FOREWORD

This manual covers the service procedures of the TOYOTA FORKLIFT 5FG/5FD33 ~ 45 series. Please use this manual for providing quick, correct servicing of the corresponding forklift models.

This manual has been edited by combining Repair Manual Pub. No. CE005 as Part I (Sections 0 to 15) and Repair Manual (Supplement) Pub. No. CE014. as Part 11 (Sections 0 to 4).

Part I explains the service procedures for the models produced since August, 1988 while Part II covers those for the models subject to the minor change in September, 1994. For servicing the vehicles after the minor change, please refer to both Part I and Part II.

Please understand that disagreement can take place between the descriptions in the manual and actual vehicles due to change in design and specifications. Any change or modifications thereafter will be informed by Toyota Industrial Equipment Parts & Service News.

For the service procedures of the mounted engine, read the repair manuals listed below as reference together with this manual.

(Reference)

Repair manuals related to this manual are as follows:

TOYOTA INDUSTRIAL EQUIPMENT 3F ENGINE
REPAIR MANUAL (No. CE614)

TOYOTA INDUSTRIAL EQUIPMENT 1FZ ENGINE
REPAIR MANUAL (No. CE627)

TOYOTA INDUSTRIAL EQUIPMENT 11Z, 12Z ENGINE
REPAIR MANUAL (No. CE615-1)

TOYOTA MOTOR CORPORATION

PART Ⅰ : 1988. 8~
SECTION INDEX (CE005)

GENERAL

EXTERIOR VIEWS

Front View (5FD35) LAQ72-1

Rear View (5FD35) LAQ72-2

VEHICLE LISTING

Load capacity	Model	Engine model	Engine type	Drive system	Remarks
3.25 ton	5FG33	3F	Gasoline	Clutch	Wheelbase 1800 mm (71 in)
	02-5FG33	↑	↑	Torgue converter	
	5FD33	11Z	Diesel	Clutch	
	02-5FD33	↑	↑	Torque converter	
3.5 ton	5FG35	3F	Gasoline	Clutch	
	02-5FG35	↑	t	Torque converter	
	5FD35	11Z	Diesel	Clutch	
	02-5FD35	↑	↑	Torque converter	
	5FGE35	3F	Gasoline	Clutch	Wheelbase 2000 mm (78.5 in)
	02-5FGE35	↑	↑	Torque converter	
	5FDE35	11Z	Diesel	Clutch	
	02-5FDE35	↑	↑	Torque converter	
4.0 ton	5FG40	3F	Gasoline	Clutch	
	02-5FG40	↑	↑	Torque converter	
	5FD40	11Z	Diesel	Clutch	
	02-5FD40	↑	↑	Torque converter	
4.5 ton	5FG45	3F	Gasoline	Clutch	
	02-5FG45	↑	↑	Torque converter	
	5FD45	11Z	Diesel	Clutch	
	02-5FD45	↑	↑	Torque converter	

ABBREVIATIONS

Abbreviations used in this manual are as follows:

Abbreviation (Code)	Meaning	Abbreviation (Code)	Meaning
ABDC	After button dead center	PS	Horsepower
ASSY	Assembly	P/S	Power steering
ATDC	After top dead center	RH	Right hand
ATM	Automatic transmission	SAE	Society of automotive engineers (USA)
BTDC	Before top dead center		
L/	Less	SST	Special service tool
LH	Left hand	STD	Standard
LLC	Long life coolant	SUB-ASSY	Sub-assembly
MTM	Manual transmission	T =	Tightening torque
OHV	Overhead valve	OOT	Number of teeth (00)
OPT	Option	U/S	Undersize
O/S	Oversize	w/	With

OPERATIONAL TIPS

1. Safe operation
   (1) Make sure that correct size wire is used for hoisting a heavy material.
   (2) After jacking up, always support with rigid racks or stands.

2. Preparation of SSTs and measuring tools
   (1) Prepare SSTs and measuring tools before starting operation.

3. Clearing and arrangement
   (1) Always keep the workshop neat and orderly for easy operation.
   (2) Disassembly of hydraulic equipment shall always be done in a clean place using clean tools.

4. Genuine Toyota parts
   Genuine Toyota parts should be used even in the replacement of packings, gaskets and O-rings.

5. Repairs on electrical system
   Before doing any repairs on the electical system, disconnect the cables from the battery terminals. Be sure to disconnect the negative ⊖ cable first.

6. Tightening torque for installation
   Be sure to observe the tightening torque given in this manual. If not specified, tighten to the torque listed in standard bolt & nut tightening torque.

7. Defect status grasp
   Do not start disassembly and replacement as soon as a defect is found, but first grasp whether the defect requires disassembly and replacement. In the case of torque converter for example, do not attempt torque converter disassembly upon a failure in starting the vehicle, but first check such factors as the oil, pressure and rotation status causing the failure.

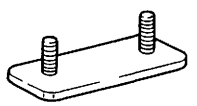
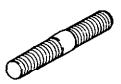
STANDARD BOLT & NUT TIGHTENING TORQUE

Standard bolt and nut tightening torques are not indicated.
Judge the standard tightening torque as shown below.

1. Find out the straight type of bolt from the list below and then find the bolt tightening torque from the table.
2. The nut tightening torque can be judged from the mating bolt type.

BOLT STRENGTH TYPE IDENTIFICATION METHOD

1. Identification by bolt shape

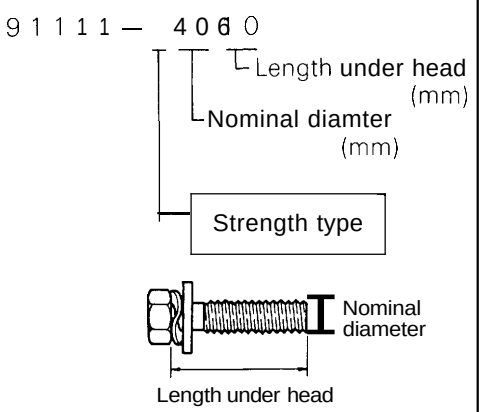
	Shape and identification method		Strength type
Standard hexagon bolt		Number in relief or hallmark on the head	4 = 4T 5 = 5T 6 = 6T 7 = 7T
		No mark	4T
Flanged hexagon bolt		No mark	4T
Standard hexagon bolt		Standard bolt with two relief lines on the head	5T
Flanged hexagon bolt		Standard bolt with two relief lines on the head	6T
Standard hexagon bolt		Standard bolt with three relief lines on the head	7T
Weld bolt			4T
Stud bolt		No mark	6T
		Approximately 2 mm (0.08 in) hollow on eigher or both ends	

BAHS28

2. Identification by part No.

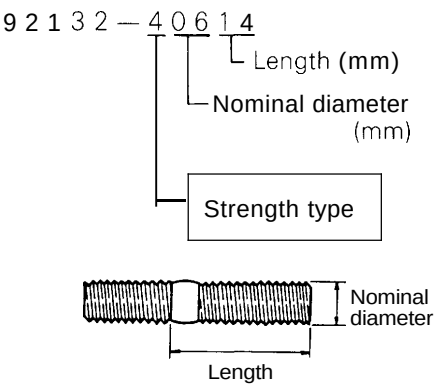
Hexagon bolt

Part No. example



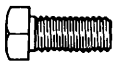
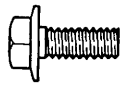
Stud bolt

Part No. example



BAHS25

TIGHTENING TORQUE TABLE

Strength type	Nominal diameter mm	Pitch mm	Standard tightening torque kg-cm (ft-lb)	
			Standard 	Flanged 
4T	6	1.0	55 (4.0)	60 (4.3)
	8	1.25	130 (9.4)	145 (10.5)
	10	1.25	260 (18.8)	290 (20.9)
	12	1.25	480 (34.7)	540 (39.0)
	14	1.5	760 (54.9)	850 (61.4)
	16	1.5	1150 (83.0)	–
5T	6	1.0	65 (4.7)	–
	8	1.25	160 (11.6)	–
	10	1.25	330 (23.8)	–
	12	1.25	600 (43.3)	–
	14	1.5	930 (67.1)	–
	16	1.5	1400 (101.1)	–
6T	6	1.0	80 (5.8)	90 (6.5)
	8	1.25	195 (14.1)	210 (15.2)
	10	1.25	400 (28.9)	440 (31.8)
	12	1.25	730 (52.7)	810 (58.5)
	14	1.5	1100 (79.4)	1250 (90.3)
7T	6	1.0	110 (7.9)	230 (8.7)
	8	1.25	260 (18.8)	290 (20.9)
	10	1.25	530 (38.3)	590 (42.6)
	12	1.25	970 (70.0)	1050 (75.8)
	14	1.5	1500 (108.3)	1700 (122.7)
	16	1.5	2300 (166.1)	–

