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Printed in U S A



DATSUN

SERVICE • REPAIR HANDBOOK

510 and Pick-up • 1968-1972



Car No PL 510-834200 (April, 1969)

Engine No L16-217847

Type WPL 510

DATSUN

SERVICE • REPAIR HANDBOOK

510 AND PICK-UP • 1968-1972

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CHAPTER ONE

GENERAL INFORMATION

This manual provides maintenance information on the Datsun 510-Series and 521-Series of vehicles. The 510-Series includes the two door sedan, four door sedan, and station wagon. The 521-Series is the pick-up truck. Coverage is from 1968 through 1972 models.

All models use the L16 engine, a 96-horsepower, four-cylinder, overhead camshaft design. The 510 has a fully synchronized four-speed manual or three-speed automatic transmission. The 521 has a four-speed manual transmission only. In 1972, horsepower rating was lowered to 92 horsepower due to changes in emission control device requirements. **Figure 1** is an overall view of the four door sedan, **Figure 2** shows the station wagon, and **Figure 3** illustrates the pick-up truck.

Over the years, the 510 and 521 series have remained essentially the same, with the exception of changes to the emission control systems and overall body styling. In this manual, every effort has been made to pinpoint significant differences between model years.

The use of special tools and test equipment has been avoided wherever possible. When necessary, special tools and test equipment are illustrated, either in actual use or alone. A well equipped mechanic may find he can substitute

similar tools or make his own to fulfill a requirement.

Recommendations are occasionally made to refer service or maintenance to a Datsun dealer or a specialist in a specified field. In these cases, work will probably be done more quickly and economically than if the mechanic performs them himself.

MODEL IDENTIFICATION

Body Number Plate

The body number is stamped on the fire wall in the engine compartment. The numbers give the chassis model and serial number.

Model Identification Plate

The model identification plate, **Figure 4**, is mounted within the engine compartment. This plate gives engine number and vehicle number.

Engine Identification

The engine identification marking is stamped on the right-hand side of the cylinder block just below the third and fourth spark plugs.

Model Identification Numbers

The following numbers have been assigned to the 510- and 521-Series vehicles.

Sedan

Four-speed Floor Shift P510-UT, PL510-T,
PL510 UT

Automatic Three-speed P510-UA, PL510-A,
PL510 UA

Wagon

Four speed Floor Shift WP510-UT, WPL510-T,
WPL510-UT

Automatic Three speed WP510 UA, WPL510-A,
WPL510-UA

Pick-up

Four-speed Floor Shift PL521 TU, PL521-TN

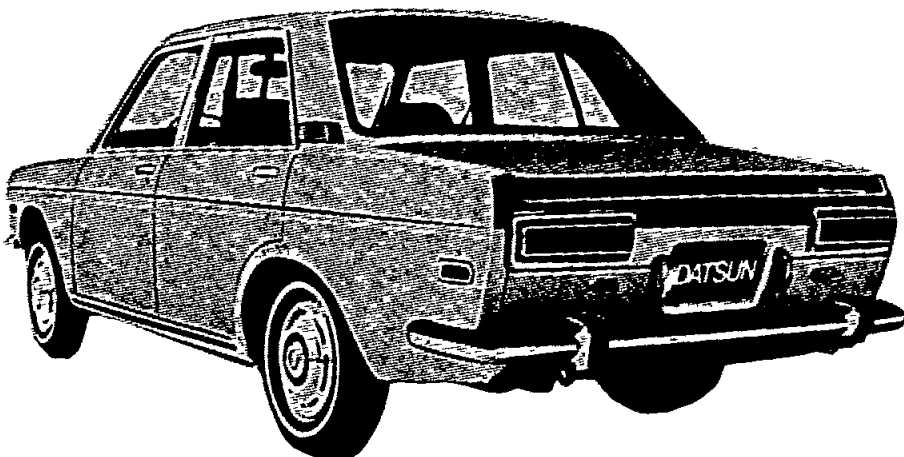
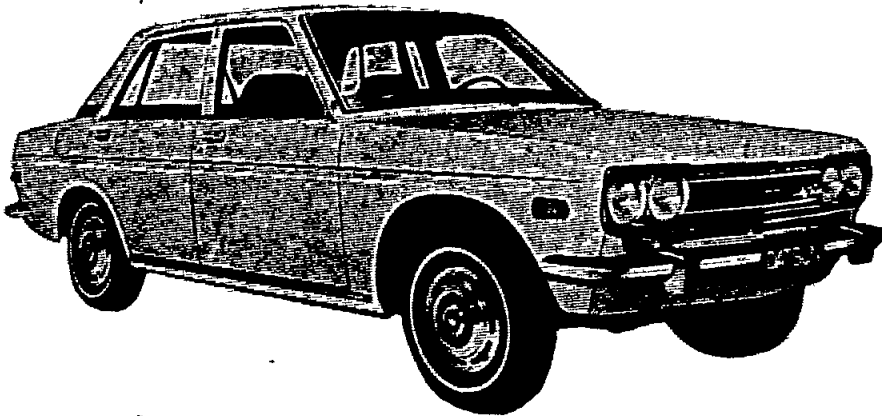
MAIN SPECIFICATIONS AND DIMENSIONS

Table 1 covers general specifications and dimensions. Detailed system specifications, including clearances, tolerances, and torque tightening information, are presented within each chapter.

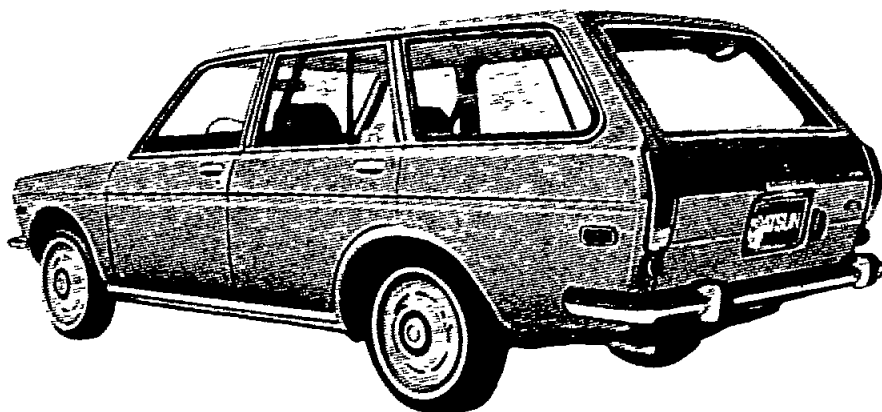
Parts Replacement

When you order parts from the dealer or other parts distributor, always order by engine and

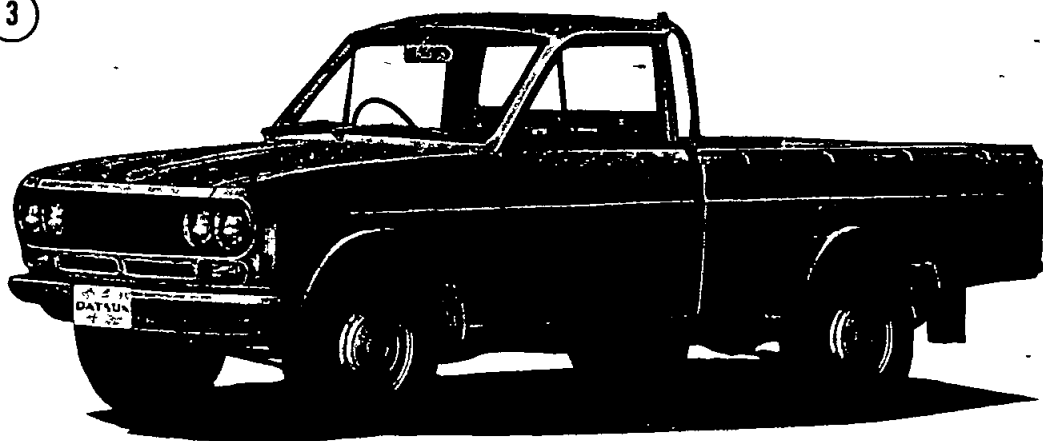
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2



3



4

DATSUN		TYPE	510
ENGINE CAPACITY	1595 cc		
MAX HP at RPM	96 HP at 5600 rpm		
WHEELBASE	2420 mm		
ENGINE NUMBER	L16-00986		
CAR NO	P610-00034		
NISSAN MOTOR CO., LTD.			
YOKOHAMA JAPAN			

chassis number Write the numbers down and carry them in your wallet.

Service Hints

Throughout this manual, keep two conventions in mind: "Front" refers to the front of the vehicle. The "left" and "right" sides of the vehicle refer to a person sitting in the car facing forward. For example, the steering wheel is on the left-hand side. All dimensions and capacities are expressed in units familiar to a United States mechanic, such as inches and pounds. Metric measurements are also given. Metric tools are required to work on the Datsun.

Table 1 MAIN SPECIFICATIONS AND DIMENSIONS

ITEM	Sedan	Wagon	Pick-up
Engine Type	L16	L16	L16
Valve Arrangement	Overhead Cam	Overhead Cam	Overhead Cam
Bore	3.2677 in (83mm)	3.2677 in (83mm)	3.2677 in (83mm)
Stroke	2.902 in (73.7mm)	2.902 in (73.7mm)	2.902 in (73.7mm)
Displacement	97.3 cu in (1595cc)	97.3 cu in (1595cc)	97.3 cu in (1595cc)
Compression Ratio	8.5:1	8.5:1	8.5:1
Maximum SAE Horsepower	96 @ 5,600 rpm	96 @ 5,600 rpm	96 @ 5,600 rpm
Maximum SAE Torque	99.8 ft.-lb (13.8 kg/m)	99.8 ft.-lb (13.8 kg/m)	99.8 ft.-lb (13.8 kg/m)
Fuel Octane	85	85	85
Length	162.2 in (4,120mm)	163.2 in (4,145mm)	168.9 in (4,290mm)
Width	61.4 in (1,560mm)	61.4 in (1,560mm)	62.8 in (1,595mm)
Height	55.1 in (1,400mm)	56.5 in (1,435mm)	60.8 in (1,545mm)
Wheelbase	95.3 in (2,420mm)	95.3 in (2,420mm)	99.6 in (2,530mm)
Room Space			
Inner Length	63.3 in (1,610mm)	67.3 in (1,710mm)	72.8 in (1,850mm)
Inner Width	49.9 in (1,270mm)	50.7 in (1,290mm)	56.3 in (1,430mm)
Inner Height	44.4 in (1,130mm)	44.6 in (1,135mm)	15.7 in (399mm)
Tread			
Front	50.4 in (1,280mm)	50.2 in (1,275mm)	49.2 in (1,250mm)
Rear	50.4 in (1,280mm)	49.6 in (1,260mm)	49.9 in (1,267mm)
Road Clearance	7.4 in (188mm)	6.4 in (163mm)	7.87 in (200mm)
Weight			
4-Speed	2,061 lb (935 kg)	2,138 lb (970 kg)	2,127 lb (965 kg)
Automatic	2,114 lb (959 kg)	2,182 lb (990 kg)	—
Minimum Turning Radius	15.7 ft (4.8m)	15.7 ft (4.8m)	17.1 ft (5.2m)
Seating Capacity	5	5	2
Battery			
Volt	12	12	12
Capacity	40 or 50 AH	40 or 50 AH	40 or 60 AH
Connection	Negative ground	Negative ground	Negative ground
Fuel Tank Capacity	11.9 gal (45 liter)	11.9 gal (45 liter)	10.8 gal (41 liter)
Oil Pan Capacity	4.2 qts. (4.0 liter)	4.2 qts. (4.0 liter)	1.06 gal (4.0 liter)
Oil Filter Capacity	74 qt. (0.7 liter)	74 qt. (0.7 liter)	1.48 pint (0.7 liter)
Transmission Capacity	1.8 qt. (1.7 liter)	1.8 qt. (1.7 liter)	2.11 qt. (2.0 liter)
Differential Capacity	85 qt. (8.0 liter)	1.1 qt. (1.0 liter)	.87 qt. (0.83 liter)
Coolant Capacity	7.2 qt. (6.8 liter)	7.2 qt. (6.8 liter)	7.2 qt. (6.8 liter)
Clutch Type	Dry, single disc	Dry, single disc	Dry, single disc
	Diaphragm spring	Diaphragm spring	Diaphragm spring

Table 1 MAIN SPECIFICATIONS AND DIMENSIONS (continued)

ITEM	Sedan	Wagon	Pick-up
Transmission Type	Manual, Automatic	Manual, Automatic	Manual
Final Gear Type	Hypoid	Hypoid	Hypoid
Steering Gear Type	Recirculating ball	Recirculating ball	Recirculating ball
Brake			
Front	Disc	Disc	Drum
Rear	Drum	Drum	Drum
Parking Brake	Mechanical, rear wheels	Mechanical, rear wheels	Mechanical, rear wheels
Suspension Front	Independent strut type with tension rods and stabilizer	Independent strut type with tension rods and stabilizer	Independent torsion bar
Suspension Rear	Independent semi-trailing arms with coil springs and shock absorbers	Semi-elliptic leaf spring	Semi-elliptic leaf spring
Tires	5 60-13-4PR	5 60-13-4PR	6 00-14-6PRLT

TORQUES: SPARK PLUGS 11-15 LB-FT
 ENGINE DRAIN
 TRANS DRAIN + FILL 15-22(D)/18-25(F)
 DIFF DRAIN + FILL
 WHEEL LUG NUTS
 FRONT WHEEL BEARING SPINDLE NUT TIGHTEN
 TO 13-24 LB FT, SPIN & BACK OFF 40°-70°

TIMING 10° BTDC @ 700 RPM

VALVE SETTINGS:	INTAKE	COLD .008	HOT 0.010
	EXHAUST	0.010	0.012

SPARK PLUGS 0.031-0.035

CHAPTER TWO

PERIODIC MAINTENANCE

To ensure good performance, dependability, and safety, regular periodic maintenance is necessary. This chapter outlines routine and periodic maintenance for the average driver. Under heavy usage, servicing intervals will be shortened. Regular routine maintenance will help avoid expensive repairs.

