input type="radio"/>
Ski runner wear	<input type="radio"/>				<input type="radio"/>
Breaks in fuel tank		<input type="radio"/>			<input type="radio"/>
Cleaning of fuel tank					<input type="radio"/>
Fuel filter					<input type="radio"/>
Loose connection and breaks in fuel pipe		<input type="radio"/>			<input type="radio"/>
Breaks in oil tank		<input type="radio"/>			<input type="radio"/>
Oil filter					<input type="radio"/>

Check point	Every			When necessary	Seasonally
	20 hrs. or 400 km (250 mi)	40 hrs. or 800 km (500 mi)	80 hrs or 1600 km (1000 mi)		
<b>ELECTRICAL:</b>					
Wear, breakage of wire covering		○			○
Breaks in high-tension cord	○				○
Voltage regulator working voltage					○
Operation of engine stop switch		○			○
Operation of tether switch		○			○
Headlight		○			○
Taillight		○			○
Brake light		○			○

\*\* Retighten every 10 hours from the first use.

### [LUBRICATION INTERVALS]

Lubrication point	Every			When necessary	Seasonally	Oil/Grease Brand name
	20 hrs. or 400 km (250 mi)	40 hrs. or 800 km (500 mi)	80 hrs or 1600 km (1000 mi)			
<b>ENGINE:</b>						
Starter case					○	Aeroshell grease #7A or Esso Beacon 325 grease
Oil pump control box			○		○	
Pump drive cover			○		○	
Oil in the oil tank				○		YAMALUBE 2-cycle oil
<b>DRIVE:</b>						
Primary sheave weight and roller pins		○			○	Molybdenum disulfide snowmobile grease
Secondary shaft and sliding sheave		○			○	Molybdenum disulfide snowmobile grease
Front axle housing		○			○	Light all-purpose grease
Shaft 1 and shaft 2 (Slide rail)			○		○	
Drive chain oil replacement		○			○	Gear oil API "GL-3" SAE #75 or #80
<b>BODY:</b>						
Steering column lower bearing		○			○	Light all-purpose grease
Steering column upper bearing		○			○	Motor oil
Steering links		○			○	Light all-purpose grease
Ski column		○			○	
Ski wear plate		○			○	
Ski retaining pin		○			○	
Brake wire end stopper and brake lever		○			○	Esso Beacon 325 grease

### 3. SPECIFICATIONS

NOTE: \* ..... New specification  
(Compared with 1979 ET300C)

#### General

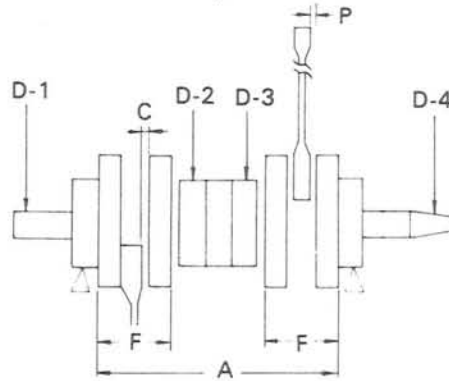
Model	ET300D
Model (I.B.M. No.)	* ET300D (8K0)
Frame I.D. & starting number	* 8K0-009101
Engine I.D. & starting number	* E294-009101
Dimension:	
Overall length	2,385 mm (93.9 in)
Overall width (std)	935 mm (36.8 in)
Overall height (w/windshield)	965 mm (38.0 in)