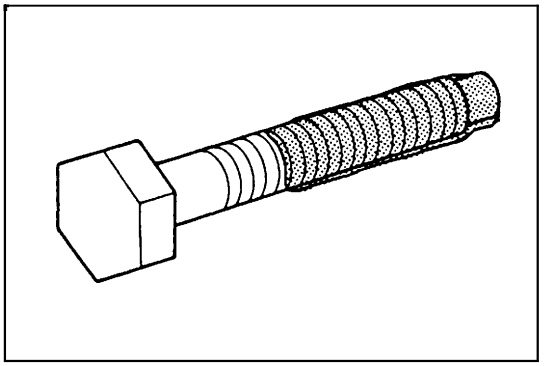
BAHS26

PRECOAT BOLTS

(Bolts with seal lock agent coating on threads)

1. Do not use the precoat bolt as it is in either of the following cases:
   (a) After it is removed.
   (b) When the precoat bolt is moved (loosened or tightened) by tightness check, etc.

   Note:
   For torque check, use the lower limit of the allowable tightening torque range. If the bolt moves, retighten it according to the steps below.



Precoat Bolts B4460 (JAES96)

2. Method for reuse of precoat bolts
   (1) Wash the bolt and threaded hole. (The threaded hole must be washed even for replacement of the bolt.)
   (2) Perfectly dry the washed parts by air blowing.
   (3) Coat the specified seal lock agent to the threaded portion of the bolt.

HIGH PRESSURE HOSE FITTING TIGHTENING TORQUE

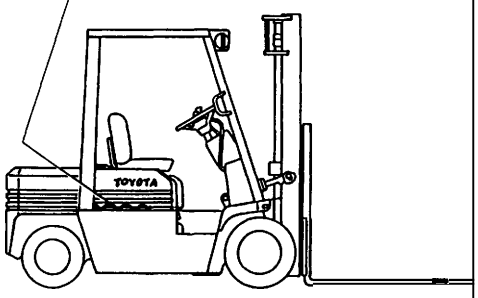
1. When connecting a high pressure hose, wipe the hose fitting and mating nipple contact sufaces with clean cloth to remove foreign matters and dirt. Also check no dent or other damage on the contact surfaces before installation.

2. When connecting a high pressure hose, hold the hose to align the fitting with the nipple and tighten the fitting.

3. The maximum tightening torque must not exceed twice the standard tightening torque.

Nominal diameter of screw	Standard tightening torque kg-cm (ft-lb)		Hose inside diameter (mm)
	Standard	Tightening range	
7/16 — 20 UNF	2.5 (18.1)	2.4 ~ 2.6 (17.4 ~ 18.8)	6
9/16 — 18 UNF	5.0 (36.2)	4.8 ~ 5.3 (34.7 ~ 38.3)	9
3/4 — 16 UNF	6.0 (43.4)	5.7 ~ 6.3 (41.2 ~ 45.5)	12
7/8 — 14 UNF	6.0 (43.4)	5.7 ~ 6.3 (41.2 ~ 45.5)	12
1 1/16 — 12 UNF	12.0 (86.6)	11.4 ~ 12.6 (82.4 — 91.1)	19
1 5/16 — 12 UNF	14.0 (101.2)	13.3 ~ 14.7 (96.2 ~ 106.3)	25
PF1/4	5.0 (36.2)	4.8 ~ 5.3 (34.7 ~ 38.3)	9
PF3/8	5.0 (36.2)	4.8 ~ 5.3 (34.7 ~ 38.3)	9
PF1/2	6.0 (43.4)	5.7 ~ 6.3 (41.2 ~ 45.5)	12
PF3/4	12.0 (86.8)	11.4 ~ 12.6 (82.4 ~ 91.1)	19
PF1	14.0 (101.2)	13.3 ~ 14.7 (96.2 ~ 106.3)	25

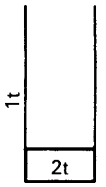
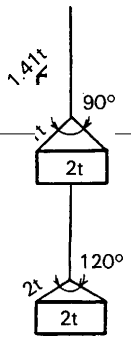
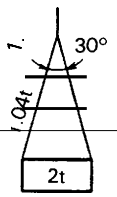
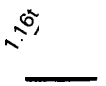
FRAME NUMBER

Engine	Model	Punching format	Punching ,position
3F	5FG 33	*1 5FG35—10011 "2 5FG35E10011 "3 5FG35—20011 *4 5FG35E20011 "5 5FG35©20011	Frame No. punching position 
	02—5FG 33		
	5FG 35		
	02—5FG 35		
11Z	5FD 33	*1 5FD35—10011 "2 5FD35E10011 "3 5FD35—20011 "4 5FD35E20011 *5 5FD35©20011	
	02—5FD 33		
	5FD 35		
	02—5FD 35		
3F	5FGE35	*1 5FG45—10011 "2 5FG45E10011 "3 5FG45—20011 "4 5FG45E20011 *5 5FG45©20011	
	02—5FGE35		
	5FG 40		
	02—5FG 40		
	5FG 45		
	02—5FG 45		
11Z	5FDE35	*1 5FD45—10011 "2 5FD45E10011 "3 5FD45—20011 "4 5FD45E20011 *5 5FD45©20011	
	02—5FDE35		
	5FD 40		
	02—5FD 40		
	5FD 45		
	02—5FD 45		

*1 1988.6—1993.3
"2 1992.11—1993.3 (EEC spec.)
"3 1993.4~
*4 1993.4—1993.9 (EEC spec.)
"5 1993.10~(EEC spec.)

LAQS129

WIRE ROPE SUSPENSION ANGLE LIST

Lifting angle	Tension	Compression	Suspension method	Lifting angle	Tension	Compression	Suspension method
0°	1.00 time	0 time		90°	1.41 time	1.00 time	
30°	1.04 time	0.27 time		120°	2.00 time	1.73 time	
60°	1.16 time	0.58 time					

JAEM88

SAFE LOAD FOR EACH WIRE ROPE SUSPENSION ANGLE

Unit: ton (lb)

Rope diameter	Cutting load	Single-rope suspension	Two-rope suspension				Four-rope suspension			
		0°	0°	30°	60°	90°	0°	30°	60°	90°
6 mm (0.24 in.)	2.18 (4807)	0.31 (683.6)	0.62 (1367)	0.6 (1323)	0.53 (1169)	0.44 (970)	1.24 (2734)	1.2 (2646)	1.06 (2337)	0.88 (1940)
8 mm (0.32 in.)	3.21 (7078)	0.45 (992.3)	0.9 (1985)	0.87 (1918)	0.78 (1720)	0.64 (1411)	1.8 (3969)	1.74 (3937)	1.56 (3440)	1.28 (2822)
10 mm (0.4in.)	5.02 (11069)	0.71 (1565.6)	1.43 (3153)	1.37 (3021)	1.2 (2646)	1.0 (2205)	2.8 (6174)	2.7 (5954)	2.4 (5292)	2.0 (4410)
12.5 mm (0.5 in.)	7.84 (17387)	1.12 (2469.5)	2.2 (4851)	2.1 (4631)	1.9 (4190)	1.5 (3308)	4.4 (9702)	4.2 (9261)	3.8 (8379)	3.0 (6615)
14 mm (0.56in)	9.83 (21675)	1.4 (3087)	2.8 (6174)	2.7 (5954)	2.4 (5292)	1.9 (4190)	5.6 (12348)	5.4 (11907)	4.8 (10584)	3.8 (8379)