ROUTINE CHECKS

The following checks should be performed at each fuel stop

- 1 Check engine oil level. Top up as required.
- 2 Check radiator coolant level. Top up as required.
- 3 Check battery electrolyte. The battery case is marked with upper limit and lower limit lines. Level should be maintained between the lines.
- 4 Check that the master cylinder brake fluid reservoir level is between the "max" and "min" lines marked on the plastic case.
- 5 Check the plastic clutch cylinder reservoir level. Level should be between the "max" and "min" lines.
- 6 Check the windshield washer fluid reservoir. Top up as required.

7 Check tire pressures when the tires are cold. Front and rear tire pressures should be 24 pounds under normal driving conditions. Tire pressure should be 28 pounds for high-speed driving conditions.

8 Check the engine for general condition. Check for leaky or cracked hoses and loose wiring.

9 Check condition of windshield wiper blades.

PERIODIC CHECKS

Table 1 provides periodic checks and maintenance that should be performed on a set schedule. Table 2 gives recommended lubricants and Table 3 specifies the grades of oil that should be used. Procedures for performing the services are presented in various chapters of this manual.

Table 3 RECOMMENDED GRADES OF OIL

Temperature	Engine Oil (MS)
Above 32° C (90° F) average	SAE 30, 10W-30
32° to 0° C (90° to 32° F)—minimum	SAE 20, 20W, 10W-30
0° to -12° C (32° to 10° F)—minimum	SAE 10W, 10W-30
Below -12° C (10° F)—minimum	SAE 10W, 10W-30

Table 1 ENGINE LUBRICATION AND MAINTENANCE

	FREQUENCY, EVERY:				
	Week	3,000 miles (5,000 km)	6,000 miles (10,000 km)	12,000 miles (20,000 km)	24,000 miles (40,000 km)
Check engine oil level, top-up if required	X				
Change engine oil		X			
Lubricate carburetor linkage			X		
Lubricate distributor rotor shaft and arm shaft			X		
Apply grease to distributor cam heel			X		
Check radiator coolant level	X				
Change radiator coolant			X		
Change radiator coolant additive					X
Check battery electrolyte level	X				
Check specific gravity of battery				X	
Check engine starting, exhaust color	X				
Tighten cylinder head, manifolds, and pipe flanges			X		
Adjust valve clearance			X		
Check ignition timing			X		
Tighten carburetor fittings	X				
Check fan belt tension		X			
Check for oil pan leakage	X				
Tighten engine mounts				X	
Check fuel strainer			X		
Replace fuel strainer					X
Check for fuel leaks	X				
Replace oil filter			X		
Check spark plugs		X			
Replace spark plugs				X	
Check distributor cap, rotor, and points		X			
Adjust engine idle speed		X			
Check air cleaner fittings			X		
Clean oil filler cap			X		
Clean battery cables and terminals			X		
Check alternator and voltage regulator function				X	
Check starter motor function				X	
Replace air cleaner element					X
Check fuel pump function					X
Check cylinder compression					X
Clean carburetor jets and float chamber					X
Check distributor condenser					X
Check crankcase ventilation control valve				X	

Table 2 RECOMMENDED LUBRICANTS

	Manufacturer						Lubricating points
	Shell	Mobil	Caltex	Esso	BP	Castrol	
Single-grade Engine oil	Shell Super Motor Oil Shell x -100 10W-30	Mobiloil Special HD 10W-30	Havoline Custom made 10W-30	Esso Extra Motor Oil 10W-30 20W-40	BP Viscostatic Longlife Motor Oil or Viscostatic Motor Oil	Castrolite 10W-30	Engine Carburetor linkage Distributor shaft
Multi-grade Engine oil	Shell x -100 30, 20 20W, 10W	Mobiloil Arctic or Mobiloil A or AF	Havoline or RPM Motor Oil HD	Esso Motor Oil, 30 10W, 20W	BP H D Motor Oil	Castrol 20HD 30HD	Engine Carburetor linkage Distributor shaft
Multi-purpose Grease	Shell Retinax A	Mobil Grease	Marfak	Esso Multi-purpose Grease or Beacon	BP Energ grease L ₂	Castrol-lease LM	Distributor cam heel

CHAPTER THREE

TROUBLESHOOTING

Troubleshooting the Datsun can be relatively simple if done logically. The first step must always be to define symptoms as closely as possible. Subsequent steps involve testing and analyzing areas which could cause the symptoms. Procedures in this chapter analyze typical symptoms, and give logical methods of isolation. These are not the only methods. There may be several approaches to solving a problem, but all must have one thing in common—a logical, systematic approach.

TROUBLESHOOTING EQUIPMENT

The following equipment is necessary to properly troubleshoot an engine:

- 1 Voltmeter, Ammeter, and Ohmmeter
- 2 Hydrometer
- 3 Compression Tester
- 4 Vacuum Gauge
- 5 Fuel Pressure Gauge
- 6 Dwell Meter
- 7 Tachometer
- 8 Stroboscopic Timing Light
9. Exhaust Gas Analyzer

Items 1 through 8 are essential. Item 9 is necessary for exhaust emission control compliance. The following is a brief description of the function of each instrument.

Voltsmeter, Ammeter, and Ohmmeter

For testing the ignition and electrical systems, a good voltmeter is required. For automotive use, an instrument covering 0-20 volts is satisfactory. It should have an accuracy of about $\pm \frac{1}{2}$ volt, which excludes the common automotive type found in instrument panels.

An ohmmeter measures electrical resistance, and is required to check electrical continuity (open- and short-circuits), and for testing fuses and lights.

The ammeter measures electrical current. One for automotive use should cover 0-10 and 0-100 amperes. An ammeter is useful for checking battery charging and starting current. The starter and generator procedures in this manual use an ammeter to check for shorted windings. Several inexpensive VOM's (volt-ohmmeters) combine all instruments and fit easily into any tool box. The ammeter ranges are often too small for automotive work, though.

Hydrometer

A hydrometer is necessary to check battery condition and charge. It measures specific gravity of the electrolyte in each cell.

Compression Tester

The compression tester measures compression.

pressure built up in each cylinder. The readings, when properly interpreted, indicate general cylinder and valve condition.

Vacuum Gauge

The vacuum gauge is easy to use, but difficult for an inexperienced mechanic to interpret. The results, when considered with other findings, can provide valuable clues to possible trouble.

Connect the vacuum gauge with a T-connection in the hose from the carburetor to the vacuum advance on the distributor. Start the engine and let it warm up thoroughly. Vacuum reading should be steady at 18-22 inches.

NOTE *Subtract 1 inch from reading for every 1000 feet of altitude*

Figure 1 shows numerous typical readings with interpretations. Results are not conclusive without comparing to other tests, such as compression readings.

Fuel Pressure Gauge

This instrument is vital for evaluating fuel pump performance. Often, a vacuum gauge and fuel pressure gauge are combined.

Dwell Meter

A dwell meter measures the distance, in degrees of cam rotation, that the breaker points remain closed while the engine is running. Since this angle is determined by breaker point gap, the dwell angle is an accurate indication of point gap. Many tachometers intended for tuning and testing incorporate a dwell meter as well. Follow the manufacturer's instruction to measure dwell on the Datsun.

Tachometer

A tachometer is essential for tuning Datsuns with exhaust emission control devices. Ignition timing and carburetor adjustments must be performed at the specified idle speed. The best instrument for this purpose is one with a range of 0-1,000 or 0-2,000 rpm. Extended range (0-6,000 or 8,000) instruments lack accuracy at lower speeds. The instrument should be capable of detecting changes of 25 rpm.

Stroboscopic Timing Light

This instrument permits accurate ignition timing. By flashing a light at the precise instant cylinder No. 1 fires, the position of the crankshaft pulley at that instant can be seen. Marks on the pulley line up with a reference pointer on the block during the timing procedure. Suitable lights are neon bulb types and xenon strobe lights. Neon timing lights are difficult to see and must be used in dimly lit areas. Xenon strobe lights can be used in bright sunlight. Use the light according to the manufacturer's instructions.

Exhaust Analyzer

Of all instruments described here, this is the least likely to be owned by a home mechanic. One instrument samples the exhaust gases from the tailpipe and measures the thermal conductivity of the exhaust gas. Since different gases conduct heat at varying rates, thermal conductivity of the exhaust is a good indication of gases present. This instrument is vital for accurately checking the effectiveness of exhaust emission control adjustments, but is too expensive for an amateur mechanic to consider buying.

STARTER

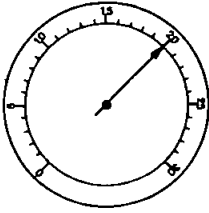
Starter system troubles are relatively easy to isolate. The following are common symptoms and cures.

1 Engine cranks very slowly or not at all

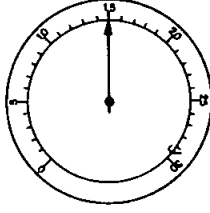
Turn on the headlights, if the lights are very dim, most likely the battery or the connecting wires are at fault. Check the battery using the procedures described in the Tune-up chapter. Check wiring for breaks, shorts, and dirty connections.

If the battery and connecting wires check good, turn the headlights on and try to crank the engine. If the lights dim drastically, the starter is probably shorted to ground. Remove the starter and test it using the procedures given in Chapter Nine. If the lights remain bright or dim slightly when cranking the engine, the trouble may be in the starter, solenoid, or wiring. To isolate the trouble, short the two large solenoid terminals together (not to ground), if the starter cranks normally, check the solenoid and wiring up to the

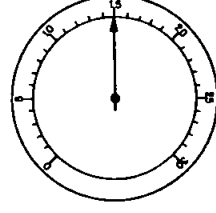
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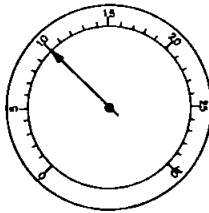
1. NORMAL READING
18-22° at idle



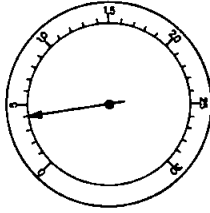
2. NORMAL READING
High lift cam with large overlap



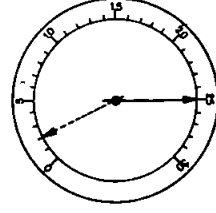
3. LATE IGNITION TIMING
14-17° at idle Normal cam lap



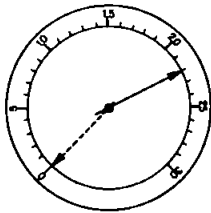
4. LATE VALVE TIMING
8-15° at idle



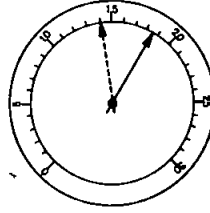
5. INTAKE LEAK
Low steady reading



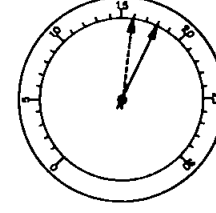
6. NORMAL READING
Drops to 2, then rises to 25 when accelerator is rapidly depressed and released.