#### Engine

Description:	
Engine type	Fan cooled two-stroke 5-port, twin cylinders
Engine model	E294
Displacement	294 cc (17.94 cu.in)
Bore × Stroke	56 × 59.6 mm (2.21 × 2.35 in)
Effective compression ratio	6.5 : 1
Starting system	Recoil hand starter
Ignition system	C.D.I.
Lubrication system	"Autolube" oil injection
Cylinder head:	
Combustion chamber volume	18.3 cc (1.12 cu.in) with spark plug
Compression chamber type	Dome + Squish
Head gasket thickness	0.5 mm (0.02 in)
Cylinder:	
Material	Cast iron sleeves aluminum
Bore size	56 mm (2.21 in)
Taper limit	0.05 mm (0.0020 in)
Out of round limit	0.01 mm (0.0004 in)
Piston:	
Piston skirt clearance (Measuring point)	0.040 ~ 0.045 mm (0.0016 ~ 0.0018 in) (10 mm from piston skirt end)
Piston oversize	1st 56.25 mm (2.213 in) 2nd 56.50 mm (2.224 in) 3rd 56.75 mm (2.234 in) 4th 57.00 mm (2.244 in)
Piston pin outside diameter × length	φ16 × 47 mm (φ0.630 × 1.85 in)
Piston ring:	
Piston ring design (Top)	Keystone
Piston ring design (2nd)	* Plane
Ring end gap (installed) (Top)	* 0.15 ~ 0.35 mm (0.006 ~ 0.014 in)
Ring end gap (installed) (2nd)	0.30 ~ 0.50 mm (0.012 ~ 0.020 in)
* Ring groove side clearance (2nd)	* 0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Small end bearing:	
Type	Needle bearing
Big end bearing:	
Type	Needle bearing

**Crankshaft:**

Crankshaft assembly width (A)	160 ± 0.1 mm (6.30 ± 0.004 in)
Crankshaft assembly width (F)	52 <sup>+0</sup> / <sub>-0.05</sub> mm (2.047 <sup>+0</sup> / <sub>-0.002</sub> in)
Crankshaft deflection (D)	0.03 mm (D-1) 0.04 mm (D-2) 0.04 mm (D-3) 0.03 mm (D-4)
Connecting rod big end side clearance (C)	0.25 ~ 0.35 mm (0.010 ~ 0.014 in)
Connecting rod small end deflection (P)	2.0 mm (0.079 in)



Crank pin outside diameter × length	φ22 × 51 mm (φ0.866 × 2.008 in)
Crank pin type	Solid shaft assembly type with serration
Crank bearing type (Left) × q'ty	#6306 special 1 pc.
Crank bearing type (Center) × q'ty	#6206 special × 2 pcs.
Crank bearing type (Right) × q'ty	#6305 special × 1 pc.
Crank oil seal type (Left) × q'ty	FPJ-30 72 8 2 TS × 1 pc.
Crank oil seal type (Center) × q'ty	Labyrinth seal × 1 pc.
Crank oil seal type (Right) × q'ty	FPJ-25 48 8TS × 1 pc.

**Carburetor:**

Type & manufacturer/quantity	B38-32 MIKUNI × 1 pc.
I.D. Mark	8H900
Main jet (M.J.)	#210
Pilot jet (P.J.)	#90
Pilot screw (P.S.)	1-1/4 turns out
Throttle valve (Th.V.)	#185
Valve seat (V.S.)	φ1.5 mm (0.059 in)
Float height	25 ± 1 mm (0.98 ± 0.04 in)
Idling engine speed	1600 r/min

**Main jet setting chart:**

Altitude	Temperature					
	-30°C (-22°F)	-20°C (-4°F)	-10°C (14°F)	0°C (32°F)	10°C (50°F)	20°C (68°F)
Sea level	#220		#210 (Std.)			#200
~ 600m (2000 ft)			#210 (Std.)		#200	
~ 1200m (4000 ft)	#210 (Std.)		#200			#190
~ 1800m (6000 ft)		#200		#190		#180
~ 2400m (8000 ft)		#200			#190	
~ 3000m (10000 ft) or more						#180

Lubrication:	
Autolube pump — Color code	Blue
Autolube pump — Minimum stroke	0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in)
Autolube pump — Maximum stroke	1.65 ~ 1.87 mm (0.0650 ~ 0.0736 in)
Autolube pump — Reduction ratio	1/36
Autolube pump — Output Min./200 strokes	0.50 ~ 0.63 cc (0.0169 ~ 0.0213 oz)
Autolube pump — Output Max./200 strokes	4.15 ~ 4.70 cc (0.1403 ~ 0.1589 oz)
Autolube pump wire free play	25 ± 1 mm (0.98 ± 0.04 in) at idle
Oil tank capacity	2.4 liter (2.5 US. qt)
Oil grade	YAMALUBE 2-cycle