COMPONENTS WEIGHT

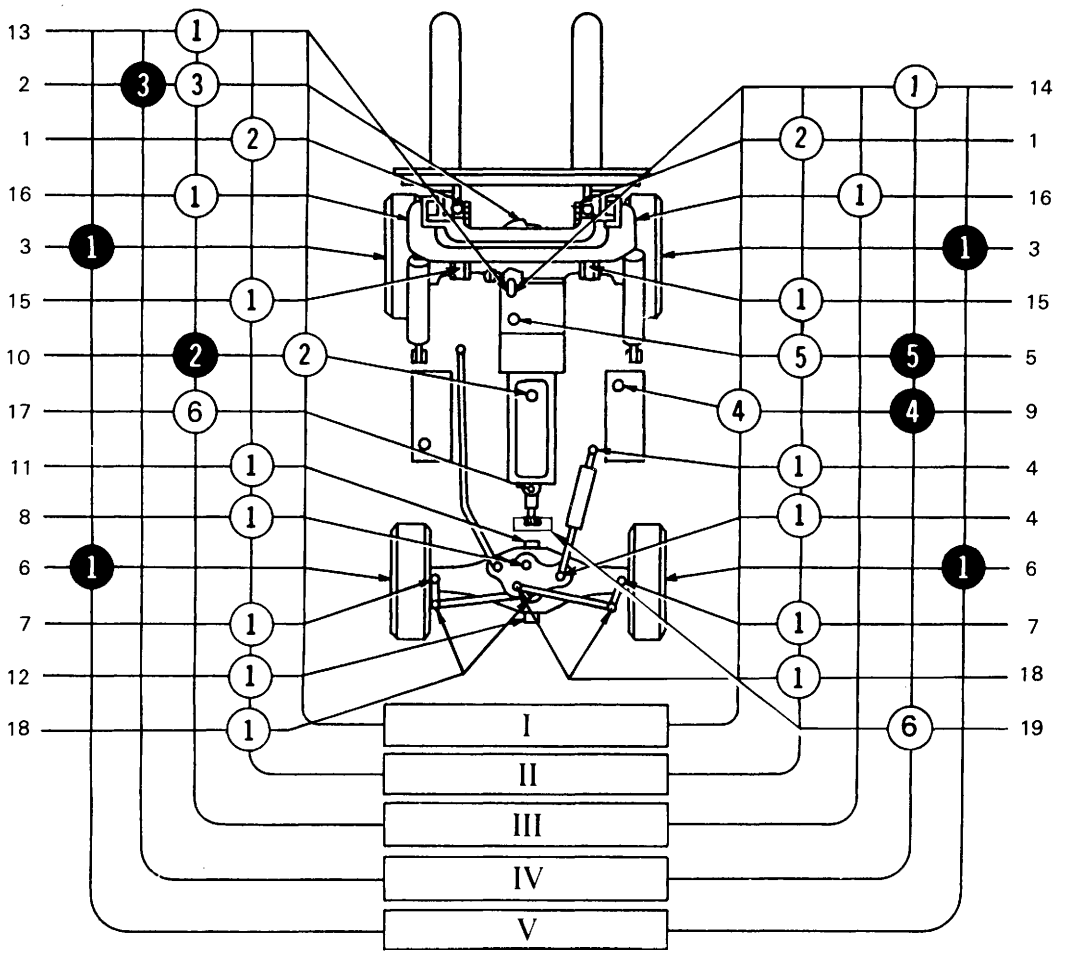
Unit: kg (lb.)

Engine	11Z: 330 (728) 3F : 250 (551)
Transmission with differential	Approx. 200 (441)
Torque converter with differential	Approx. 360 (794)
Balance weight	3.25 ton Approx. 1920 (4234) 3.5 ton Approx. 2220 (4895) E3.5 ton Approx. 2130 (4410) 4.0 ton Approx. 2520 (5557) 4.5 ton Approx. 2830 (6240)
Mast L/ Lift Bracket (Max. Fork Height: 3000 mm (118 in.)	3.25 – 4.0 ton Approx. 650 (1433) 4.5 ton Approx. 850 (1874)

RECOMMENDED LUBRICANT QUANTITY & TYPES

Description		Classification	Type	Application	Quantity
Engine	Gasoline	API SD, SE, SF	Motor Oil SAE30 (SAE20 in cold area) SAE20W-40 (SAE1OW-30 in cold area)	3F	Up to '88 Nov. 8.0 ℓ (2.1 US gal) From '88 Dec. 9.3 ℚ (2.5 US gal)
	Diesel	API CC, CD	Diesel engine oil SAE30 (SAE20 in cold area) SAE1OW-30	11Z	12.5 ℓ (3.3 US gal)
Transmission		API GL-4 GL-5	Hypoid gear oil SAE85W-90	MTM models	6.0 ℚ (1.6 US gal)
Differential		API GL-4 GL-5	Hypoid gear oil SAE85W-90	All models	9.5 ℚ (2.5 US gal)
Torque converter		ATF	GM Dexron® II	ATM models	15 ℓ (4.0 US gal)
Hydraulic oil		ISO VG32	Hydraulic oil ISO VG32	Fork height 3000 mm (118 in.)	60 ℓ (16 US gal)
Fuel tank				Gasoline models	95 ℓ (25 US gal)
				Diesel models 5FD33, 35	95 ℓ (25 US gal)
				Diesel models 5FDE35, 5FD40, 45	120 ℚ (32 US gal)
Chasis parts			MP Grease	All models	Proper quantity
Coolant (Excluding reserve tank)		LLC	•LLC 30-50% mixture (for winter or all season) *Coolant with rust-inhibitor (for spring, summer and autumn)	3F 11Z	13.0 ℚ (3.4 US gal) 13.0 ℚ (3.4 US gal)
Coolant (Reservoir tank)		↑	↑	All models	1.1 ℓ (0.3 US gal) (at Full level)
Drive shaft pulley (Oil pump spline shaft)			Molybdenum disulfide grease	All models	Proper quantity

LUBRICATION CHARTS



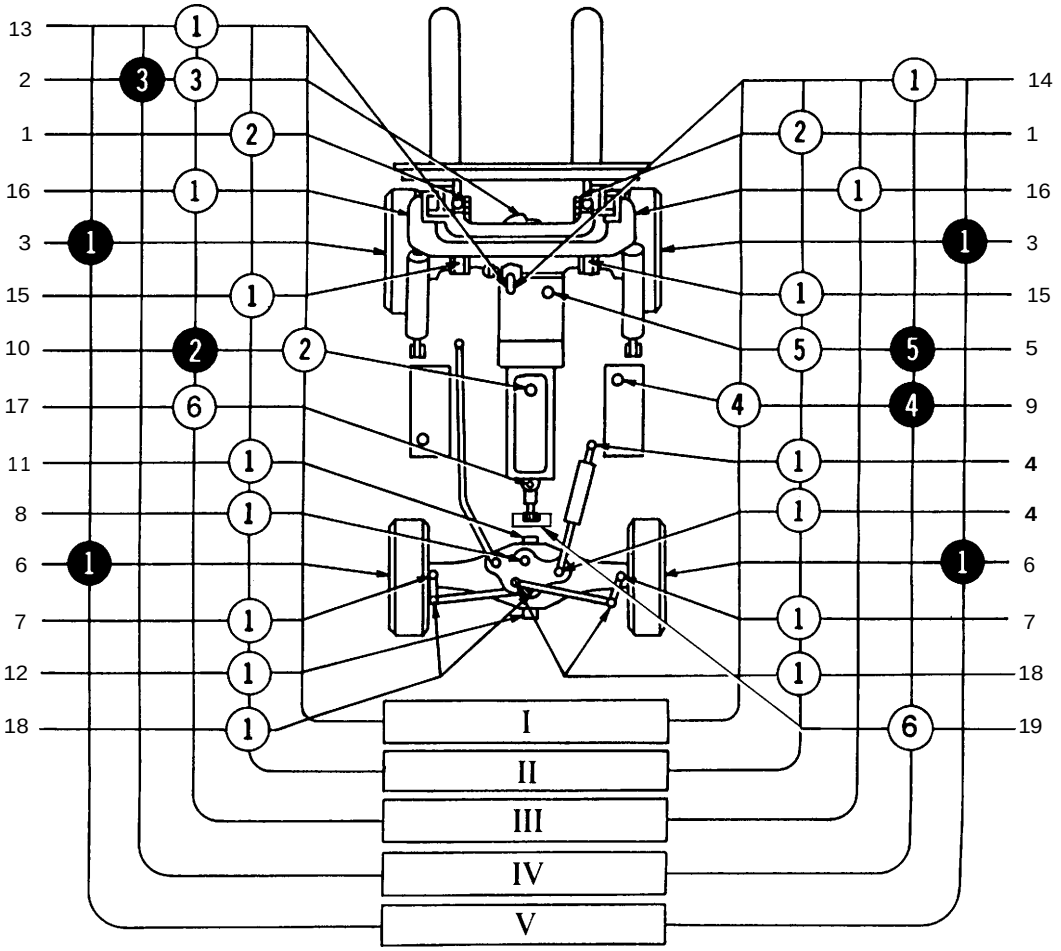
1. Chain
2. Differential gear
3. Front wheel bearing
4. Power cylinder joint
5. Transmission case
6. Rear wheel bearing
7. Steering knuckle king pin
8. Bell crank pin
9. Oil tank
10. Engine crankshaft
11. Rear axle beam front
12. Rear axle beam rear
13. Tilt steering universal joint
14. Tilt steering locking mechanism
15. Mast support bushing
16. Tilt cylinder front pin
17. Propeller shaft (Oil pump drive shaft)
18. Tie-rod end
19. Drive shaft pulley (Oil pump spline shaft)

