YAMAHA 2008

SUPPLEMENTARY SERVICE MANUAL

YFM45FGX

LIT-11616-21-46 5ND-F8197-13

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and data for the YFM45FGX. For complete service information procedures it is necessary to use this Supplementary Service Manual together with the following manual.

YFM450FAR SERVICE MANUAL: LIT-11616-16-01 (5ND-F8197-10)
YFM450FAS SUPPLEMENTARY SERVICE MANUAL: LIT-11616-17-25 (5ND-F8197-11)
YFM450FAT SUPPLEMENTARY SERVICE MANUAL: LIT-11616-18-35 (5ND-F8197-12)

YFM45FGX
SUPPLEMENTARY
SERVICE MANUAL

First edition, July 2007

Printed in U.S.A.
LIT-11616-21-46

EBS00002

NOTICE

This manual was produced by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual, so it is assumed that anyone who uses this book to perform maintenance and repairs on Yamaha vehicle has a basic understanding of the mechanical ideas and the procedures of vehicle repair. Repairs attempted by anyone without this knowledge are likely to render the vehicle unsafe and unfit for use.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the vehicle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his vehicle and to conform to federal environmental quality objectives.

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

NOTE:

- This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.
- Designs and specifications are subject to change without notice.

EBS00003

IMPORTANT INFORMATION

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

⚠ 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 vehicle operator, a bystander or a person checking or repairing the vehicle.

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

NOTE: A NOTE provides key information to make procedures easier or clearer.

EBS00004

HOW TO USE THIS MANUAL

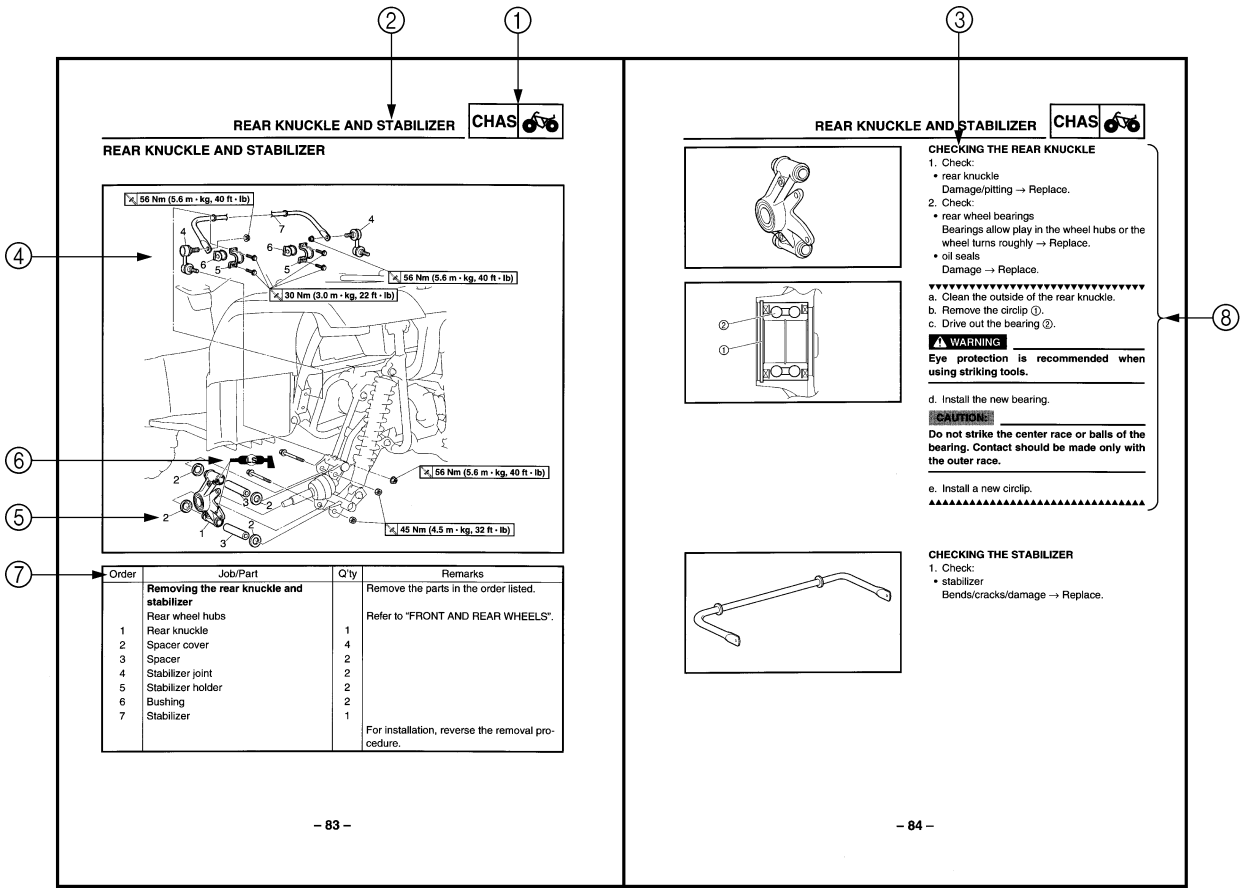
MANUAL ORGANIZATION

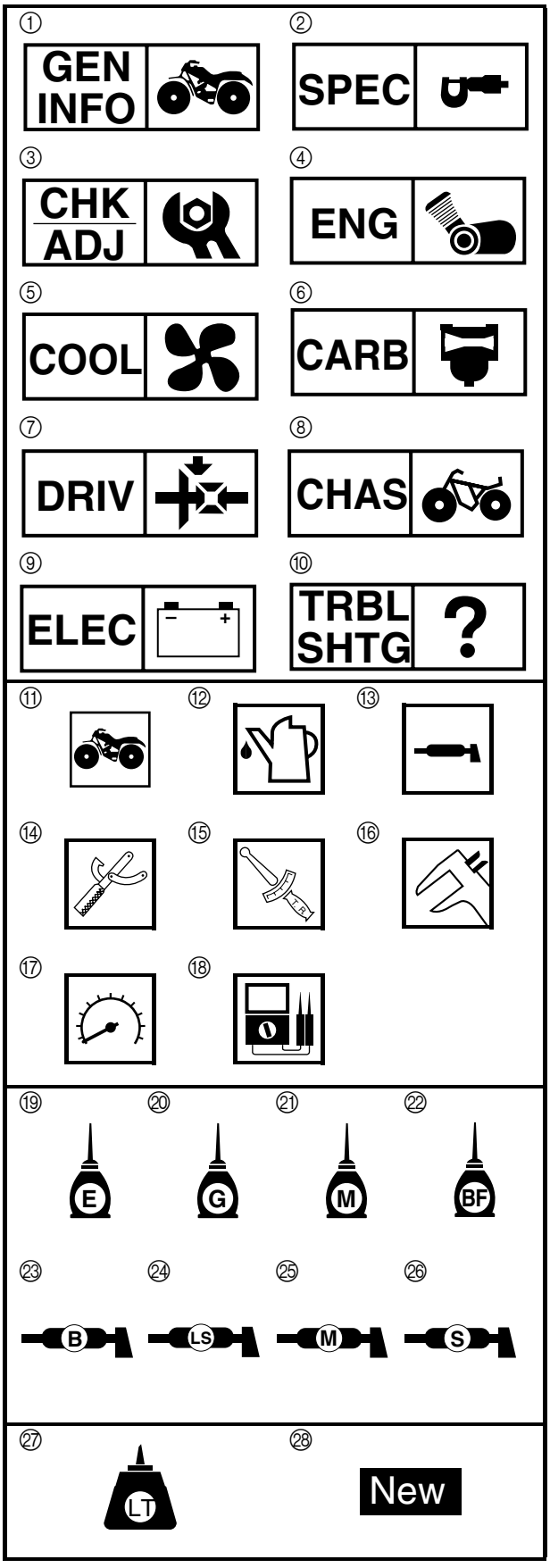
This manual consists of chapters for the main categories of subjects. (See “symbols”)
1st title ①: This is the title of the chapter with its symbol in the upper right corner of each page.
2nd title ②: This title indicates the section of the chapter and only appears on the first page of each section. It is located in the upper left corner of the page.
3rd title ③: This title indicates a sub-section that is followed by step-by-step procedures accompanied by corresponding illustrations.

EXPLODED DIAGRAMS

To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

1. An easy-to-see exploded diagram ④ is provided for removal and disassembly jobs.
2. Numbers ⑤ are given in the order of the jobs in the exploded diagram. A number that is enclosed by a circle indicates a disassembly step.
3. An explanation of jobs and notes is presented in an easy-to-read way by the use of symbol marks ⑥. The meanings of the symbol marks are given on the next page.
4. A job instruction chart ⑦ accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
5. For jobs requiring more information, the step-by-step format supplements ⑧ are given in addition to the exploded diagram and the job instruction chart.





EBS00006

SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑩ indicate the subject of each chapter.

① General information
② Specifications
③ Periodic checks and adjustments
④ Engine
⑤ Cooling system
⑥ Carburetion
⑦ Drive train
⑧ Chassis
⑨ Electrical
⑩ Troubleshooting

Symbols ⑪ to ⑱ indicate the following

⑪ Can be serviced with engine mounted
⑫ Filling fluid
⑬ Lubricant
⑭ Special tool
⑮ Torque
⑯ Wear limit, clearance
⑰ Engine speed
⑱ Electrical data (Ω, V, A)

Symbols ⑲ to ㉖ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑲ Apply engine oil
⑳ Apply gear oil
㉑ Apply molybdenum disulfide oil
㉒ Apply brake fluid
㉓ Apply wheel bearing grease
㉔ Apply lithium-soap-based grease
㉕ Apply molybdenum disulfide grease
㉖ Apply silicone grease

Symbols ㉗ to ㉘ in the exploded diagrams indicate where to apply a locking agent ㉗ and when to install a new part ㉘.

㉗ Apply the locking agent (LOCTITE®)
㉘ Replace

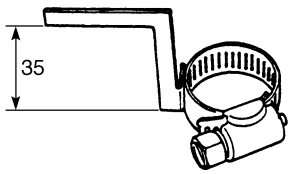
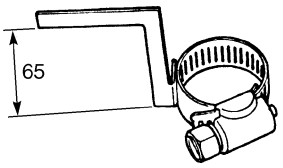
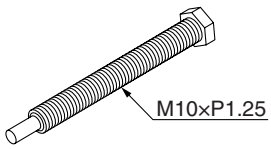
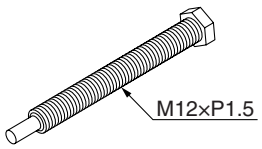
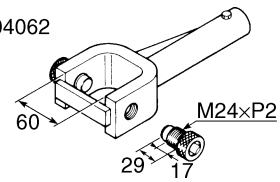
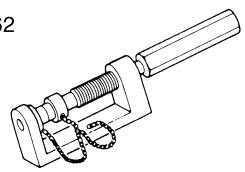
CONTENTS

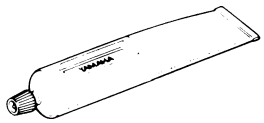
GENERAL INFORMATION

EBS00021

SPECIAL TOOLS

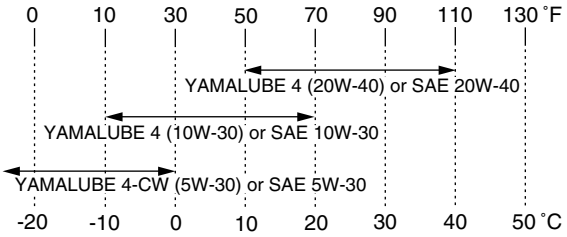
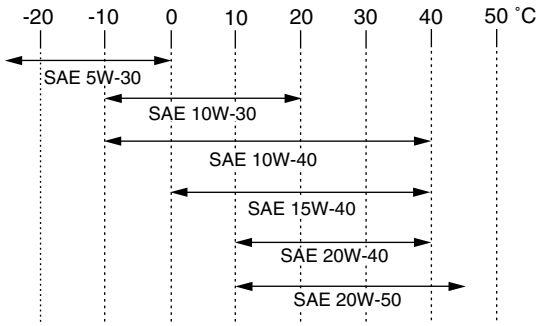
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools; this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools may differ by shape and part number from country to country. In such a case, two types are provided.
When placing an order, refer to the list provided below to avoid any mistakes.
For US and CDN
P/N. YM-, YU-, YS-, YK-, ACC-
Except for US and CDN
P/N. 90890-

Tool No.	Tool name/How to use	Illustration
90890-01467 YM-01467	Gear lash measurement tool This tool is used to measure the gear lash.	
90890-01475 YM-01475	Gear lash measurement tool Middle drive gear lash tool This tool is used to measure the gear lash.	
90890-01527 YM-01527	Ring gear fix bolt (M10) This tool is used to measure the gear lash.	
90890-01530 YM-01530	Ring gear fix bolt (M12) This tool is used to measure the gear lash.	
90890-04062 YM-04062	Universal joint holder This tool is needed when removing or installing the universal joint yoke nut.	90890-04062  YM-04062 

Tool No.	Tool name/How to use	Illustration
90890-85505	Yamaha bond No. 1215 (Three bond No.1215®) This bond is used on crankcase mating surfaces, etc.	

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item	Standard
Model code	17S1, 17S5 (for USA) (for panel wheel models) 17S2, 17S6 (for CDN) (for panel wheel models) 17S3, 17S7 (for Europe) (for panel wheel models) 17S4 (for Oceania) 17SA (for USA) (for cast wheel models) 17SB (for CDN) (for cast wheel models) 17SC (for Europe) (for cast wheel models)
Basic weight With oil and full fuel tank	285 kg (628 lb) (for USA and CDN) (for panel wheel models) 284 kg (626 lb) (for Europe) (for panel wheel models) 288 kg (635 lb) (for Oceania)
Oil type or grade Engine oil For USA and CDN  For Europe and Oceania  	API service SG type or higher, JASO standard MA
Final gear oil	Yamaha Friction Modified Shaft Drive Gear Oil (Part No.: ACC-SHAFT-LU-00) (for USA and Oceania) Yamaha Friction Modified Shaft Drive Gear Oil (for CDN and Europe)

Item		Standard
Differential gear oil		Yamaha Friction Modified Shaft Drive Gear Oil (Part No.: ACC-SHAFT-LU-00) or SAE 80 API GL-4 Hypoid gear oil (for USA and Oceania) Yamaha Friction Modified Shaft Drive Gear Oil or SAE 80 API GL-4 Hypoid gear oil (for CDN and Europe)
Oil capacity		
Engine oil		
Periodic oil change		2.30 L (2.02 Imp qt, 2.43 US qt)
With oil filter replacement		2.40 L (2.11 Imp qt, 2.54 US qt)
Total amount		2.60 L (2.29 Imp qt, 2.75 US qt)
Final gear case oil		
Periodic oil change		0.50 L (0.44 Imp qt, 0.53 US qt)
Total amount		0.53 L (0.47 Imp qt, 0.56 US qt)
Differential gear case oil		
Periodic oil change		0.23 L (0.20 Imp qt, 0.24 US qt)
Total amount		0.25 L (0.22 Imp qt, 0.26 US qt)
Radiator capacity (including all routes)		1.32 L (1.16 Imp qt, 1.40 US qt)
Chassis		
Frame type		Steel tube frame
Caster angle		2.5°
Camber angle		1°
Kingpin angle		11°
Kingpin offset		–5.0 mm (–0.20 in)
Trail		8.5 mm (0.33 in)
Tread (STD)	front	850 mm (33.46 in)
	rear	839 mm (33.03 in)
Toe-in		0 ~ 10 mm (0 ~ 0.39 in)
Brakes		
Front brake	type	Dual disc brake
	operation	Right hand operation
Rear brake	type	Wet, multiple-plate brake
	operation	Left hand and right foot operation

Item		Standard
Tires		
Type		Tubeless
Size	front	AT25 × 8-12
	rear	AT25 × 10-12
Manufacturer	front	MAXXIS (for USA, CDN, and Europe) (for panel wheel models) CHENG SHIN (for Oceania) ITP (for USA, CDN, and Europe) (for cast wheel models)
	rear	MAXXIS (for USA, CDN, and Europe) (for panel wheel models) CHENG SHIN (for Oceania) ITP (for USA, CDN, and Europe) (for cast wheel models)
Model	front	M979 (for USA, CDN, and Europe) (for panel wheel models) C-828 (for Oceania) MUD LITE (for USA, CDN, and Europe) (for cast wheel models)
	rear	M980 (for USA, CDN, and Europe) (for panel wheel models) C-828 (for Oceania) MUD LITE (for USA, CDN, and Europe) (for cast wheel models)

ENGINE SPECIFICATIONS

Item		Standard	Limit
Carburetor			
I. D. mark		1D9M 10 (for USA and CDN)	----
		5ND6 00 (for Europe and Oceania)	----
Main jet	(M.J)	#131.3	----
Main air jet	(M.A.J)	#50	----
Jet needle	(J.N)	5EP19-1 (for USA and CDN)	----
		5EP13-55-3 (for Europe and Oceania)	----
Needle jet	(N.J)	P-0M	----
Pilot air jet	(P.A.J.1)	#80	----
Pilot air jet	(P.A.J.2)	1.3	----
Pilot outlet	(P.O)	0.95	----
Pilot jet	(P.J)	#17.5	----
Bypass 1	(B.P.1)	0.8	----
Bypass 2	(B.P.2)	0.8	----
Bypass 3	(B.P.3)	0.8	----
Valve seat size	(V.S)	2.0	----
Starter jet	(G.S.1)	#70	----
Starter jet	(G.S.2)	0.9	----
Throttle valve size	(Th.V)	#90	----
Float height	(F.H)	13 mm (0.51 in)	----
Fuel level	(F.L)	4.0 ~ 5.0 mm (0.16 ~ 0.20 in)	----
Engine idle speed		1,450 ~ 1,550 r/min	----
Intake vacuum		33.3 kPa (250 mmHg, 9.84 inHg)	----

CHASSIS SPECIFICATIONS

Item		Standard	Limit
Front suspension			
Shock absorber travel		99 mm (3.90 in)	----
Fork spring free length		286.6 mm (11.28 in)	----
Spring fitting length		233.5 mm (9.19 in)	----
Spring rate	(K1)	15 N/mm (1.53 kg/mm, 85.65 lb/in)	----
Stroke	(K1)	0 ~ 99 mm (0 ~ 3.90 in)	----
Optional spring		No	----
Rear suspension			
Shock absorber travel		95 mm (3.74 in)	----
Spring free length		279.5 mm (11.00 in)	----
Spring fitting length		249.5 mm (9.82 in)	----
Spring rate	(K1)	27 N/mm (2.75 kg/mm, 154.17 lb/in)	----
Stroke	(K1)	0 ~ 95 mm (0 ~ 3.74 in)	----
Optional spring		No	----
Rear disc brake			
Type		Wet, multiple-plate brake	----
Friction plate diameter		144.50 mm (5.69 in)	----
Friction plate thickness		2.45 mm (0.10 in)	2.22 mm (0.09 in)
Rear brake plate thickness		2.29 mm (0.09 in)	2.14 mm (0.08 in)
Front wheel			
Type		Panel wheel (for panel wheel models)	----
		Cast wheel (for cast wheel models)	----
Rim size		12 × 6.0 AT	----
Rim material		Steel (for panel wheel models)	----
		Aluminum (for cast wheel models)	----
Rim runout limit	radial	----	2 mm (0.08 in)
	lateral	----	2 mm (0.08 in)

Item		Standard	Limit
Rear wheel			
Type		Panel wheel (for panel wheel models)	----
		Cast wheel (for cast wheel models)	----
Rim size		12 × 7.5 AT	----
Rim material		Steel (for panel wheel models)	----
		Aluminun (for cast wheel models)	----
Rim runout limit	radial	----	2 mm (0.08 in)
	lateral	----	2 mm (0.08 in)
Brake lever and brake pedal			
Rear brake lever free play		8.0 ~ 10.5 mm (0.31 ~ 0.41 in)	----
Brake pedal position (from footrest bracket)		75 ~ 85 mm (2.95 ~ 3.35 in)	----
Brake pedal free play		17.0 ~ 20.0 mm (0.67 ~ 0.79 in)	----
Throttle lever free play		3 ~ 5 mm (0.12 ~ 0.20 in)	----

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
CDI		
Magneto model/manufacturer	F4T464/MITSUBISHI	----
Pickup coil resistance/color	459 ~ 561 Ω at 20 °C (68 °F)/ White/Red – White/Green	----
Rotor rotation direction sensing coil resistance/color	0.086 ~ 0.105 Ω at 20 °C (68 °F)/ Red – White/Blue	----
CDI unit model/manufacturer	F8T40381/MITSUBISHI	----
Headlight relay		
Model/manufacturer	G8HN-1C4T-DJ-Y52/OMRON	----
Coil resistance	94.5 ~ 115.5 Ω at 20 °C (68 °F)	----

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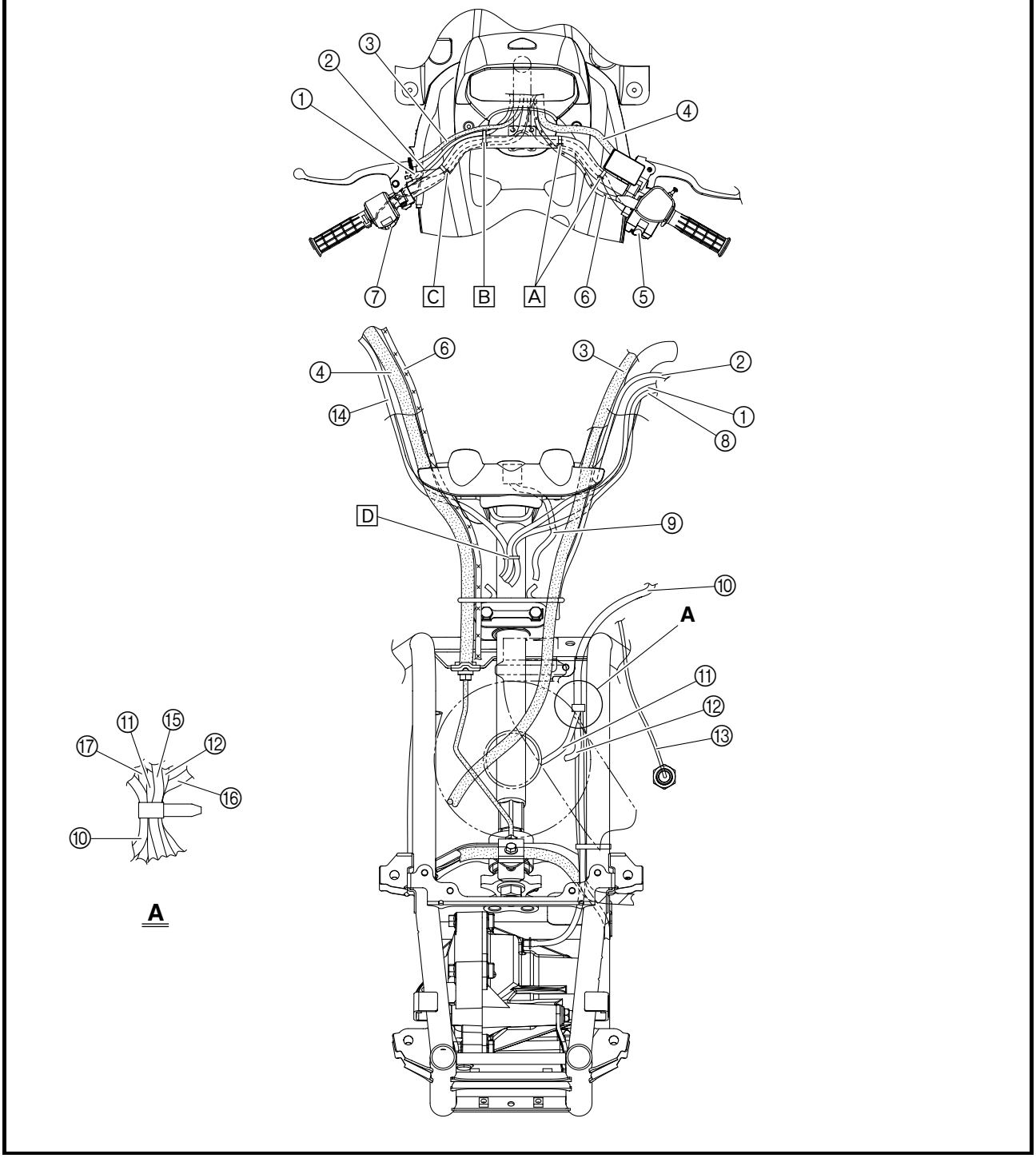
TIGHTENING TORQUES

CHASSIS TIGHTENING TORQUES

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m · kg	ft · lb	
Differential gear case and frame	M10	55	5.5	40	
Differential gear case filler bolt	M14	23	2.3	17	
Differential gear case drain bolt	M10	10	1.0	7.2	
Differential gear case and differential gear case cover	M8	24	2.4	17	
Differential gear motor	M6	11	1.1	8.0	
Universal joint yoke (differential drive pinion gear)	M14	62	6.2	45	G
Universal joint yoke (final drive pinion gear)	M14	110	11.0	80	G
Front wheel axle nut	M20	260	26.0	190	Stake
Final gear case and sub-frame	M10	45	4.5	32	LS
Final gear case filler bolt	M12	24	2.4	17	
Final gear case drain bolt	M12	24	2.4	17	
Final gear case (left side) and final gear case (right side)	M8	24	2.4	17	
Final gear case (left side) and pressure plate	M8	24	2.4	17	G
Sub-frame and frame	M10	48	4.8	35	
	M12	82	8.2	59	
Rear brake camshaft lever	M8	13	1.3	9.4	
Rear brake pedal bracket and frame	M8	23	2.3	17	
Brake pedal light switch cover, rear brake pedal and bracket	M6	7	0.7	5.1	
Locknut (rear brake pedal height adjusting bolt)	M6	7	0.7	5.1	