### Drive and track suspension

Transmission:	
Type	V-belt automatic centrifugal engagement
Drive ratio	3.5 : 1 ~ 1 : 1
Engagement rpm	3100 r/min
Primary spring:	
Part No.	90501-55345
Color code	Red—Red
Secondary spring:	
Part No.	90508-40080
Color code	No. painted
Secondary spring pre-load (twist)	160°
Sheave distance	266 ± 2 mm (10.47 ± 0.08 in)
Sheave off-set	11 ± 1 mm (0.43 ± 0.04 in)
V-belt width and outer line length	31.6 × 1,099 mm (1.24 × 43.3 in)
V-belt wear limit	26 mm (1.02 in)
Track suspension:	
Type	Slide rail suspension
Damper type	Oil and gas damper
Spring color code (Rear)	No. painted
Slide runner wear limit	10 mm (0.394 in)
Track width	380 mm (15 in)
Track deflection	25 ~ 30 mm/10 kg (0.98 ~ 1.18 in/22 lb)
Length on ground	650 mm (25.6 in)
Wheel sprocket material and number of teeth	Polyethylene 11T
Stopper band length	210 mm (8.27 in)
Secondary drive:	
Type	Chain (#40K-1)
Reduction ratio	22/13 (1.692)
Chain pitch × Number of links	12.7 mm (0.5 in) × 60L
Free play	10 <sup>+5</sup> / <sub>-2</sub> mm (0.4 <sup>+0.2</sup> / <sub>-0.08</sub> in)
Chain housing oil quantity	450 cc (15.2 oz)
Chain housing oil grade	Gear oil API "GL3" (SAE #75 or 85)
Brake:	
Type	Disc brake
Brake pad thickness	7.3 mm (0.287 in)
Brake pad wear limit	1.0 mm (0.04 in)
Gap between pad and disc	0.2 ~ 1.0 mm (0.008 ~ 0.039 in)

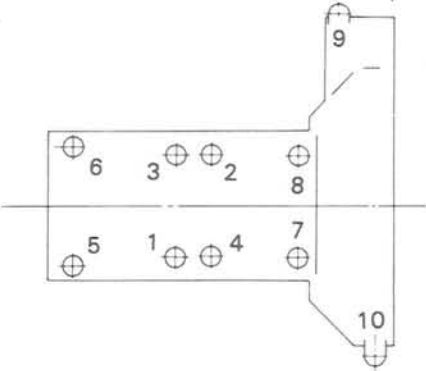
## Chassis

Frame: Material	Aluminum + Steel
Steering system: Caster (ski column) Camber Ski length × width × thickness Ski stance Ski toe-out Steering linkage type Lock to lock angle (ski)  Lock to lock angle (steering column)	25° 0° 980 × 120 × 1.6 mm (38.6 × 4.7 × 0.06 in) 800 mm (31.5 in) 0 ~ 6 mm (0 ~ 0.23 in) Tie-rod Right ski, L: 27.6° R: 24.8° Left ski, L: 24.8° R: 27.6° Right: 54.3° Left: 56.3°
Front suspension: Type Damper type	Leaf spring Oil damper
Fuel tank: Capacity Fuel grade	22.7 liter (6 US. gal) Regular gasoline