I. Inspect every 8 hours (daily)
II. Inspect every 40 hours (weekly)
III. Inspect every 170 hours (monthly)
IV. Inspect every 1000 hours (6 monthly)
V. Inspect every 2000 hours (annually)

○ Inspect and service
● Replace

① MP grease
② Engine oil
③ Hypoid gear oil
④ Hydraulic oil
⑤ Hypoid gear oil
⑥ Molybdenum disulfide grease

Clutch Model Lubrication Chart LAQM67



1. Chain
2. Differential gear
3. Front wheel bearing
4. Power cylinder joint
5. Transmission case
6. Rear wheel bearing
7. Steering knuckle king pin
8. Bell crank pin
9. Oil tank
10. Engine crankshaft
11. Rear axle beam front
12. Rear axle beam rear
13. Tilt steering universal joint
14. Tilt steering locking mechanism
15. Mast support bushing
16. Tilt cylinder front pin
17. Propeller shaft (Oil pump drive shaft)
18. Tie-rod end
19. Drive shaft pulley (Oil pump spline shaft)

I. Inspect every 8 hours (daily)
II. Inspect every 40 hours (weekly)
III. Inspect every 170 hours (monthly)
IV. Inspect every 1000 hours (6 monthly)
V. Inspect every 2000 hours (annually)

○ Inspect and service
● Replace

① MP grease
② Engine oil
③ Hypoid gear oil
④ Hydraulic oil
⑤ Automatic transmission fluid
⑥ Molybdenum disulfide grease

Torque Converter Model Lubrication Chart LAQM68

PERIODIC MAINTENANCE

INSPECTION METHOD

I : Inspeciton. Repairorreplacement if required.
M : Measurement. Repair or adjustment if required.
T : Retightening C : Cleaning L : Lubrication
* : For new vehicle *1 : Soapy water *2 : Detector *3 : Flaw detector

Item \ Inspection Period		Every	1	3	6	12	Months
		Every	170	500	1000	2000	Hours
ENGINE							
Main body	Proper starting and abnormal noise		I	←	←	←	
	Rotating condition at idling		M	←	←	←	
	Rotating condition during acceleration		M	←	←	←	
	Exhaust gas condition		I	←	←	←	
	Air cleaner element		C	←	←	←	
	Valve clearance					M	
	Compression					M	
	Cylinder head bolt loosening					T	
	Muffler rubber mount					I	
PCV system	Clogging and damage in PCV valve and piping		I	←	←	←	
Governor	No-load maximum rpm		M	←	←	←	
Lubrication system	Oil leak		I	←	←	←	
	Oil level		I	←	←	←	
	Clogging and dirt of oil filter		I	←	←	←	
Fuel system	Fuel leak		I	←	←	←	
	Operation of carburetor link mechanism		I	←	←	←	
	Dirt and clogging of fuel filter and element		I	←	←	←	
	Injection timing				M	←	
	Injection nozzle injection pressure and spray status					M	
	Draining of sedimenter				I	←	
Cooling system	Coolant level in radiator and leak		I	←	←	←	
	Rubber hose degradation		I	←	←	←	
	Radiator cap condition		I	←	←	←	
	Fan belt tension, looseness and damage		I	←	←	←	
	Radiator rubber mount					I	
	Radiator screen		C	←	←	←	

Item \ Inspection Period		Every	1	3	6	12	Months
		Every	170	500	1000	2000	Hours
POWER TRANSMISSION SYSTEM							
Clutch	Clutch pedal play		M	←	←	←	
	Abnormal sound and functioning (connection)		I	←	←	←	
	Clutch booster function and leak		I	←	←	←	
	Oil clutch mechanism and leak				I	←	
Transmission	Leak		I	←	←	←	
	Fluid level		I	←	←	←	
	Gear function and abnormal noise		I	←	←	←	
Differntial	Leak		I	←	←	←	
	Oil level		I	←	←	←	
	Bolt loosening					T	
Torque converter and transmission	Leak		I	←	←	←	
	Fluid level		I	←	←	←	
	Operating mechanism function and looseness		I	←	←	←	
	Control valve and clutch functions		I	←	←	←	
	Inching valve function		I	←	←	←	
	Stall and hydraulic pressure measurement				M	←	
DRIVE SYSTEM							
Wheels	Tire inflation pressure		M	←	←	←	
	Tire cuts, damage and uneven wearing		I	←	←	←	
	Loose rim and hub nuts		T	←	←	←	
	Tire groove depth		M	←	←	←	
	Metal chips, pebbles and other foreign matter trapped in tire grooves		I	←	←	←	
	Rim, side bearing and disc wheel damage		I	←	←	←	
	Abnormal sound and looseness of front wheel bearing		I	←	←	←	

Item	Inspection Period	Every	1	3	6	12	Months
		Every	170	500	1000	2000	Hours
Wheel	Abnormal sound and looseness of rear wheel bearing		I	←	←	←	
Front axle	Cracks, damage and deformation of housing					I	
Rear axle	Cracks, damage and deformation of beam					I	
	Looseness of axle beam in vehicle longitudinal direction					M	
STEERING SYSTEM							
Steering wheel	Play and looseness		I	←	←	←	
	Function		I	←	←	←	
Gear box	Oil leak		I	←	←	←	
	Looseness of mounting		T	←	←	←	
	Clogging of relief valve filter				C	←	
Rods, links and arm	Looseness and damage		I	←	←	←	
	Linkage and wear and mounting condition					I	
Power steering	Oil leak		I	←	←	←	
	Mounting and linkage looseness		I	←	←	←	
	Damage of power steering hose					I	
Knuckle	King pin looseness		I	←	←	←	
	Cracks and deformation					I	
Steering shaft	Wheel alignment					M	
	Left and right turning angle					M	
BRAKING SYSTEM							
Brake pedal	Play and reserve		M	←	←	←	
	Braking effect		I	←	←	←	
Parking brake	Operating force		I	←	←	←	
	Braking effect		I	←	←	←	
	Rod and cable looseness and damage		I	←	←	←	
Brake pipe	Leak, damage and mouting condition		I	←	←	←	
Brake booster and wheel cylinder	Function, wear, damage, leak and mounting looseness					I	

Item	Inspection Period	Every	1	3	6	12	Months
		Every	170	500	1000	2000	Hours
Brake drum and brake shoe	Clearance between drum and lining		M	←	←	←	
	Wear of shoe sliding portion and lining					I	
	Drum wear and damage					I	
	Shoe operating condition					I	
	Anchor pin rusting					I	
	Return spring fatique					M	
	Automatic adjuster function					I	
Backing plate	Deformation, cracks and damage					I	
	Loose mounting					T	
MATERIAL HANDLING SYSTEM							
Forks	Abnormality of fork and stopper pin		I	←	←	←	
	Misalignment between left and right fork fingers		I	←	←	←	
	Cracks at fork root and welded part					I*3	
Mast and fork bracket	Deformation and damage of each part and crack at welded part		I	←	←	←	
	Mast and lift bracket looseness		I	←	←	←	
	Wear and damage of mast support bush					I	
	Wear, damage and rotating consdition of rollers		I	←	←	←	
	Wear and damage of roller pins					I	
	Wear and damage of mast strip		I	←	←	←	
Chain and chain wheel	Tension, deformation and damage of chain		I	←	←	←	
	Chain lubrication		I	←	←	←	
	Abnormality of chain anchor bolt		I	←	←	←	
	Wear, damage and rotating condition of chain wheel		I	←	←	←	
Various attachment	Abnormality and mounting condition of each part		I	←	←	←	
HYDRAULIC SYSTEM							
Cylinder	Loosening and damage of cylinder mounting		T	←	←	←	
	Deformation and damage of rod, rod screw and rod end		I	←	←	←	
	Cylinder operation		I	←	←	←	
	Natural drop and natural forward tilt (hydraulic drift)		M	←	←	←	