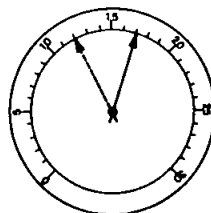
7. WORN RINGS, DILUTED OIL
Drops to 0, then rises to 22 when accelerator is rapidly depressed and released



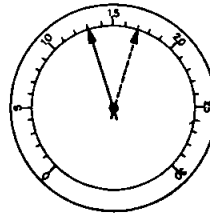
8. STICKING VALVE(S)
Normally steady Intermittently flicks downward about 4°



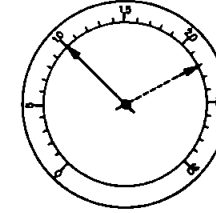
9. LEAKY VALVE
Regular drop about 2°



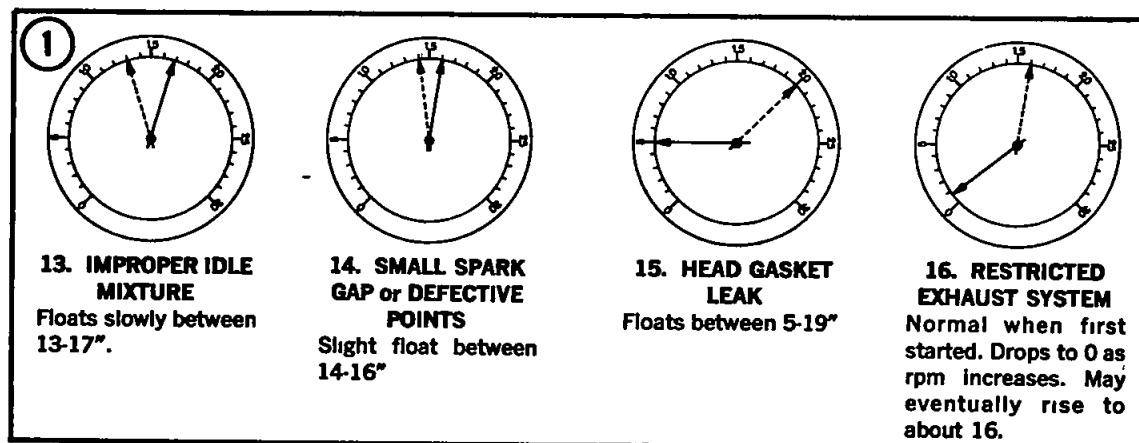
10. BURNED OR WARPED VALVE
Regular, evenly spaced down-scale flick about 4°



11. WORN VALVE GUIDES
Oscillates about 4°



12. WEAK VALVE SPRINGS
Violent oscillations (about 10°) as rpm increases. Often steady at idle.



ignition switch. If the starter still fails to crank properly, remove the starter and test it.

2. Starter turns, but does not engage with engine.
This trouble is usually a defective pinion or solenoid shifting fork. It may also be that the teeth on the pinion, flywheel ring gear, or both are worn down too far to engage properly.

3. Starter engages, but will not disengage when ignition switch is released.

This trouble is usually caused by a sticking solenoid, but occasionally the pinion can jam on the flywheel. With manual transmissions, the pinion can be temporarily freed by rocking the car in high gear. Naturally, this is not possible in automatics; the starter must be removed.

4. Loud grinding noises when starter runs.

This usually means the teeth on the pinion and/or flywheel are not meshing properly. It may also mean the overrunning clutch is broken. In the first case, remove the starter and examine the gear teeth. In the latter, remove the starter and replace the pinion drive assembly.

CHARGING SYSTEM

Charging system troubles may be in the alternator, voltage regulator, or fan belt. The following symptoms are typical.

1. Alternator warning lamp does not come on when ignition is turned on.

This may indicate a defective ignition switch, battery, voltage regulator, or lamp. First, try to

start the car. If it doesn't start, check the ignition switch and battery.

If the car starts, find the voltage regulator and disconnect the white/red wire, this is the lamp wire. Ground the wire. If the lamp lights, the voltage regulator is defective, not properly grounded (try tightening the mounting screws), or the alternator brushes are not contacting the commutator. If the lamp does not light when the wire is grounded, the lamp is probably burned out; replace it.

2. Alternator warning lamp comes on and stays on.

This usually indicates that no charging is taking place. First check the fan belt tension and adjust if necessary. Check the battery condition with the hydrometer, and check all electrical connections in the charging system. Finally isolate the trouble to the alternator or voltage regulator.

3. Alternator warning lamp flashes erratically.

This usually indicates the charging system is working intermittently. Check the fan belt tension, and all electrical connections in the charging system. Check alternator brushes and condition of the commutator.

4. Battery requires frequent additions of water, or lamps require frequent replacement.

The alternator is probably overcharging the battery. The voltage regulator is probably faulty, check it using the procedures given in Chapter Nine.

5. Excessive noise from the alternator

Check for loose alternator mounting. The

trouble may also be worn bearings. Remove the alternator and repair.

ENGINE

These procedures assume the starter cranks the engine over normally. If not, refer to Starter section in this chapter.

1 *Engine won't start.*

Could be caused by the ignition or fuel problems. First determine if high voltage to spark plug occurs. To do this, disconnect one of the spark plug wires. Hold the exposed wire terminal $\frac{1}{4}$ to $\frac{1}{2}$ inch from ground (any metal in engine compartment) with an insulated screwdriver. Crank the engine over. If sparks do not jump to ground or the sparks are very weak, the trouble may be in the ignition system. See Ignition System Troubleshooting to further check. If sparks occur properly, the trouble may be in the fuel system. See Fuel System Troubleshooting.

2 *Engine misses steadily*

Remove one spark plug wire at a time and ground the wire. If engine miss increases, that cylinder was working properly. Reconnect the wire and check the others. When a wire is disconnected and engine miss remains the same, that cylinder is not firing.

Check spark as described in Step 1. If no spark occurs for one cylinder only, check distributor cap, wire, and spark plug. If spark occurs properly, check compression and intake manifold vacuum to isolate the trouble.

3 *Engine misses erratically at all speeds*

Intermittent trouble can be difficult to find. It could be in the ignition system, exhaust system, or fuel system. Follow troubleshooting procedures for these systems carefully to isolate the trouble.

4 *Engine misses at idle only*

Trouble could exist anywhere in ignition system. Follow Ignition Troubleshooting procedure carefully. Trouble could also exist in the carburetor idle circuit. Check idle mixture adjustment and check for restrictions in the idle circuit.

5 *Engine misses at high speed only.*

Problems could be in the fuel or ignition systems.

Check accelerator pump operation, fuel pump delivery, fuel lines, etc., as described under Fuel System Troubleshooting. Also check spark plugs and wires.

6 *Low performance at all speeds, poor acceleration*

Trouble usually in ignition or fuel system. Check each with the appropriate troubleshooting procedure.

7 *Excessive fuel consumption*

Could be caused by a wide variety of seemingly unrelated factors. Check for clutch slippage, brake drag, defective wheel bearings, or poor front end alignment. Check ignition system and fuel system.

8 *Oil pressure lamp does not light when ignition switch is on*

Check the alternator warning lamp. If it isn't on either, go to Step 1, Charging System Troubleshooting. If only the oil pressure lamp is off, open the engine compartment lid and locate the oil pressure sender on the block near the oil filter. Make sure the wire is connected to the sender and making good contact. Pull the wire off and ground it. If the lamp lights, replace the sender. If the lamp does not light, replace the lamp.

9 *Oil pressure lamp lights or flickers when engine is running*

Indicates low or complete loss of oil pressure. Stop the engine immediately, coast to a stop with the clutch disengaged. This may simply be caused by a low oil level, or an overheating engine. Check the oil level and fan belt tension. Check for a shorted oil pressure sender with an ohmmeter or a continuity tester. Remove and clean the oil dipstick and check oil level and condition. Replenish or replace the oil as required. Listen for unusual noises indicating damaged bearings, etc. Do not re-start the engine until you know why the light went on and are sure that the problem has been corrected.

IGNITION SYSTEM

This procedure assumes the battery is in good enough condition to crank the engine at a normal rate.

1 *No spark to one plug*

The only possible causes are a defective distributor cap or spark plug wire. Examine the distributor cap for moisture, dirt, or carbon tracking caused by flashover, cracks, etc.

2 *No spark to any plug*

This could indicate trouble in the primary or secondary circuits. First remove the coil wire from the center post of the distributor. Hold the wire end about 1/4 inch from ground with an insulated screwdriver. Crank the engine. If sparks are produced, the trouble is in the rotor or distributor cap. Remove the cap and check for burns, moisture, dirt, carbon tracking, cracks, etc. Check the rotor for excessive burning, pitting, or cracks. Replace both if necessary.

If the coil does not produce any spark, check the secondary wire for opens. If the wire is good, turn the engine over so the breaker points are open. Examine the points for excessive gap, burning, pitting, and looseness. Replace and adjust if necessary. With the points open, check voltage to ground at the coil with a voltmeter or test lamp. If voltage is present, the coil is probably bad. Have it checked or substitute a known good one.

If voltage is not present, check wire connections to coil and distributor. Temporarily disconnect the wire from the distributor to the coil and measure from the coil to ground. If voltage is present, the distributor is shorted. Examine the breaker points and connecting wires carefully. If voltage is still not present, check the other coil terminal for ground. Voltage at this terminal but not at the other indicates a defective coil. No voltage at this terminal indicates an open wire between the terminal and the battery.

3 *Weak spark*

If the spark is so small it cannot jump from the wire to ground, check battery condition. Other causes are bad breaker points, condenser, incorrect breaker point gap, dirty or loose connections in the primary circuit, or dirty or burned rotor or distributor. Also check for worn distributor cam lobes.

4 *Missing*

This is usually caused by fouled or damaged plugs, plugs of the wrong heat range, or incorrect

plug gap. Clean and regap the spark plugs. This trouble can also be caused by weak spark (see symptom 3) or incorrect ignition timing.

5 *Spark polarity*

Less voltage is required to cause electron flow from a relatively hot electrode to a cooler electrode. Since the center electrode is hottest, this electrode should be negative. Electron flow is then from the center electrode to the outer electrode. From 20 to 40 percent more voltage is required to cause electron flow from the outside electrode to the hotter center electrode. This occurs when the spark voltage is positive. The coil wires must be connected correctly.

FUEL SYSTEM

Fuel system troubles must be isolated at the carburetor, fuel pump, or fuel lines. These procedures assume that the ignition system has been checked and properly adjusted.

1 *Engine will not start.*

First, determine that fuel is reaching the carburetor. Remove the air cleaner, look into the carburetor throat, and depress the accelerator several times. There should be a stream of fuel from the discharge tube each time the accelerator is depressed. If not, the fuel pump is not delivering fuel to the carburetor or the float system in the carburetor is not working. Make certain there is fuel in the fuel tank. Check the automatic choke (if so equipped) to make certain it is not stuck. If necessary, rebuild the fuel pump or overhaul the carburetor, whichever is determined to be faulty.

2 *Engine runs at fast idle*

Usually this is caused by misadjustment of the carburetor idle setting. Readjust as required.

3 *Rough idle or engine miss with frequent stalling*

Check idle mixture and idle speed adjustments. Inspect the overall condition of the carburetor for foreign material and clean or overhaul as required.

4 *Engine "diesels" (continues to run after engine is turned off)*

Check idle mixture and idle speed adjustments.

5 *Stumbling when accelerating from idle*

Check accelerator pump diaphragm and idle speed adjustment

6 *Engine misses at high speed or lacks power*

This indicates possible fuel starvation. Check fuel pump pressure and capacity. Clean main jet and float needle valve.

7 *Black exhaust smoke*

Black exhaust smoke means a badly overrich mixture. Check idle mixture and idle speed adjustment. Check for excessive fuel pump pressure or blocked return line from carburetor to fuel tank. Check for leaky float or worn needle valve.

8 *Excessive fuel consumption*

This may be another indication of an overrich fuel mixture. Check that automatic choke operates (if so equipped) or that the manual choke control is not being left out. Check idle mixture and idle speed. Check for excessive fuel pump pressure, leaky float, or worn needle valve. Make certain that jets are the proper size.

Fuel Pump Pressure Testing

1. Install a "T" fitting in the fuel line close to the carburetor.
2. Connect a fuel pressure gauge to the fitting with a short tube.
3. Check fuel pump pressure as described in the Fuel System chapter.