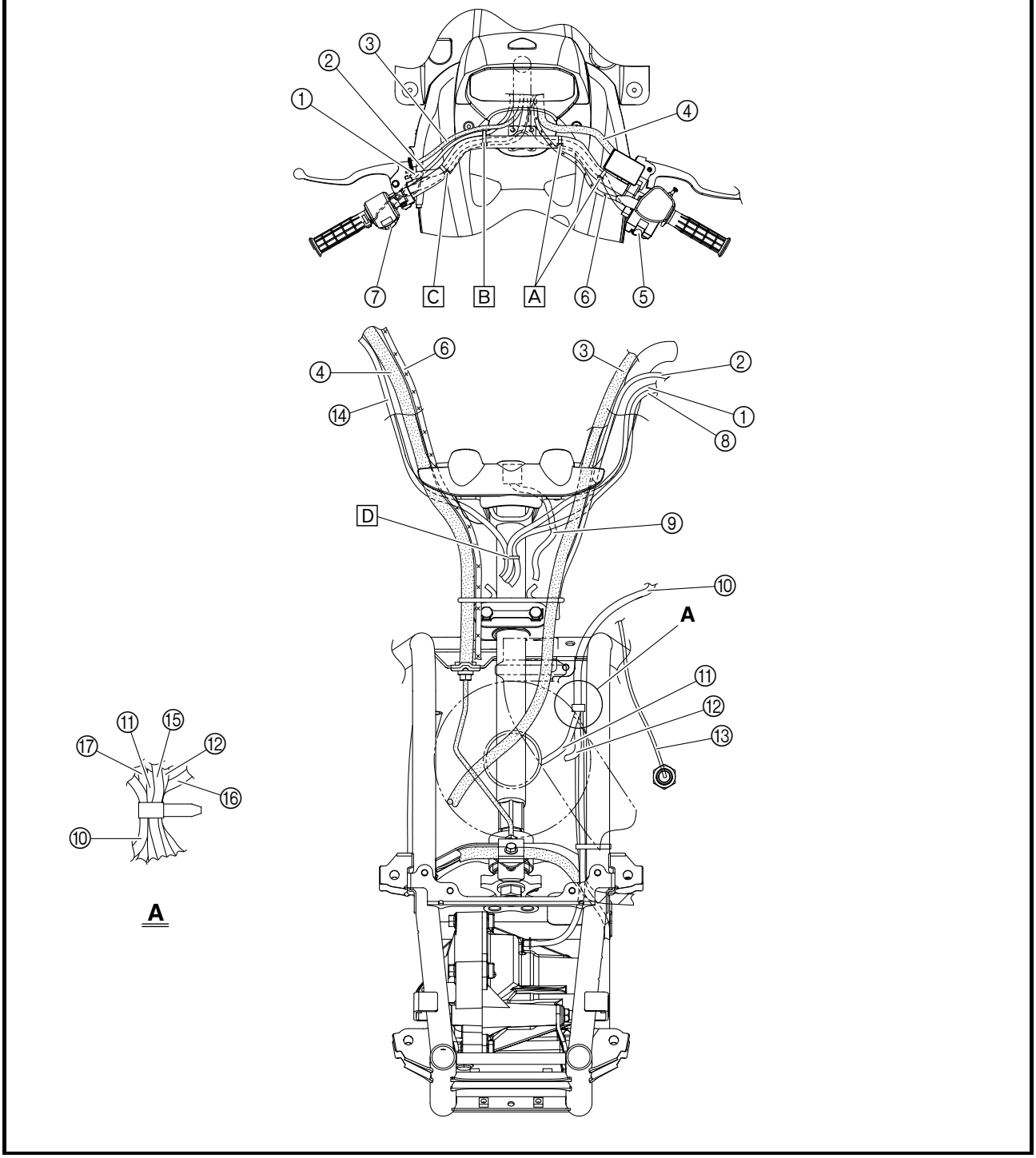
CABLE ROUTING

① Rear brake lever light switch lead
② Starter cable
③ Rear brake cable
④ Front brake hose
⑤ On-command four-wheel drive switch and differential gear lock switch
⑥ Throttle cable
⑦ Handlebar switch
⑧ Handlebar switch lead
⑨ Main switch lead
⑩ Wire harness
⑪ Fan motor lead
⑫ Fan motor breather hose
⑬ Thermo switch 2 lead
⑭ On-command four-wheel drive switch and differential gear lock switch lead
⑮ Coolant reservoir hose
⑯ Differential gear case breather hose



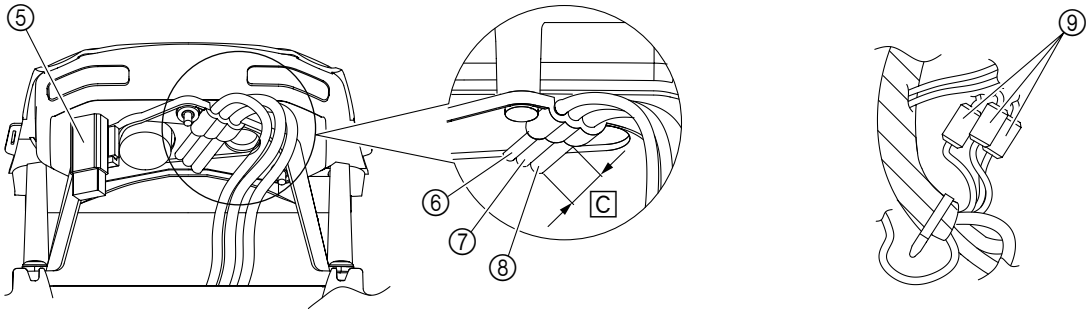
⑰ Coolant reservoir breather hose

A Fasten the on-command four-wheel drive switch and differential gear lock switch lead behind the handlebar with a plastic band.
B Fasten the starter cable, handlebar switch lead and rear brake lever light switch lead behind the handlebar with a plastic band.
C Fasten the handlebar switch lead and rear brake lever light switch lead behind the handlebar with a plastic band.
D Fasten the handlebar switch lead, rear brake lever light switch lead, and on-command four-wheel drive switch and differential gear lock switch lead with a plastic band.

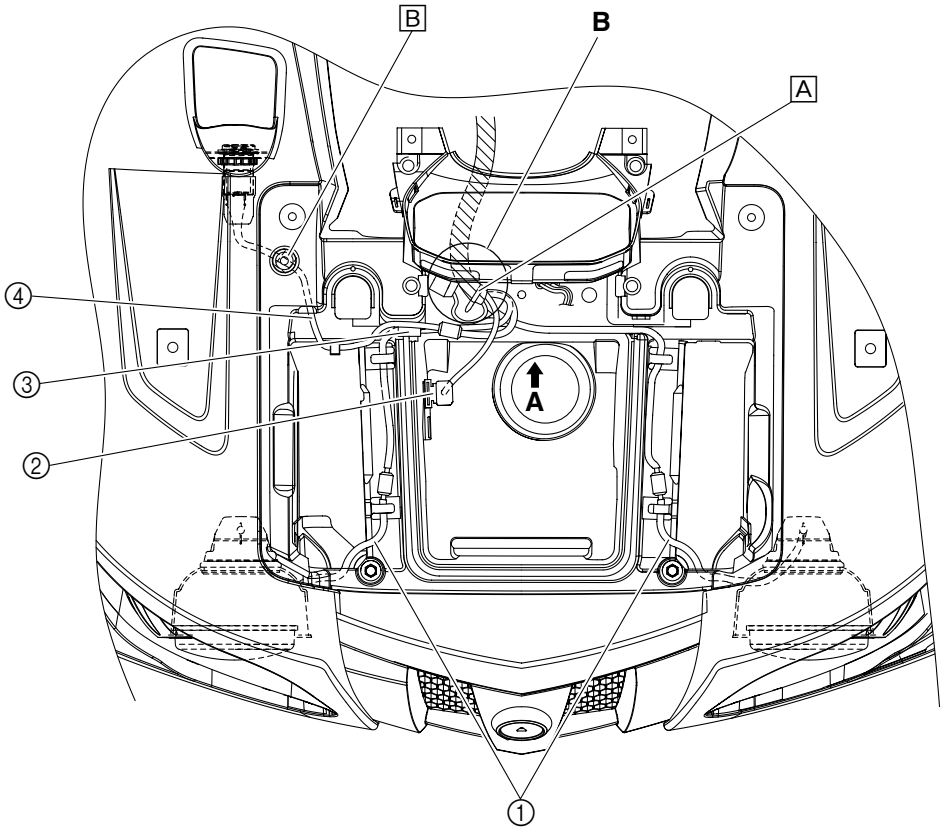


① Headlight leads
② Headlight relay
③ Circuit breaker (fan motor)
④ Auxiliary DC jack lead
⑤ Four-wheel drive relay 3
⑥ Fan motor breather hose
⑦ Differential gear case breather hose
⑧ Coolant reservoir breather hose
⑨ Meter assembly couplers

[A] Fasten the wire harness with a plastic band.
[B] Fasten the auxiliary DC jack lead with a plastic holder.
[C] 50 ~ 60 mm (1.97 ~ 2.36 in)

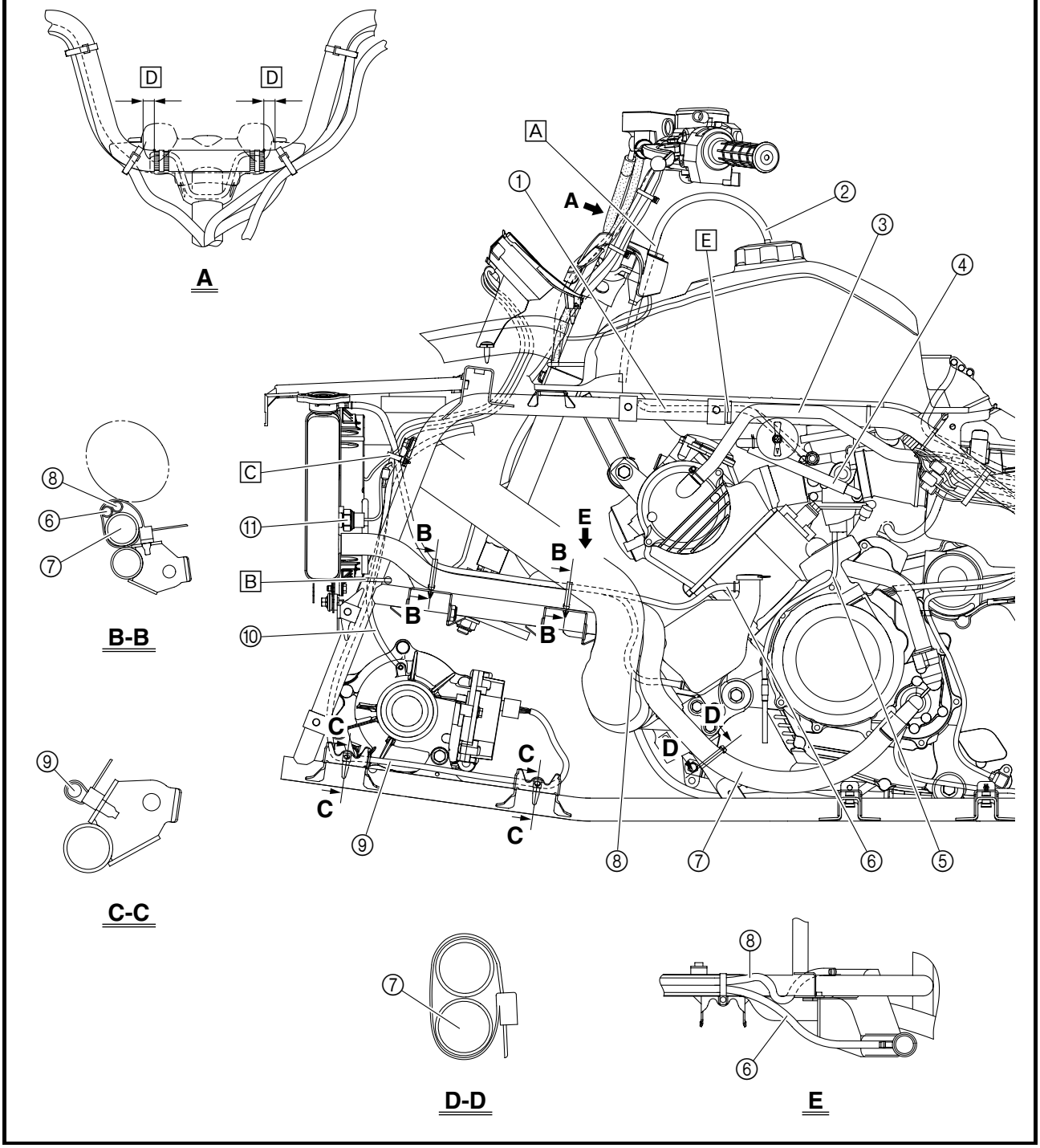


A **B**

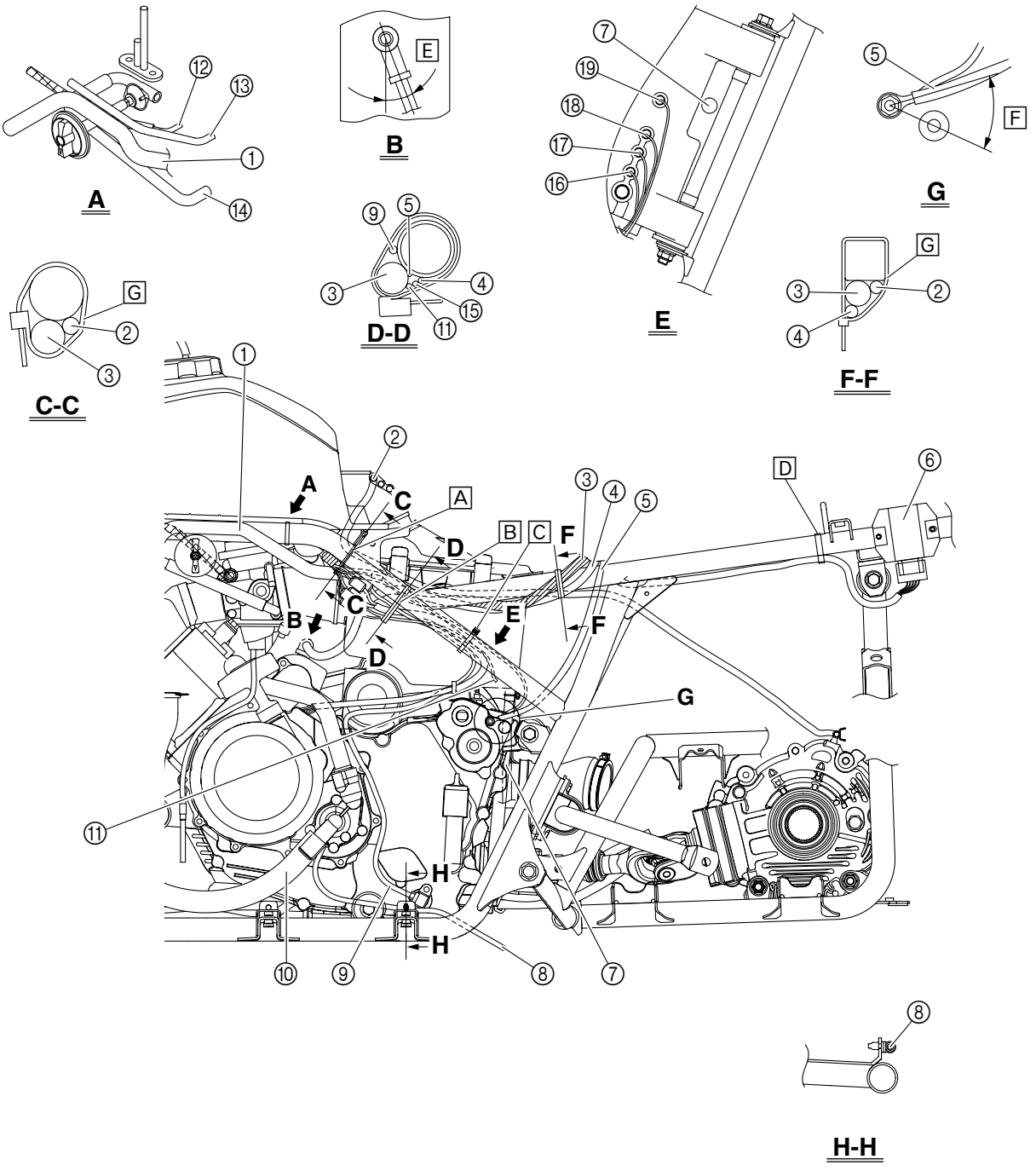


① Starter cable
② Fuel tank breather hose
③ Cylinder head breather hose
④ Fuel hose
⑤ Carburetor drain hose
⑥ Coolant reservoir breather hose
⑦ Radiator outlet hose
⑧ Coolant reservoir hose
⑨ Wire harness
⑩ Differential gear case breather hose
⑪ Thermo switch 2

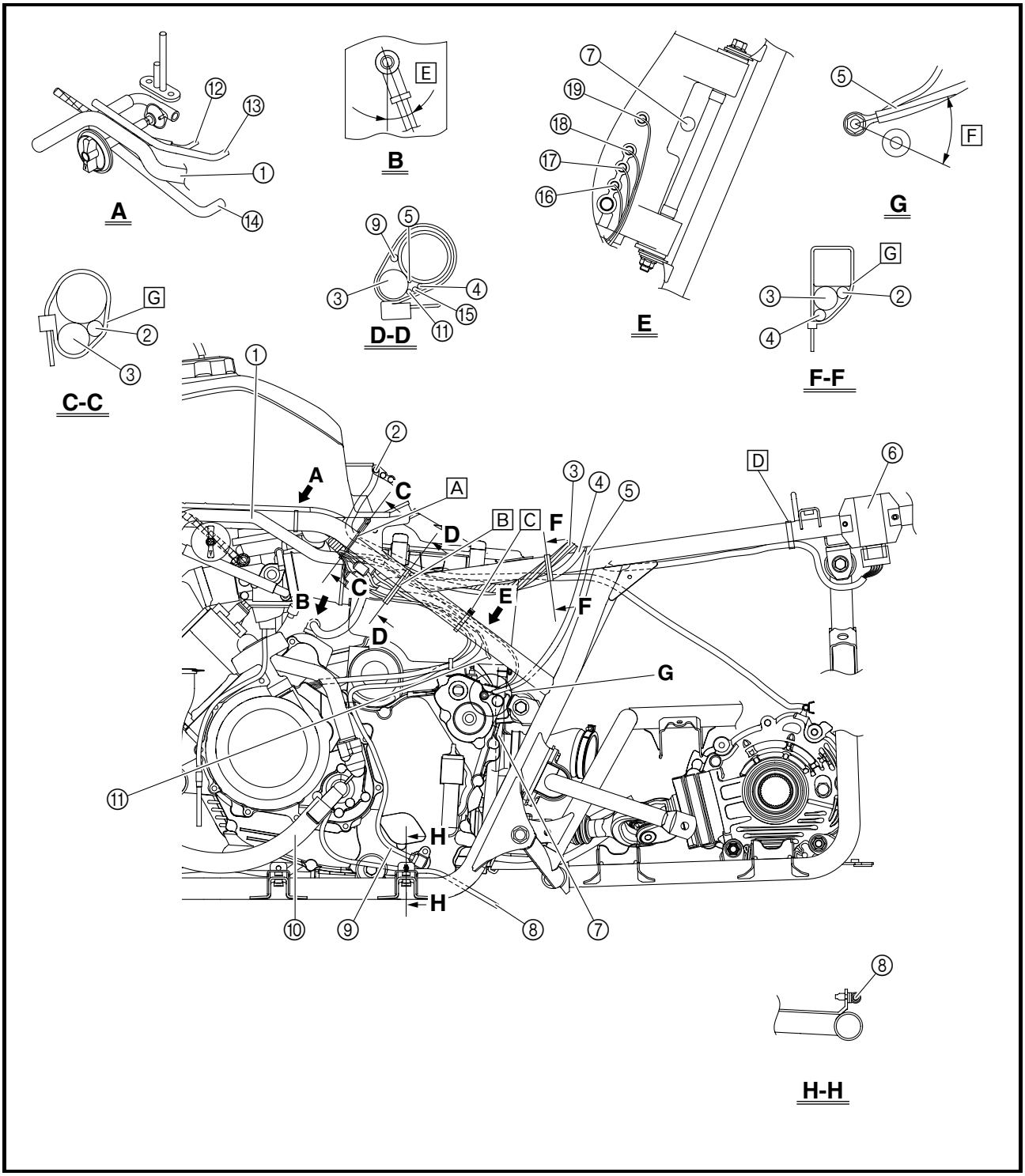
A Insert the fuel tank breather hose into the hole of the handlebar cover.
B Fasten the wire harness and differential gear case breather hose with a plastic band.
C Fasten the wire harness, differential gear case breather hose, coolant reservoir hose, coolant reservoir breather hose, fan motor lead, and fan motor breather hose with a plastic band.
D 7.0 ~ 17.0 mm (0.28 ~ 0.67 in)
E Fasten the starter cable with a plastic band.



① Cylinder head breather hose
② Final drive gear case breather hose
③ Wire harness
④ Starter motor lead
⑤ Negative battery lead
⑥ Rectifier/regulator
⑦ Air filter case check hose
⑧ Water pump breather hose
⑨ Speed sensor lead
⑩ Radiator outlet hose
⑪ Sub-wire harness 2 lead
⑫ Starter cable
⑬ Float chamber air vent hose
⑭ Fuel hose
⑮ AC magneto lead
⑯ Low-range switch
⑰ High-range switch
⑱ Neutral switch
⑲ Reverse switch

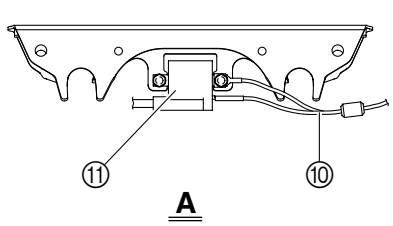


[A] Fasten the wire harness and final drive gear case breather hose with a plastic band.
[B] Fasten the starter motor lead, wire harness, negative battery lead, sub-wire harness 2 lead, speed sensor lead, and AC magneto lead with a plastic band.
[C] Fasten the sub-wire harness 2 lead, speed sensor lead, AC magneto lead, rectifier/regulator lead and negative battery lead with a plastic band.
[D] Fasten the rectifier/regulator lead with a plastic band.
[E] 10 ~ 30°
[F] 35 ~ 45°
[G] Do not pinch the final drive gear case breather hose.

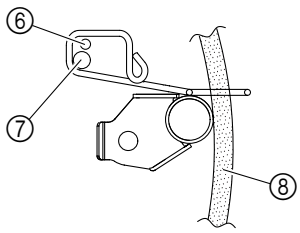


① Throttle cable
② Radiator inlet hose
③ Spark plug lead
④ Main switch
⑤ Wire harness
⑥ Brake pedal light switch lead
⑦ Select lever control cable
⑧ Rear brake lever cable
⑨ Brake pedal cable
⑩ Sub-wire harness 1 lead
⑪ Ignition coil
⑫ Final drive gear case breather hose

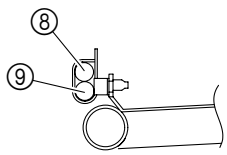
A Fasten the radiator inlet hose and spark plug lead with a plastic band.
B Fasten the select lever control cable with a plastic holder.
C Fasten the radiator inlet hose with a plastic band.
D Fasten the select lever control cable and brake pedal light switch lead with the plastic bands.