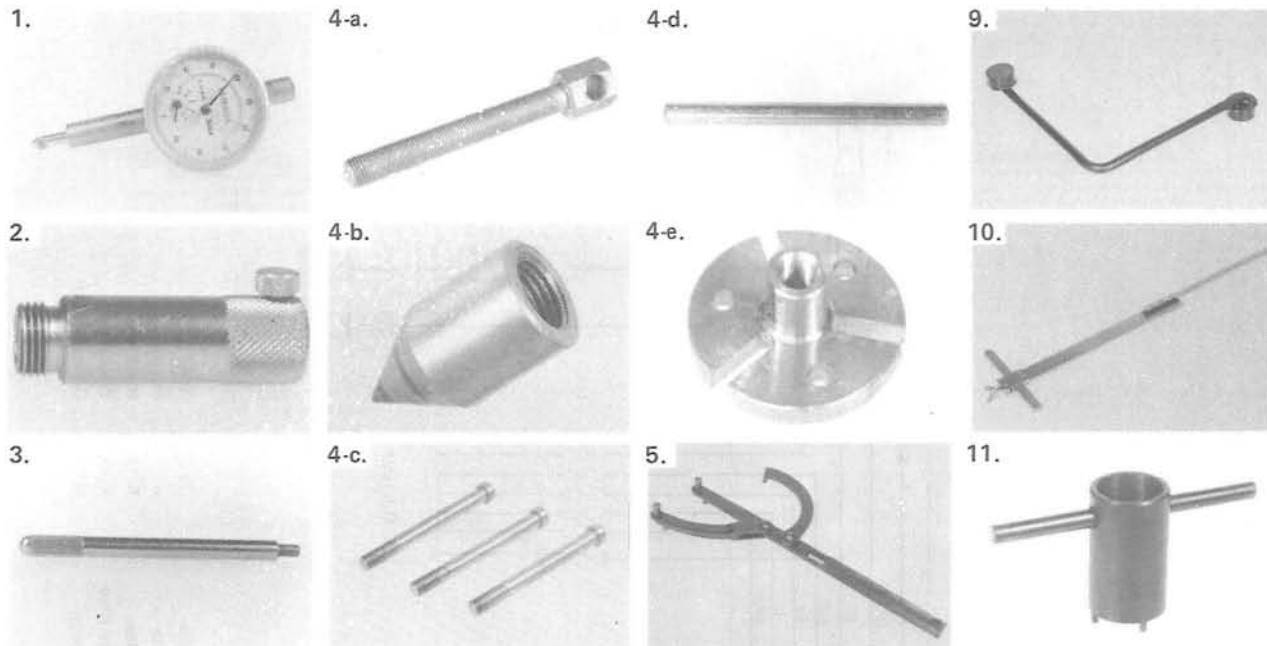
## Electrical

Ignition system: Type—flywheel magento (C.D.I. type) Model/manufacture Voltage Pulser coil resistance Charging coil resistance Charging coil resistance	F3T352/MITSUBISHI 12V 9.0Ω at 20°C (68°F) (White/Red—Black) 350Ω at 20°C (68°F) (Brown—Black) 15.0Ω at 20°C (68°F) (Blue—Black)
Ignition timing: B.T.D.C.	1.4 ± 0.1 mm (0.055 ± 0.004 in)
Ignition coil: Model: Manufacturer Spark gap  Primary winding resistance Secondary winding resistance Diode (Yes or No)	CM62-20 HITACHI 9 mm (0.4 in)/300 r/min 11 mm (0.6 in)/3,000 r/min 0.15Ω at 20°C (68°F) 3.6kΩ at 20°C (68°F) No
Spark plug: Type & quantity Spark plug gap	* NGK BR-9ES × 2 pcs. 0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
Spark plug cap: Type Noise suppressor resistance	Rubber type with noise suppressor 5kΩ at 20°C (68°F)
C.D.I. unit: Model/Manufacturer	8H4-20/MITSUBISHI
Lighting system: Lighting output Lighting coil resistance Headlight type Bulb wattage/q'ty Tail/stop light wattage	12V-100W 0.19Ω at 20°C (68°F) (Yellow—Black) Semi shield 12V-60/60W × 1 pc. 12-8W/23W
A.C. regulator: Model/manufacture Voltage	TRIZ-24B/HITACHI or S8516B/TOSHIBA 13.8 ± 0.5V