EXHAUST EMISSION CONTROL

The following symptoms assume you have adjusted the ignition and carburetor to specification and that you have checked the results on an accurate exhaust gas analyzer.

1 *CO content too low*

Make sure idle speed is not too low. Check idle mixture adjustment (too lean). Check carburetor jets and channels. Clean and/or replace as necessary. Check engine condition with a compression and vacuum test.

2. *CO content too high*

Check idle mixture adjustment (too rich). Check for dirty air cleaner and defective automatic choke (if so equipped). Check carburetor jets

and channels. Clean and/or replace as necessary. Check engine condition with compression and vacuum test.

3 *Hydrocarbon level too high*

Check that idle speed and mixture adjustments are to specification. Check spark plug condition and gap. Check breaker points. Check ignition timing (too early). Check intake manifold for leaks. Check valve clearance (too small). Check condition of valves with compression test.

MANUAL CLUTCH

1 *Slippage*

This is most noticeable when accelerating in a high gear at relatively slow speed. To check slippage, park the car on a level surface with the handbrake set. Shift to 2nd gear and release the clutch as if driving off. If the clutch is good, the engine will slow and stall. If the clutch slips, continued engine speed will give it away.

CAUTION

This is a severe test. Perform only when slippage is suspected, not periodically.

Slippage results from insufficient clutch pedal free play, oil or grease on the clutch disc, worn pressure plate, or weak springs. Also check for binding in the clutch cable and lever arm which may prevent full engagement.

2 *Drag or failure to release*

This problem usually causes difficult shifting and gear clash, especially when downshifting. The causes may be excessive clutch pedal free play, warped or bent pressure plate or clutch disc, excessive clutch cable guide sag, and broken or loose clutch linings. Check condition of main shaft splines.

3 *Chatter or grabbing*

A number of things can cause this. Check cable guide sag and tightness of transmission-to-frame and engine-to-transmission mounting bolts. Check for worn or misaligned pressure plate and misaligned release plate.

4 *Other noises*

Noise usually indicates a dry or defective release bearing. Check the bearing and replace if neces-

sary Also check all parts for misalignment and uneven wear

TRANSMISSION

1 *Difficult to mesh gears*

Make certain the clutch, pressure plate, and release bearing are in good condition The trouble can be caused by worn gears, shaft, and/or bearings Disassemble and repair as required Also can be caused by insufficient operating stroke due to worn or loose sliding parts or a defective synchronizer Disassemble, carefully inspect, and replace as required

2 *Gears slip out of mesh*

Generally, this trouble occurs when the interlock plunger, check ball, and/or spring is weakened or worn The trouble can also be caused by worn fork rod ball groove, damaged bearings, or damaged gears Disassemble, carefully inspect, and replace as required

3 *Noise*

If noises are heard with the engine idling and the clutch disengaged, the noise is probably coming from the transmission Several items can cause noises either singly or in combination Check the quality and quantity of lubricant in the transmission Replace or replenish as necessary Worn bearings will usually produce a high humming at high speed, and a cyclic knocking sound at low speed Worn or damaged splines and bushings will also cause noise

BRAKES

1 *Brake pedal goes to floor*

There are numerous causes for this including excessively worn linings, air in the hydraulic system, leaky brake lines, leaky wheel cylinders, or leaky or worn master cylinder. Check for leaks and thin brake linings Bleed and adjust the brakes If this doesn't cure the trouble, rebuild wheel cylinders and/or master cylinder

2 *Spongy pedal*

Normally caused by air in the system, bleed and adjust the brakes

3 *Brakes pull*

Check brake adjustment Also check for contam-

inated brake linings (from leaks), leaky wheel cylinders, loose calipers, frozen or seized pistons, and restricted brake lines or hoses In addition, check front end alignment and suspension damage such as broken front or rear springs, shocks, etc Check condition of tires

4 *Brakes squeal or chatter*

Check brake lining thickness and brake drum roundness Ensure that the shoes have chamfered ends and are not loose Inspect the condition of the rotors on the front wheel disc brakes to make certain they are not scored or damaged Clean away all dirt on shoes, pads, rotors, or drums

5 *Dragging brakes*

Check brake adjustment including handbrake Check for broken or weak shoe return springs, swollen rubber parts due to improper brake fluid or other contamination Clean or replace defective parts

6 *Hard pedal*

Check brake linings for contamination Also check for restricted brake lines and hoses.

7 *High speed fade*

Check for distorted or out-of-round drums and contaminated brake linings Make certain the recommended brake fluid is used Drain entire system and refill if in doubt

8 *Pulsating pedal*

Check for distorted or out-of-round drums or rotors Check for excessive brake disc run-out

STEERING AND SUSPENSION

NOTE *Unusual steering, pulling, or wandering is usually caused by bent or otherwise misaligned suspension parts Because of the specialized equipment required to evaluate and correct these faults, it is recommended that service to the steering and suspension system be referred to your Datsun dealer or a qualified specialist in this field*

1 *Vibration felt in steering wheel*

Vibration can be caused by several things including improper air pressure in tires, uneven wear

of tire, loose wheels, improper adjustment or wear of front wheel bearings, faulty wheel alignment, or wear of transverse link and tension rod bushings. Inspect all parts carefully for wear or damage. Replace or repair parts as required.

2 Shock transmitted through steering wheel.

This is usually most noticeable when traveling over bad roads at relatively high speeds. Causes include damage to the idler arm, insufficient tightening of steering gear box, wear of the steering linkage, and wear of the suspension ball joint. Inspect all parts for wear or damage. Refer to Chapter Thirteen for service or repair you can perform and for procedures which should be referred to your dealer.

3 Shimmying

This is usually most noticeable when a specific speed is attained and will normally repeat at that speed. Causes are generally unbalanced wheels, improper adjustment of steering gear (insufficient backlash), malfunction of the shock absorbers, or loose bolts for the strut mounting. Repair or replace defective parts as required. Refer to Chapter Thirteen.

4 Wandering of car in one direction.

This problem can be caused by improper air pressure, loose wheel nuts, difference in tire tread wear from left to right side, incorrect adjustment of wheel bearings, defective wheel bearings, collapsing or twisting of front spring, or incorrect wheel alignment. Also, binding of the brake shoes, worn bushings in the transverse link or the tension rod, and deformation of steering linkage and suspension link can cause wander. Carefully inspect all parts for looseness and wear; and replace or repair as required. In some cases a defective rear suspension may also cause the vehicle to wander.

5 Instability.

Instability can be caused by improper tire pressures, worn bushings in the transverse link and tension rod, incorrect wheel alignment, worn steering linkage, incorrect adjustment of steering gear, and unbalanced wheels. Inspect all parts carefully for wear and damage. Adjust, repair, or replace as required.

6. Heavy feeling in steering.

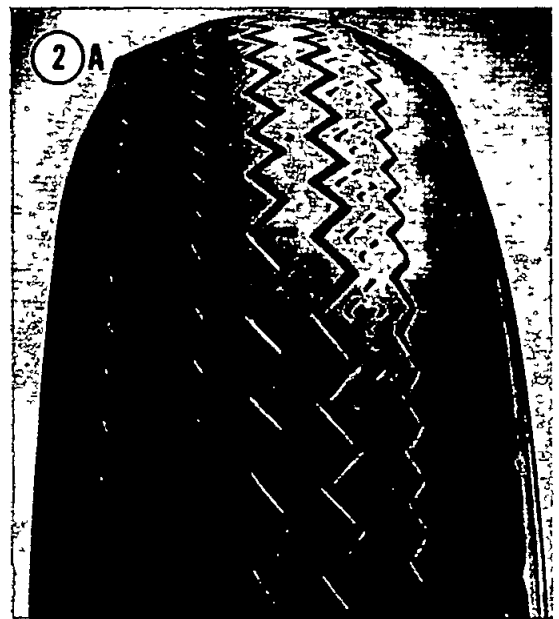
This can be caused by improper tire pressures, insufficient or contaminated lubricant in gear-box, damage or insufficient grease in suspension ball joint, damaged or badly adjusted wheel bearings, worn or damaged steering gear, damage of upper strut bearing, and interference of steering column with turn signal switch. Inspect all parts carefully for wear and damage. Adjust, repair, or replace as required.

7. Excessive play in steering wheel

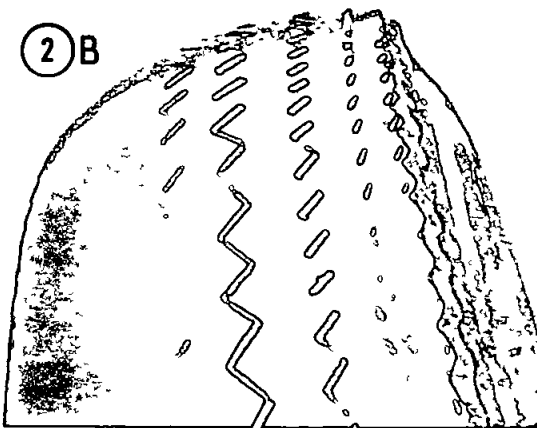
This is usually caused by incorrect adjustment of the steering gear, worn bushings in the steering linkage or idler arm, incorrect adjustment of the front wheel bearings, worn bushings in the transverse link and tension rod. Carefully inspect all parts for wear or damage. Adjust, repair, or replace as required.

TIRE WEAR ANALYSIS

Abnormal tire wear should always be analyzed to determine the cause. The most common are incorrect tire pressure, improper driving, overloading, and incorrect wheel alignment. **Figures 2A through 2F** identify wear patterns and indicate likely causes.



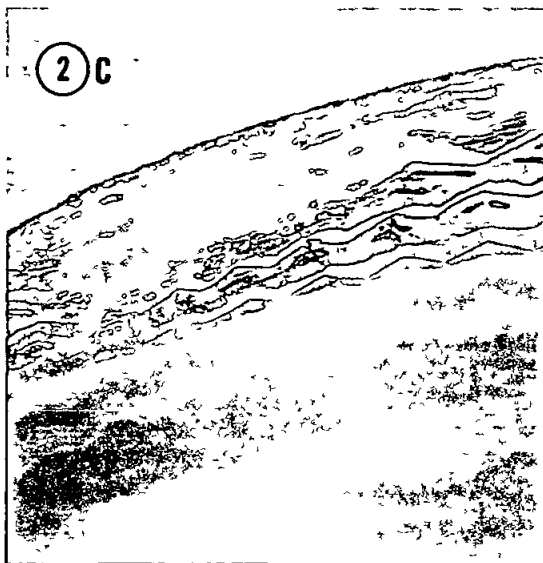
Underinflation—Worn more on sides than in center



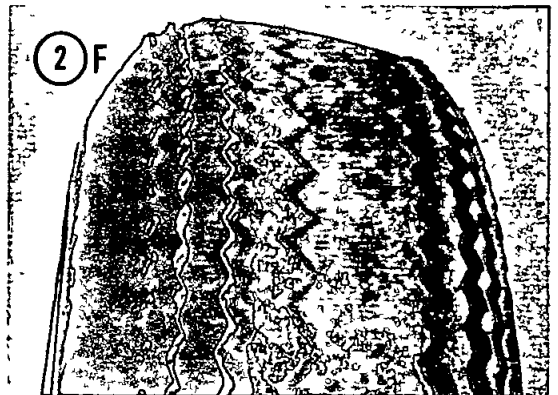
Wheel Alignment—Worn more on one side than the other. Edges of tread feathered



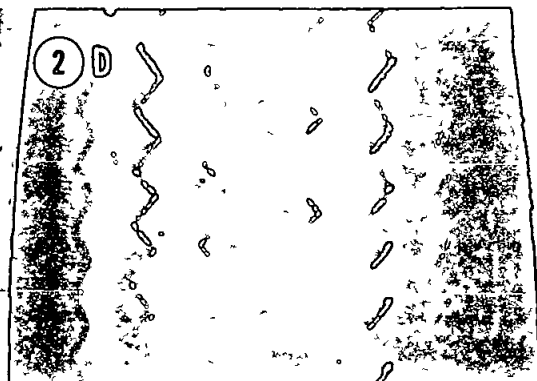
Wheel Balance—Scalloped edges indicate wheel wobble or tramp due to wheel imbalance



Road Abrasion—Rough wear on entire tire or in patches



Combination—Most tires exhibit a combination of the above. This tire was overinflated (center worn) and the toe in was incorrect (feathering). The driver cornered hard at high speed (feathering, rounded shoulders) and braked rapidly (worn spots). The scaly roughness indicates a rough road surface.