Item \ Inspection Period		Every	1	3	6	12	Months
		Every	170	500	1000	2000	Hours
Cylinder	Oil leak and damage		I	←	←	←	
	Wear and damage of pin and cylinder bearing		I	←	←	←	
	Lifting speed		M	←	←	←	
	Uneven movement		I	←	←	←	
Oil pump	Oil leak and abnormal sound		I	←	←	←	
Hydraulic oil tank	Oil level and contamination		I	←	←	←	
	Tank and oil strainer				C	←	
	Oil leak		I	←	←	←	
Control lever	Loose linkage		I	←	←	←	
	Operation		I	←	←	←	
Oil control valve	Oil leak		I	←	←	←	
	Relief pressure measurement					M	
	Relief valve and tilt lock valve functions		I	←	←	←	
Hydraulic piping	Oil leak		I	←	←	←	
	Deformation and damage		I	←	←	←	
	Loose joint		T	←	←	←	
ELECTRICAL SYSTEM							
Ignition timing	Cracks on distributor cap		I	←	←	←	
	Spark plug and burning and gap (~1997.12)		I	←	←	←	
	Distributor side terminal burning		I	←	←	←	
	Distributor cap center piece wear and damage		I	←	←	←	
	Distributor points gap		M	←	←	←	
	Plug cord internal discontinuity					I	
	Ignition timing				M	←	
Starting motor	Pinion gear meshing status		I	←	←	←	
Charger	Charging function		I	←	←	←	
Battery	Battery fluid level		I	←	←	←	
	Battery fluid specific gravity				M	←	
Electrical wiring	Damage of wiring harness		I	←	←	←	
	Fuses		I	←	←	←	

Item \ Inspection Period		Every	1	3	6	12	Months
		Every	170	500	1000	2000	Hours
Preheater	Open-circuit in intake heater				I	←	
Engine stopping system	Diesel engine key stop device function		I	←	←	←	
SAFETY DEVICE, ETC.							
Head guard	Cracks at welded portion		I	←	←	←	
	Deformation and damage		I	←	←	←	
Back-rest	Loosening of mounting		T	←	←	←	
	Deformation, crack and damage		I	←	←	←	
Lighting system	Function and mounting condition		I	←	←	←	
Horn	Function and mounting condition		I	←	←	←	
Direction indicator	Function and mounting condition		I	←	←	←	
Instruments	Functions		I	←	←	←	
Backup buzzer	Function and mounting condition		I	←	←	←	
Rear-view mirror	Dirt, damage		I	←	←	←	
	Rear reflection status		I	←	←	←	
Seat	Loosening and damage of mounting		I	←	←	←	
Body	Damage and cracks of frame, cross members, etc					I	
	Bolt looseness					T	
Other	Grease up		L	←	←	←	

PERIODIC REPLACEMENT LUBRICANTS AND PARTS

■ Replacement

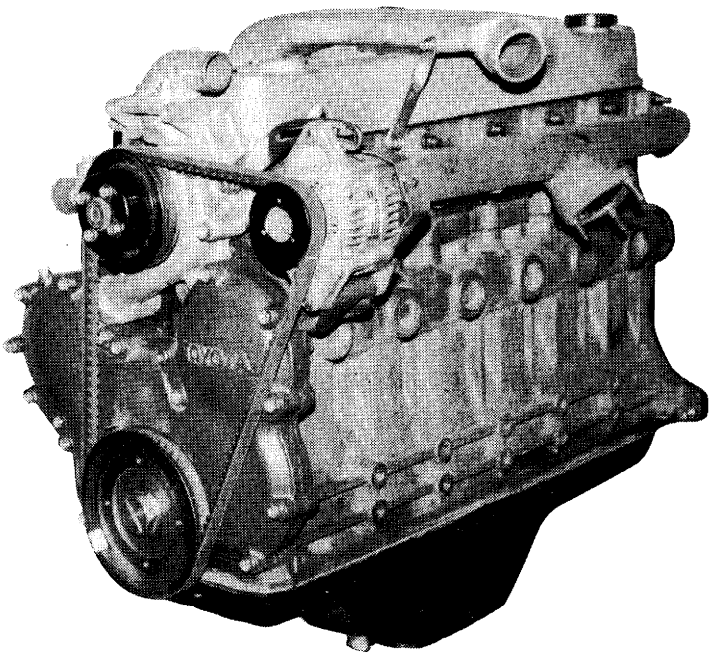
Item \ Interval	Every 1 month / Every 170 hours	Every 3 months / Every 500 hours	Every 6 months / Every 1000 hours	Every 12 months / Every 2000 hours
Engine	●	←	←	←
Engine oil filter		●	←	←
Engine coolant (every 2 years for LLC)		●	←	←
Fuel filter			●	←
Torque converter oil			●	←
Torque converter oil filter			●	←
Transmission oil			●	←
Differential oil			●	←
Hydraulic oil			●	←
Hydraulic oil return filter	●*1		●	←
Wheel bearing grease				●
Spark plug			■(–1997.12)	●
Distributor points			●	←
Air cleaner element				●
Brake booster rubber parts				●
Cups and seals for wheel cylinders				●
Power steering hoses				●*2
Power steering rubber parts				●*2
Hydraulic hoses				●*2
Fuel hoses				●*2
Torque converter rubber hoses				
Chains				●*3

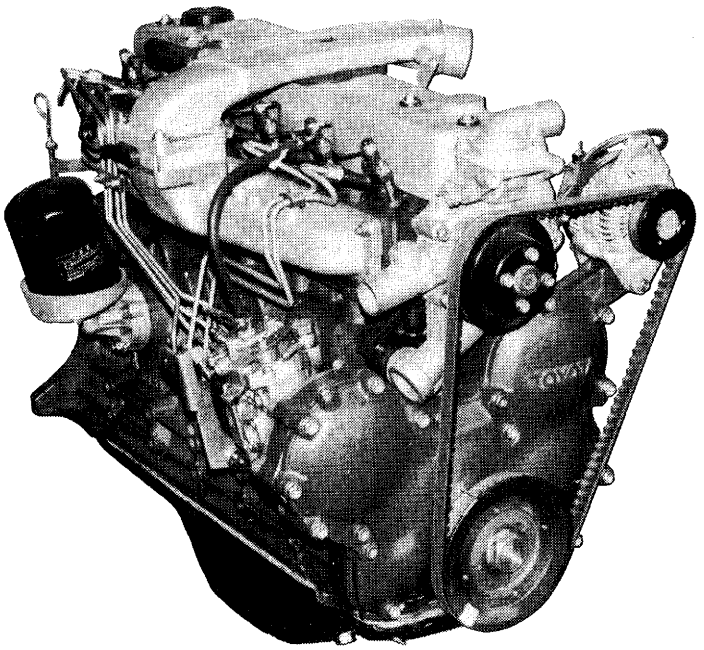
*1: for new vehicle *2: Every 2 years *3: Every 3 years

Replacement shall be made upon arrival of the operation hours or months, whichever is earlier.