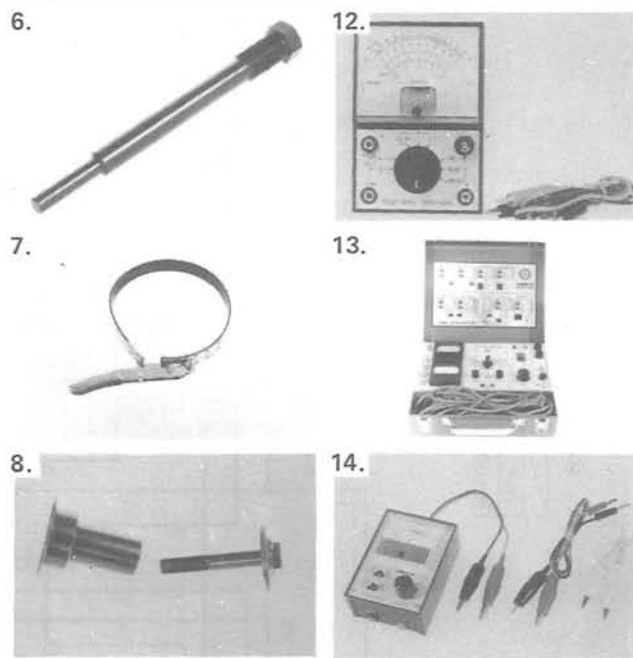
## Tightening torque

Part to be tightened	Thread size	Tightening torque	Remarks
Engine: Spark plug Cylinder head Flywheel magneto Crankcase upper and lower	M14 P1.25 M8 P1.25 M16 P1.0 M8 P1.25	2.8 m-kG (20 ft-lb) 2.5 m-kG (18 ft-lb) 7.3 m-kG (53 ft-lb) First: 1.0 m-kG (7 ft-lb) Final: 2.0 m-kG (15 ft-lb)	
			
Starter pulley Crankcase and engine bracket	M8 P1.25 M10 P1.25	1.6 m-kG (11.5 ft-lb) 3.0 m-kG (21.5 ft-lb)	
Drive and track suspension: Primary sliding sheave and cap Installation of primary sheave  Installation of drive chain sprocket Installation of driven chain sprocket Chain housing and frame Chain housing cap Chain tensioner lock nut Installation of front axle R.H. Front axle housing and frame Wheel sprocket and front axle Shaft 1 and frame Pivot arm 1 and sliding frame 1 Suspension wheel Spring hook Sliding frame 1 Rear guide wheel Sliding runner 1 Sliding runner 2 Stopper 1 Suspension bar	M6 P1.0 UNF 1/2"  M12 P1.25 M10 P1.25 M8 P1.25 M8 P1.25 M10 P1.25 M20 P1.0 M8 P1.25  M10 P1.25 M10 P1.25 M12 P1.25 M8 P1.25 M8 P1.25 M8 P1.25 M6 P1.0 M6 P1.0 M6 P1.0 M8 P1.25	1.1 m-kG (8 ft-lb) Initial: 10 m-kG (72.5 ft-lb) Loosen once and retighten: 6.0 m-kG (43.5 ft-lb) 4.0 m-kG (29 ft-lb) 3.5 m-kG (25 ft-lb) 2.3 m-kG (16.5 ft-lb) 1.6 m-kG (11.5 ft-lb) 3.3 m-kG (24 ft-lb) 8.0 m-kG (58 ft-lb) 2.3 m-kG (16.5 ft-lb) 0.5 m-kG (3.5 ft-lb) 5.5 m-kG (40 ft-lb) 5.0 m-kG (36 ft-lb) 7.3 m-kG (53 ft-lb) 2.3 m-kG (16.5 ft-lb) 2.3 m-kG (16.5 ft-lb) 2.3 m-kG (16.5 ft-lb) 0.25 m-kG (2 ft-lb) 0.65 m-kG (5 ft-lb) 0.4 m-kG (3 ft-lb) 2.3 m-kG (16.5 ft-lb)	Use Motor oil  Use cotter pin  Use LOCK-TITE  Use LOCK-TITE Use LOCK-TITE
Chassis: Engine mounting bolt Ski runner Steering column and gate Steering relay rod adjusting nut Outside arm and ski column Steering lower bracket Installation of steering column 1, 2 Steering relay ass'y Universal joint Steering gate	M10 P1.25 M8 P1.25 M8 P1.25 M10 P1.25 M10 P1.25 M8 P1.25 M8 P1.25 M10 P1.25 M10 P1.25 M10 P1.25 M8 P1.25	3.0 m-kG (22 ft-lb) 1.4 m-kG (10 ft-lb) 2.0 m-kG (14.5 ft-lb) 2.5 m-kG (18 ft-lb) 3.0 m-kG (22 ft-lb) 2.3 m-kG (16.5 ft-lb) 1.45 m-kG (10.5 ft-lb) 3.0 m-kG (22 ft-lb) 2.5 m-kG (18 ft-lb) 1.4 m-kG (10 ft-lb)	Use lock washer  Use lock washer Use lock washer