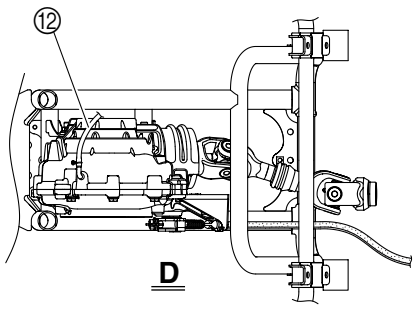
A



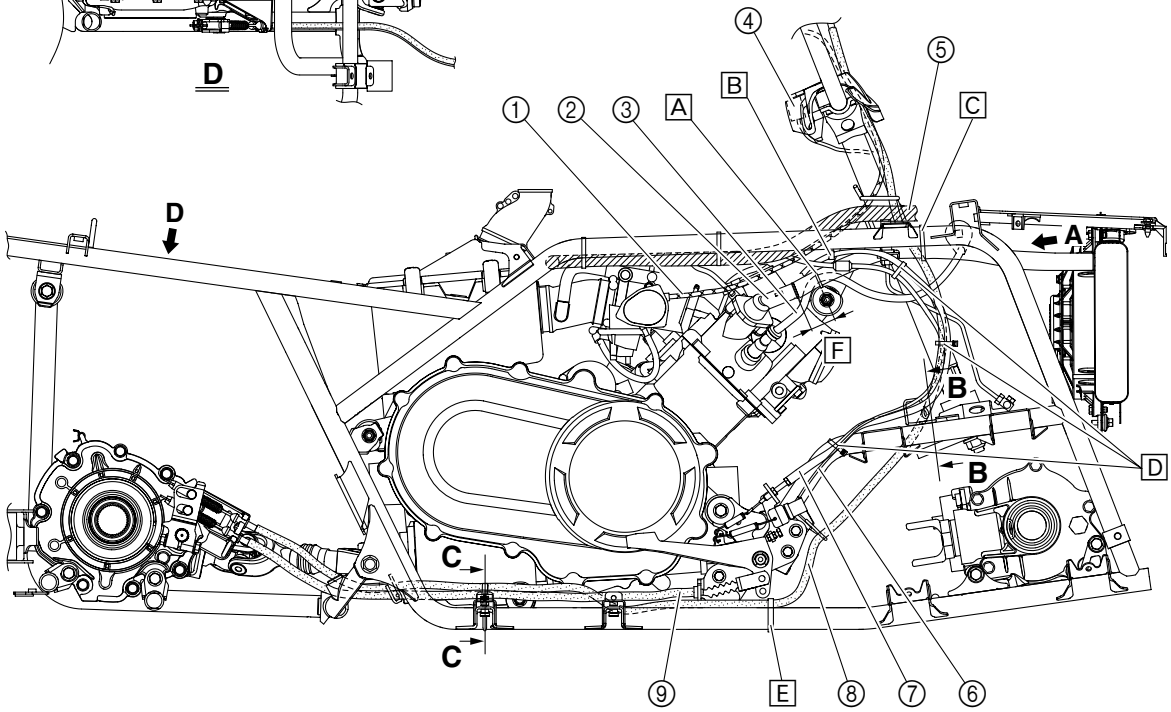
B-B



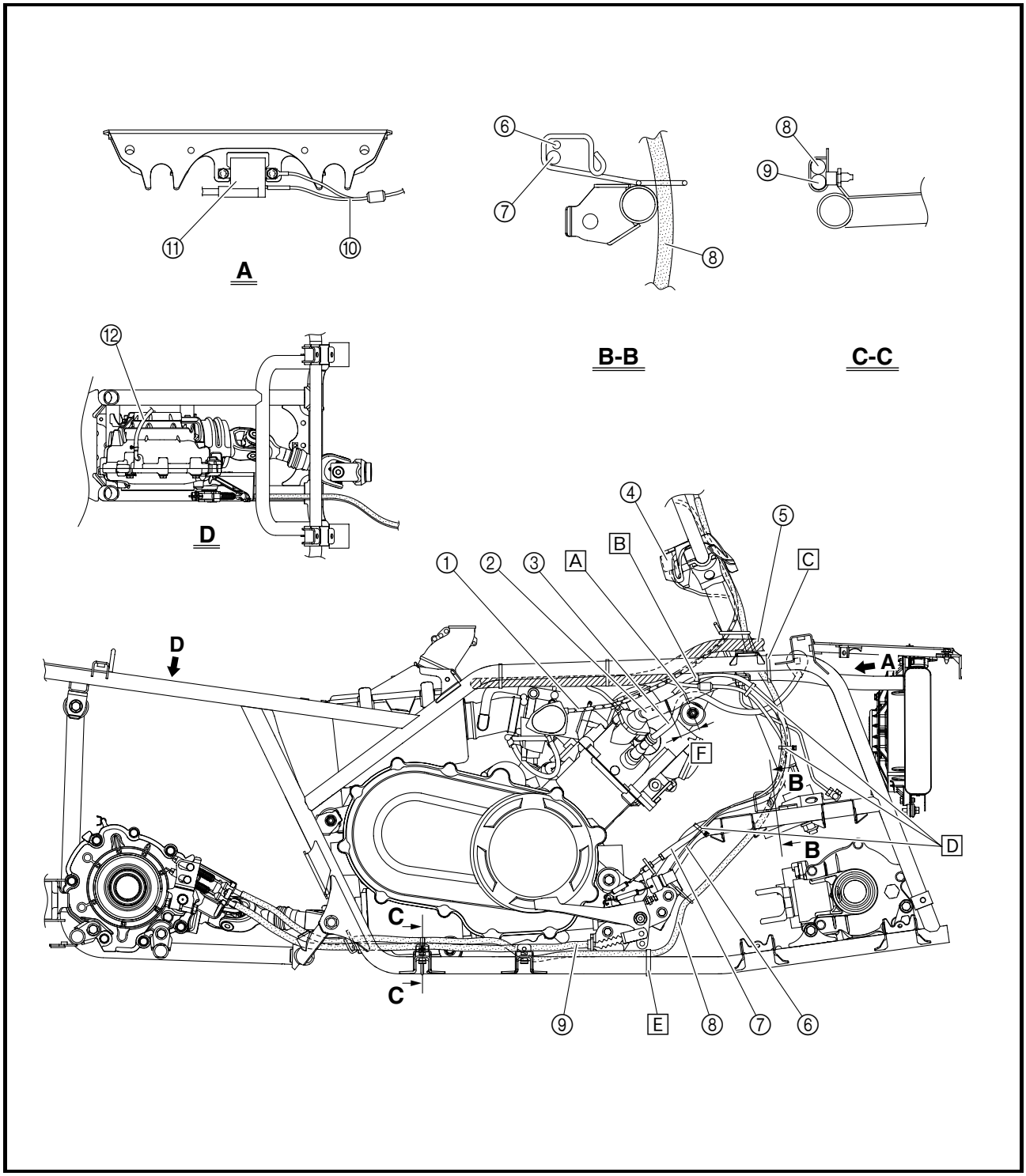
C-C



D

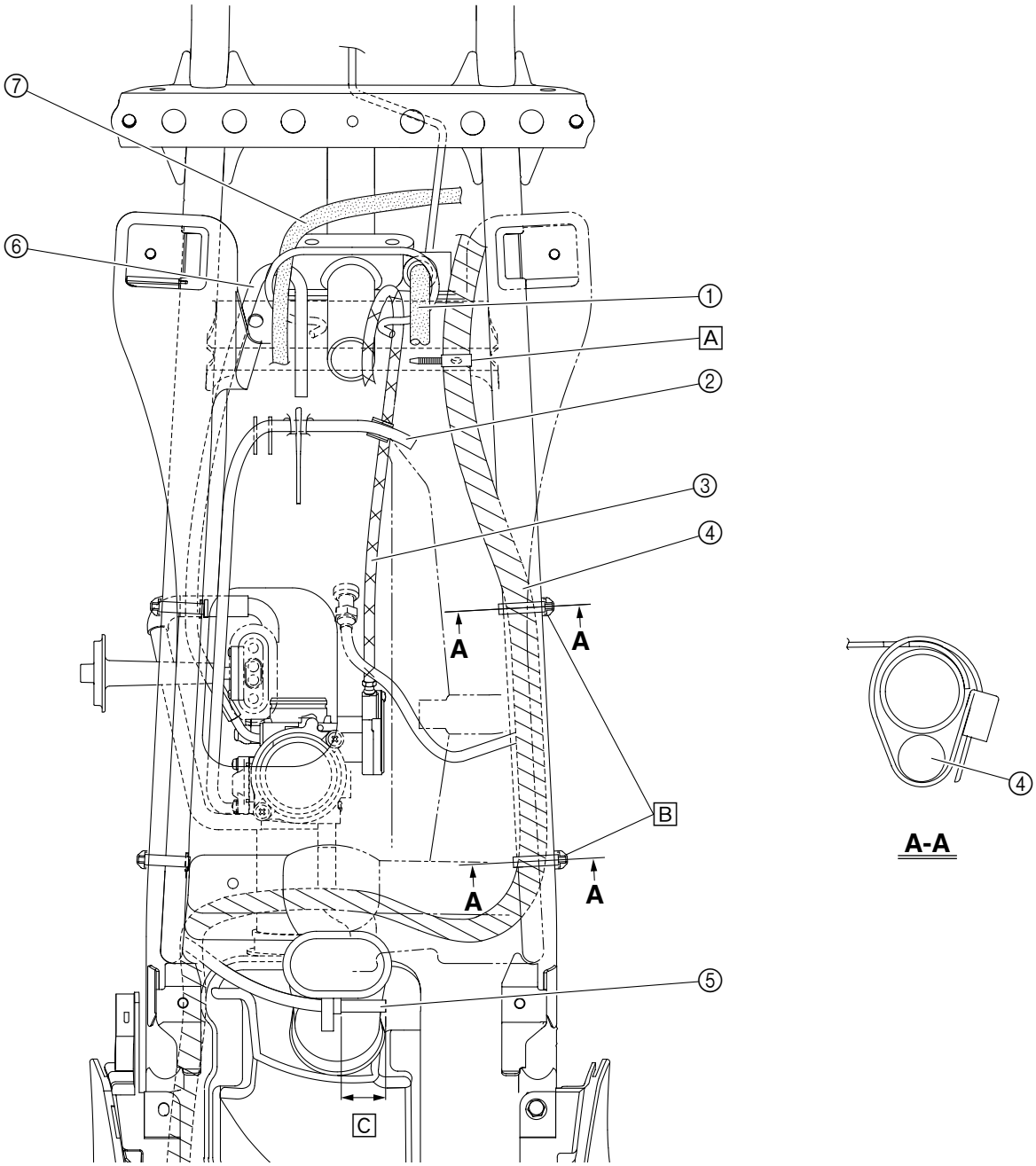


E Fasten the rear brake lever cable with a plastic band.
F 15 ~ 45 mm (0.59 ~ 1.77 in)



① Front brake hose
② Float chamber air vent hose
③ Throttle cable
④ Wire harness
⑤ Final drive gear case breather hose
⑥ Starter cable
⑦ Rear brake lever cable

A Fasten the wire harness with a plastic band. Face the end of the plastic band inward.
B Fasten the wire harness with a plastic band.
C 30 ~ 40 mm (1.18 ~ 1.57 in)



EBS00029

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks 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 to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

EBU21742

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

NOTE:

- For ATVs not equipped with an odometer or an hour meter, follow the month maintenance intervals.
- For ATVs equipped with an odometer or an hour meter, follow the km (mi) or hours maintenance intervals. However, keep in mind that if the ATV isn't used for a long period of time, the month maintenance intervals should be followed.
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NO.		ITEM	CHECK OR MAINTENANCE JOB	Whichever comes first ⇨		INITIAL			EVERY	
					month	1	3	6	6	12
					km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
					hours	20	80	160	160	320
1	*	Fuel line	• Check fuel hoses for cracks or other damage, and replace if necessary.					√	√	√
2		Spark plug	• Check condition and clean, regap, or replace if necessary.			√	√	√	√	√
3	*	Valves	• Check valve clearance and adjust if necessary.			√		√	√	√
4	*	Carburetor	• Check starter (choke) operation and correct if necessary. • Check engine idling speed and adjust if necessary.				√	√	√	√
5	*	Crankcase breather system	• Check breather hose for cracks or other damage, and replace if necessary.					√	√	√
6	*	Exhaust system	• Check for leakage and replace gasket(s) if necessary. • Check for looseness and tighten all screw clamps and joints if necessary.					√	√	√
7		Spark arrester	• Clean.					√	√	√

EBU21864

GENERAL MAINTENANCE AND LUBRICATION CHART

NO.		ITEM	CHECK OR MAINTENANCE JOB	Whichever comes first ⇨		INITIAL			EVERY	
					month	1	3	6	6	12
					km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
					hours	20	80	160	160	320
1		Air filter element	• Clean and replace if necessary.			Every 20 ~ 40 hours (more often in wet or dusty areas)				
2	*	Front brake	• Check operation and correct if necessary. • Check fluid level and ATV for fluid leakage, and correct if necessary.			√	√	√	√	√
			• Replace brake pads.			Whenever worn to the limit				
3	*	Rear brake	• Check operation and correct if necessary. • Check brake lever and pedal free play, and adjust if necessary.			√	√	√	√	√
			• Replace brake friction plates.			Whenever worn to the limit				
4	*	Brake hoses	• Check for cracks or other damage, and replace if necessary.				√	√	√	√
			• Replace.			Every 4 years				
5	*	Wheels	• Check runout and for damage, and replace if necessary.			√		√	√	√
6	*	Tires	• Check tread depth and for damage, and replace if necessary. • Check air pressure and balance, and correct if necessary.			√		√	√	√
7	*	Wheel hub bearings	• Check for looseness or damage, and replace if necessary.			√		√	√	√
8	*	V-belt	• Check for wear, cracks or other damage, and replace if necessary.			√		√	√	√
9	*	Drive shaft universal joint	• Lubricate with lithium-soap-based grease.					√	√	√
10	*	Chassis fasteners	• Make sure that all nuts, bolts, and screws are properly tightened.			√	√	√	√	√
11	*	Shock absorber assemblies	• Check operation and correct if necessary. • Check for oil leakage and replace if necessary.					√	√	√
12	*	Stabilizer bushes	• Check for cracks or other damage, and replace if necessary.					√	√	√
13	*	Rear knuckle pivots	• Lubricate with lithium-soap-based grease.					√	√	√
14	*	Steering shaft	• Lubricate with lithium-soap-based grease.					√	√	√
15	*	Steering system	• Check operation and repair or replace if damaged. • Check toe-in and adjust if necessary.			√	√	√	√	√
16	*	Engine mount	• Check for cracks or other damage, and replace if necessary.					√	√	√
17	*	Axle boots	• Check for cracks or other damage, and replace if necessary.			√	√	√	√	√
18		Engine oil	• Change. • Check ATV for oil leakage, and correct if necessary.			√		√	√	√
19		Engine oil filter cartridge	• Replace.			√		√		√
20	*	Engine oil strainer	• Clean.			√		√		√
21		Differential gear oil	• Change. • Check ATV for oil leakage, and correct if necessary.			√				√

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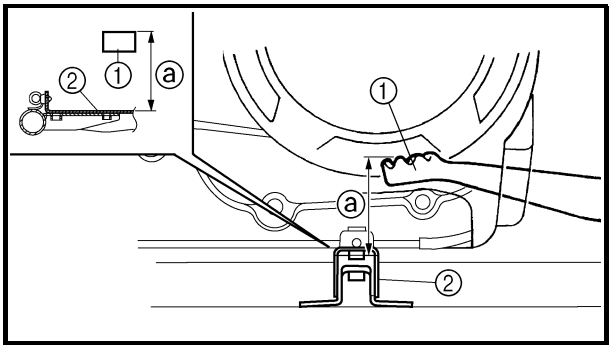
NO.		ITEM	CHECK OR MAINTENANCE JOB	Whichever comes first ⇨		INITIAL			EVERY	
					month	1	3	6	6	12
					km (mi)	320 (200)	1300 (800)	2500 (1600)	2500 (1600)	5000 (3200)
					hours	20	80	160	160	320
22		Final gear oil	• Change. • Check ATV for oil leakage, and correct if necessary.			√		√	√	
23		Cooling system	• Check coolant level and ATV for coolant leakage, and correct if necessary.			√	√	√	√	√
			• Replace coolant.			Every 2 years				
24	*	Moving parts and cables	• Lubricate.				√	√	√	√
25	*	Drive select lever safety system cable	• Check operation and adjust or replace if necessary.					√	√	√
26	*	Throttle lever housing and cable	• Check operation and correct if necessary. • Check throttle cable free play and adjust if necessary. • Lubricate throttle lever housing and cable.			√	√	√	√	√
27	*	Front and rear brake switches	• Check operation and correct if necessary.			√	√	√	√	√
28	*	Lights and switches	• Check operation and correct if necessary. • Adjust headlight beams.			√	√	√	√	√

EBU28390

NOTE:

- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
  - Regularly check and, if necessary, correct the brake fluid level.
  - Every two years replace the internal components of the brake master cylinder and calipers, and change the brake fluid.
  - Replace the brake hoses every four years and if cracked or damaged.



CHASSIS

ADJUSTING THE BRAKE PEDAL HEIGHT

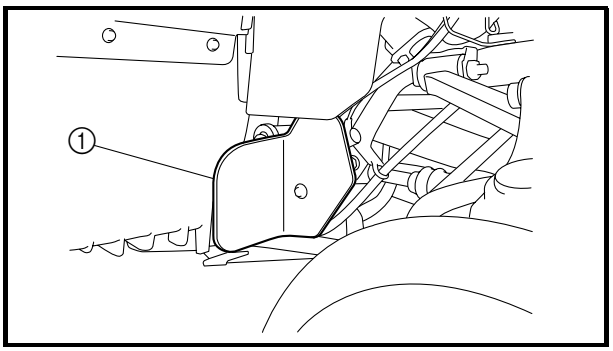
NOTE:

Adjust the brake pedal height before adjusting the brake pedal free play and the brake lever free play.

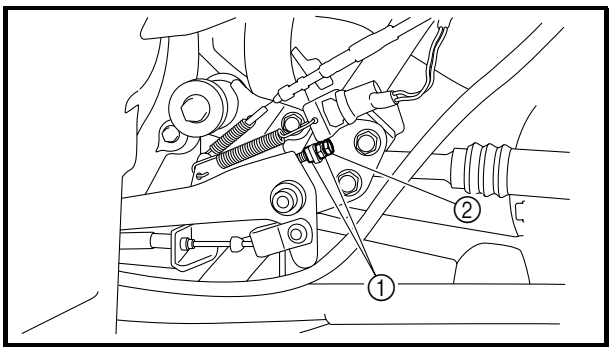
1. Check:
   - brake pedal height ⓐ
     Out of specification → Adjust.

	Brake pedal height **75 ~ 85 mm (2.95 ~ 3.35 in)**

① Brake pedal
② Footrest bracket



2. Remove:
   - front wheel nuts (right side)
   - front wheel (right side)
   - brake pedal light switch cover ①



3. Adjust:
   - brake pedal height

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a. Loosen the locknuts ①.

b. Turn the adjusting bolt ② in or out until the correct height is obtained.

Turning in	**Brake pedal is lowered.**
Turning out	**Brake pedal is raised.**

c. Tighten the locknuts.

	Locknut **7 Nm (0.7 m · kg, 5.1 ft · lb)**

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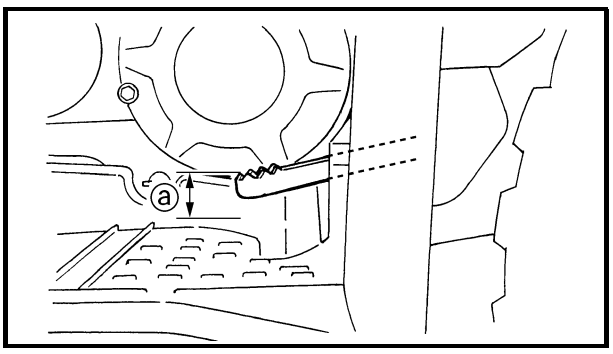
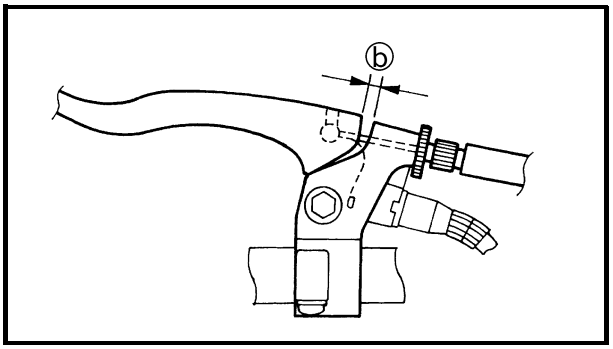
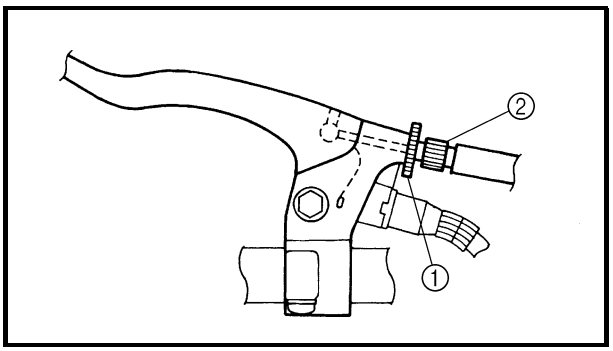
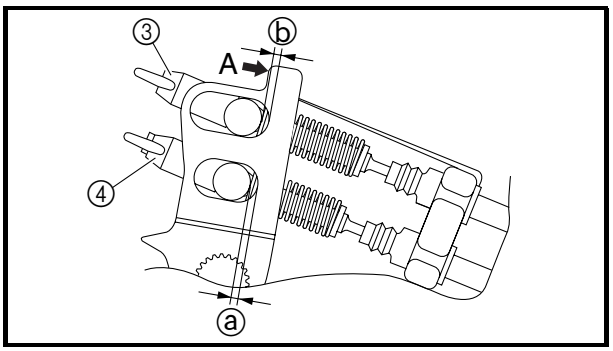
4. Install:
   - brake pedal light switch cover
   - front wheel (right side)
   - front wheel nuts (right side)

	55 Nm (5.5 m · kg, 40 ft · lb)









ADJUSTING THE REAR BRAKE

NOTE:

- Before adjusting the rear brake, adjusting the brake pedal height.
- When adjusting the rear brake, be sure to adjust both the brake pedal and the brake lever.

1. Check:
   - brake pedal free play ⓐ
   - rear brake lever free play ⓑ
   Out of specification → Adjust.

Brake pedal free play
17 ~ 20 mm (0.67 ~ 0.79 in)
Rear brake lever free play
8.0 ~ 10.5 mm (0.31 ~ 0.41 in)

2. Adjust:
   - rear brake lever free play
   - brake pedal free play

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a. Loosen the locknut (handlebar) ① and fully screw in the rear brake lever free play adjusting bolt (handlebar) ②.
b. Fully loosen the brake lever free play adjusting nut (final gear case) ③.
c. Apply a force of 50 N (5.1 kg, 11.2 lb) in direction “A” until the brakes are engaged, then turn the brake pedal free play adjusting nut ④ until the gap ⓐ is within the specified limits.

Gap
2.5 ~ 3.0 mm (0.10 ~ 0.12 in)

d. Checking the brake pedal free play to see whether or not it is within the specified limits. If not, perform the above steps again.

Brake pedal free play
17 ~ 20 mm (0.67 ~ 0.79 in)

e. Apply a force 50 N (5.1 kg, 11.2 lb) in direction “A” until the brakes are engaged, then turn the brake lever free play adjusting nut (final gear case) ③ until the gap ⓑ is within the specified limits.

Gap
4.0 ~ 6.0 mm (0.16 ~ 0.24 in)

f. Checking the rear brake lever free play to see whether or not it is within the specified limits. If not, perform the above steps again and adjust the rear brake lever free play adjusting bolt (handlebar) ② as necessary.

Rear brake lever free play
8.0 ~ 10.5 mm (0.31 ~ 0.41 in)

g. Tighten the locknut (handlebar) ①.

⚠ WARNING

After this adjustment is performed, lift the front and rear wheels off the ground by placing a block under the engine, and spin the rear wheels to ensure there is no brake drag. If any brake drag is noticed perform the above steps again.

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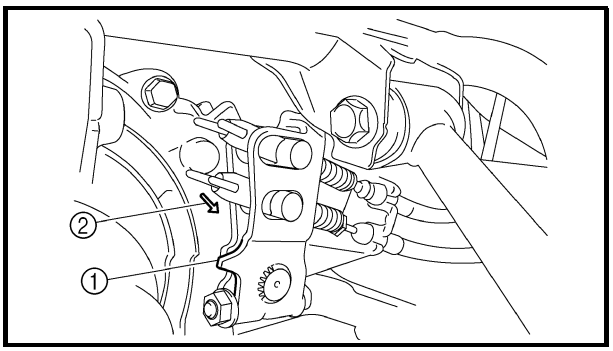
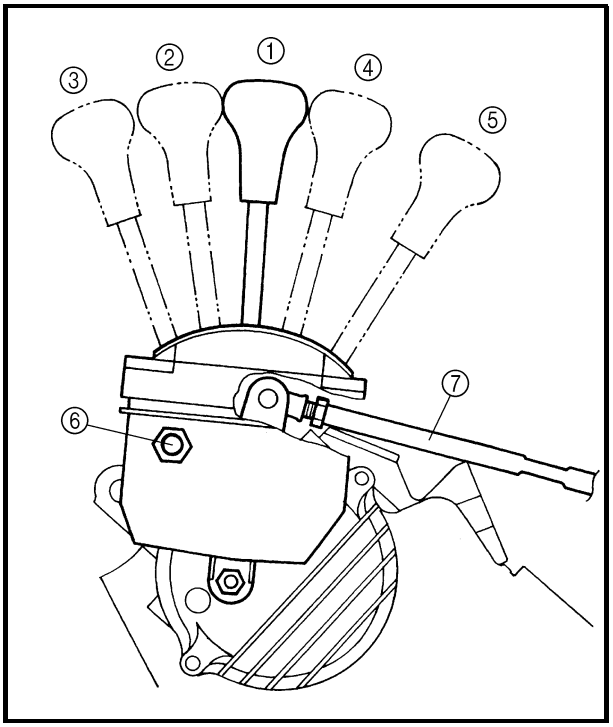
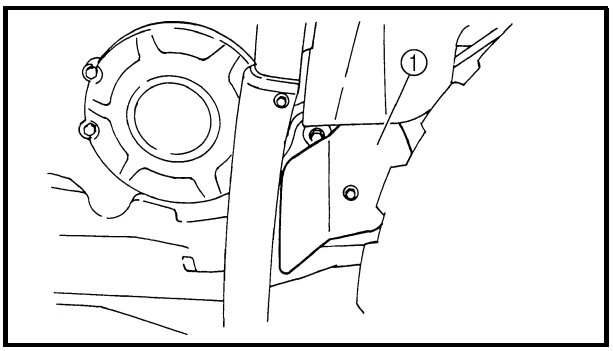
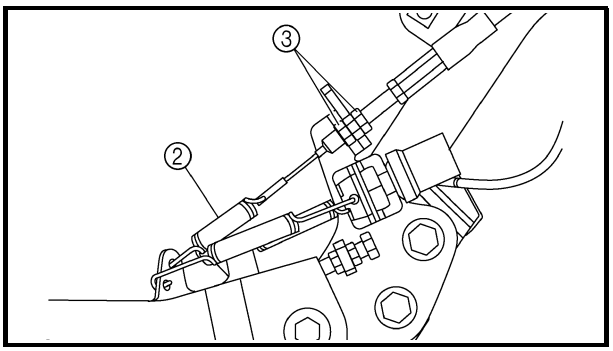


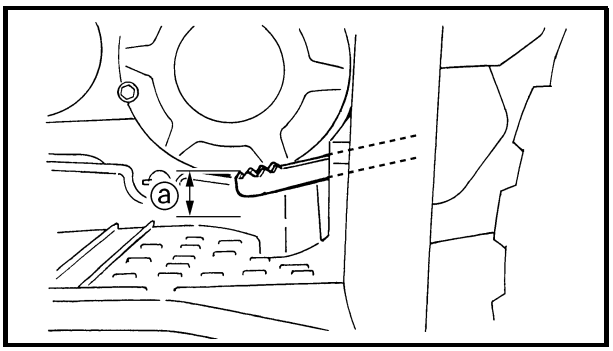
CHECKING THE REAR BRAKE FRICTION PLATES

1. Operate the brake lever or brake pedal.
2. Check:
   - wear indicator ①
     Reaches the wear limit point ② → Replace the brake friction plates as a set.
     Refer to “FRONT AND REAR BRAKES”.









ADJUSTING THE SELECT LEVER CONTROL CABLE AND SHIFT ROD

① NEUTRAL
② HIGH
③ LOW
④ REVERSE
⑤ PARK
⑥ Control cable
⑦ Select lever shift rod

⚠ WARNING

Before moving the select lever, bring the vehicle to a complete stop and return the throttle lever to its closed position. Otherwise the transmission may be damaged.

1. Adjust:
   - brake pedal height
     Refer to "ADJUSTING THE BRAKE PEDAL HEIGHT".

2. Adjust:
   - select lever control cable
   - select lever shift rod

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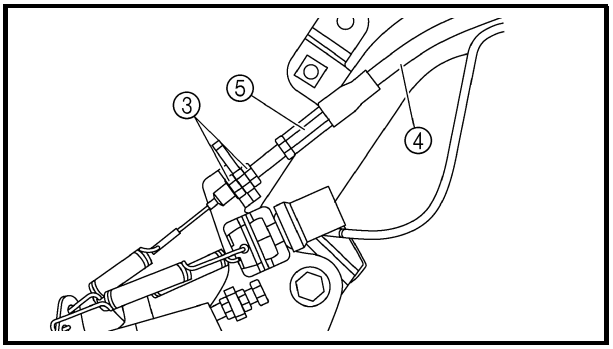
Shift control cable:

a. Remove the rear brake light switch cover ①.
b. Make sure the select lever is in NEUTRAL.
c. Adjust the control cable so there is zero free play in the cable. When the adjustment is correct, slack in the return spring ② will be taken up.

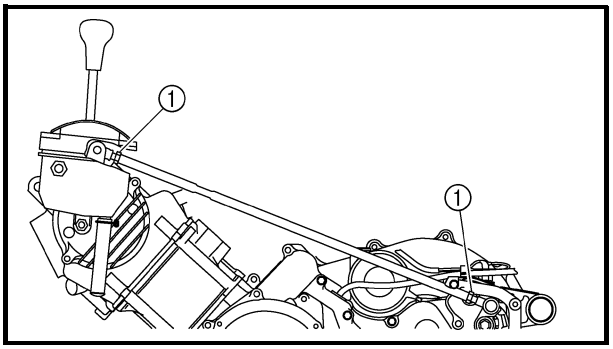
NOTE:

In some cases it will be necessary to further adjust the cable with the locknuts ③ arrangement that holds the cable to its mount.

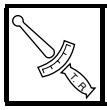
d. When the brake begins to work "ⓐ = 20 ~ 30 mm (0.8 ~ 1.2 in)", verify that the select lever can be shifted to REVERSE from NEUTRAL, to PARK from REVERSE and to NEUTRAL from REVERSE.
e. Before the brake begins to work "ⓐ = 0 ~ 20 mm (0 ~ 0.8 in)", verify that the select lever cannot be shifted to REVERSE from NEUTRAL, to PARK from REVERSE, to REVERSE from PARK, and to NEUTRAL from REVERSE.



f. Check that locknuts ③ are tightened correctly.
g. If the operation of the select lever is incorrect, adjust the select lever control cable ④ with the adjuster ⑤.



Select lever shift rod:
h. Make sure the select lever is in NEUTRAL.
i. Loosen both locknuts ①.
j. Adjust the shift rod length for smooth and correct shifting.
k. Tighten the locknuts ①.

	**Locknut** **15 Nm (1.5 m · kg, 11 ft · lb)**

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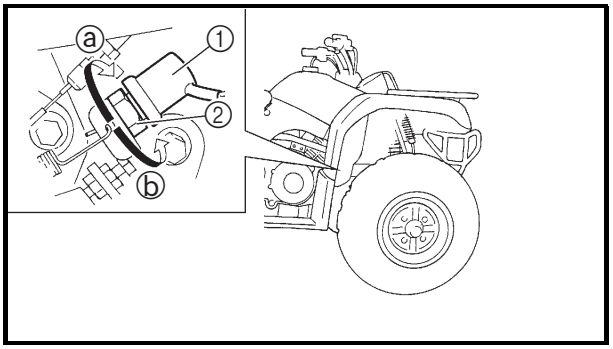
ADJUSTING THE BRAKE PEDAL LIGHT SWITCH

NOTE:
- The brake pedal light switch is operated by movement of the brake pedal.
- The brake pedal light switch is properly adjusted when the brake light comes on just before the braking effect starts.