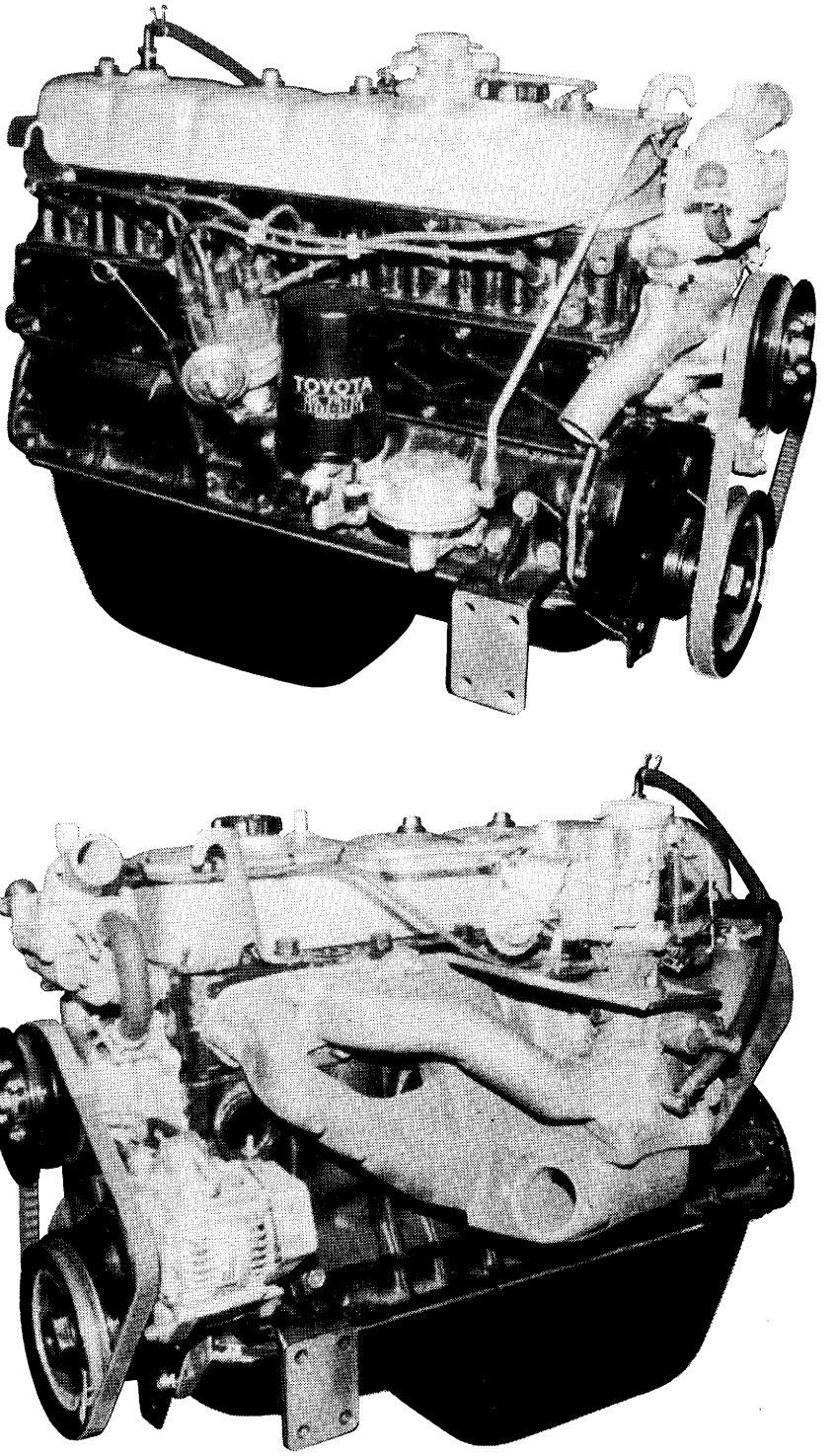
ENGINE

GENERAL

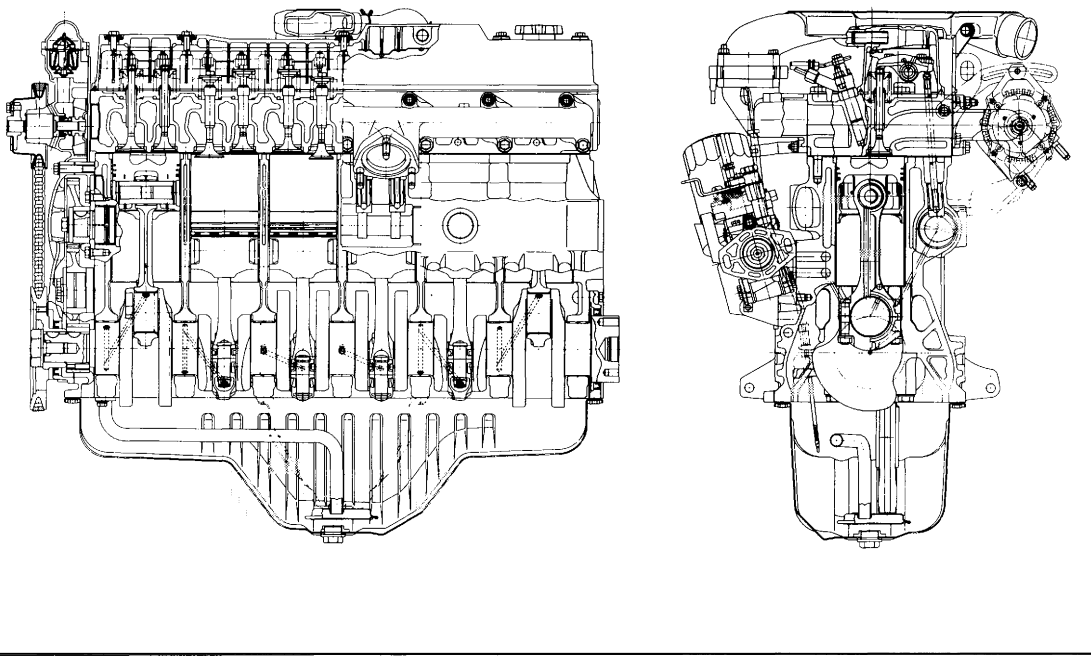




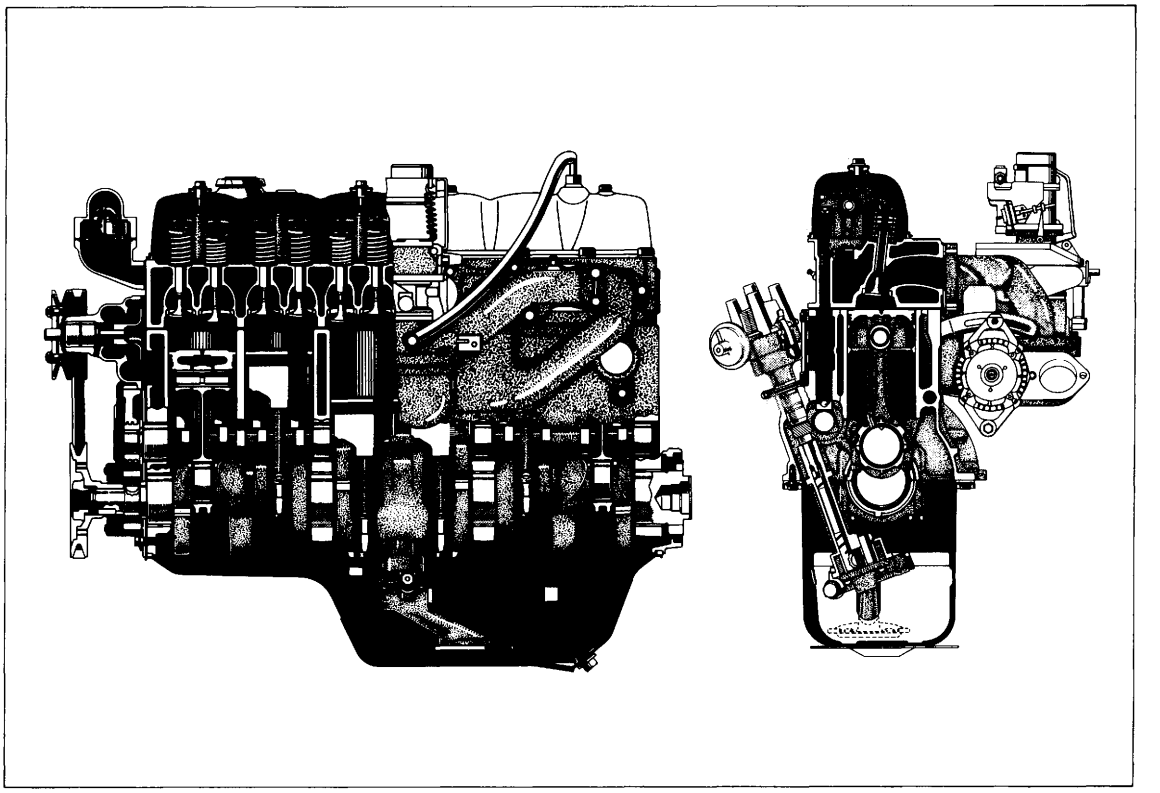
11Z Engine Exterior View KAL28-26, 35-15