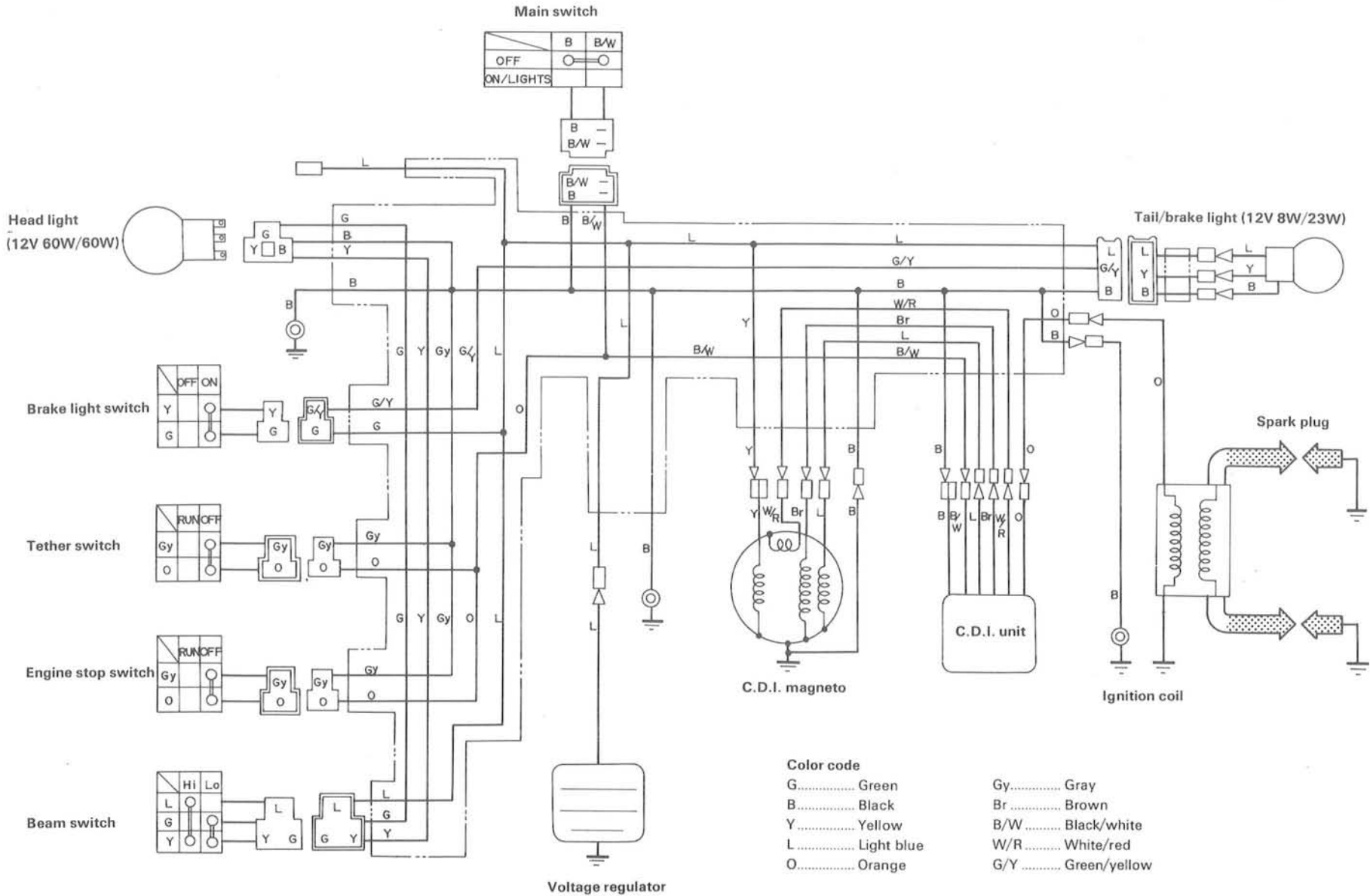
## 4. SPECIAL TOOLS



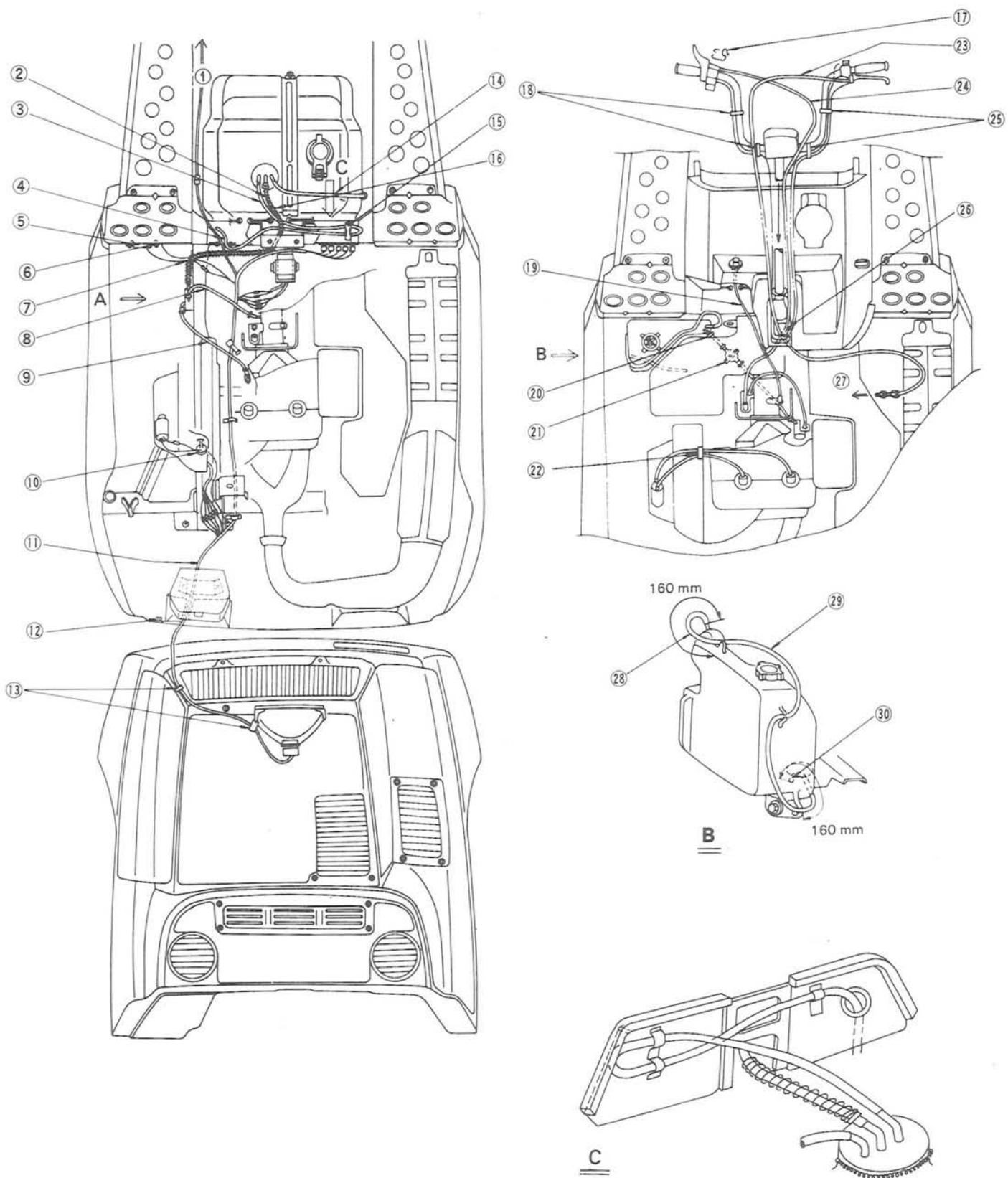
No.	Description	Tool No.
1	Dial gauge	90890-03097
2	Dial gauge stand No. 2	90890-01195
3	Dial gauge needle (56 mm)	90890-03098
4-a	Flywheel puller bolt	90890-01803
4-b	Flywheel puller attachment	90890-01804
4-c	Flywheel puller screw	90890-01806
4-d	Drive handle	90890-01817
4-e	Flywheel puller body	90890-01848
5	Rotor holding tool	90890-01235
6	Primary fixed sheave puller	90890-01881
7	Sheave holder	90890-01880
8	Sheave sub-assembly tool	90890-01879
9	Bushing tool	90890-01877
10	Sheave gauge	90890-01875
11	Main switch ring nut tool	90890-01857
12	Pocket tester	90890-03104
13	Electro tester	90890-03021
14	A.C. Regulator checker	90890-03090