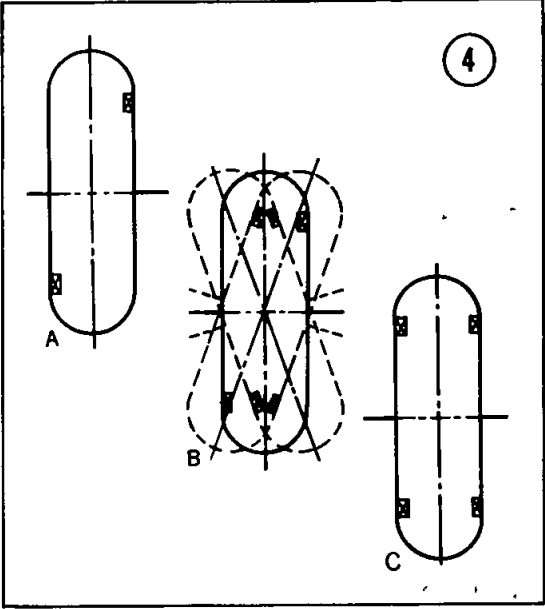
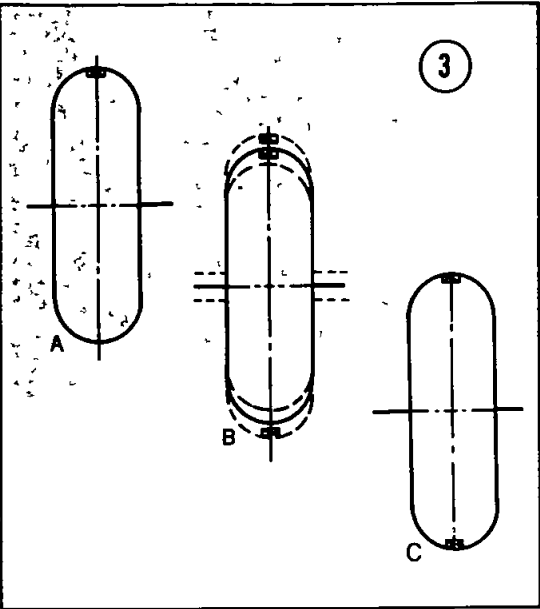


Overinflation—Worn more in center than on sides

WHEEL BALANCING

All four wheels and tires must be in balance along two axes. To be in static balance, weight must be evenly distributed around the axis of rotation. Figure 3A shows a statically unbalanced wheel. Figure 3B shows the result—wheel tramp or hopping. Figure 3C shows proper static balance.

To be in dynamic balance, the centerline of the weight must coincide with the centerline of the wheel. Figure 4A shows a dynamically unbalanced wheel. Figure 4B shows the result—wheel wobble or shimmy. Figure 4C shows the proper dynamic balance.



CHAPTER FOUR

ENGINE AND IGNITION TUNE-UP

For best performance and economy, care must be taken in performing tune-ups. While accuracy is required, the task is not difficult if the steps in this chapter are followed carefully.

Cars used primarily in city stop-and-go driving will require attention more frequently than those used on highways. This is because the engine does not reach full operating temperature. Consequently, valves tend to stick, compression drops, and engine operation becomes rough.

A tune-up is advisable every 6,000 miles or sooner depending on type of driving. Every 12,000 miles, the spark plugs and ignition breaker points should be replaced, not just cleaned and adjusted.

A minor tune-up consists of checking battery condition, cleaning, gapping, or replacing spark plugs and distributor breaker points, adjusting distributor dwell angle, adjusting ignition timing, and setting the carburetor idle mixture and idle speed. A major tune-up includes the above items plus ignition, compression, valve clearance, carburetor, emission control device, and electrical checks and adjustments.

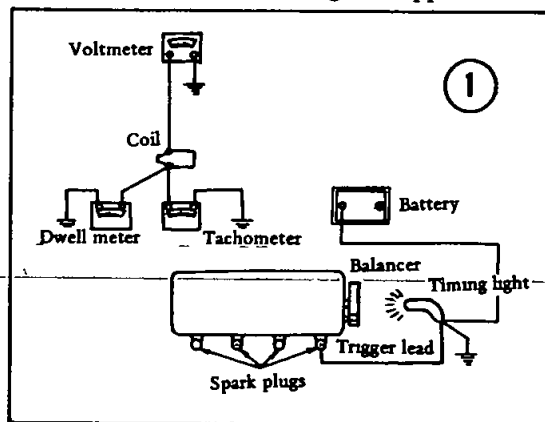
Tune-up Equipment Required

The following equipment is required. Chapter Two provides a brief description of the test equipment.

- 1 Voltmeter, ammeter, and ohmmeter
- 2 Hydrometer
- 3 Compression tester
- 4 Vacuum gauge
- 5 Dwell meter
- 6 Tachometer
- 7 Stroboscopic timing light
- 8 Feeler gauges
- 9 Torque wrench
- 10 Assorted hand tools

Connection of Tune-up Equipment

Follow the manufacturer's recommendations for the use of test equipment, if possible. Figure 1 is a basic schematic diagram applicable to



many types of test equipment and may be used as a guide if the manufacturer's instructions are not available. Connections shown in Figure 1 are as follows:

1. Voltmeter
 - a Positive lead to resistor side of coil
 - b Negative lead to ground
2. Timing Light
 - a Positive lead to positive battery terminal
 - b Trigger lead to number 1 spark plug
 - c Negative lead to ground
3. Tachometer
 - a Positive lead to distributor side of coil
 - b Negative lead to ground
4. Dwell Meter
 - a Positive lead to distributor side of coil
 - b Negative lead to ground

BATTERY INSPECTION AND SERVICE

- 1 Check the level of the electrolyte in battery cells. If necessary, replenish with distilled water. Do not overfill.
- 2 Measure the specific gravity of the battery electrolyte. Refer to the following table.

	Permissible Value	Full Charge Value (68 degrees F 20 degrees C)
Frigid climates	Over 1.22	1.28
Tropical climates	Over 1.18	1.23
Other climates	Over 1.20	1.26

- 3 Clean top of battery and terminals with a solution of baking soda and water. Rinse off and dry thoroughly. Top of battery must be clean to prevent current leakage between terminal and from positive terminal to hold-down clamp. Prolonged accumulation of acid and dirt on top of battery may cause blistering of the material covering on the connector straps and deterioration of the straps themselves.
- 4 Tighten the cable connectors to the terminal securely.
- 5 Coat the terminals lightly with petrolatum to protect them from corrosion.

SPARK PLUGS INSPECTION AND SERVICE

- 1 Remove spark plug wires. Mark them to insure correct replacement.

2 Use the proper size socket and wrench to remove spark plugs from the cylinder head. Make certain that the gaskets are removed from the spark plug holes.

3 Wipe off the insulator with a clean rag to remove grease and dirt.

4 Carefully inspect the insulator and body of each plug for signs of cracks or chips. Replace if faulty.

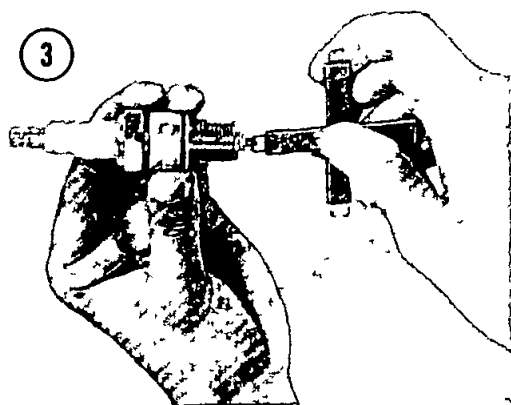
5 Inspect spark plug threads and electrodes for damage or excessive wear. Replace as required. **Figure 2** shows the condition of normal and defective spark plugs, along with an explanation of the causes of the abnormal conditions.

6 If the spark plugs are still serviceable, clean them thoroughly with a stiff brush or, preferably, with a sand blasting type of cleaner.

7 File the center electrode so that it has a flat surface.

8 File the surfaces of the outer electrode so that all surfaces are flat and smooth.

9 Using a feeler gauge, adjust clearance between the electrodes to 0.031 to 0.035 in. (0.8 to 0.9 mm), as shown in **Figure 3**.



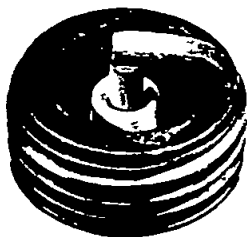
10 Reinstall spark plugs. Make certain to use a new gasket for each plug. Use a torque wrench to tighten spark plugs from 11.0 to 15.0 ft-lb (1.5 to 2.0 kg/m).

11 Reinstall wires.

DISTRIBUTOR INSPECTION AND SERVICE

Depending on the model year, vehicles have a single point or a dual point distributor system.

2



Normal plug appearance noted by the brown to grayish-tan deposits and slight electrode wear. This plug indicates the correct plug heat range and proper air/fuel ratio.



Red, brown, yellow and white coatings caused by fuel and oil additives. These deposits are not harmful if they remain in a powdery form.



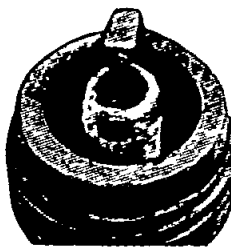
Carbon fouling distinguished by dry, fluffy black carbon deposits which may be caused by an over-rich air/fuel mixture, excessive hand choking, clogged air filter or excessive idling.



Shiny yellow glaze on insulator cone is caused when the powdery deposits from fuel and oil additives melt. Melting occurs during hard acceleration after prolonged idling. This glaze conducts electricity and shorts out the plug.



Oil fouling indicated by wet, oily deposits caused by oil pumping past worn rings or down the intake valve guides. A hotter plug temporarily reduces oil deposits, but a plug that is too hot leads to pre-ignition and possible engine damage.



Overheated plug indicated by burned or blistered insulator tip and badly worn electrodes. This condition may be caused by pre-ignition, cooling system defects, lean air/fuel ratios, low octane fuel or over advanced ignition timing.

Spark plug condition photos courtesy of AC Spark Plug Division, General Motors Corporation

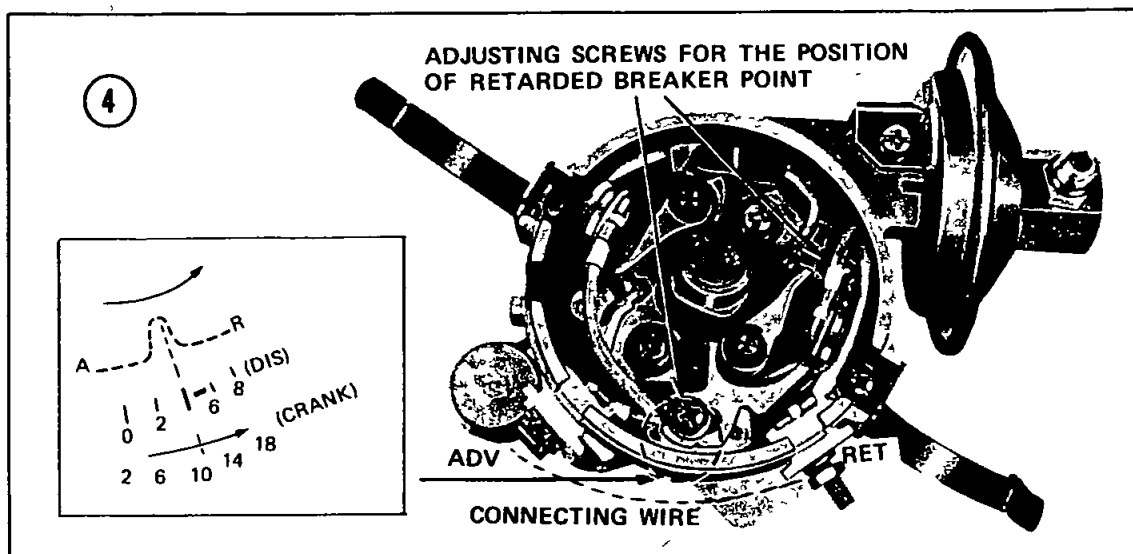
The procedures given below would generally apply to either type. In the dual point system, one set of points is known as the advance set and the other the retard set. Complete details are given in Chapter Nine. **Figure 4** is a detail of the dual point system.

1. Remove distributor cap. Clean it carefully to remove grease or dirt.
2. Examine the inside of the cap for dirt or excessive wear. Look for signs of carbon tracks

(arcing) from contact to contact inside the distributor cap. Carbon tracks indicate defects or cracks, and if found, the cap should be replaced.

3. Remove the rotor and inspect for excessive wear around the top metal contact wiper surface. If defective, replace. As a matter of good practice, the rotor should be replaced whenever the contact points are replaced.