3F Engine Exterior View KAM10-9, 11

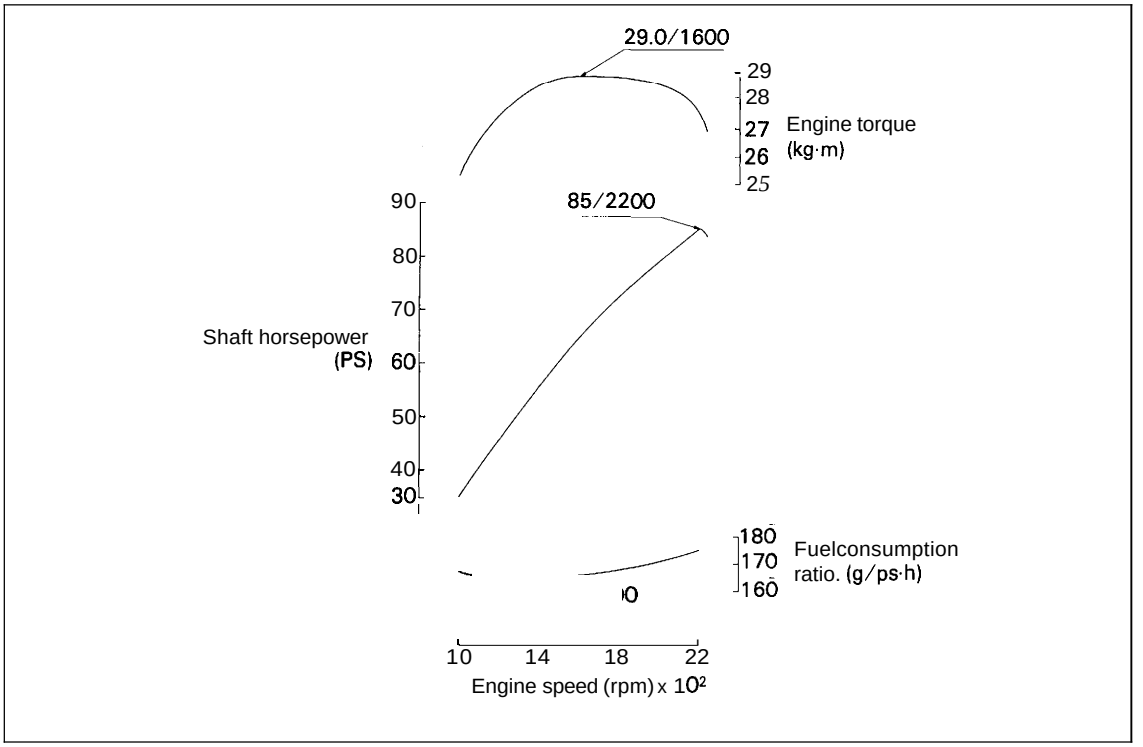


11Z Engine Sectional View LAQM61, 62

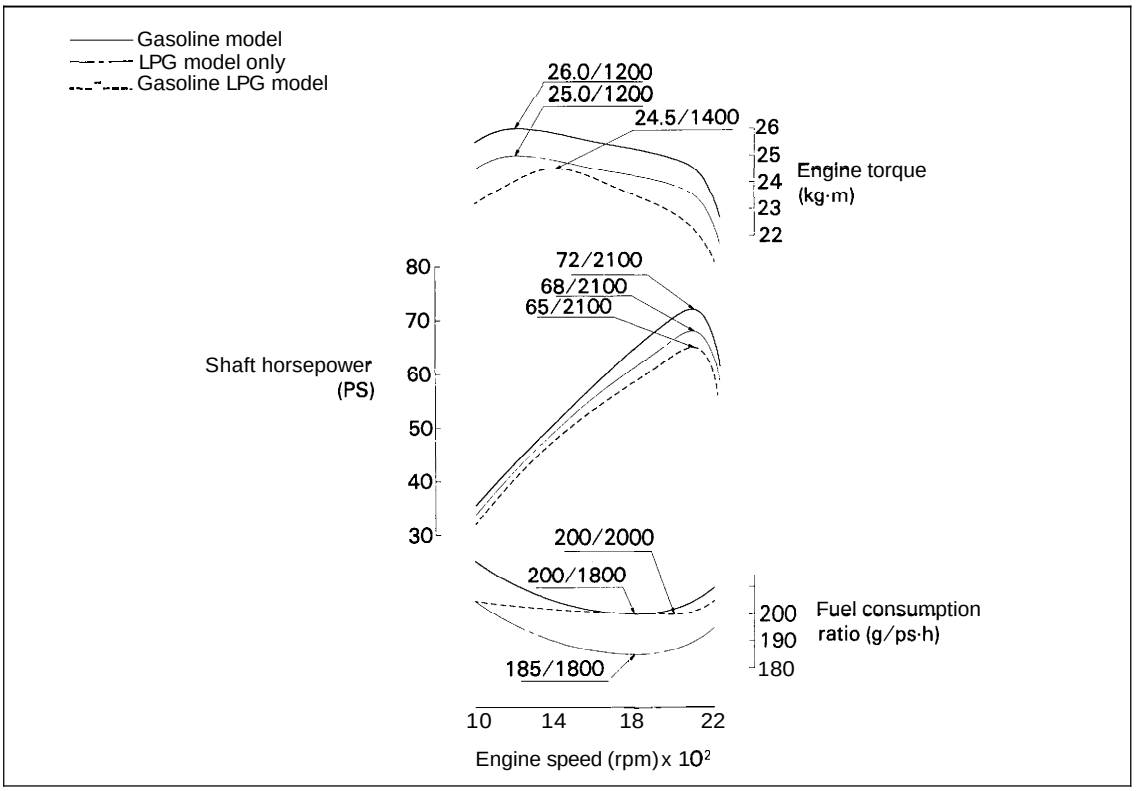


3F Engine Sectional View LAQL18, 19

Engine Performance Curves



Engine Performance Curve (11Z) KALM1



Engine Performance Curve (3F) KALM47

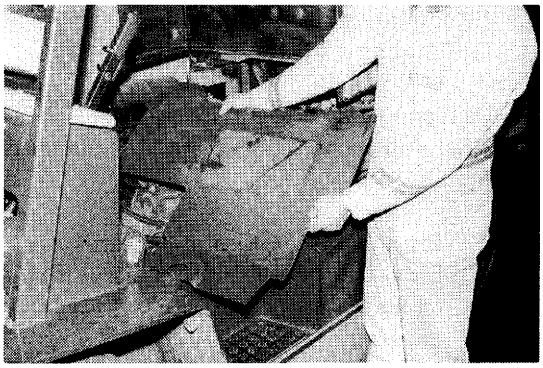
SPECIFICATIONS

	11Z (Diesel)	3F (Gasoline)
Piston displacement cc (cu-in.)	4429 (270)	3955 (241)
Number of cylinders	6	6
Valve mechanism	OHV gear driven	←
Bore x stroke mm (in.)	96.0 x 102.0 (3.78 x 4.02)	94.0 x 95.0 (3.70 x 3.74)
Compression ratio	18.6	8.1
Combustion chamber type	Direct injection	
Rated output ps/rpm (SAE NET: HP/rpm)	85/2200 (81/2200)	72/2100 (69/2100)
Maximum torque kg-m/rpm (SAE NET : ft-lb/rpm)	29/1600 (202/1600)	26/1200 (182/1200)
Fuel consumption ratio g/ps-h/rpm	165/1200	200/1800
Injection pump type	Bosch (VE)	
Injection timing (BTDC)	0° (Static)	
Injection order	1 – 4 – 2 – 6 – 3 – 5	
Ignition timing (BTDC)		7°/750
Ignition order		1 – 5 – 3 – 6 – 2 – 4
Service weight kg (lb.)	330 (728)	250 (551)

ENGINE ASSY

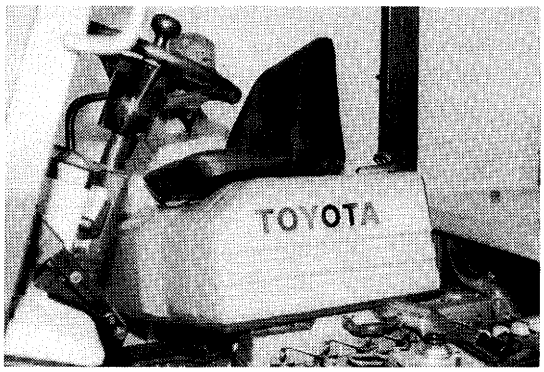
REMOVAL (CLUTCH MODEL)