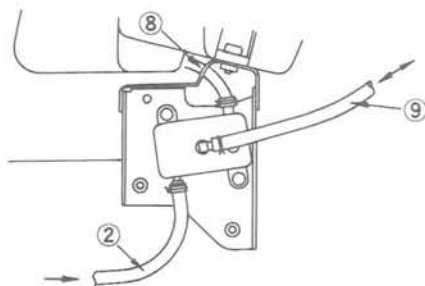
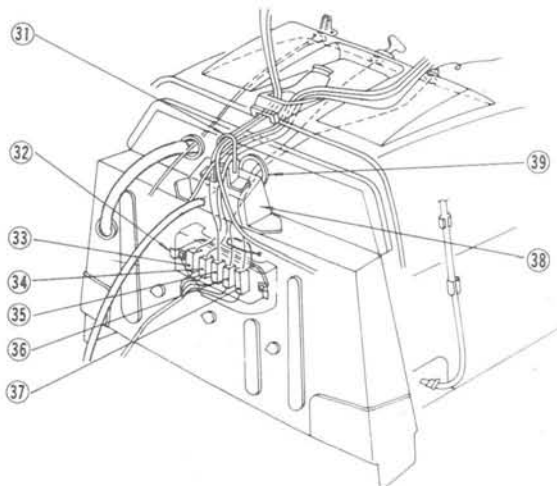


# 5. WIRING DIAGRAM



# 6. WIRE AND PIPE ROUTING DIAGRAM





**A**

1. To taillight
2. Fuel pipe
3. Fuel tank breather pipe
4. Through pipe inside the steering gate
5. Voltage regulator
6. Ground to body
7. Clamp voltage regulator ground wire
8. Fuel delivery pipe
9. Pulse pipe
10. Band
11. Wire harness assembly
12. Ground to body
13. Clamp
14. Fuel level pipe
15. Clamp
16. Pipe protector (Coil spring)
17. Clip
18. Band (Clamp the engine stop switch lead wire)
19. Starter wire
20. Oil pipe
21. Oil filter
22. Clamp
23. Brake wire
24. Throttle wire
25. Band (Clamp the beam switch and brake light switch lead wire)
26. Grommet
27. To brake caliper
28. When installing breather pipe, route it inside the instrument panel.
29. Oil tank breather pipe
30. Through the breather pipe end into the fuel pump bracket hole.
31. Bearing holder (Through the throttle wire, brake wire, beam switch lead wire, engine stop switch lead wire and brake light lead wire.)
32. Hook band (Through the beam switch lead wire, engine stop switch lead wire and brake light lead wire.)
33. Brake light switch lead wire coupler
34. Beam switch lead wire coupler
35. Engine stop switch lead wire coupler
36. Tether switch lead wire coupler
37. Main switch lead wire coupler
38. Through the main switch lead wire, tether switch lead wire and fuel tank breather pipe under the bracket 1.
39. Grommet (Through the main switch lead wire, tether switch lead wire, fuel tank breather pipe and fuel pipe.)