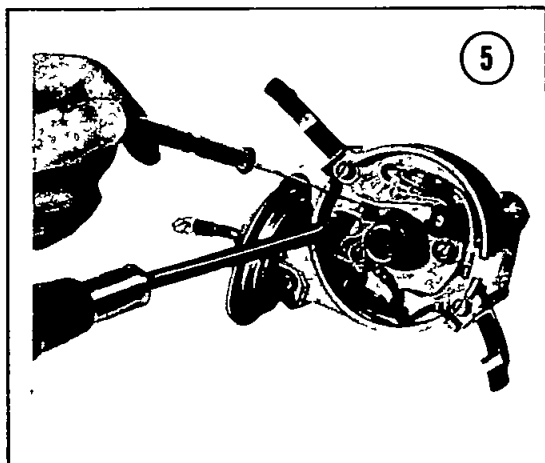
4. Use a screwdriver to gently open the contact points. If they show wear or pitting, remove the



contact point assembly from the distributor and clean or replace the points. Use a point file to clean the contacts. Do not attempt to remove all roughness. Apply a trace of bearing lubricant to the breaker cam.

5 Once the points have been cleaned or replaced, install the assembly in the distributor. Make certain to reconnect wires.

6 Adjust the point gap, **Figure 5**, with the use of a screwdriver and gap gauge. Make certain the rubbing arm on the contact assembly is resting on the high point of the cam. Point gap should be adjusted to 0.0177 through 0.0217 in (0.45 to 0.55mm).



7 Check condenser capacitance for a reading of 0.22 through 0.24 microfarads. Replace if defective. As a matter of good practice, the con-

denser should be replaced whenever the points are replaced.

8 Inspect the insulation on all wires within the distributor. Replace if defective.

9 Inspect the wire towers atop the distributor cap for signs of dirt or corrosion. A pencil with fine emery cloth wrapped around the erasure end can be used to clean and burnish the metal surfaces. Make certain to blow out any dust.

10 Replace the rotor and the cap on the distributor and secure the two hold-down clamps. Firmly insert ignition wires into proper towers in cap.

IGNITION TIMING

Ignition timing is adjusted with the engine running. Use a stroboscopic timing light and proceed as follows:

1 Make certain that spark plug gaps and distributor contact points are accurately set.

2 Disconnect the vacuum line from the carburetor at the distributor. Plug the end of the vacuum line with tape or a wooden stopper.

3 Hook up the timing light per instructions.

4 Hook up tachometer per instructions.

5 The timing marks are located on the front edge of the crankshaft pulley. The grooves are graduated in 5 degree increments. The top dead center mark is located to the extreme left-hand side of the engine as viewed from the front. A stationary pointer is connected to the cylinder

*On pickup: Only adjustable retarded point
for carburetor of carburetor timing as on 11-12*

block and should be used as the reference point in making adjustments

6. With a piece of white chalk, mark a line down the center of the pointer and mark the timing groove on the crankshaft pulley which is to be used in timing the engine. Specification for timing requires timing at 10 degrees before top dead center, which would be the fourth mark from the left end of the row of marks

7. Loosen the hold-down bolt at the base of the distributor.

8. Locate the slow speed idle adjusting screw on the carburetor so that idle speed can be adjusted while running. Also locate throttle adjusting screw

9. Start engine and adjust speed with the adjusting screws to the readings below.

Single point distributor	600 rpm
Dual point distributor	700 rpm

10. Alternate adjustment of the two screws until the smoothest idle at the proper speed is achieved

11. Point the timing light at the stationary pointer. When the light flashes, the timing mark on the crankshaft pulley should line up with the mark on the stationary pointer. If it does not exactly line up, rotate the distributor gradually until the marks align, indicating correct timing

12. Shut off the engine, remove the timing light and tachometer, tighten the hold-down bolt on the distributor, and connect the vacuum advance line to the distributor

IGNITION TIMING, IDLE SPEED, IDLE MIXTURE (DUAL POINT DISTRIBUTOR ONLY)

The following applies to vehicles with dual point distributor and an exhaust emission control device. If these procedures are followed, harmful exhaust emission should be below the maximum allowable level

1. Locate the idle and throttle adjusting screws on the carburetor

2. Warm up the engine thoroughly

3. Connect tachometer and timing light.

4. Set the idle speed at 700 rpm with the idle adjust screw

5. Adjust ignition timing at 10 degrees before top dead center

6. Increase the speed of the engine to 2,000 rpm with the accelerator or throttle linkage and hold for about 15 seconds.

7. Return to idle for one minute.

8. Set the engine to best idle at 750 rpm (770 rpm for automatic transmission) with the idle and throttle adjusting screws

9. Reduce engine speed at 700 rpm (720 rpm for automatic transmission) by turning the idle adjusting screw clockwise for a leaner mixture.

10. Connect a wire lead between the advance and retard side terminals. See Figure 4. Speed should drop from 100 to 150 rpm

11. Check ignition timing with timing light. It should now be at top dead center

12. If the timing is not correct, stop the engine and adjust the retarded breaker point.

13. Start the engine and recheck the timing. If incorrect, reset the retarded breaker point until it is correct. Repeat, as necessary

14. Disconnect the wire between the advance and retard terminals

15. Recheck timing. It should be 10 degrees before top dead center.

16. If incorrect, repeat the above procedures until satisfactory

17. The idle speed of automatic transmission vehicles should be about 575 rpm with the gear selector in the drive position

DWELL ANGLE SETTING

1. Connect the dwell angle meter

2. Adjust dwell angle to 49 to 55 degrees.

COMPRESSION TEST

A compression test is performed to check for worn piston rings or to detect the cause of a low speed miss. Before undertaking the test, eliminate the possibility of sticky valves by using one of the oil additives designed for the purpose.

With valves free, test compression as follows:

1. Run the engine for 15 to 20 minutes until normal operating temperatures are obtained

2. Shut off engine, remove air cleaner, and

block the throttle and choke in the wide open position.

3 Remove all four spark plugs.

4 Sequentially press a compression test gauge into each of the spark plug holes and crank the engine for at least four strokes. Record the compression reading for each cylinder. Standard compression reading is 171 lbs./in.² (12.0 kg/cm²). Minimum acceptable reading is 159 lbs./in.² (11.5 kg/cm²).

5. No reading should be less than 80% of the highest cylinder reading. Excessive variations between cylinders, accompanied by low speed missing of the cylinder or cylinders that read low usually indicates a valve not properly seating or a broken piston ring.

Low pressures, even though uniform, may indicate worn rings. This is especially true if excessive oil consumption has been noticed. If one or more cylinders read low or uneven, inject about a tablespoon of engine oil on top of the piston of that cylinder and crank the engine several times, noting the compression reading. If compression has risen, the piston rings or cylinders are worn and should be serviced. If compression has not improved after adding oil, the valves are sticking or are not seating properly.

If two adjacent cylinders have low compression, and injecting oil does not increase the reading, the head gasket between the cylinders is probably leaking.

VALVE CLEARANCE ADJUSTMENT

Valve adjustment should be done in two steps, first with the engine cold and then at operating temperature. Refer to Figure 6 and proceed as follows:

1. Remove air filter.

2. Remove rocker arm cover. Take care not to damage the gasket.

3. Remove the spark plugs and rotate the engine until number 1 cylinder is at top dead center on the compression stroke. This can be determined when the top dead center mark on the crankshaft pulley is in alignment with the stationary pointer and both valves for number 1 cylinder are closed.



4 Counting from the front of the engine, adjust valves 1, 2, 3, and 5 as follows. Loosen the pivot locking nut and turn the pivot screw until clearance between the pivot screw and the rocker arm is 0.0079 in. (0.200mm) for the intake valves and 0.0098 in. (0.25mm) for the exhaust valves. Check clearances with a feeler gauge, as shown. When correct, tighten the pivot locking nut.

5 Rotate the crankshaft until the number 4 piston is at top dead center on the compression stroke. This is one complete revolution of the crankshaft. Again, the 0 degree mark should align with the pointer and both valves on number 4 cylinder should be closed.

6 Adjust valves 4, 6, 7, and 8 as above.

7 Replace spark plugs, ignition wires, rocker arm cover, gasket, and air filter.

8 Start engine and run it until operating temperature is reached.

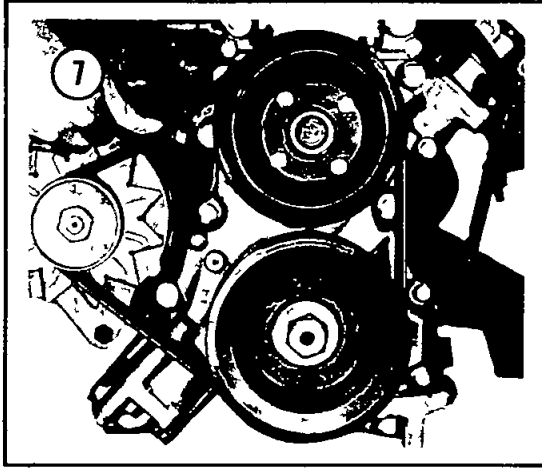
9. Remove rocker arm cover and repeat adjustment. Clearances should be 0.0098 in. (0.25mm) for the intake valves and 0.0118 in. (0.30mm) for the exhaust valves. Check clearances before loosening the pivot locking nuts as they may already be properly set. If not, adjust as required.

ADDITIONAL CHECKS

During tune-ups, check the following items for signs of defects or excessive wear:

1. Inspect the carburetor for buildup of foreign material. Pay special attention to the throat and linkages. Clean or overhaul as required. Details for carburetor maintenance are given in Chapter Seven.

2. Check all belts, hoses, and fuel lines. Replace if required. Check the tension of the belts for the air pump and the alternator. Adjust as required. Normal deflection of the belts when



pushed in by hand should be approximately 0.5 in (13mm), as shown in **Figure 7**.

3. Inspect the oil filter for leaks. Tighten or replace as necessary. The filter should be replaced at least every 6,000 miles.

4. Inspect the air cleaner for excessive accumulation of dirt. Replace at least every 24,000 miles under normal operating conditions.

5. Carefully inspect the water pump and the radiator for signs of leaks. Repair as necessary.

6. Check the emission control device (if so equipped). Refer to Chapter Ten for checks and tests to be made.

7. Check engine oil. Replenish or replace as required.

8. Check the level of the brake fluid in the brake and clutch master cylinder reservoirs. Replenish as necessary.

CHAPTER FIVE

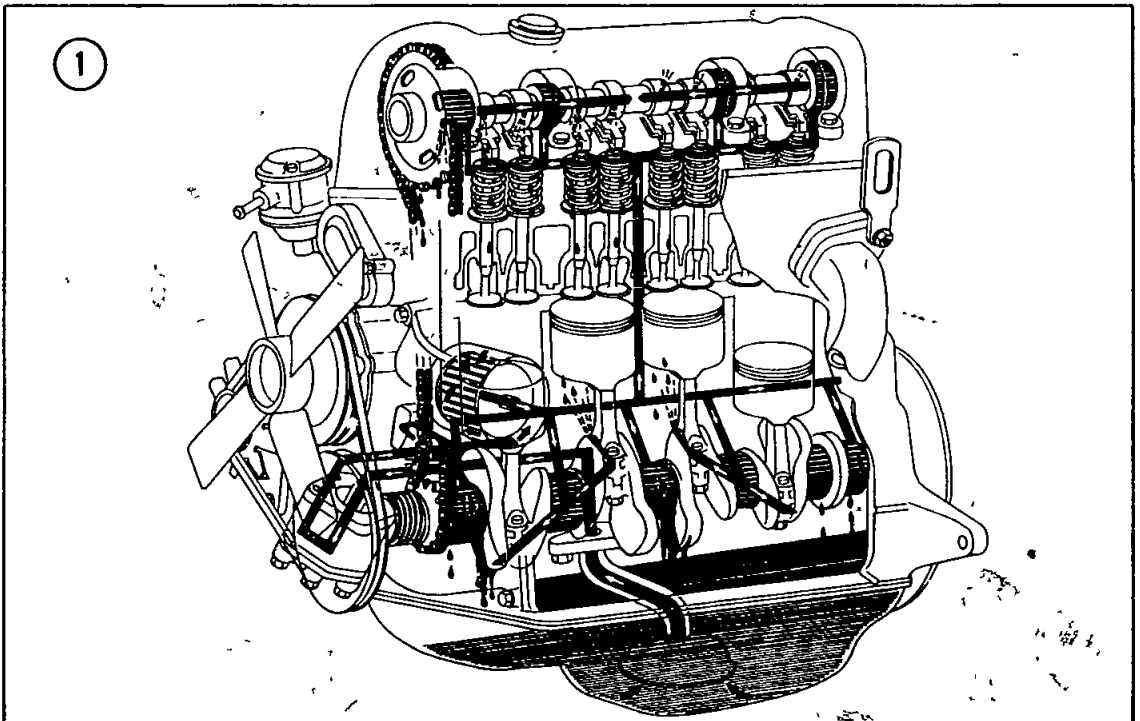
ENGINE LUBRICATION SYSTEM

DESCRIPTION

The Datsun L16 engine uses a pressure feed oil system. **Figure 1** illustrates the flow of the engine oil. Refer to Chapter Two for the recommended type of oil and the frequency that changing is recommended.