1. Check:
   - brake pedal light switch operation timing
     Incorrect → Adjust.



2. Adjust:
   • brake pedal light switch operation timing

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a. Hold the main body ① of the brake pedal light switch so that it does not rotate and turn the adjusting nut ② in direction ⓐ or ⓑ until the rear brake light comes on at the proper time.

Direction ⓐ	**Brake light comes on sooner.**
Direction ⓑ	**Brake light comes on later.**

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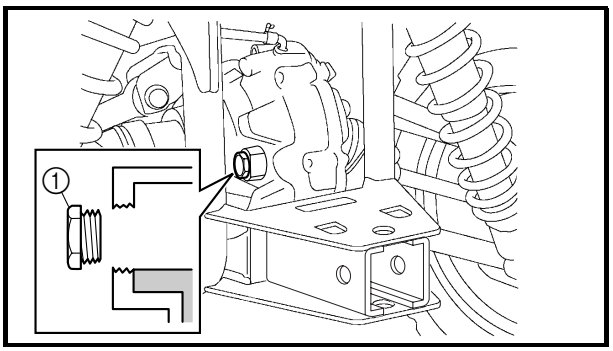


CHECKING THE FINAL GEAR OIL LEVEL

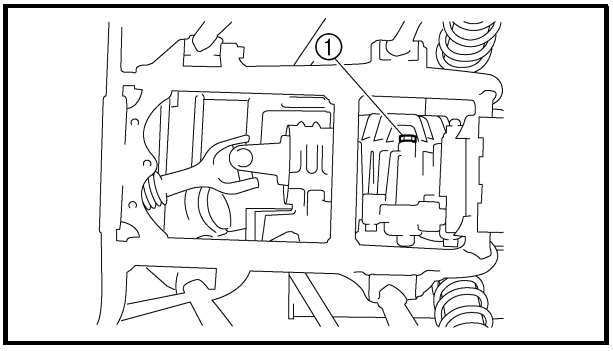
1. Place the vehicle on a level place.
2. Remove:
   • oil filler bolt ①
3. Check:
   • final gear oil level
   The final gear oil level should be up to the brim of the filler hole.
   Below the brim → Add recommended final gear oil to the proper level.

Recommended oil
Yamaha Friction Modified Shaft Drive Gear Oil
(Part No.: ACC-SHAFT-LU-00)

CAUTION:

Take care not allow foreign material to enter the final gear case.

4. Install:
   • oil filler bolt — **24 Nm (2.4 m · kg, 17 ft · lb)**



CHANGING THE FINAL GEAR OIL

1. Place the vehicle on a level surface.
2. Remove:
   - final gear case skid plate
     Refer to "REAR CONSTANT VELOCITY JOINTS, FINAL DRIVE GEAR AND DRIVE SHAFT".
3. Place a receptacle under the final gear case.
4. Remove:
   - oil filler bolt
   - drain plug ①
5. Drain:
   - final gear oil
6. Install:
   - drain plug — **24 Nm (2.4 m · kg, 17 ft · lb)**

NOTE:

Check the drain plug gasket. If it is damaged, replace it with a new one.

7. Fill:
   - final gear case

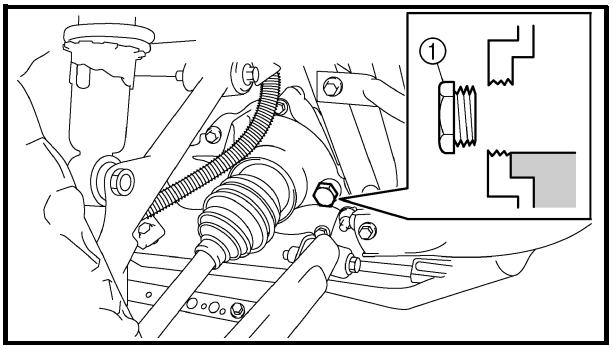
Periodic oil change
0.50 L (0.44 Imp qt, 0.53 US qt)
Total amount
0.53 L (0.47 Imp qt, 0.56 US qt)
Recommended oil
Yamaha Friction Modified Shaft Drive Gear Oil
(Part No.: ACC-SHAFT-LU-00)

CAUTION:

Take care not to allow foreign material to enter the final gear case.

8. Check:
   - final gear oil level
     Refer to "CHECKING THE FINAL GEAR OIL LEVEL".

9. Install:
   - oil filler bolt — **24 Nm (2.4 m · kg, 17 ft · lb)**
   - final gear case skid plate
     Refer to "REAR CONSTANT VELOCITY JOINTS, FINAL DRIVE GEAR AND DRIVE SHAFT".



CHECKING THE DIFFERENTIAL GEAR OIL LEVEL

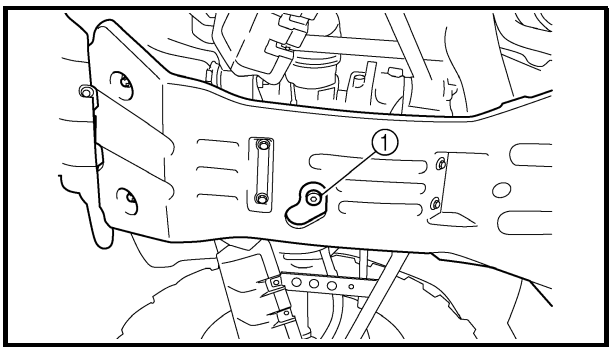
1. Place the vehicle on a level surface.
2. Remove:
   - oil filler bolt ①
3. Check:
   - differential gear oil level
     The differential gear oil level should be up to the brim of the filler hole.
     Below the brim → Add recommended differential gear oil to proper level.

Recommended oil
Yamaha Friction Modified Shaft Drive Gear Oil (Part No.: ACC-SHAFT-LU-00) or SAE 80 API GL-4 Hypoid gear oil

CAUTION:

Take care not allow foreign material to enter the differential gear case.

4. Install:
   - oil filler bolt — **23 Nm (2.3 m · kg, 17 ft · lb)**



CHANGING THE DIFFERENTIAL GEAR OIL

1. Place the vehicle on a level surface.
2. Place a receptacle under the differential gear case.
3. Remove:
   - oil filler bolt
   - drain plug ①

4. Drain:
   • differential gear oil
5. Install:
   • drain plug — **10 Nm (1.0 m · kg, 7.2 ft · lb)**

NOTE:
Check the drain plug gasket. If it is damaged, replace it with new one.

6. Fill:
   • differential gear case

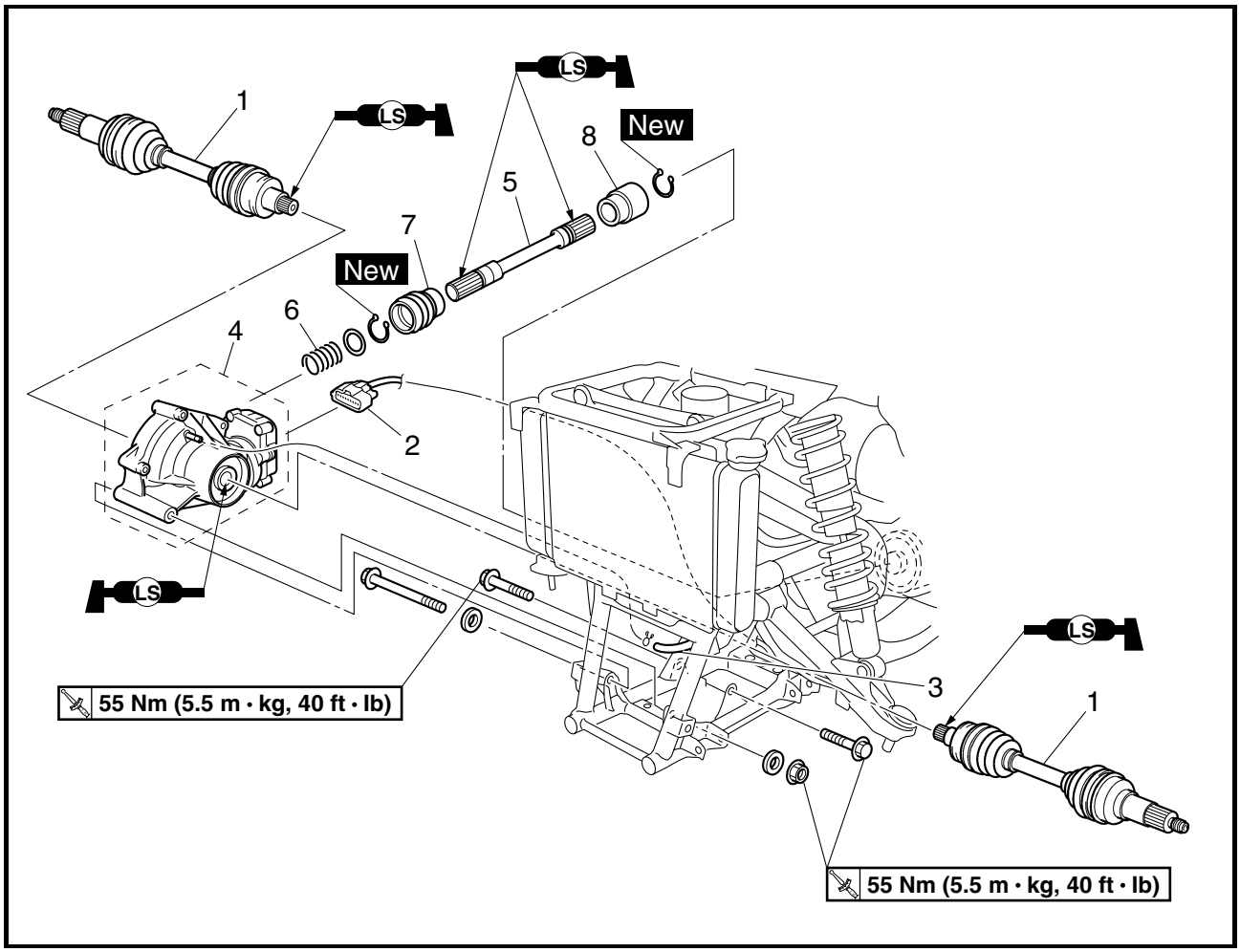
Periodic oil change
0.23 L (0.20 Imp qt, 0.24 US qt)
Total amount
0.25 L (0.22 Imp qt, 0.26 US qt)
Recommended oil
Yamaha Friction Modified Shaft Drive Gear Oil (Part No.: ACC-SHAFT-LU-00) or SAE 80 API GL-4 Hypoid gear oil

CAUTION:
Take care not to allow foreign material to enter the differential gear case.

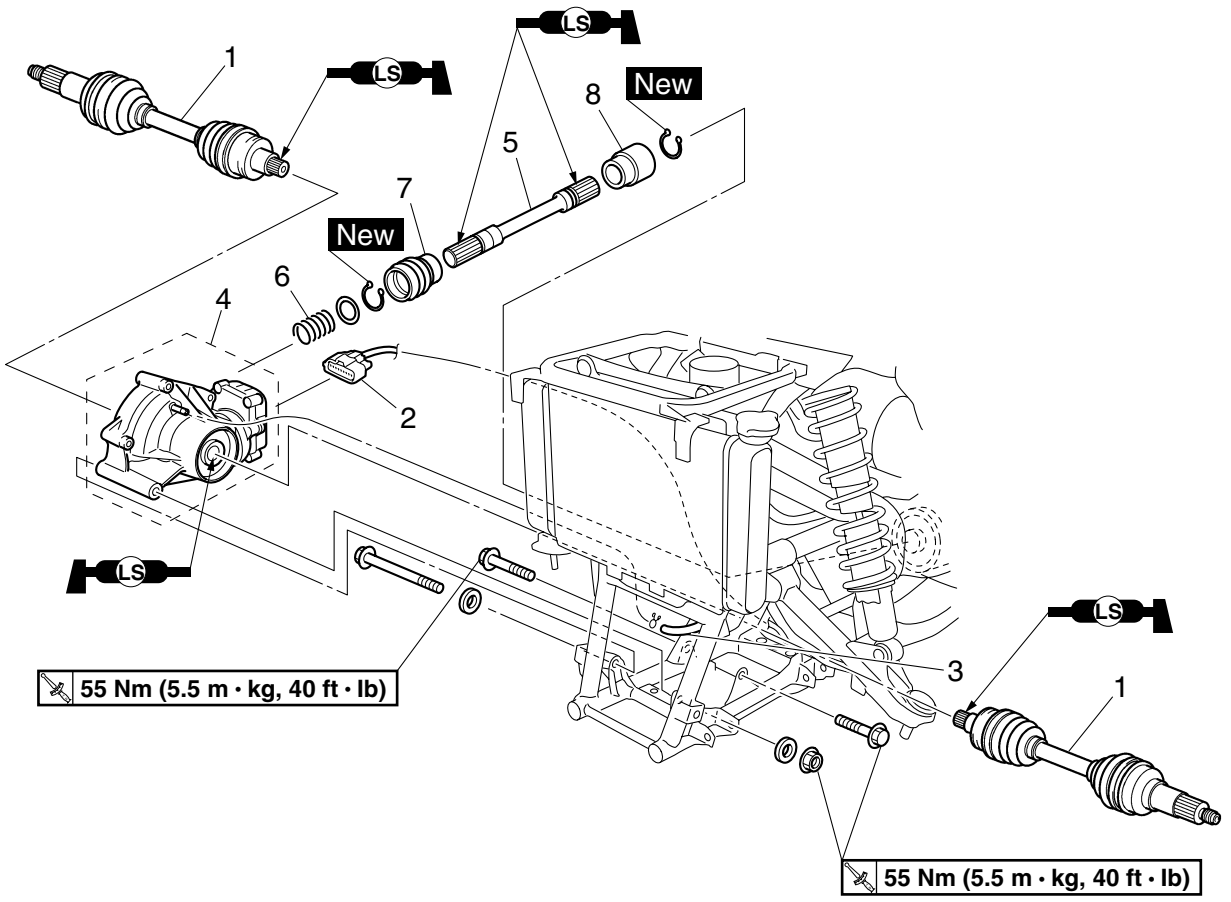
7. Check:
   • differential gear oil level
   Refer to “CHECKING THE DIFFERENTIAL GEAR OIL LEVEL”.
8. Install:
   • oil filler bolt — **23 Nm (2.3 m · kg, 17 ft · lb)**

DRIVE TRAIN

FRONT CONSTANT VELOCITY JOINTS AND DIFFERENTIAL GEAR

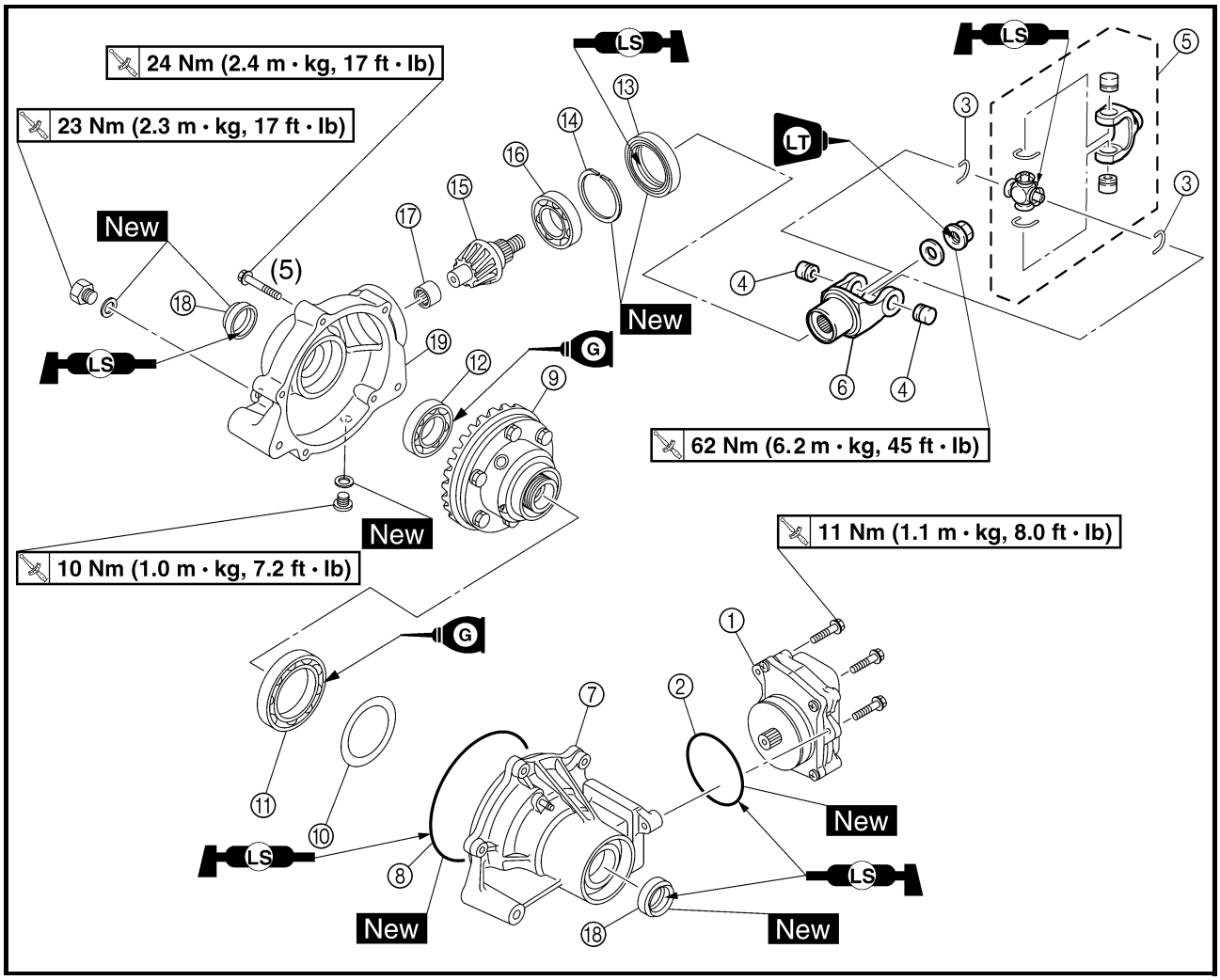


Order	Job/Part	Q'ty	Remarks
	Removing the front constant velocity joints and differential gear		Remove the parts in the order listed.
	Differential gear oil		Drain. Refer to "CHANGING THE DIFFERENTIAL GEAR OIL".
	Engine skid plate Front fender		Refer to "SEAT, CARRIERS, FENDERS AND FUEL TANK". (Manual No.: 5ND-F8197-12)
	Steering knuckle		Refer to "STEERING SYSTEM". (Manual No.: 5ND-F8197-11)
	Front arms (lower)		Refer to "FRONT ARMS AND FRONT SHOCK ABSORBERS". (Manual No.: 5ND-F8197-12)
1	Front constant velocity joint	2	
2	Differential gear motor coupler	1	Disconnect.
3	Differential gear case breather hose	1	Disconnect.

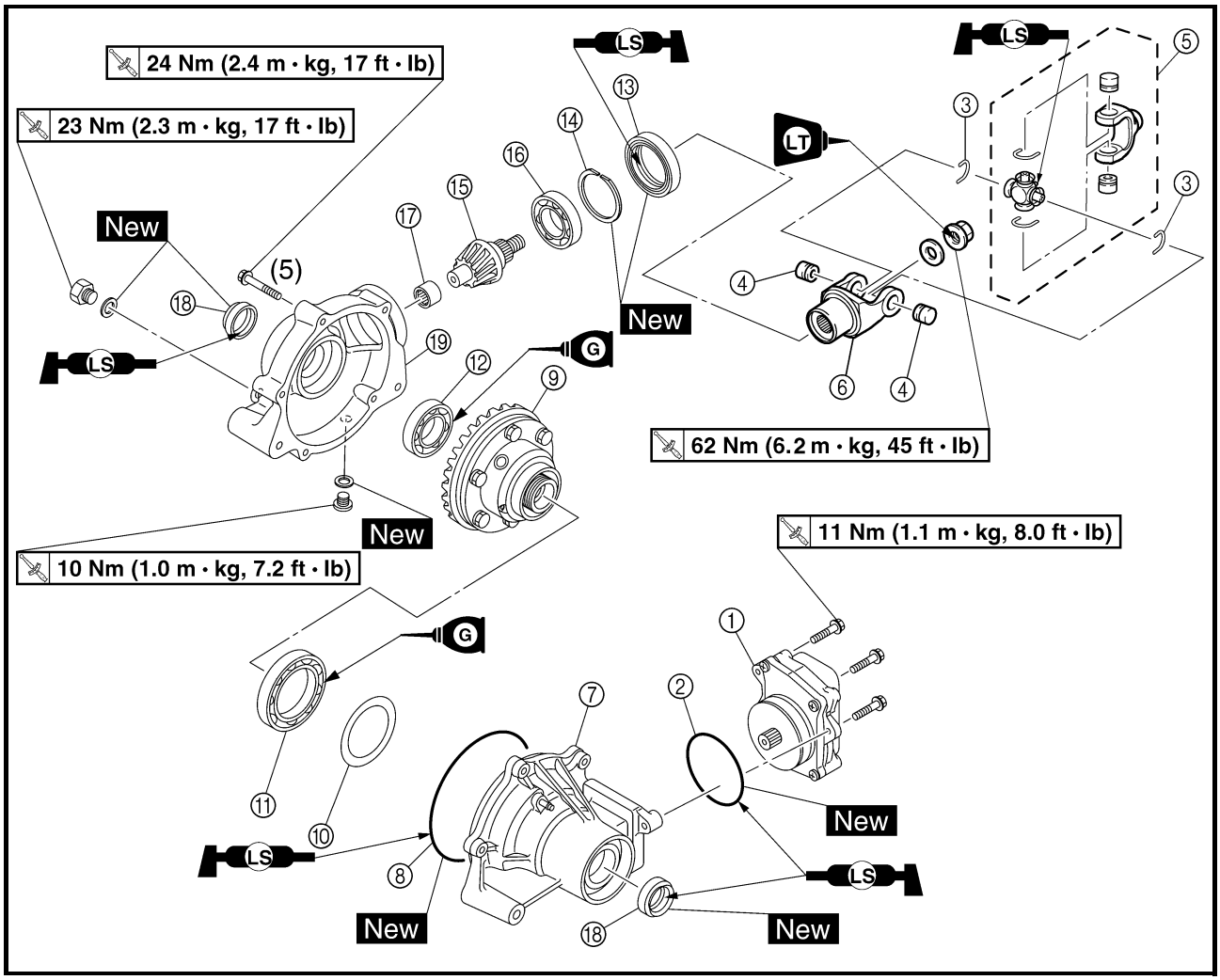


Order	Job/Part	Q'ty	Remarks
4	Differential gear case assembly	1	
5	Front drive shaft	1	
6	Compression spring	1	
7	Dust seal	1	
8	Dust seal	1	
			For installation, reverse the removal procedure.

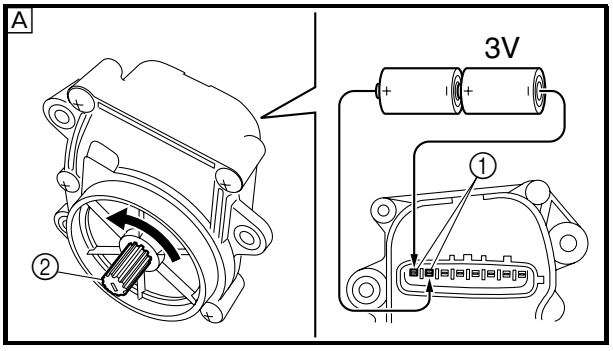
EBS00160

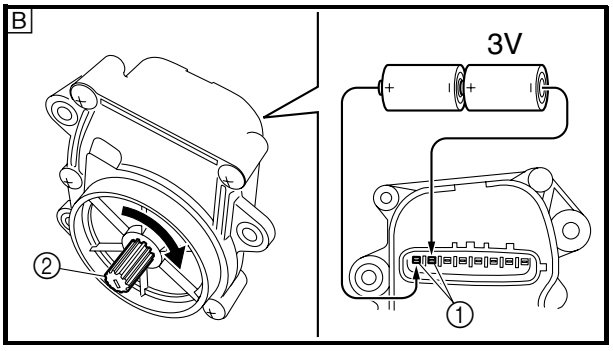


Order	Job/Part	Q'ty	Remarks
	Disassembling the differential gear case		Remove the parts in the order listed.
①	Differential gear motor	1	Refer to "ASSEMBLING THE DIFFERENTIAL GEAR".
②	O-ring	1	
③	Circlip	2	Refer to "REMOVING THE UNIVERSAL JOINT" in chapter 7 (Manual No.: 5ND-F8197-10) and "ASSEMBLING THE DIFFERENTIAL GEAR".
④	Bearing	2	
⑤	Universal joint	1	
⑥	Universal joint yoke	1	
⑦	Differential gear case cover	1	
⑧	O-ring	1	
⑨	Differential gear assembly	1	
⑩	Differential drive pinion gear shim	1	
⑪	Bearing	1	



Order	Job/Part	Q'ty	Remarks
⑫	Bearing	1	
⑬	Oil seal	1	
⑭	Clip	1	
⑮	Differential drive pinion gear	1	
⑯	Bearing	1	
⑰	Bearing	1	
⑱	Oil seal	2	
⑲	Differential gear case	1	
			For assembly, reverse the disassembly procedure.





CHECKING THE DIFFERENTIAL GEAR MOTOR

1. Check:
   - differential gear motor

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a. Connect two C size batteries to the gear motor terminals ① (as shown in illustration).

CAUTION:

- **Be sure to check the motor operation after removing it from the differential gear case assembly.**
- **Do not use a 12 V battery to operate the pinion gear.**

A Check that the pinion gear ② turns counter-clockwise.
B Check that the pinion gear ② turns clockwise.

NOTE:

Be sure not to disassemble the gear motor and remove the pinion gear.

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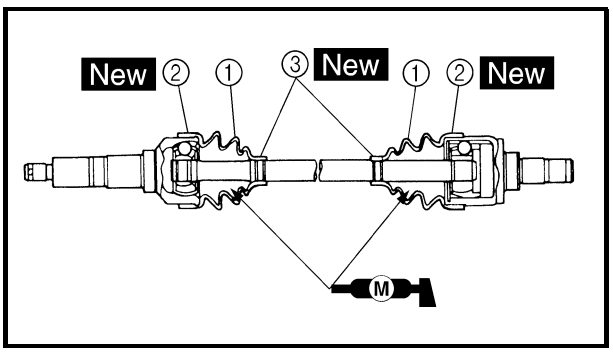
EBS00167

ASSEMBLING THE FRONT CONSTANT VELOCITY JOINTS

1. Apply:
   - molybdenum disulfide grease (into the ball joint assembly)

NOTE:

Molybdenum disulfide grease is included in the repair kit.