1. Remove the toe board.
   (1) Toe board
   (2) Floor set bolts
   (3) Floor



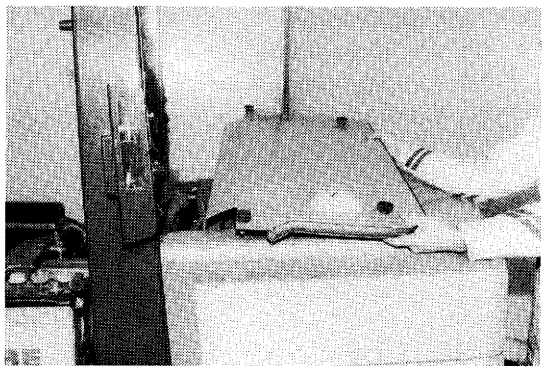
Removing the Toe Board LAQ28-17

2. Remove the engine hood.
   (1) Disconnect the engine hood damper on the frame side.
   (2) Disconnect the engine hood stay on the frame bracket side.
   (3) Hood hinge set screws
   (4) Engine hood



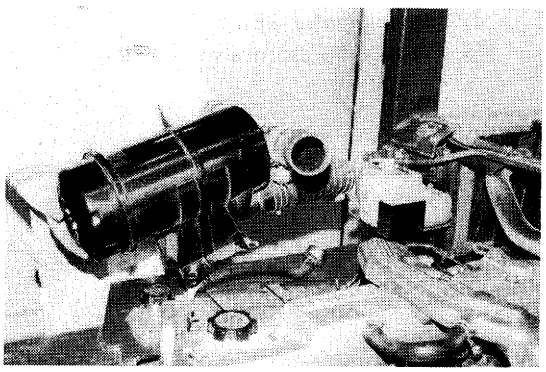
Removing the Engine Hood LAQ29-9

3. Remove the radiator cover



Removing the Radiator Cover LAQ29-11

4. Remove the air cleaner ASSY.
   (1) Disconnect the vacuum switch harness.
   (2) Disconnect the air cleaner hose.
   (3) Hydraulic oil tank breather set bolt.
   (4) Air cleaner set bolt
   (5) Air cleaner ASSY (with hose)



Removing the Air Cleaner ASSY LAQ29-19

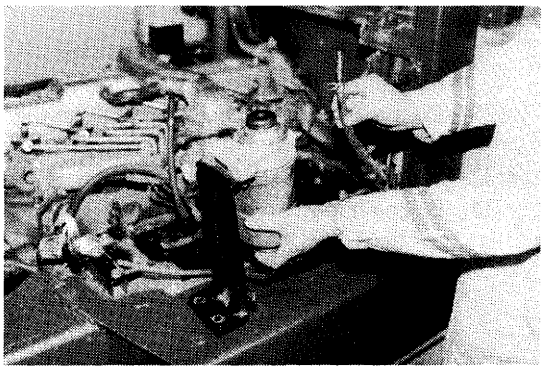
5. Remove the battery.
   (1) Disconnect the battery cables.

   Caution:
   Always disconnect the negative (–) terminal first.

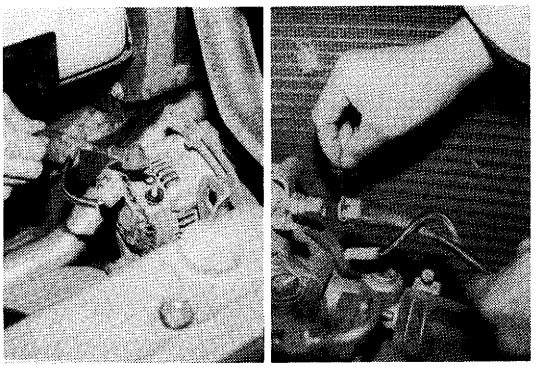
   (2) Disconnect the wiring to the battery.
   (3) Disconnect the wirings to the distributor and ignition coil. (3F)
   (4) Battery stopper
   (5) Battery
   (6) Battery case

Removing the Batery LAQ29-22

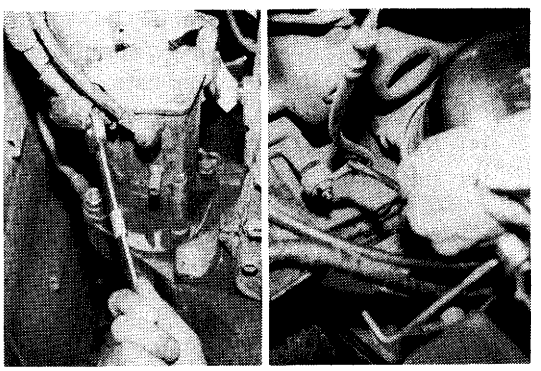
6. Remove the sedimenter. (11Z)
   (1) Disconnect the fuel hose.
   (2) Disconnect the wirings.
   (3) Set bolt
   (4) Sedimenter (with bracket)


Removing the Sedimenter LAQ29-27

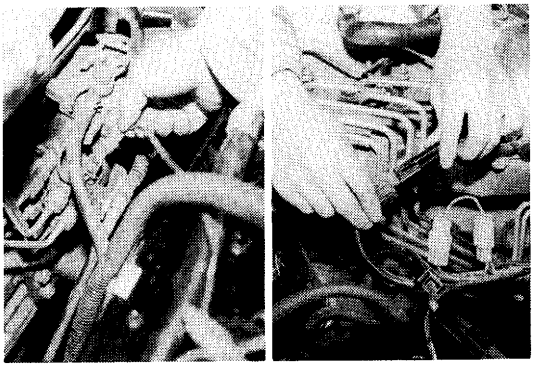
7. Disconnect wirings.
   (1) Alternator wiring
   (2) Water temperature switch wiring
   (3) Water temperature sensor wiring (11Z)


Disconnecting Wiring (1) LAQ29-28, 34

   (4) Starting motor wiring
   (5) Engine oil pressure switch wiring

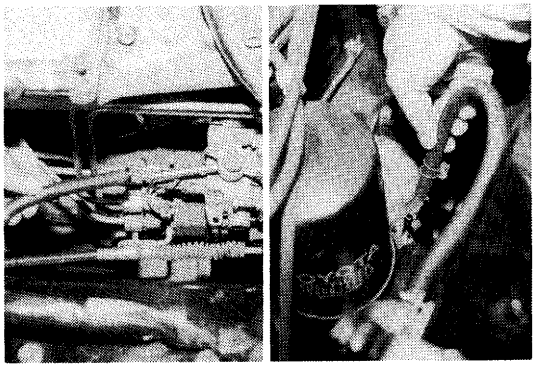

Disconnecting Wirings (2) LAQ30-5, 29-35

(6) Fuel cut solenoid wiring (11Z)
(7) Intake heater wiring (11Z)
(8) Carburetor wiring (3F)



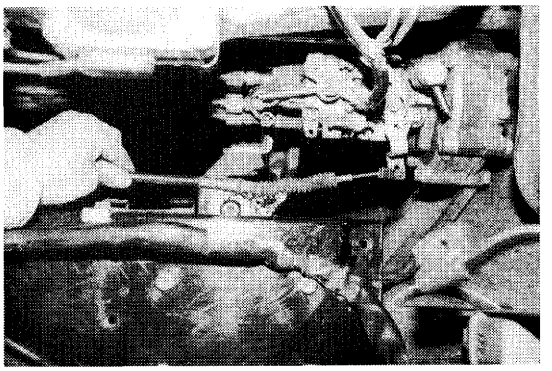
Disconnecting Wirings (3) LAQ30-1, 29-32

8. Disconnect piping and wires.
(1) Fuel piping

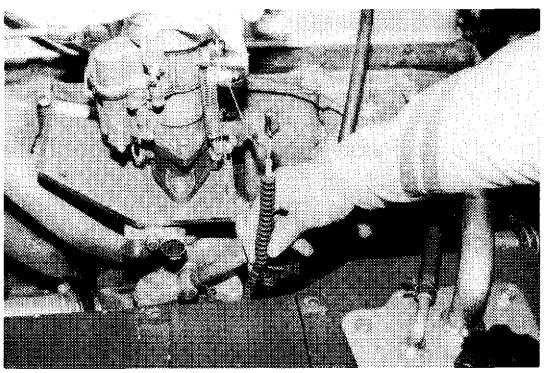


Disconnecting the Fuel Piping (11Z/3F) LAQ30-8, 19-4

(2) Accelerator wire



Disconnecting the Accelerator Wire (11Z) LAQ30-9



Disconnecting the Accelerator Wire (3F) LAQ19-18

Thank you very much for your reading.

Please Click Here Then Get More Information.