LUBRICATION CIRCUIT

Oil is drawn from the oil pan through the inlet screen and tube to the inlet side of the oil pump. Oil flows through the outlet portion of the oil pump and the oil gallery to the inlet side of the oil filter and then to the main gallery. The main

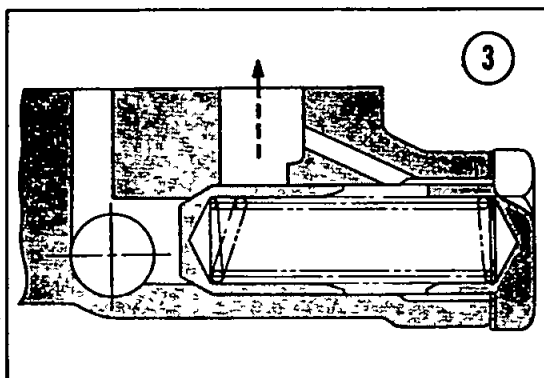
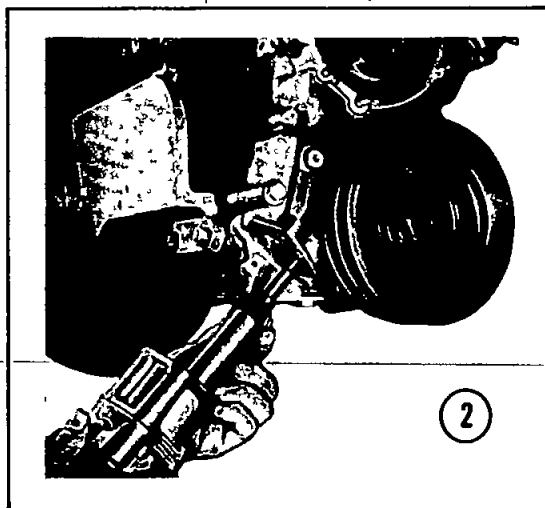


oil gallery supplies oil to the crankshaft main bearings. Drilled passages in the crankshaft direct oil from the main bearings to the connecting rod bearings. Oil injected from jet holes in the connecting rods is directed to the cylinder walls and piston pins. Oil distributed from the main gallery enters the chain tensioner. The pad is held against the chain by oil pressure and spring tension. The timing chain receives oil through the jet located near it.

Lubrication is supplied to the cylinder head main oil gallery through the crankshaft center bearings. Camshaft bearings on the cylinder head are fed directly from the cylinder head main gallery. The rocker arms and valves are lubricated intermittently by the camshaft oil gallery and the small channel at the base circle portion of each cam. Oil is supplied to the camshaft oil gallery through the No. 2 and No. 3 camshaft bearings.

OIL PUMP

The oil pump is installed in the bottom of the front cover, as shown in **Figure 2**. The pump is held in place by four bolts to the front cover. It is a rotor type driven by the oil pump spindle which is driven off of the crankshaft. Pressure is regulated by a valve shown in **Figure 3**. A slot at the top of the drive rotor engages a dog clutch at the lower end of the distributor drive shaft assembly. The oil pressure relief valve is not adjustable. In the released position, the valve permits oil to be by-passed through a passage on the pump cover to the inlet side of the pump.



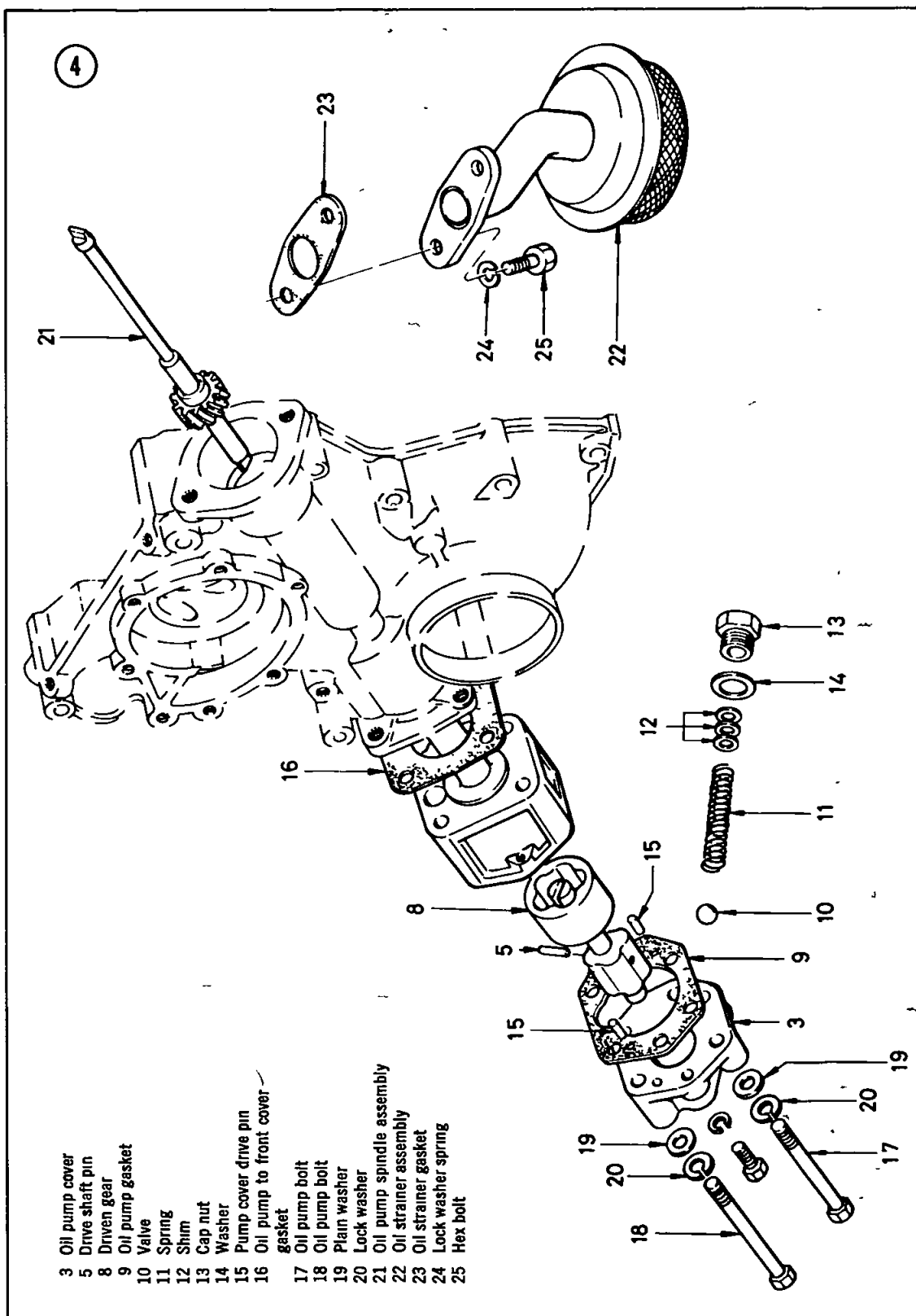
Oil Pump Removal

1. Remove the distributor from the top of the front cover. Make certain to mark the position of the distributor relative to the front cover so that it can be replaced in the same position.
2. Drain the engine oil.
3. Remove the front stabilizer from the bottom front of the engine compartment.
4. Remove the front splash shield from the bottom front of the engine compartment.
5. Remove the bolts holding the oil pump to the front cover. Remove oil pump and drive gear spindle from the front cover.

Disassembly, Inspection, Repair, and Assembly

Figure 4 is an exploded view of the oil pump assembly. Refer to the figure and the accompanying index.

1. Separate the body cover from the oil pump body by unscrewing the securing bolt.
2. Remove the pump drive mechanism and driver gear from the pump body. Clean the disassembled parts in a suitable solvent.
3. Inspect for signs of wear or damage. Repair or replace as necessary.
4. Inspect the drive rotor shaft for excessive wear or scoring. Check the following clearances:
 - a. Side clearance between inner and outer rotor. 0.0020 to 0.0047 in. (0.05 to 0.12mm).
 - b. Tip clearance 0.0492 in. (0.12mm).
 - c. Clearance between outer rotor and body. 0.0059 to 0.0083 in. (0.15 to 0.21mm).
5. Check the relief valve spring dimension to ensure that it has not lost tension. Free length should be 2.24 in. (57mm). Compressed length



should be 1.54 in. (39mm). If the spring tension is accurate, the relief valve should open at 54.0 to 59.7 lb/in.² (3.8 to 4.2 kg/cm²)

6 Reassemble the oil pump. Make certain all gaskets are mounted flat to avoid leaks.

7. Install the drive spindle and the oil pump to the front cover.

8. Install the distributor in the same relative location from which it was removed. If the number 1 cylinder was at top dead center on the compression stroke, the punch mark on the drive spindle should face toward the front of the engine.

9. Install the front splash shield and the front stabilizer.

10. Insert the drain plug in the pan and refill the engine.

11. Oil pressure at idle should be 14.2 to 17.1 lb/in.² (1.0 to 1.2 kg/cm²)

12. Tightening torque values for the oil pump mounting bolts is 10.8 to 15.2 ft.-lb. (1.5 to 2.1 kg/m) and 21.69 to 25.31 ft.-lb. (3.0 to 2.5 kg/m) for the release valve cap nut.

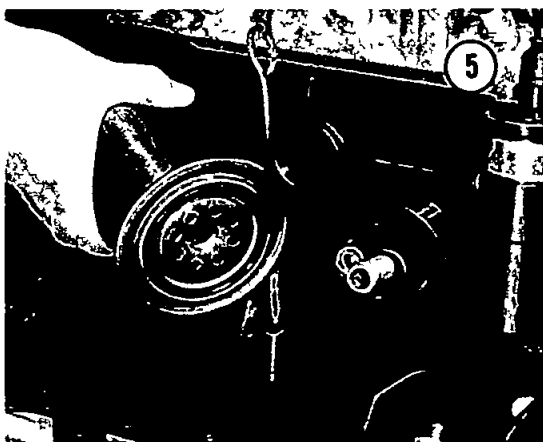
Oil Filter

The oil filter is mounted on the right-hand side of the cylinder block. It is a cartridge type with

built-in gasket, and threads onto the mounting spindle. The filter should be replaced every 6,000 miles as follows:

1 Drain the engine oil. Wait 10-15 minutes before removing oil filter to allow it to drain.

2 By hand, or with the aid of an oil filter wrench, unscrew the filter from the spindle, as shown in Figure 5.



3 Cleaning of the oil filter is not recommended. Rather, replace it as required.

4 Thread the new oil filter onto the mounting spindle by hand. Do not overtighten or leakage might occur.

CHAPTER SIX

ENGINE

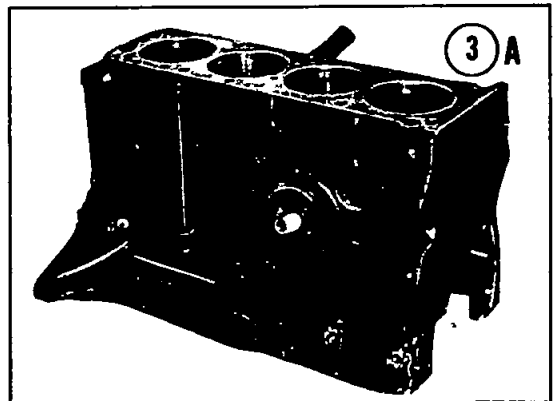
Datsun 510 and 521 vehicles use the L16 engine. Over the years, the design remained essentially the same, with minor changes made to accommodate different emission control devices.