2. Install:
   - dust boots ①
   - boot bands ②, ③ New

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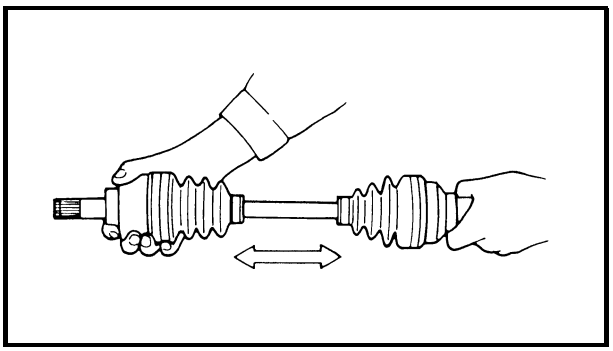
a. Apply molybdenum disulfide grease into the dust boots.

Molybdenum disulfide grease
45 g (1.6 oz) per dust boot (front wheel side)
45 g (1.6 oz) per dust boot (differential gear case side)

b. Install the dust boots.
c. Install the dust boot bands.

NOTE:

- The new boot bands may differ from the original ones.
- The dust boots should be fastened with the boot bands ③ at the grooves in the joint shaft.



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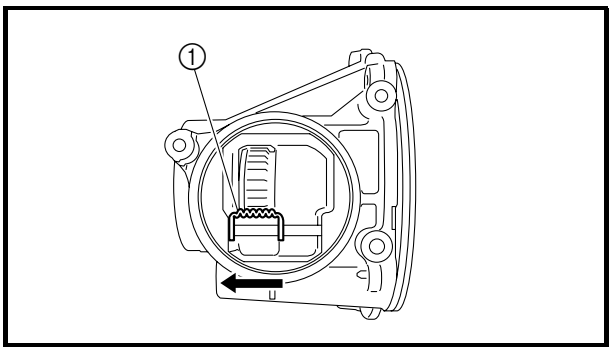
3. Check:
   - thrust movement free play
     Excessive play → Replace the joint assembly.

EBS01009

ASSEMBLING THE DIFFERENTIAL GEAR

1. Measure:
   - gear lash
     Refer to “MEASURING THE DIFFERENTIAL GEAR LASH”.



2. Install:
   - differential gear motor

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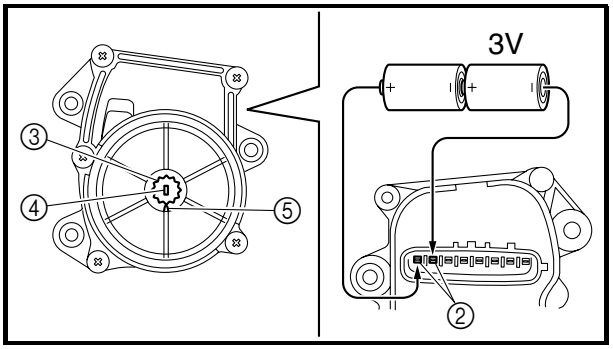
a. Slide the shift fork sliding gear ①, which is installed to the differential gear, to the left to put it into the 2WD mode.



b. Connect two C size batteries to the gear motor terminals ② to operate the pinion gear ③, and operate it until the mark ④ on the gear is aligned with the mark ⑤ on the gear motor case.

CAUTION:

Do not use a 12 V battery to operate the pinion gear.

c. Carefully install the differential gear motor onto the differential gear assembly, making sure that the shift fork sliding gear remains in the 2WD mode position.

CAUTION:

If the position of the shift fork sliding gear is moved, the position of the differential gear and the indicator light display may differ, and the 2WD or differential lock mode may not be activated.

d. Tighten the differential gear motor bolts.

	Differential gear motor bolt **11 Nm (1.1 m · kg, 8.0 ft · lb)**

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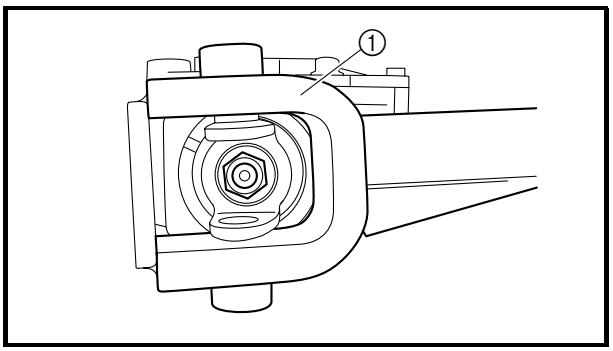


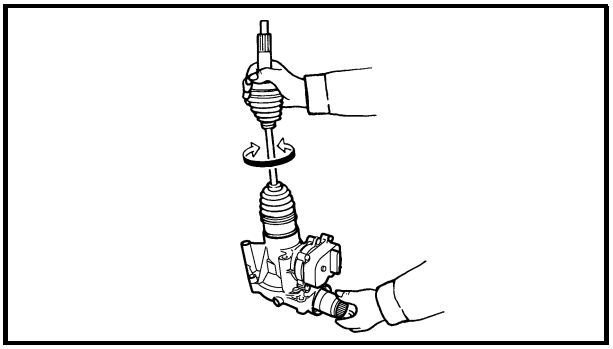
3. Install:
   - universal joint yoke
   - washer
   - nut

62 Nm (6.2 m · kg, 45 ft · lb)

	Universal joint holder **90890-04062, YM-04062**

NOTE:

- Apply locking agent (LOCTITE®) to the nut threads.
- Use the universal joint holder ① to hold the universal joint yoke.

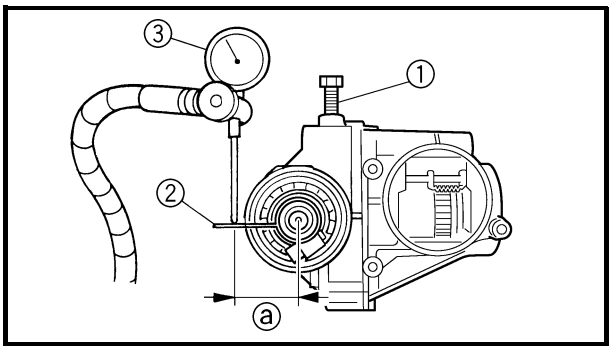


4. Check:
   • differential gear operation
   Unsmooth operation → Replace the differential gear assembly.
   Insert the double off-set joint into the differential gear, and turn the gear back and forth.

EBS00174

MEASURING THE DIFFERENTIAL GEAR LASH

1. Secure the gear case in a vise or another supporting device.
2. Remove:
   • differential gear case drain bolt
   • gasket



3. Install:
   • ring gear fix bolt (M10) ①
   (into the drain bolt hole)

Ring gear fix bolt (M10)
90890-01527
YM-01527

CAUTION:

Finger tighten the bolt until it holds the ring gear. Otherwise, the ring gear will be damaged.

4. Attach:
   • gear lash measurement tool ②
   • dial gauge ③

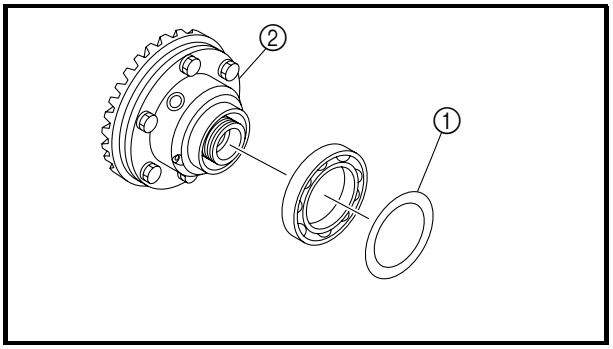
Gear lash measurement tool
90890-01475
Middle drive gear lash tool
YM-01475

ⓐ Measuring point is 22.5 mm (0.86 in)

5. Measure:
   • gear lash
   Gently rotate the coupling gear from engagement to engagement.

	Differential gear lash **0.05 ~ 0.25 mm** **(0.0020 ~ 0.0098 in)**

NOTE:
Measure the gear lash at four positions. Rotate the shaft 90° each time.



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ADJUSTING THE DIFFERENTIAL GEAR LASH

1. Remove:
   • differential drive pinion gear shim(s) ①
   • differential gear assembly ②
2. Adjust:
   • gear lash

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a. Select the suitable shims using the following chart.

Too little gear lash	**Reduce shim thickness.**
Too large gear lash	**Increase shim thickness.**

	Ring gear shim
Thickness (mm)	**0.1** **0.2** **0.3** **0.4**

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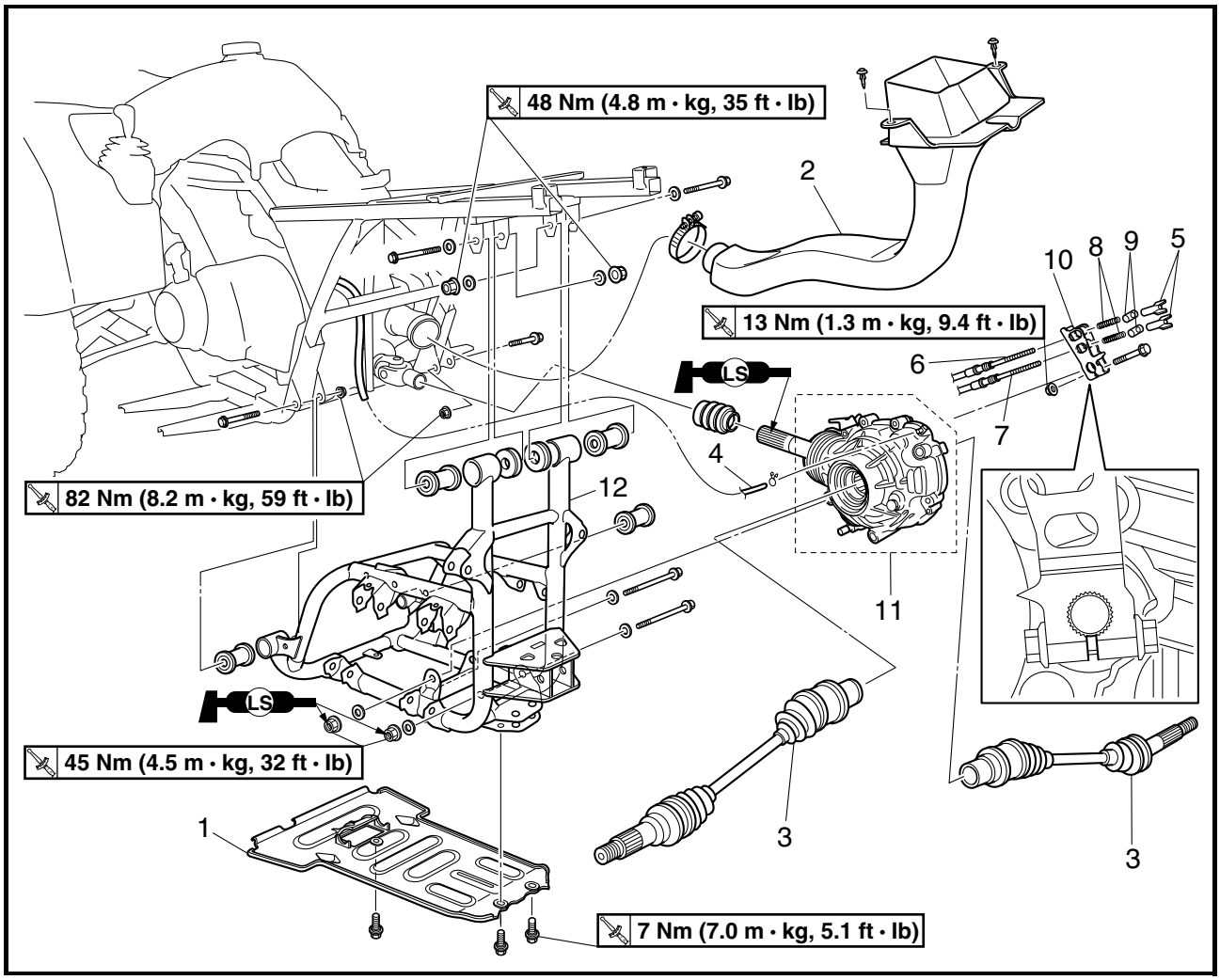
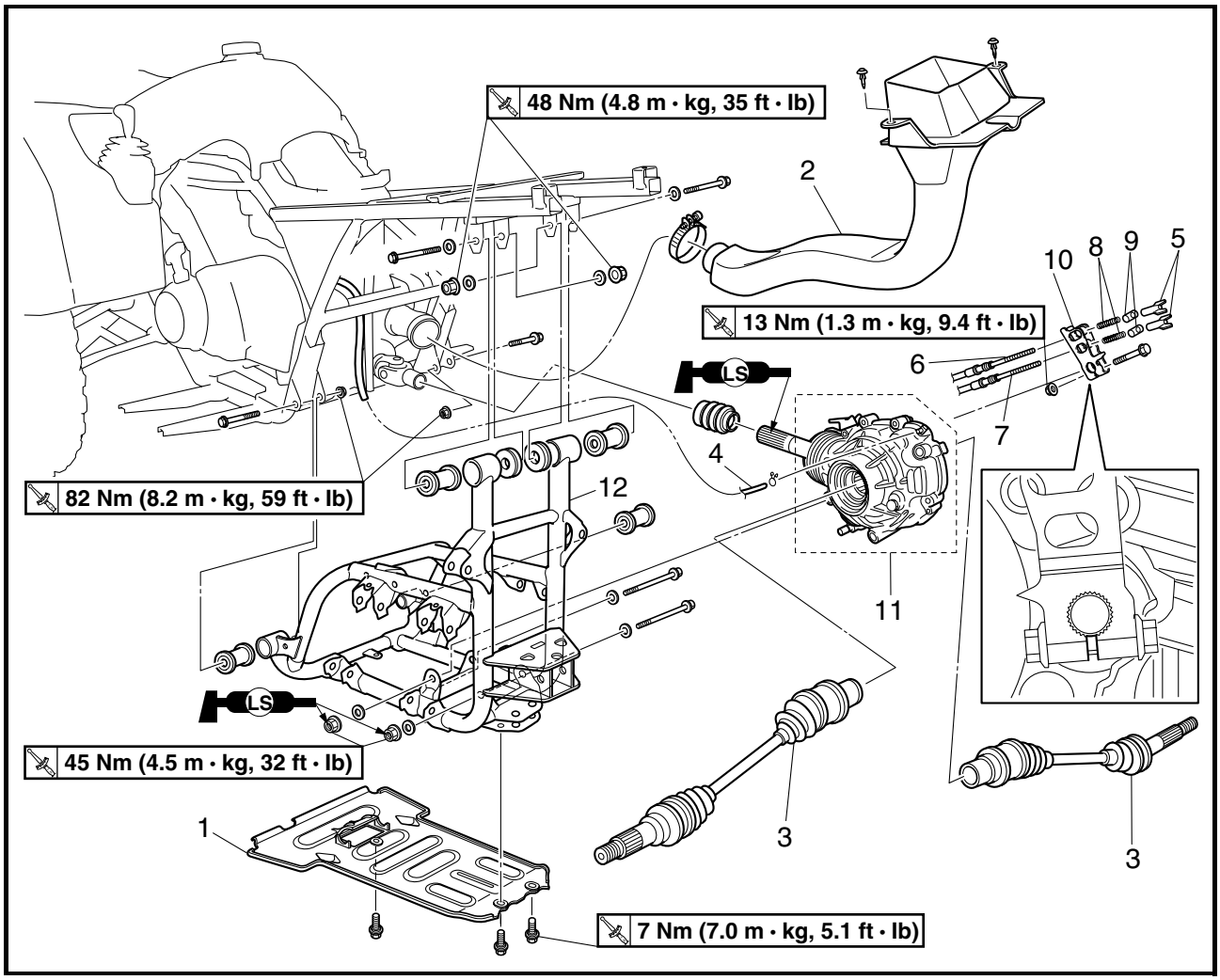
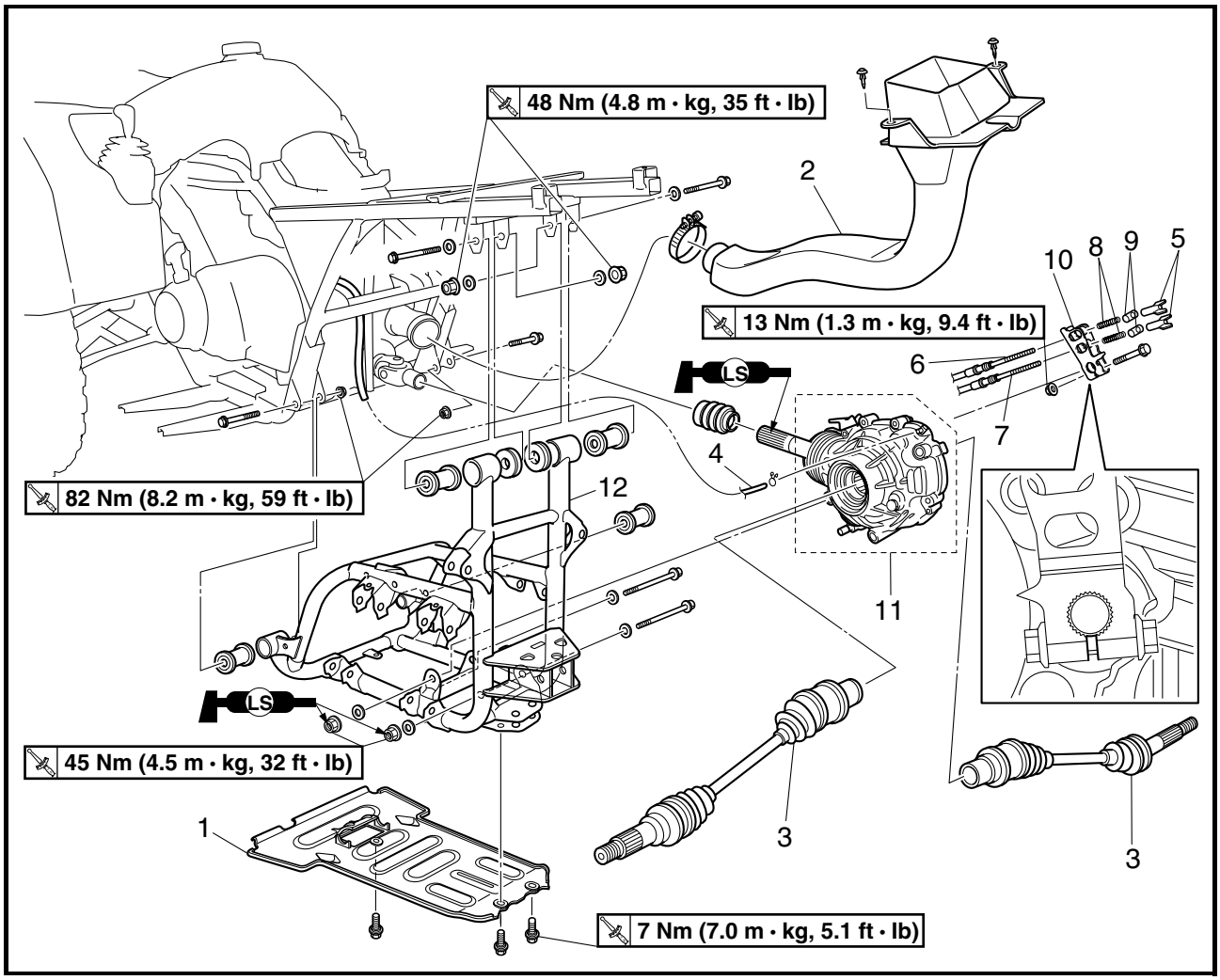
REAR CONSTANT VELOCITY JOINTS, FINAL DRIVE GEAR AND DRIVE SHAFT



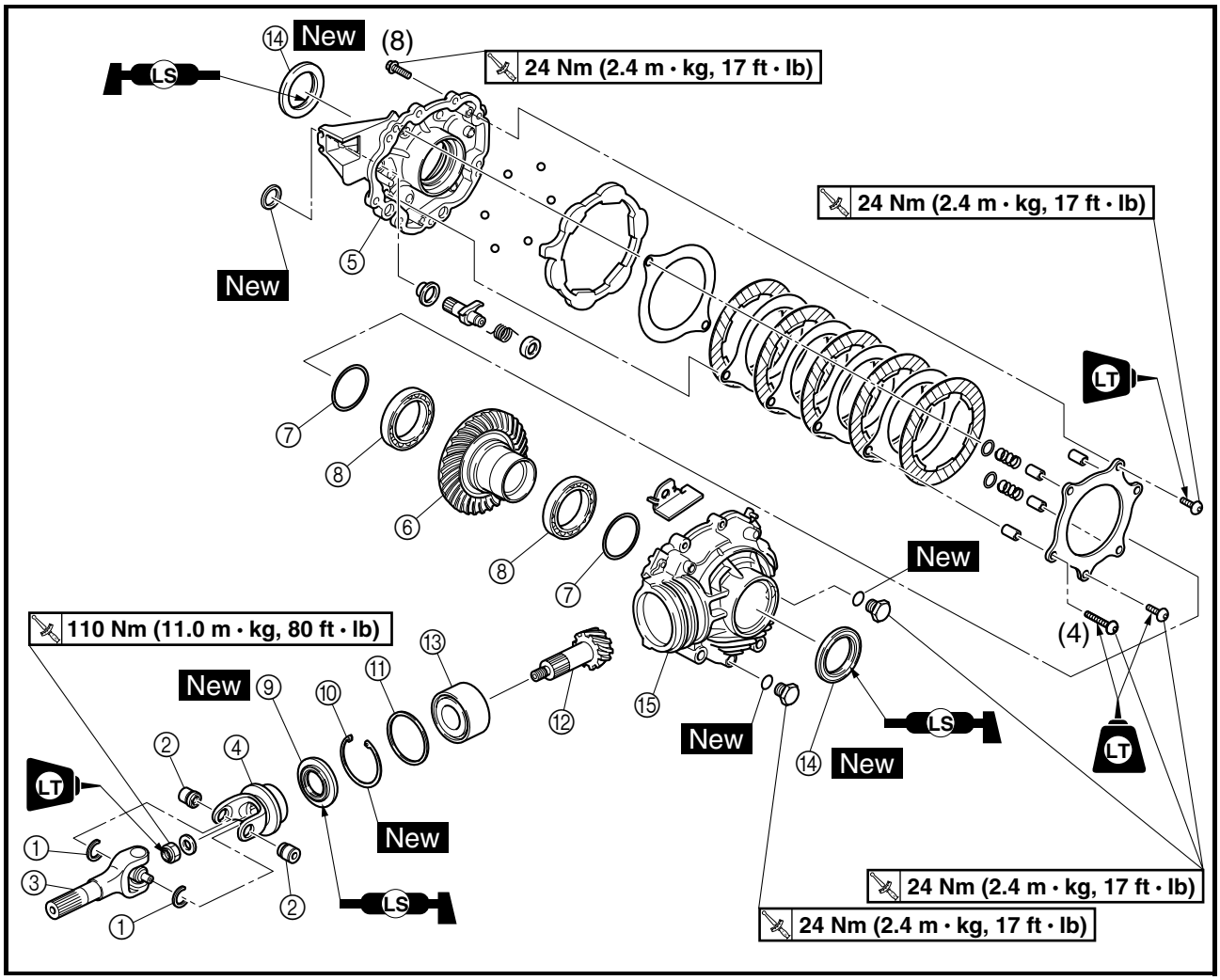
Order	Job/Part	Q'ty	Remarks
	Removing the rear constant velocity joints, final drive gear and drive shaft		Remove the parts in the order listed.
	Engine skid plate		Refer to "SEAT, CARRIERS, FENDERS AND FUEL TANK". (Manual No.: 5ND-F8197-12)
	Rear fender		Refer to "SEAT, CARRIERS, FENDERS AND FUEL TANK" in chapter 3. (Manual No.: 5ND-F8197-10)
	Footrest boards		Refer to "FOOTREST BOARDS" in chapter 3. (Manual No.: 5ND-F8197-10)
	Final gear oil		Drain.
	Rear arms and rear shock absorber		Refer to "REAR ARMS AND REAR SHOCK ABSORBERS". (Manual No.: 5ND-F8197-12)
1	Final gear case skid plate	1	



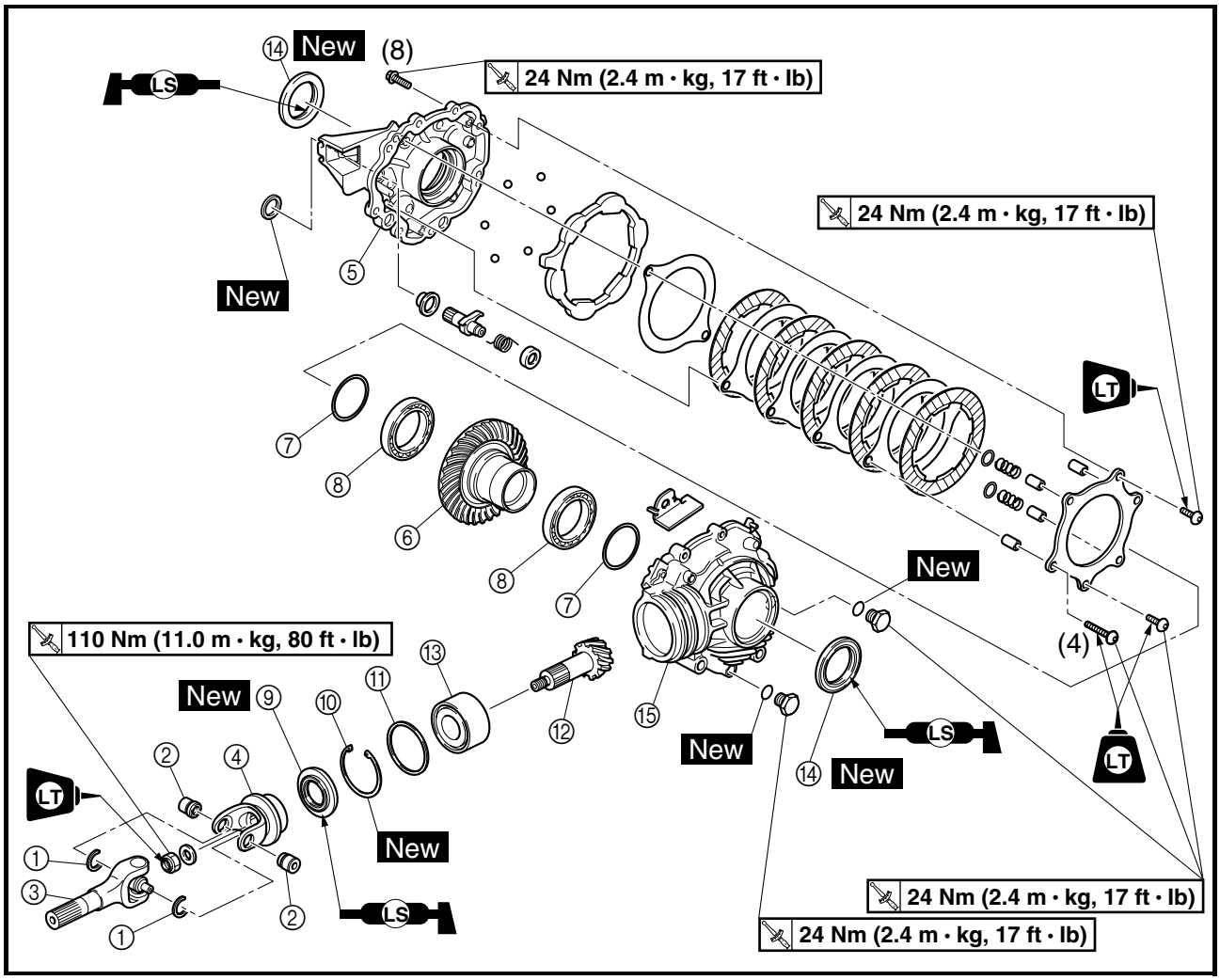
Order	Job/Part	Q'ty	Remarks
2	Air duct assembly 2	1	
3	Rear constant velocity joint	2	
4	Final gear case breather hose	1	Disconnect.
5	Rear brake cable adjusting nut	2	
6	Rear brake lever cable	1	Disconnect.
7	Brake pedal cable	1	Disconnect.
8	Spring	2	
9	Pin	2	
10	Rear brake camshaft lever	1	**NOTE:** Align the gap in the end of the rear brake camshaft lever with the location on the camshaft that does not have a spline.
11	Final gear assembly	1	



Order	Job/Part	Q'ty	Remarks
12	Sub-frame	1	For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the final drive gear		Remove the parts in the order listed.
①	Circlip	2	Refer to "DISASSEMBLING THE FINAL DRIVE GEAR" (Manual No.: 5ND-F8197-12) and "ASSEMBLING THE FINAL DRIVE GEAR".
②	Bearing	2	
③	Drive shaft/universal joint yoke	1	
④	Universal joint yoke	1	
⑤	Final gear case (right side)	1	**NOTE:** Working in a crisscross pattern, loosen each bolt 1/4 of a turn. After all the bolts are loosened, remove them.
⑥	Ring gear	1	
⑦	Ring gear shim	2	



Order	Job/Part	Q'ty	Remarks
⑧	Bearing	2	
⑨	Oil seal	1	Refer to "DISASSEMBLING THE FINAL DRIVE PINION GEAR AND BEARING" and "INSTALLING THE FINAL DRIVE PINION GEAR AND BEARING".
⑩	Circlip	1	
⑪	Thrust washer	1	
⑫	Final drive pinion gear	1	
⑬	Bearing	1	
⑭	Oil seal	2	
⑮	Final gear case (left side)	1	
			For assembly, reverse the disassembly procedure.

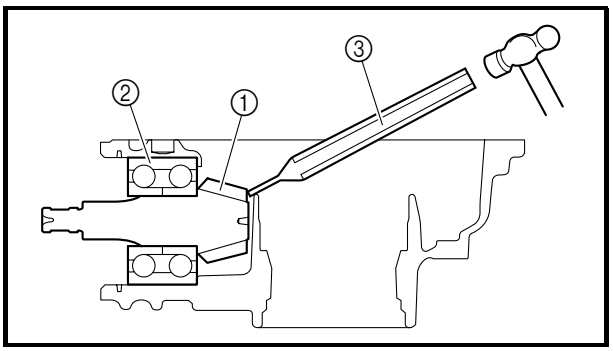
CHECKING THE FINAL DRIVE GEAR

1. Check:
   - final gear case
     Cracks/damage → Replace.

NOTE:
When the final gear case is replaced, be sure to adjust the shim of the ring gear.

2. Check:
   - gear teeth
     Pitting/galling/wear → Replace the drive pinion gear and ring gear as a set.

NOTE:
When the ring gear is replaced, be sure to adjust the shim of the ring gear.



DISASSEMBLING THE FINAL DRIVE PINION GEAR AND BEARING

1. Remove:
   - final drive pinion gear ①
   - final drive pinion gear bearing ②

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a. Heat the final gear case only to 150 °C (302 °F).
b. Remove the final drive pinion gear assembly with an appropriately shaped punch ③.
c. Remove the final drive pinion gear bearing ② from the final drive pinion gear ①.

NOTE:
The removal of the final drive pinion gear is difficult and seldom necessary.

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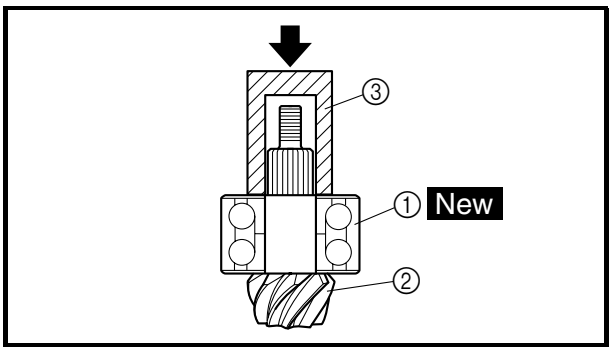
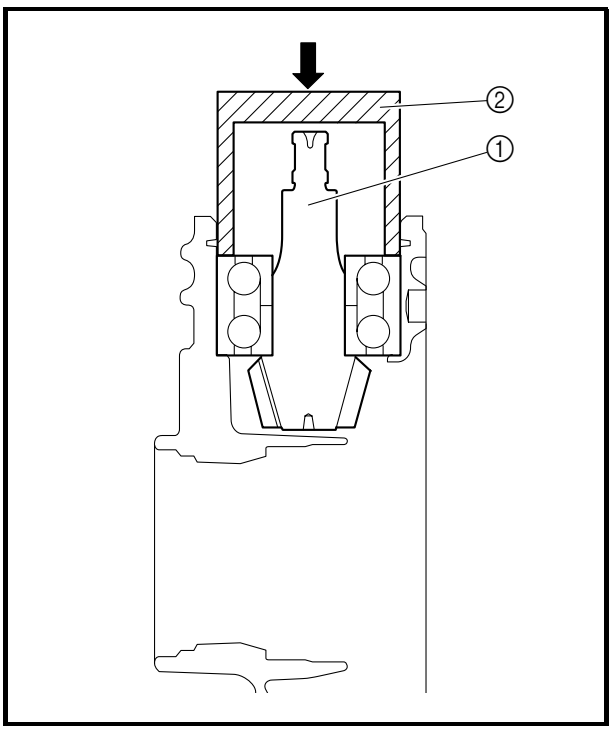


INSTALLING THE FINAL DRIVE PINION GEAR AND BEARING

1. Install:
   - final drive pinion gear bearing ① New
   - final drive pinion gear ②

NOTE:
Use a suitable press tool ③ and a press to install the final drive pinion gear bearing into the final drive pinion gear.

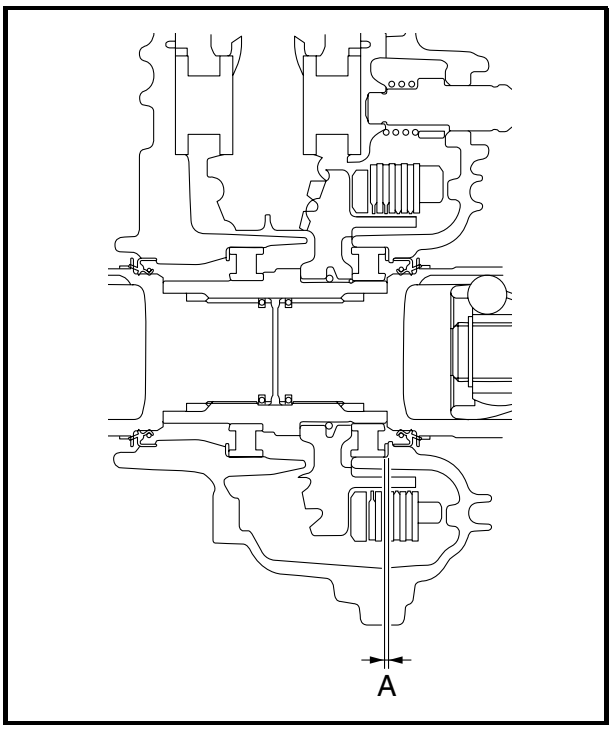


2. Install:
   • final drive pinion gear assembly ①

NOTE:
Use a suitable press tool ② and a press to install the above components into the final gear case.

POSITIONING THE FINAL DRIVE PINION GEAR AND RING GEAR

When the final drive pinion gear, ring gear, and/or final gear case are replaced, be sure to adjust the positions of ring gear using the shim(s).



MEASURING THE RING GEAR THRUST CLEARANCE

1. Measure/adjust:
   • ring gear thrust clearance "A"

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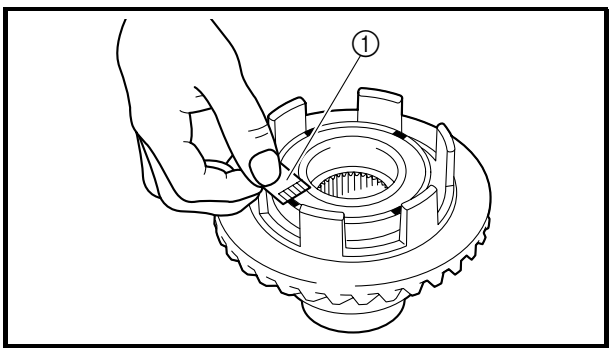
a. Place four pieces of Plastigauge® between the thrust washer and the bearing.

NOTE:
Install the thinnest ring gear shim from the following chart.

	Ring gear shim
Thickness (mm)	0.25 0.97 1.04 1.12 1.19 1.27 1.35 1.42 1.50 1.58



b. Install the ring gear assembly and tighten the bolts to specification.

	M8 bolts (bearing housing) **24 Nm (2.4 m · kg, 17 ft · lb)**

NOTE:
Do not turn the final drive pinion gear and ring gear when measuring the clearance with Plastigauge®.

c. Remove the ring gear assembly.
d. Measure the thrust clearance. Calculate the width of the flattened Plastigauge® ①.

	Ring gear thrust clearance **Less than 0.18 mm (0.007 in)**

e. If out of specification, repeat the measurement steps with a slightly thicker thrust washer until the ring gear thrust clearance is within the specified limits.

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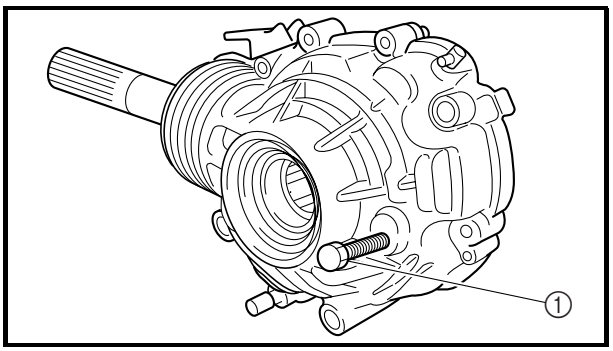
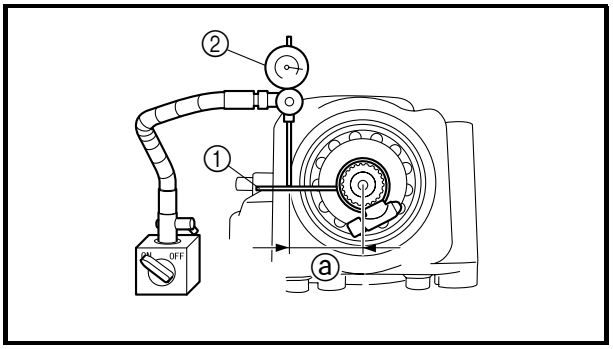


MEASUREMENT THE FINAL GEAR LASH

1. Remove:
   - final gear case filler bolt
   - O-ring
2. Install:
   - ring gear fix bolt (M12) ①
     (into the filler bolt hole)

	Ring gear fix bolt (M12) **90890-01530** **YM-01530**

CAUTION:
Finger tighten the bolt until it holds the ring gear. Otherwise, the ring gear will be damaged.



3. Attach:
   - gear lash measurement tool ①
   - dial gauge ②

	Gear lash measurement tool 90890-01467, YM-01467

ⓐ Measuring point is 19.00 mm (0.75 in)

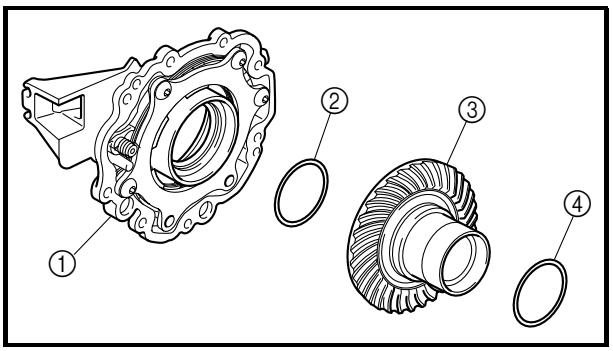
4. Measure:
   - gear lash

   Gently rotate the gear coupling from engagement to engagement.

	Final gear lash 0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

NOTE:

Measure the gear lash at four positions. Rotate the shaft 90° each time.



ADJUSTING THE FINAL GEAR LASH

1. Remove:
   - final gear case (right side) ①
   - ring gear shim ②
   - ring gear ③
   - ring gear shim ④
2. Adjust:
   - gear lash

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a. Select a suitable shim(s) using the following chart.

Too little gear lash	**Increase shim ④ thickness.**
Too large gear lash	**Reduce shim ④ thickness.**

b. If increased by more than 0.2 mm (0.008 in):
   Reduce the ring gear shim ② thickness by 0.2 mm (0.008 in) for every 0.2 mm (0.008 in) of ring gear shim ④ increase.

c. If reduced by more than 0.2 mm (0.008 in): Increase the ring gear shim ② thickness by 0.2 mm (0.008 in) for every 0.2 mm (0.008 in) that the ring gear shim ④ is decreased.

Ring gear shim ② and ④	
Thickness (mm)	0.25 0.97 1.04 1.12 1.19 1.27 1.35 1.42 1.50 1.58

NOTE:
Be sure to use one of each of the ring gear shims ② and ④ to obtain the shim thickness.

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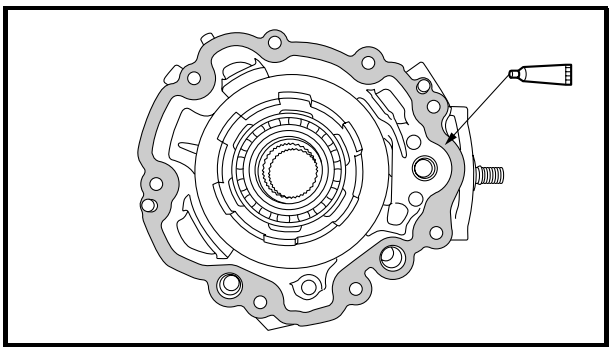
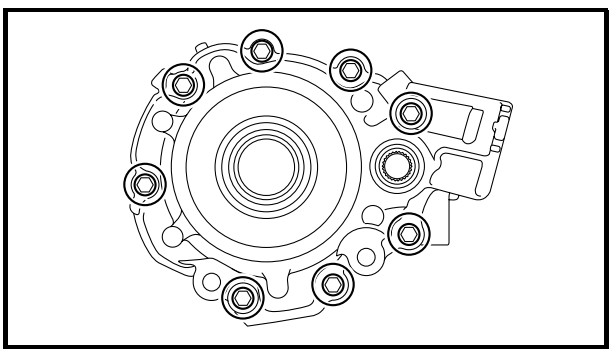


ASSEMBLING THE FINAL DRIVE GEAR

1. Apply:
   • sealant
   (to the mating surfaces of both case halves)

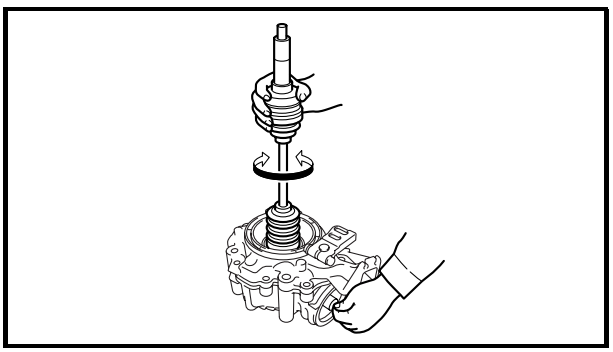
Yamaha bond No. 1215 90890-85505 (Three bond No.1215®)

2. Fit the final gear case (right side) onto the final gear case (left side). Tap lightly on the final gear case (right side) with a soft hammer.
3. Install:
   • final gear case bolts

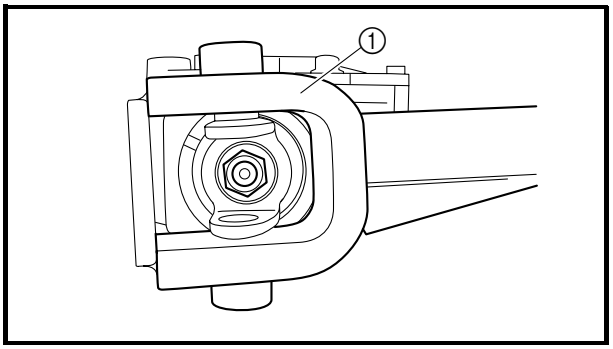


4. Tighten:
   • final gear case bolts

24 Nm (2.4 m · kg, 17 ft · lb)



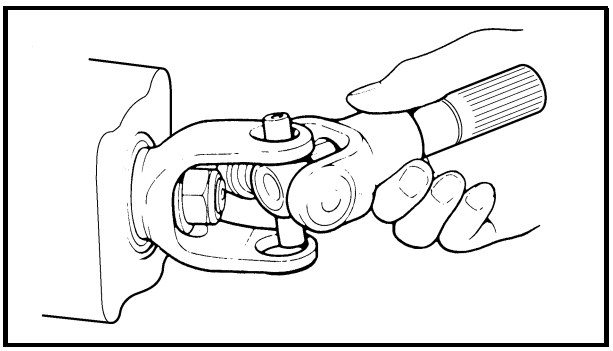
5. Check:
   - final gear operation
     Unsmooth operation → Replace the final gear assembly.
     Insert the double off-set joint into the final gear, and turn the gear back and forth.



6. Install:
   - universal joint yoke
   - washer
   - nut — **110 Nm (11.0 m · kg, 80 ft · lb)**

NOTE:
- Apply locking agent (LOCTITE®) to nut threads.
- Use the universal joint holder ① to hold the yoke.

	Universal joint holder **90890-04062, YM-04062**



7. Install:
   - drive shaft assembly

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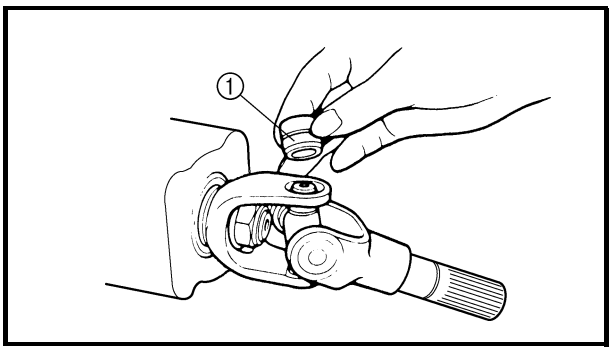
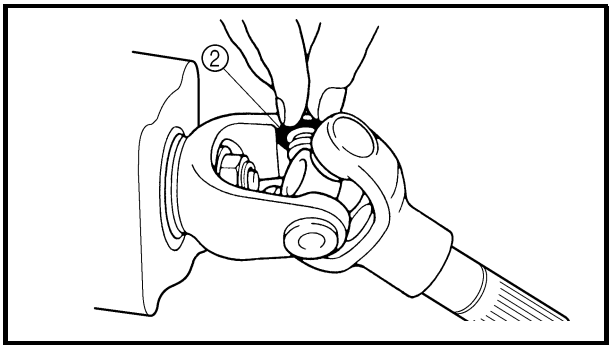
a. Install the opposite yoke into the universal joint.
b. Apply wheel bearing grease to the bearings.
c. Install the bearings ① onto the yoke.

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.





d. Press the bearings into the universal joint using a suitable socket.

NOTE:
The bearing must be inserted far enough into the universal joint so that the circlip can be installed.

e. Install the circlips ② into the groove of each bearing.

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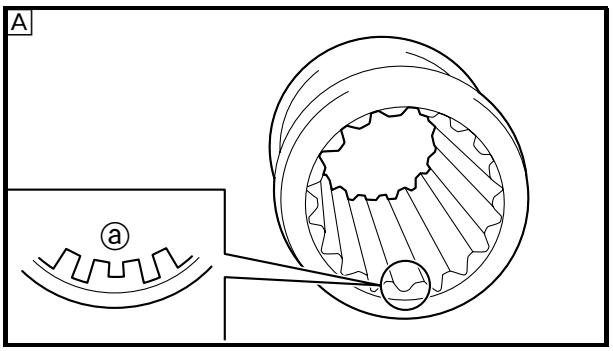
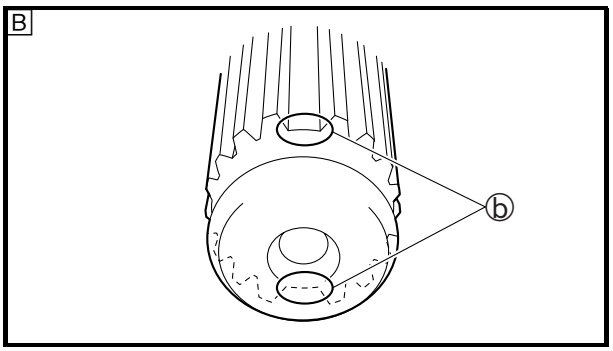




INSTALLING THE FINAL GEAR CASE

1. Install:
   • final gear case

NOTE:
Align the shallow groove ⓐ in the universal joint yoke (engine side) with a groove ⓑ in the drive shaft/universal joint yoke (final gear case side).

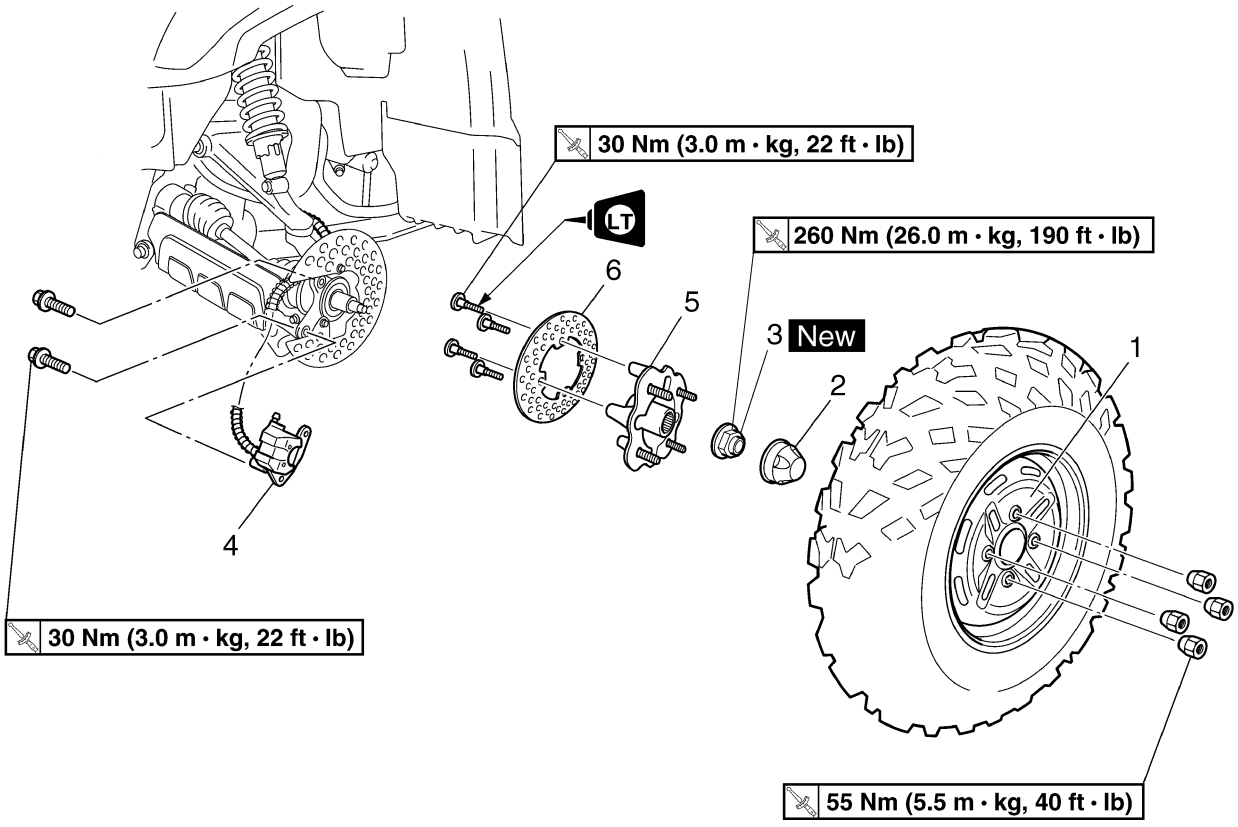
Ⓐ Universal joint yoke (engine side)
Ⓑ Drive shaft/universal joint yoke (final gear case side)

2. Adjust:
   • rear brake lever free play
   • brake pedal free play
   Refer to “ADJUSTING THE REAR BRAKE”.

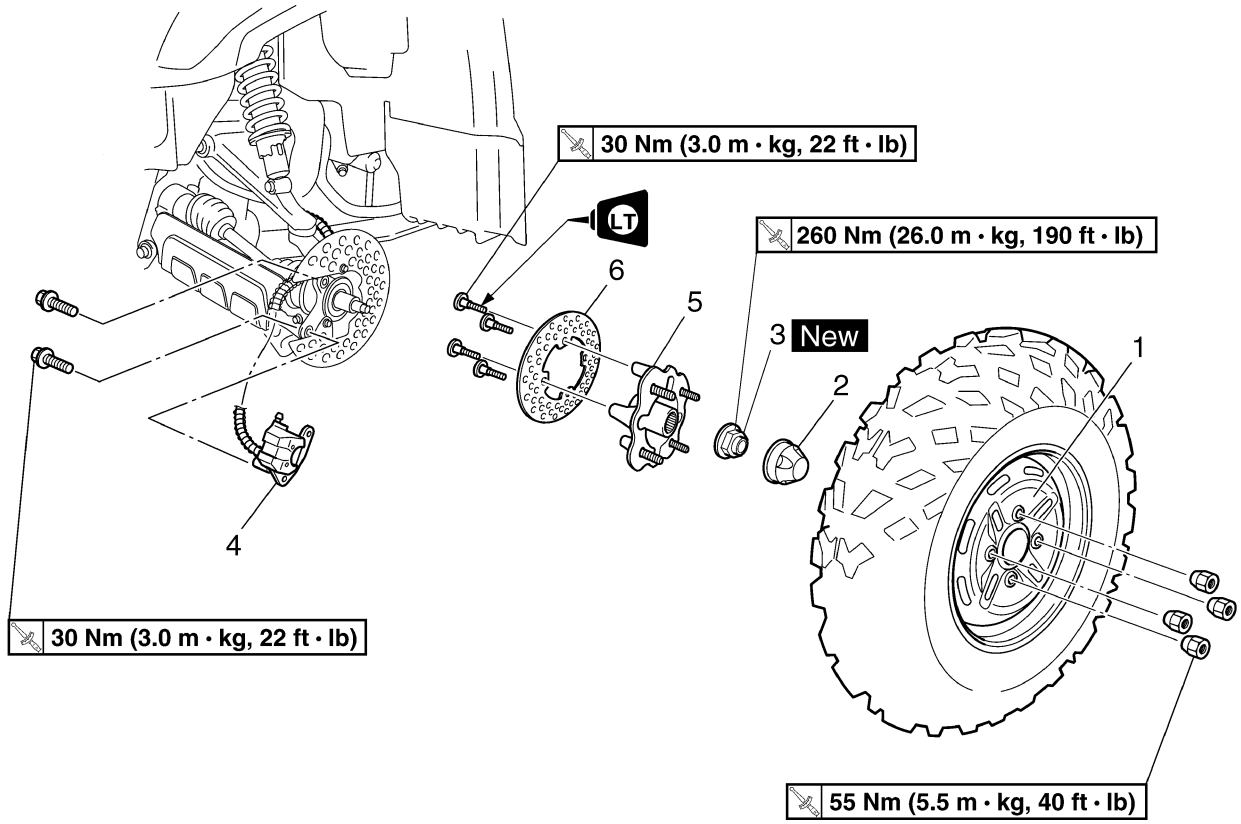
CHASSIS

FRONT AND REAR WHEELS

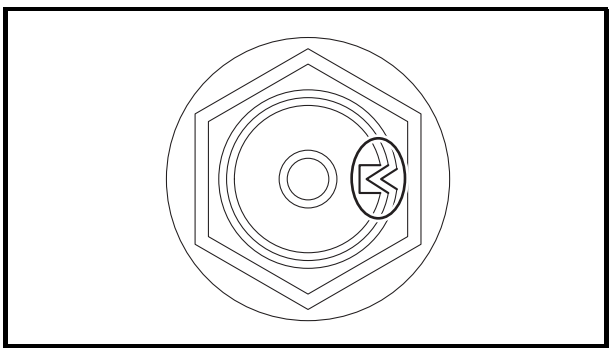
FRONT WHEELS



Order	Job/Part	Q'ty	Remarks
	Removing the front wheels		Remove the parts in the order listed. Place the vehicle on a level surface. **⚠ WARNING** **Securely support the vehicle so there is no danger of it falling over.**
1	Front wheel	1	Refer to "INSTALLING THE WHEEL" in chapter 8. (Manual No.: 5ND-F8197-10)
2	Wheel cap	1	
3	Axle nut	1	Refer to "INSTALLING THE WHEEL HUBS".
4	Brake caliper assembly	1	**NOTE:** Do not squeeze the brake lever when the brake caliper is off of the brake disc as the brake pads will be forced shut.



Order	Job/Part	Q'ty	Remarks
5	Wheel hub	1	
6	Brake disc	1	
			For installation, reverse the removal procedure.



INSTALLING THE WHEEL HUBS

1. Install:
   - axle nut New

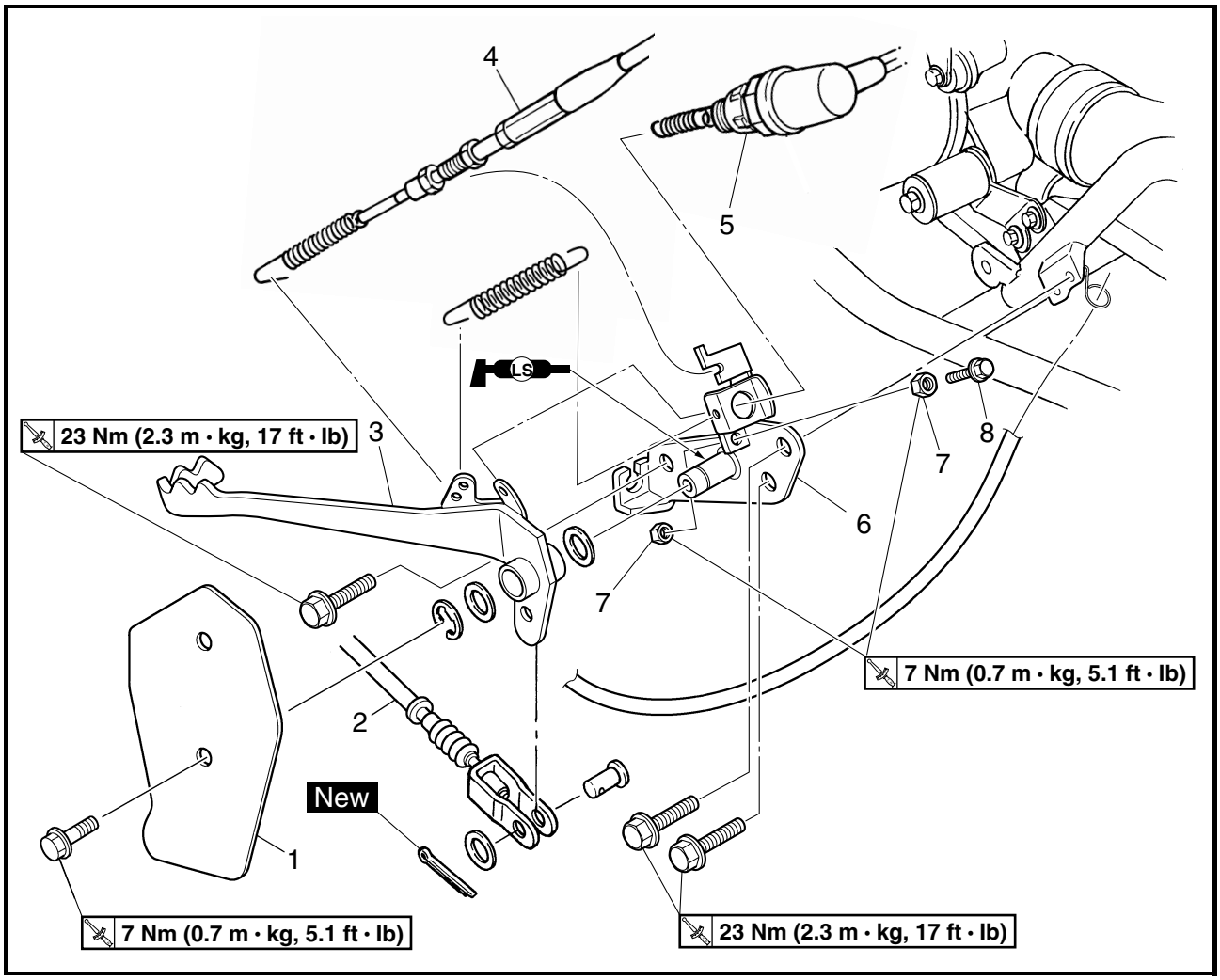
260 Nm (26.0 m · kg, 190 ft · lb)

NOTE:

- Do not apply oil to the seat of the nut.
- After tightening the nut, stake the collar of the nut into the notch of the shaft.

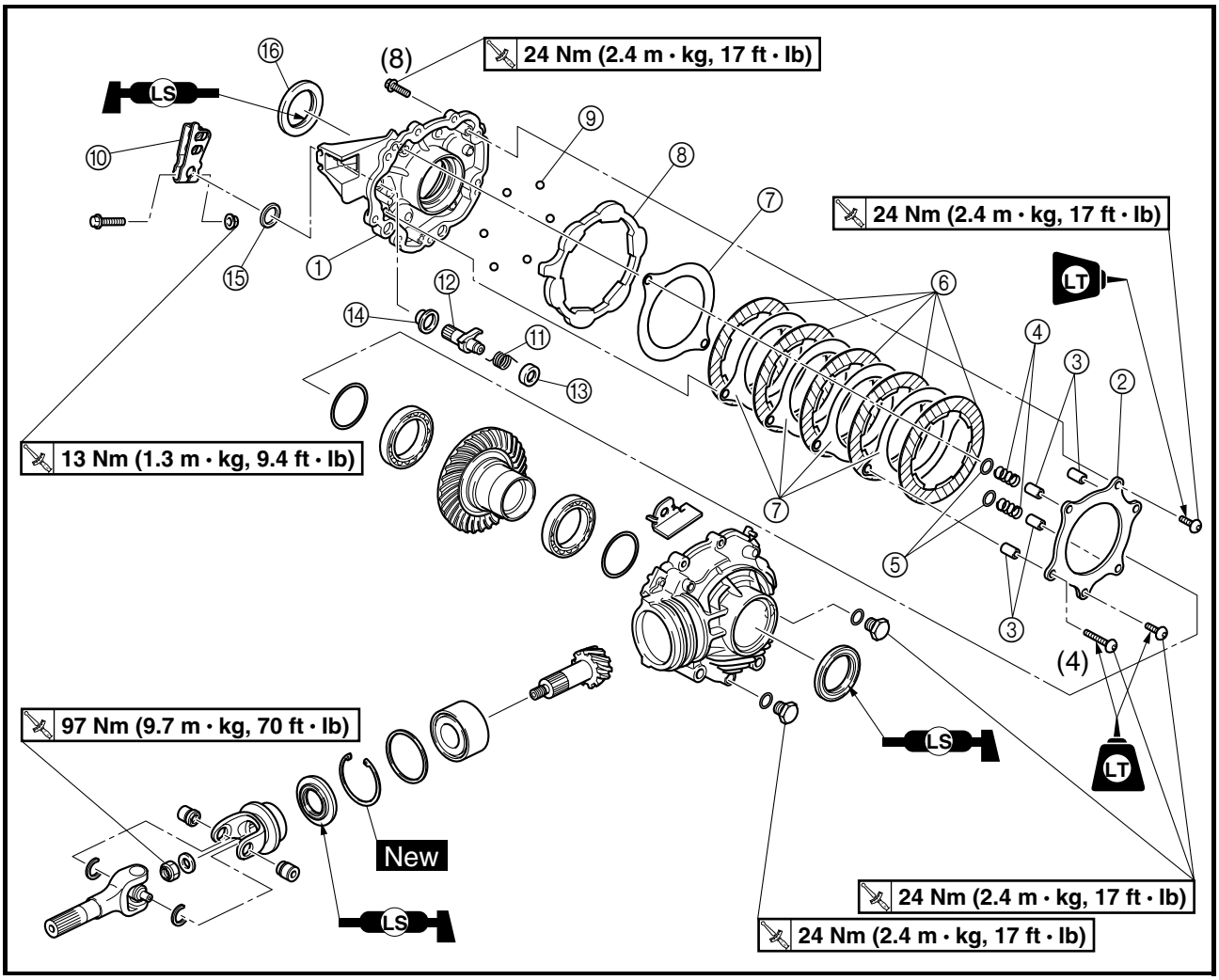
FRONT AND REAR BRAKES

BRAKE PEDAL

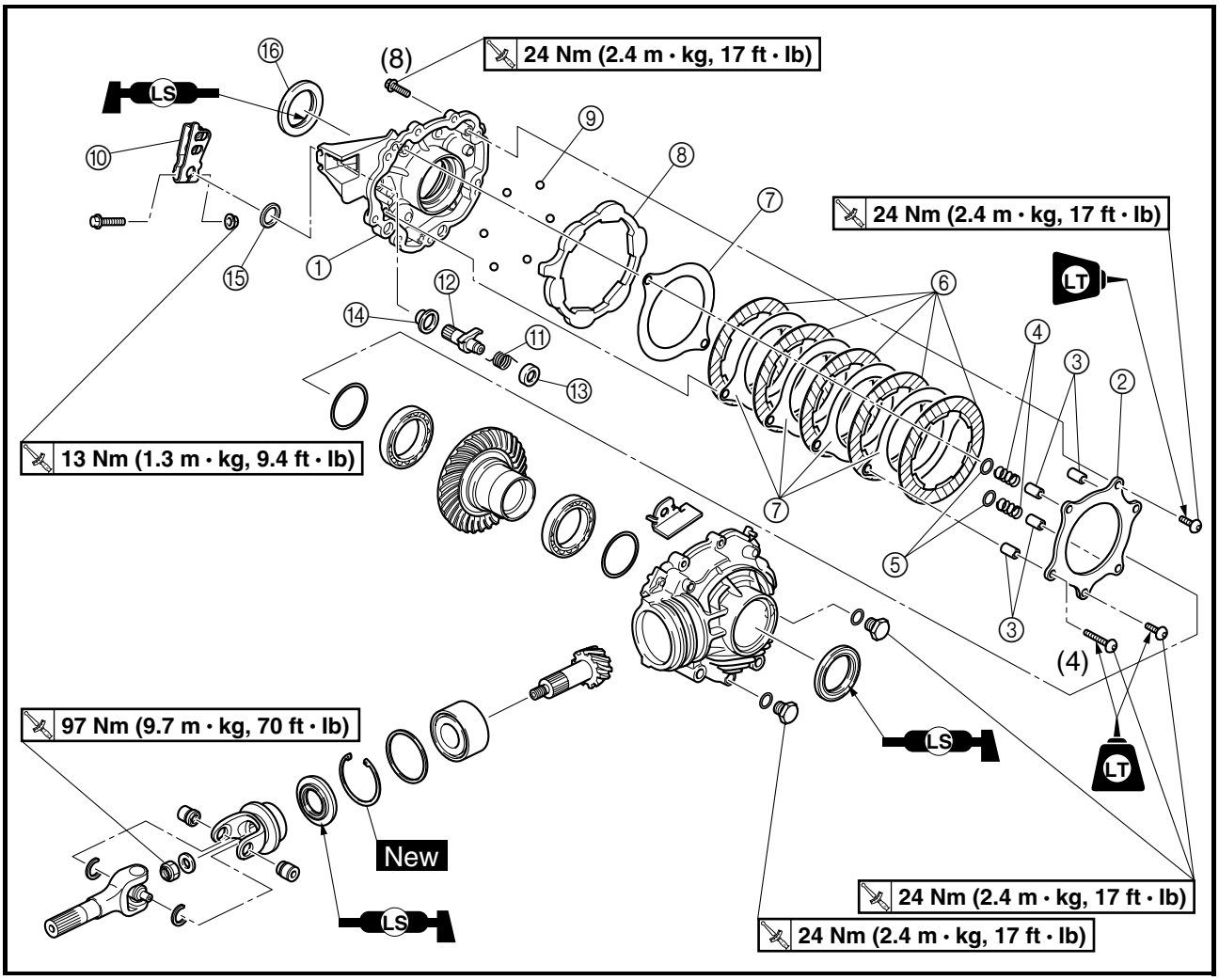


Order	Job/Part	Q'ty	Remarks
	Removing the brake pedal		Remove the parts in the order listed.
1	Brake pedal light switch cover	1	
2	Brake pedal cable	1	Disconnect.
3	Brake pedal	1	
4	Select lever control cable	1	Disconnect.
5	Brake pedal light switch	1	
6	Bracket	1	
7	Locknut	2	
8	Adjusting bolt	1	
			For installation, reverse the removal procedure.

FINAL GEAR CASE (REAR BRAKE)



Order	Job/Part	Q'ty	Remarks
	Disassembling the final gear case (rear brake)		Remove the parts in the order listed.
	Final gear case assembly		Refer to "REAR CONSTANT VELOCITY JOINTS, FINAL DRIVE GEAR AND DRIVE SHAFT"
①	Final gear case (right side)	1	**NOTE:** Working in a crisscross pattern, loosen each bolt 1/4 of a turn. After all the bolts are loosened, remove them.
②	Pressure plate	1	
③	Spacer	4	
④	Rear brake spring	2	
⑤	Washer	2	
⑥	Friction plate	5	

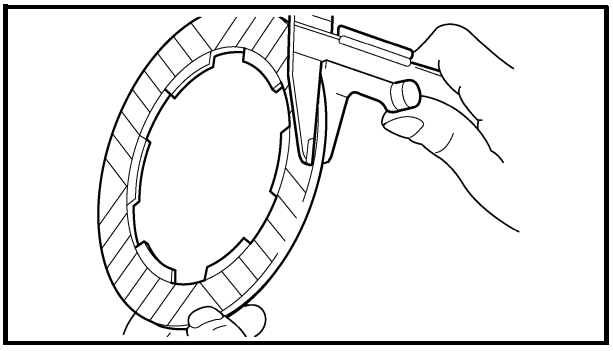


Order	Job/Part	Q'ty	Remarks
⑦	Rear brake plate	5	
⑧	Rear brake cam plate	1	
⑨	Rear brake cam ball	6	
⑩	Rear brake camshaft lever	1	
⑪	Rear brake camshaft spring	1	
⑫	Rear brake camshaft	1	
⑬	Bearing	1	
⑭	Bearing	1	
⑮	Oil seal	1	
⑯	Oil seal	1	
			For assembly, reverse the disassembly procedure.

EBS00300
CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

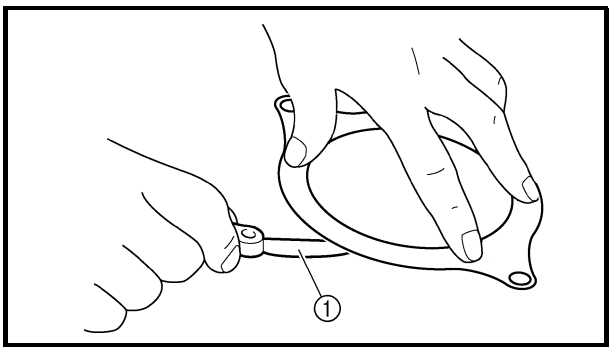
1. Check:
   - friction plate
     Damage/wear → Replace the friction plates as a set.



2. Measure:
   - friction plate thickness
     Out of specification → Replace the friction plates as a set.

NOTE:
Measure the friction plate at four places.

Friction plate thickness
2.37 ~ 2.53 mm
(0.0933 ~ 0.0996 in)
<Limit>: 2.22 mm (0.0874 in)



EBS00301
CHECKING THE REAR BRAKE PLATES

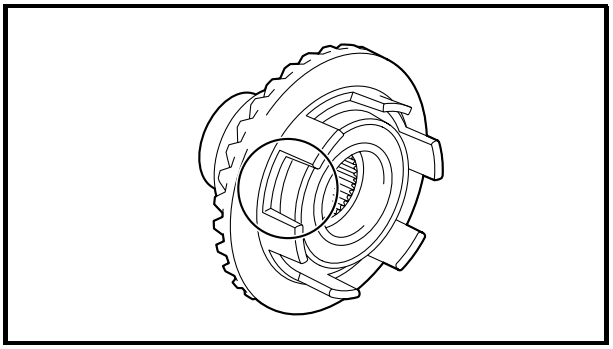
The following procedure applies to all of the rear brake plates.

1. Check:
   - rear brake plate
     Damage → Replace the rear brake plates as a set.
2. Measure:
   - rear brake plate warpage
     (with a surface plate and thickness gauge ①)
     Out of specification → Replace the rear brake plates as a set.

Maximum rear brake plate warpage
0.2 mm (0.0079 in)

EBS00302
CHECKING THE REAR BRAKE SPRINGS
The following procedure applies to all of the rear brake springs.
1. Check:
   - rear brake spring
     Damage → Replace the rear brake springs as a set.

EBS00305
CHECKING THE PRESSURE PLATE
1. Check:
   - pressure plate
     Cracks/damage → Replace.

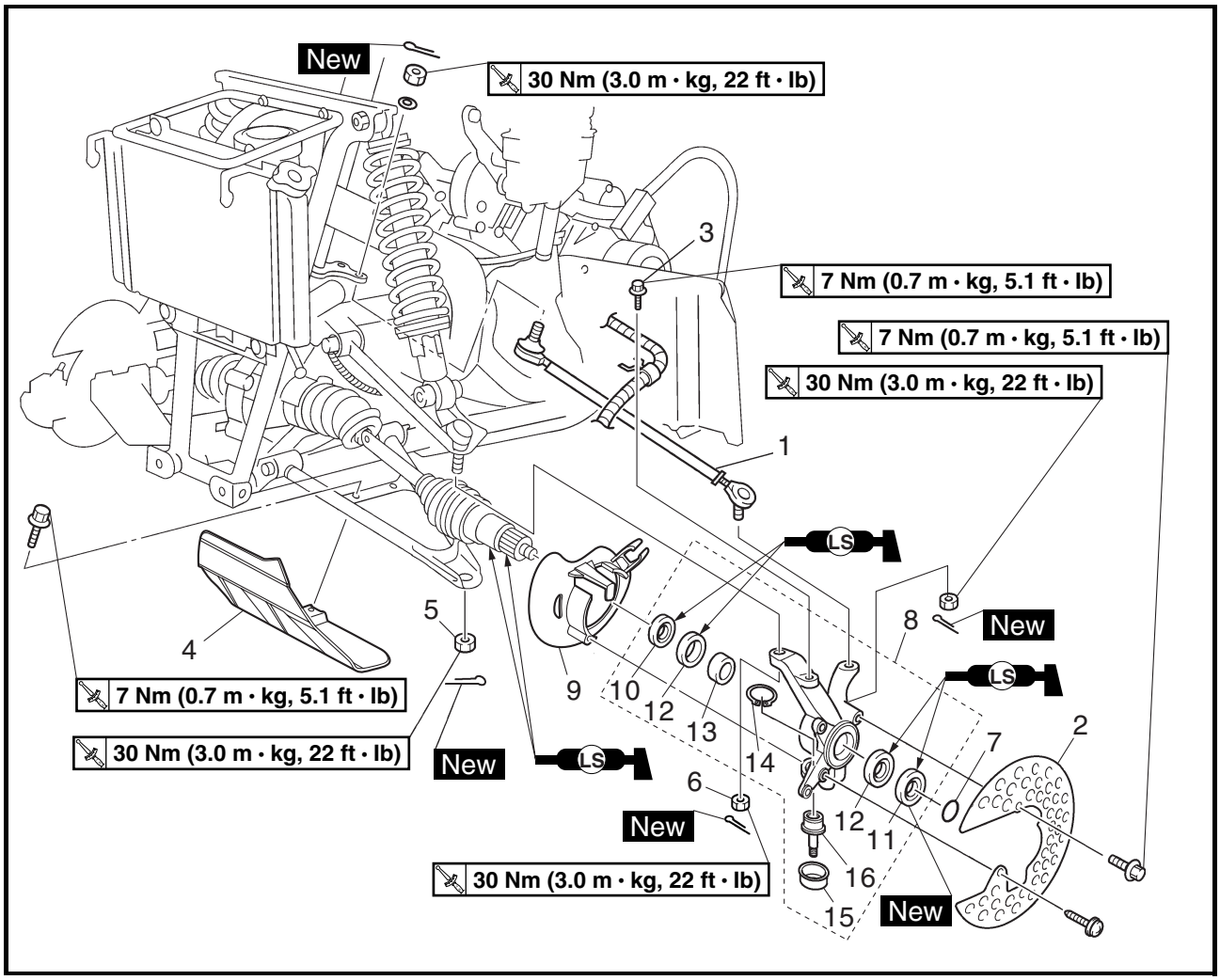


CHECKING THE RING GEAR
1. Check:
   - ring gear dogs
     Damage/pitting/wear → Deburr the ring gear dogs or replace the ring gear.

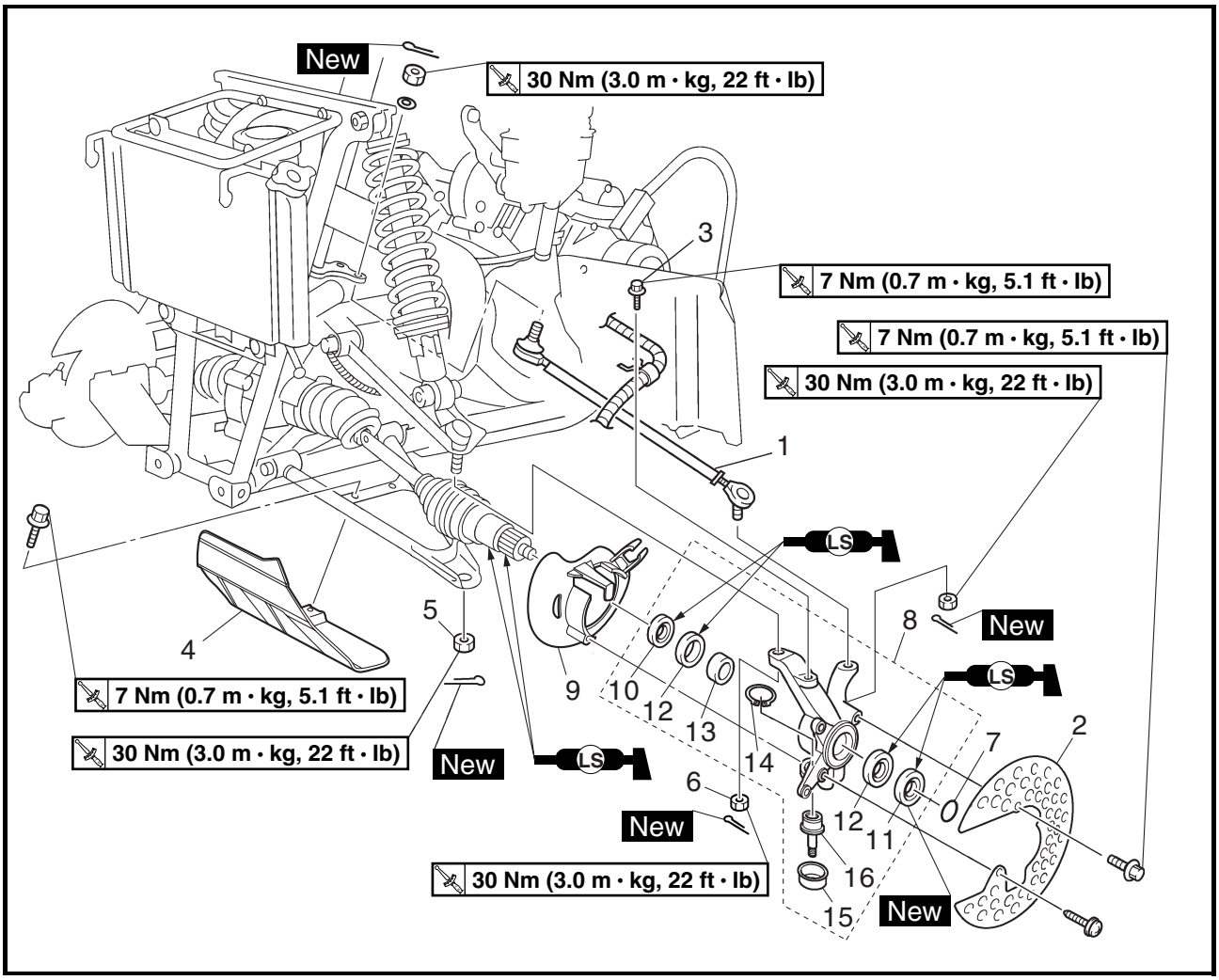
NOTE:
Pitting on the ring gear dogs will cause erratic brake operation.

STEERING SYSTEM

TIE ROD AND STEERING KNUCKLE

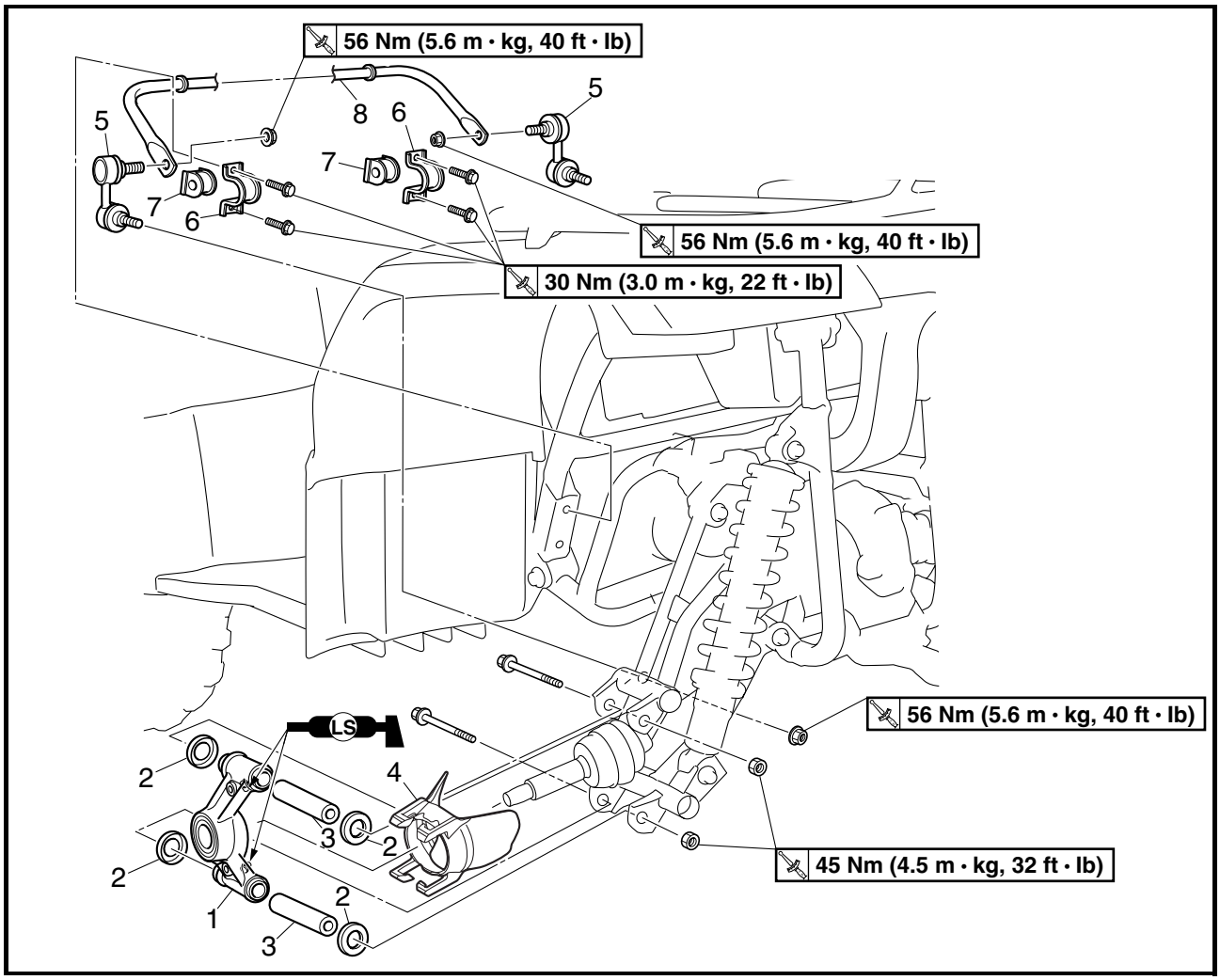


Order	Job/Part	Q'ty	Remarks
	Removing the tie rod and steering knuckle		Remove the parts in the order listed.
	Front fender		Refer to "SEAT, CARRIERS, FENDERS AND FUEL TANK". (Manual No.: 5ND-F8197-12)
	Front wheel/brake disc		Refer to "FRONT AND REAR WHEELS".
1	Tie rod	1	Refer to "INSTALLING THE TIE ROD" in chapter 8. (Manual No.: 5ND-F8197-10)
2	Brake disc guard	1	
3	Brake hose holder bolt	1	
4	Protector	1	
5	Nut	1	
6	Nut	1	
7	O-ring	1	



Order	Job/Part	Q'ty	Remarks
8	Steering knuckle	1	Refer to "REMOVING THE STEERING KNUCKLE" in chapter 8. (Manual No.: 5ND-F8197-10)
9	Mud guard	1	
10	Oil seal	1	
11	Oil seal	1	
12	Bearing	2	
13	Spacer	1	
14	Circlip	1	
15	Rubber boot	1	
16	Ball joint	1	
			For installation, reverse the removal procedure.

REAR KNUCKLES AND STABILIZER



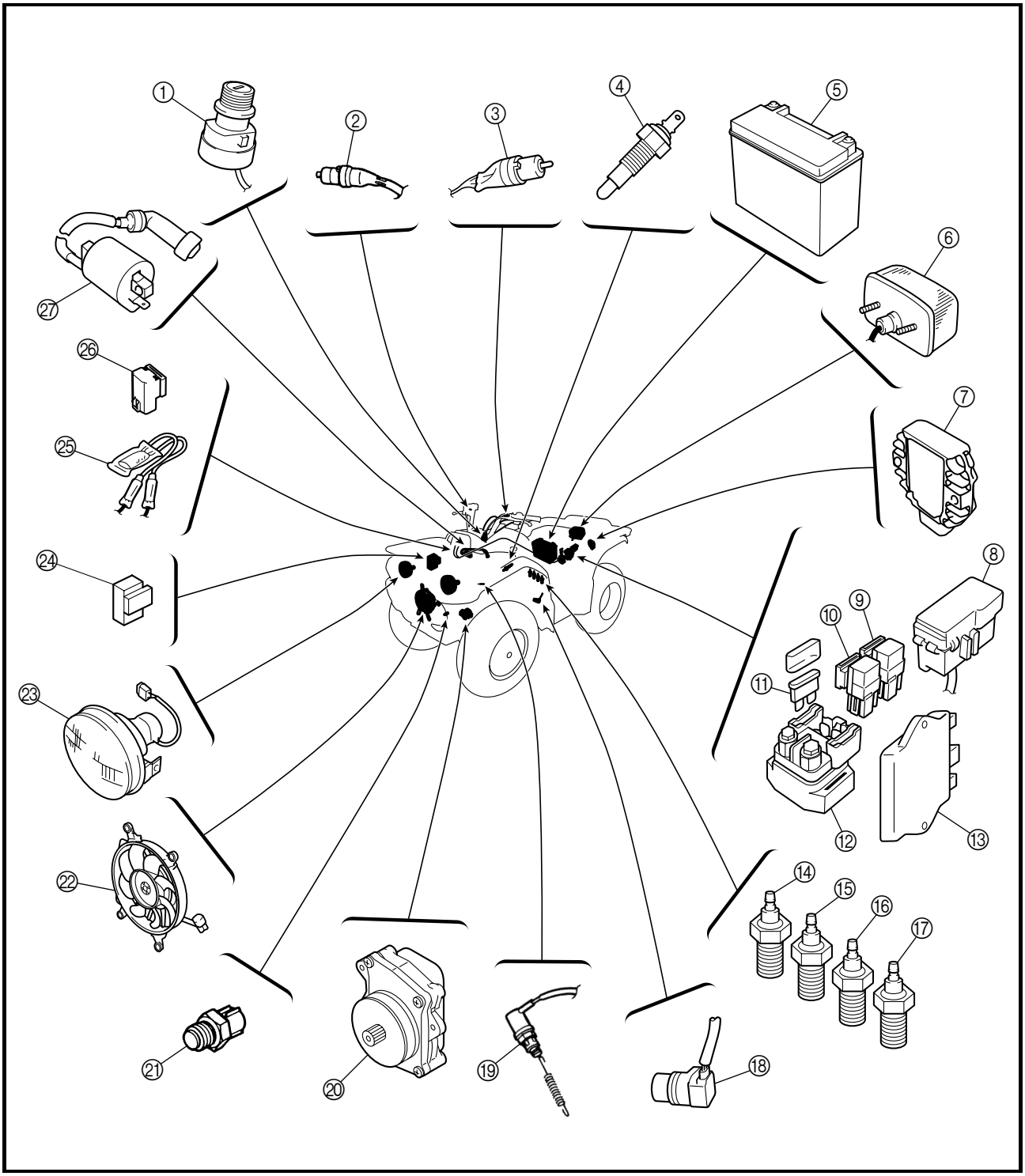
Order	Job/Part	Q'ty	Remarks
	Removing the rear knuckles and stabilizer		Remove the parts in the order listed.
	Rear wheel hubs		Refer to "FRONT AND REAR WHEELS". (Manual No.: 5ND-F8197-12)
1	Rear knuckle	1	
2	Spacer cover	4	
3	Spacer	2	
4	Mud guard	1	
5	Stabilizer joint	2	
6	Stabilizer holder	2	
7	Bushing	2	
8	Stabilizer	1	
			For installation, reverse the removal procedure.

EB800000

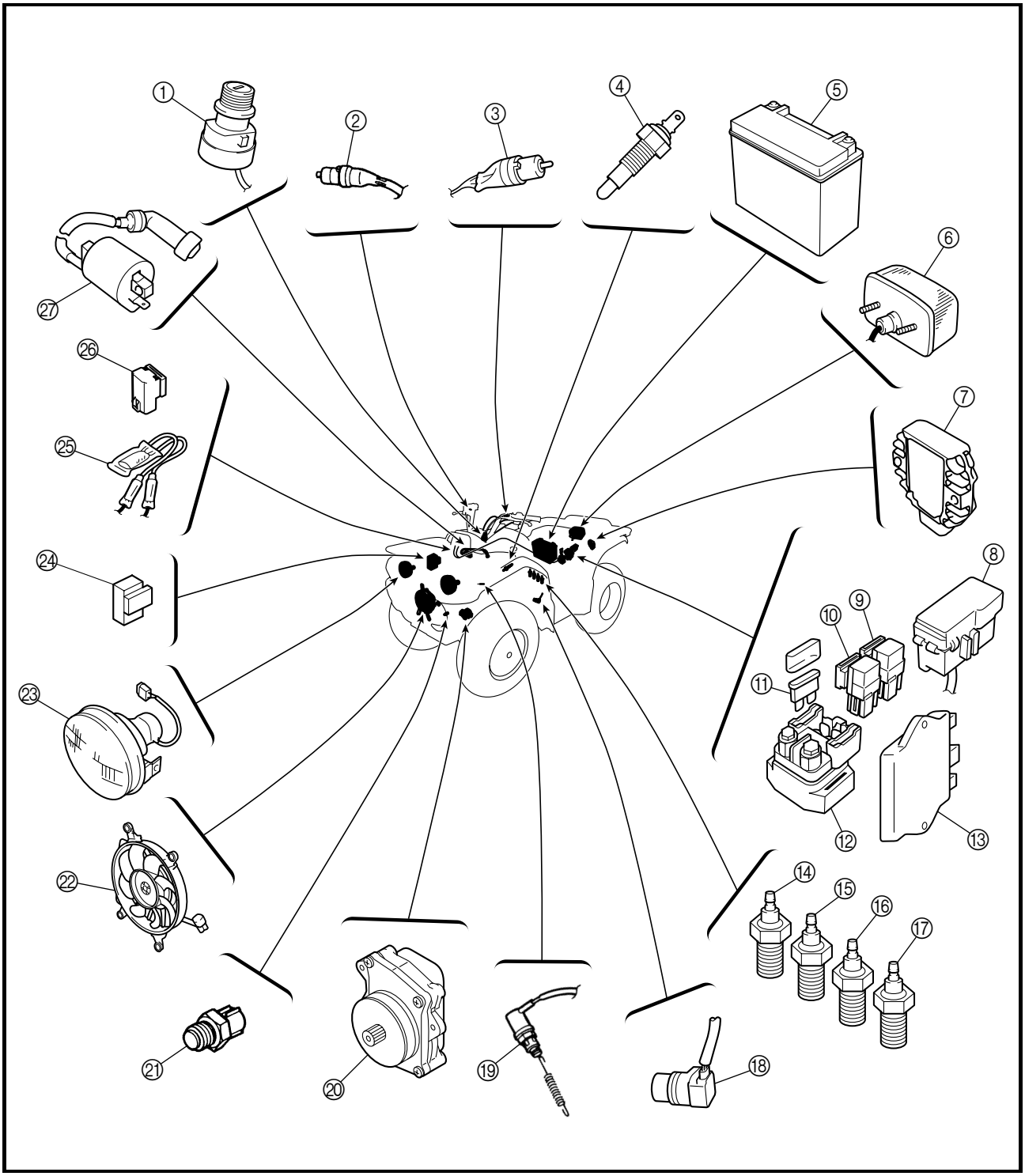
ELECTRICAL

ELECTRICAL COMPONENTS

① Main switch
② Front brake lever light switch
③ Rear brake lever light switch
④ Thermo switch 1
⑤ Battery
⑥ Tail/brake light
⑦ Rectifier/regulator
⑧ Fuse box
⑨ Four-wheel drive relay 2
⑩ Four-wheel drive relay 1
⑪ Main fuse
⑫ Starter relay
⑬ CDI unit
⑭ Reverse switch



⑮ Neutral switch
⑯ High-range switch
⑰ Low-range switch
⑱ Speed sensor
⑲ Brake pedal light switch
⑳ Gear motor
㉑ Thermo switch 2
㉒ Fan
㉓ Headlight
㉔ Headlight relay
㉕ Circuit breaker (fan)
㉖ Four-wheel drive relay 3
㉗ Ignition coil



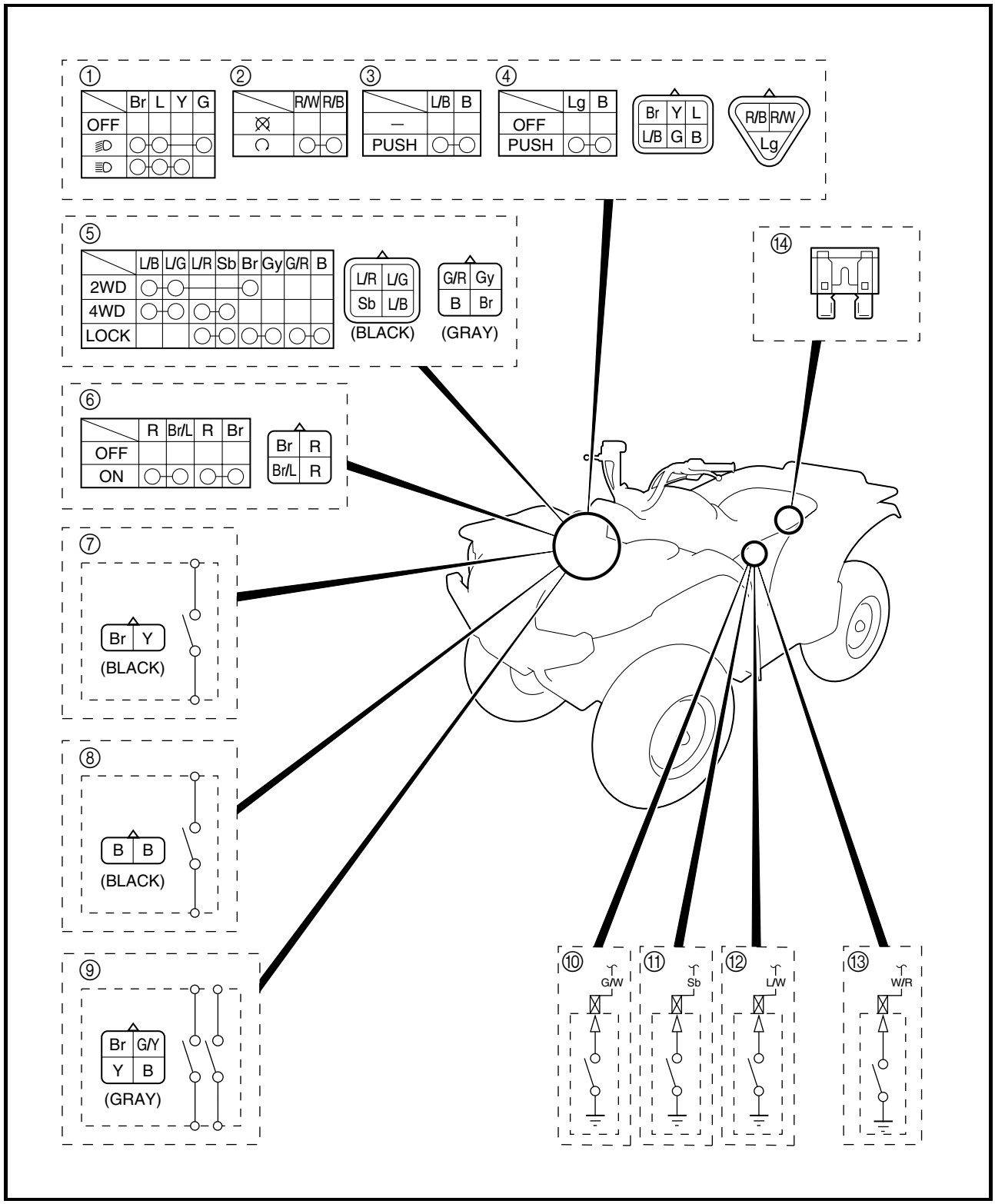
CHECKING THE SWITCHES

CHECKING THE SWITCH CONTINUITY

Refer to “CHECKING THE SWITCH” in chapter 9 (Manual No.: 5ND-F8197-10) and check for continuity between lead terminals.

Poor connection, no continuity → Correct or replace.

* The coupler locations are circled.

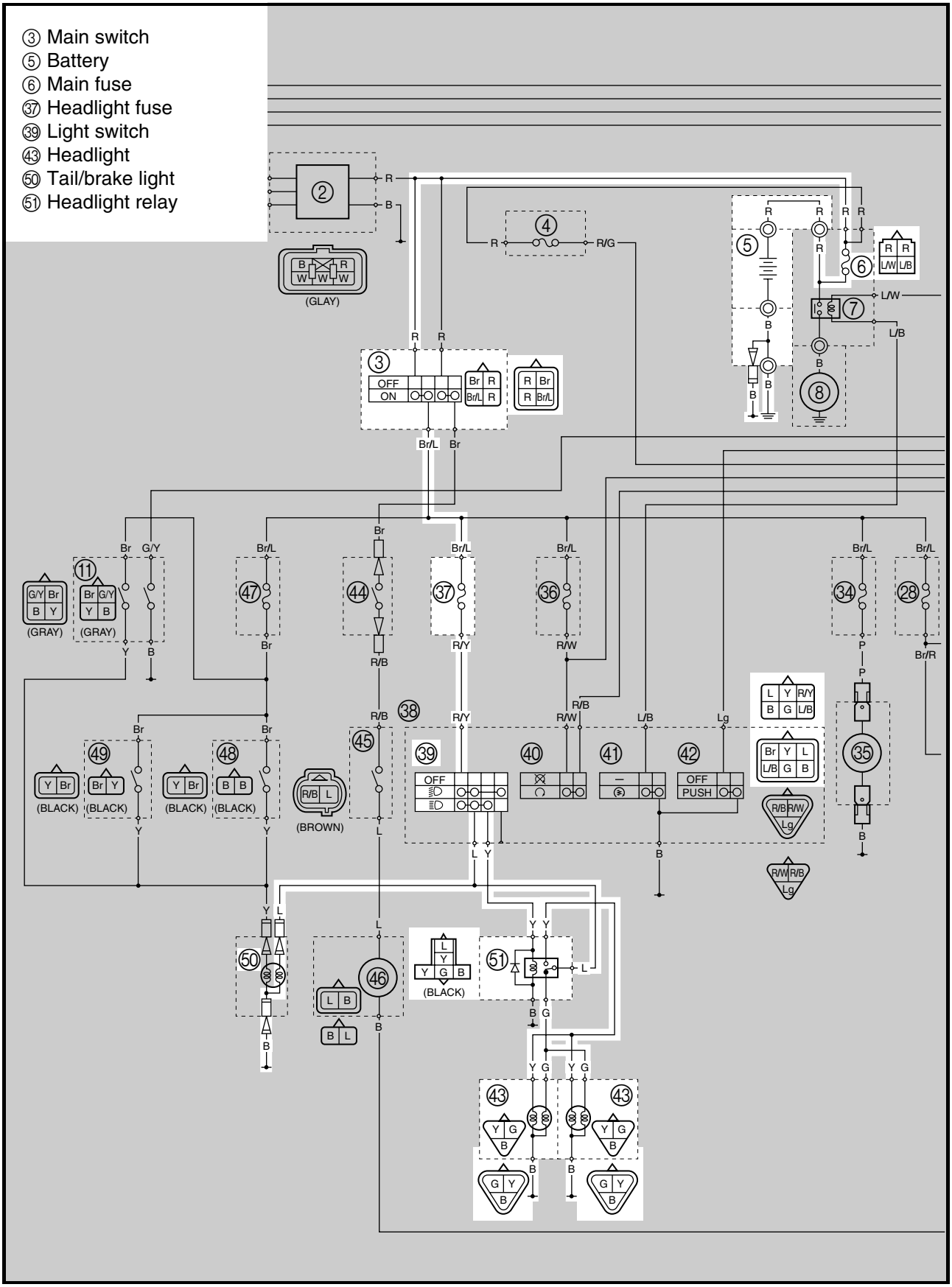


① Light switch
② Engine stop switch
③ Start switch
④ Override switch
⑤ On-command four-wheel drive switch and differential gear lock switch
⑥ Main switch
⑦ Brake pedal light switch
⑧ Front brake lever light switch
⑨ Rear brake lever light switch
⑩ Reverse switch
⑪ Neutral switch
⑫ High-range switch
⑬ Low-range switch
⑭ Fuse

EBS00518

LIGHTING SYSTEM

CIRCUIT DIAGRAM



EBS01067
TROUBLESHOOTING

Any of the following fail to light: headlights or taillight.

Check:
1. main and headlight fuses
2. battery
3. main switch
4. light switch
5. wiring connections
   (of the entire lighting system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. seat
2. front fender
3. rear fender

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112
Analog pocket tester
YU-03112-C

EBS01043

1. Main and headlight fuses
- Check the main and headlight fuses for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Are the main and headlight fuses OK?

YES → NO → Replace the fuse(s).

EBS01044

2. Battery
- Check the condition of the battery.
  Refer to “CHECKING THE BATTERY” in chapter 3. (Manual No.: 5ND-F8197-10)

Minimum open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES → NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EBS01041

3. Main switch
- Check the main switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES → NO → Replace the main switch.

EBS01068

4. Light switch
- Check the light switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the light switch OK?

YES → NO → Replace the handlebar switch.

EBS01069

5. Wiring

- Check the entire lighting system wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the lighting system wiring properly connected and without defects?

YES → Check the condition of each of the lighting system circuits. Refer to “CHECKING THE LIGHTING SYSTEM”.

NO → Properly connect or repair the lighting system wiring.

EBS01070

CHECKING THE LIGHTING SYSTEM

1. The headlight fail to come on.

1. Headlight bulb and socket

- Check the headlight bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS” in chapter 9. (Manual No.: 5ND-F8197-10)
- Are the headlight bulb and socket OK?

YES

NO → Replace the headlight bulb, socket or both.

2. Headlight relay

- Remove the headlight relay.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the headlight relay as shown.

A low beam

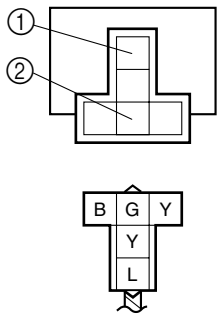
Positive tester probe → blue ①
Negative tester probe → green ②

B high beam

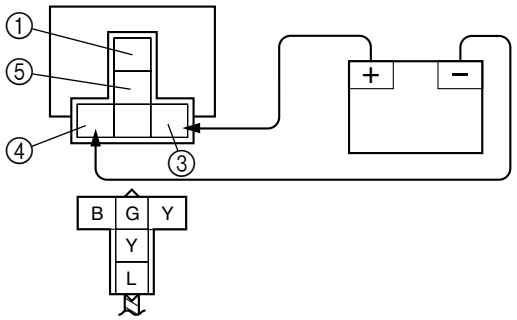
Positive battery terminal → yellow ③
Negative battery terminal → black ④

Positive tester probe → blue ①
Negative tester probe → yellow ⑤

A



B



- Does the headlight relay have continuity between blue and green? A
- Does the headlight relay have continuity between blue and yellow? B

YES

NO → Replace the headlight relay.

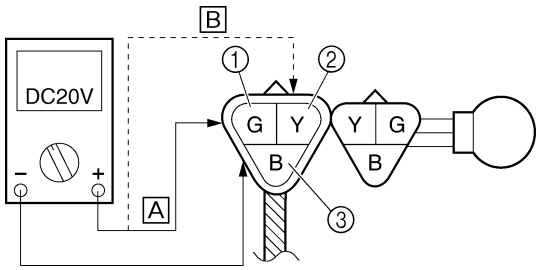
3. Voltage

- Connect the pocket tester (DC 20 V) to the headlight couplers as shown.

A When the light switch is set to "≣O".
B When the light switch is set to "≡O".

Headlight coupler (wire harness side)

Headlight
Positive tester probe →
green ① or yellow ②
Negative tester probe → black ③



- Set the main switch to "ON".
- Set the light switch to "≣O" or "≡O".
- Measure the voltage (DC 12 V) of green ① or yellow ② on the headlight coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.

YFM45FGX 2008 WIRING DIAGRAM

① AC magneto
② Rectifier/regulator
③ Main switch
④ Backup fuse
⑤ Battery
⑥ Main fuse
⑦ Starter relay
⑧ Starter motor
⑨ Reverse switch
⑩ CDI unit
⑪ Rear brake lever light switch
⑫ Ignition coil
⑬ Spark plug
⑭ Speed sensor
⑮ Thermo switch 1
⑯ Meter assembly
⑰ Multi-function meter
⑱ Differential gear lock indicator light
⑲ Coolant temperature warning light
⑳ Reverse indicator light
㉑ Neutral indicator light
㉒ Park indicator light
㉓ High-range indicator light
㉔ Low-range indicator light
㉕ Low-range switch
㉖ High-range switch
㉗ Neutral switch
㉘ Four-wheel drive fuse
㉙ Four-wheel drive relay 1
㉚ Four-wheel drive relay 2
㉛ Four-wheel drive relay 3
㉜ On-command four-wheel drive switch and differential gear lock switch
㉝ Gear motor
㉞ Auxiliary DC jack fuse
㉟ Auxiliary DC jack
㊱ Ignition fuse
㊲ Headlight fuse
㊳ Handlebar switch
㊴ Light switch
㊵ Engine stop switch
㊶ Start switch
㊷ Override switch
㊸ Headlight
㊹ Circuit breaker (fan motor)
㊺ Thermo switch 2
㊻ Fan motor
㊼ Signaling system fuse
㊽ Front brake lever light switch
㊾ Brake pedal light switch
㊿ Tail/brake light
(51) Headlight relay

COLOR CODE

B	Black
Br	Brown
G	Green
L	Blue
Lg	Light green
O	Orange
P	Pink
R	Red
Sb	Sky blue
Gy	Gray
W	White
Y	Yellow
B/R	Black/Red
B/W	Black/White
B/Y	Black/Yellow
Br/B	Brown/Black
Br/L	Brown/Blue
Br/R	Brown/Red
G/L	Green/Blue
G/R	Green/Red
G/W	Green/White
G/Y	Green/Yellow
L/B	Blue/Black
L/G	Blue/Green
L/R	Blue/Red
L/W	Blue/White
L/Y	Blue/Yellow
O/R	Orange/Red
R/B	Red/Black
R/G	Red/Green
R/W	Red/White
R/Y	Red/Yellow
W/B	White/Black
W/G	White/Green
W/L	White/Blue
W/R	White/Red
Y/B	Yellow/Black

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YFM45FGX 2008 WIRING DIAGRAM