The L16 is a four-cylinder, overhead camshaft engine with a 97.3 cubic inch (1595cc) displacement. Cylinder bore is 3.2677 in. (83mm), stroke is 2.9016 in. (73.7mm). Output is 96 horsepower (1972 models—92 horsepower) at 5,600 rpm. Compression ratio is 8.5 to 1.

Equipment includes a single, two-barrel Hitachi carburetor, an Hitachi alternator, an Hitachi starter motor, and either a single point or dual point distributor. **Figure 1** (next page) is an overall view of the engine. **Figure 2** (next page) is a sectional view. The following paragraphs describe and illustrate the major components of the engine and provide detailed instructions on the removal, disassembly, inspection, repair, and reassembly of the engine.

CYLINDER BLOCK

The cylinder block is shown in **Figure 3A**. **Figure 3B** (page 33) is an exploded view of the block and associated parts.

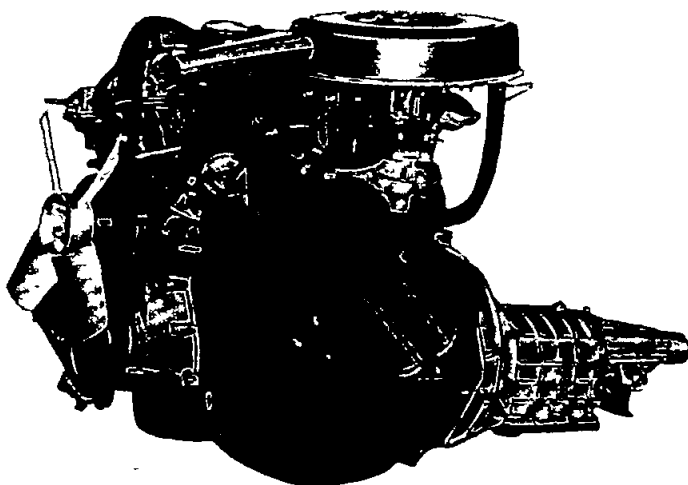


CRANKSHAFT

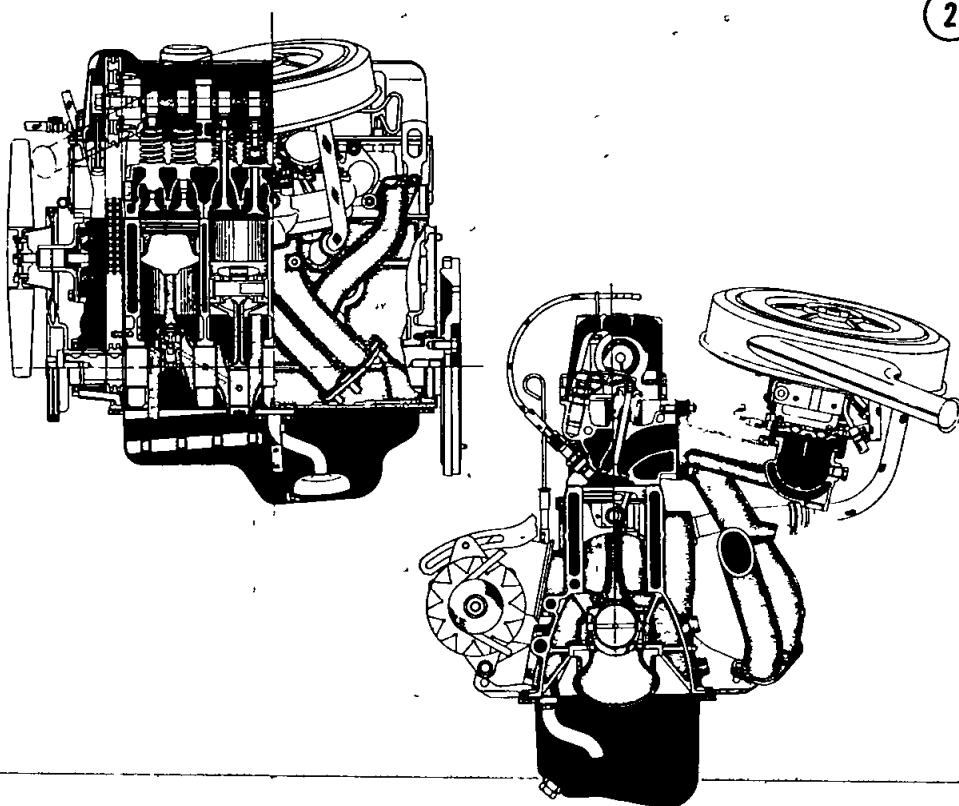
The crankshaft, **Figure 4A**, is made of forged steel and has a high capacity balance weight. **Figure 4B** shows the crankshaft and piston assemblies in an exploded view.



①



②



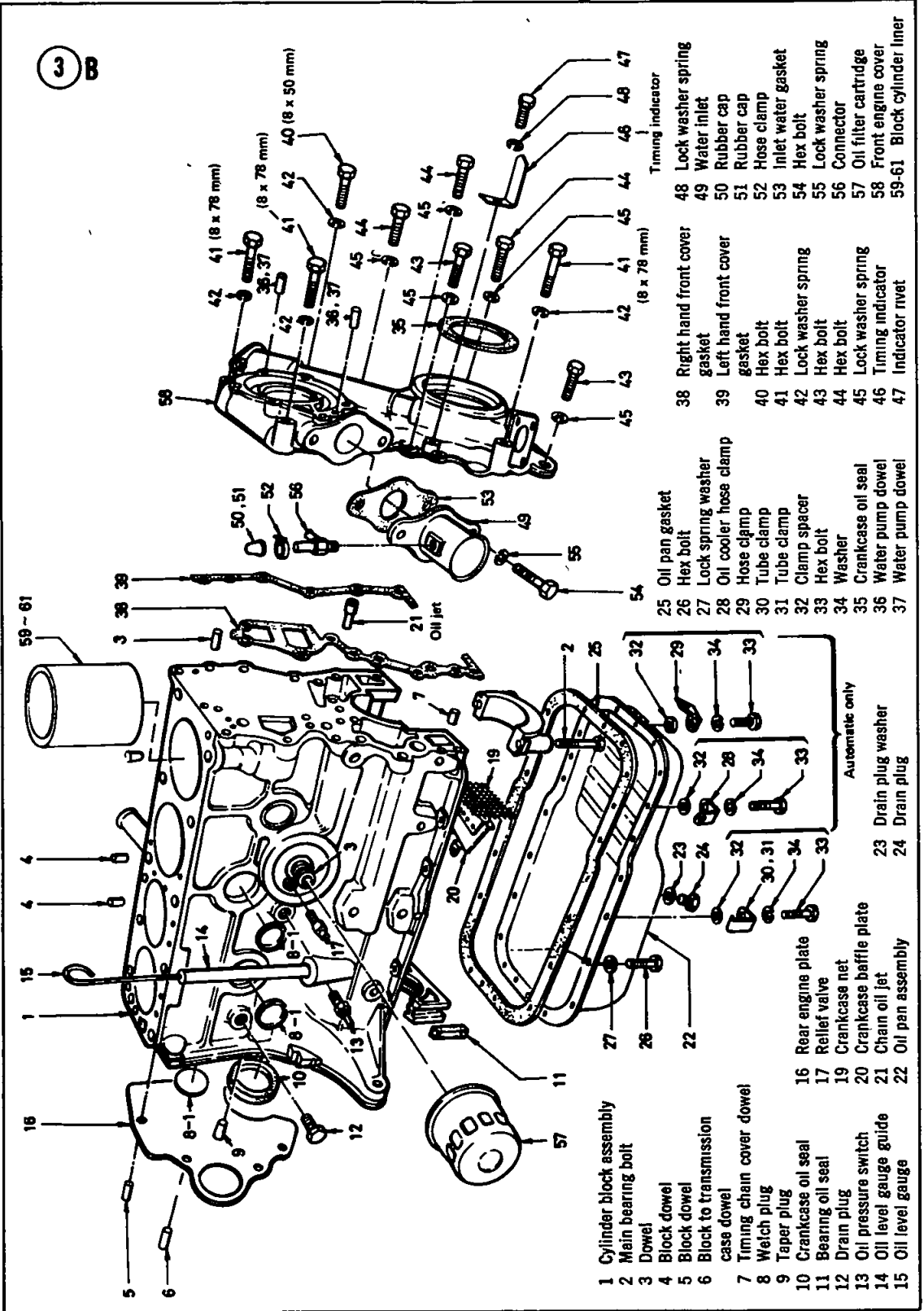
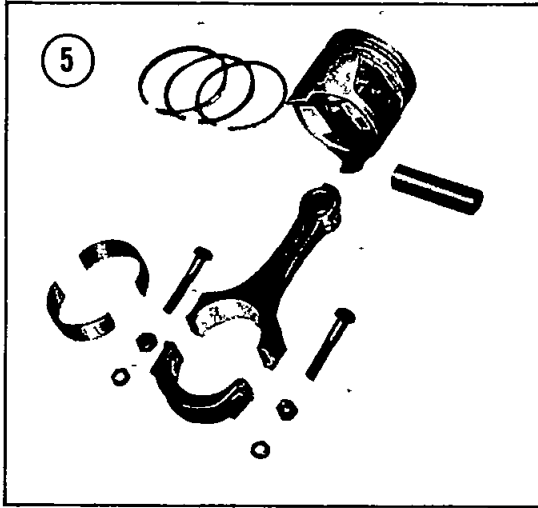


Figure 4B shows the crankshaft and piston assemblies in an exploded view

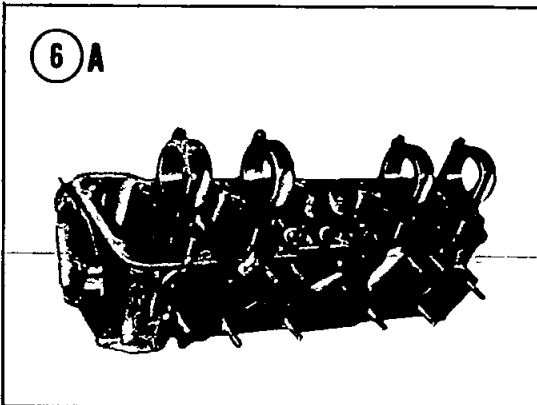
PISTONS AND CONNECTING RODS

The pistons, shown in Figure 5, are cast aluminum with concave heads. The piston pins are hollow steel and are connected to the pistons in a full floating fit. The piston pins are press fitted to the connecting rods, which are made of forged steel



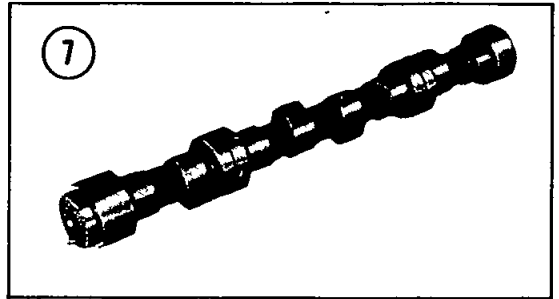
CYLINDER HEAD

The cylinder head, Figure 6A, is an aluminum alloy that provides added cooling efficiency. An exploded view of the cylinder head and associated parts is given in Figure 6B (page 36). Intake valve seats are an aluminum bronze alloy while exhaust valve seats are cast iron. All seats are hot-press fitted into the aluminum head.



CAMSHAFT

Figure 7 shows the cast iron camshaft, located inside the rocker arm cover. Four aluminum alloy brackets support the camshaft in the cylinder head.

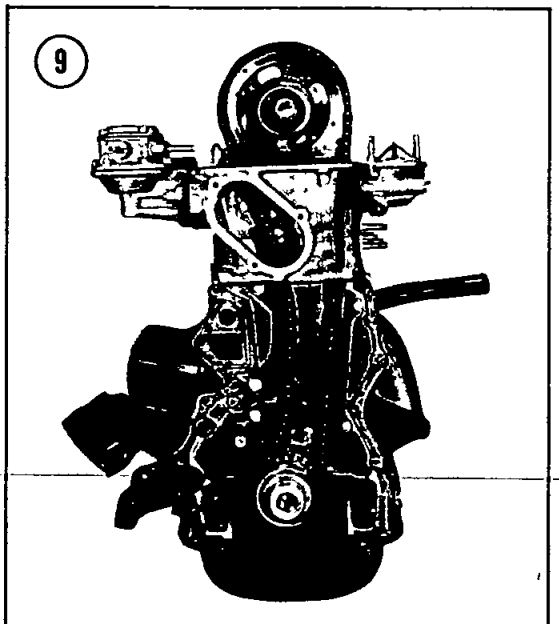


VALVE MECHANISM

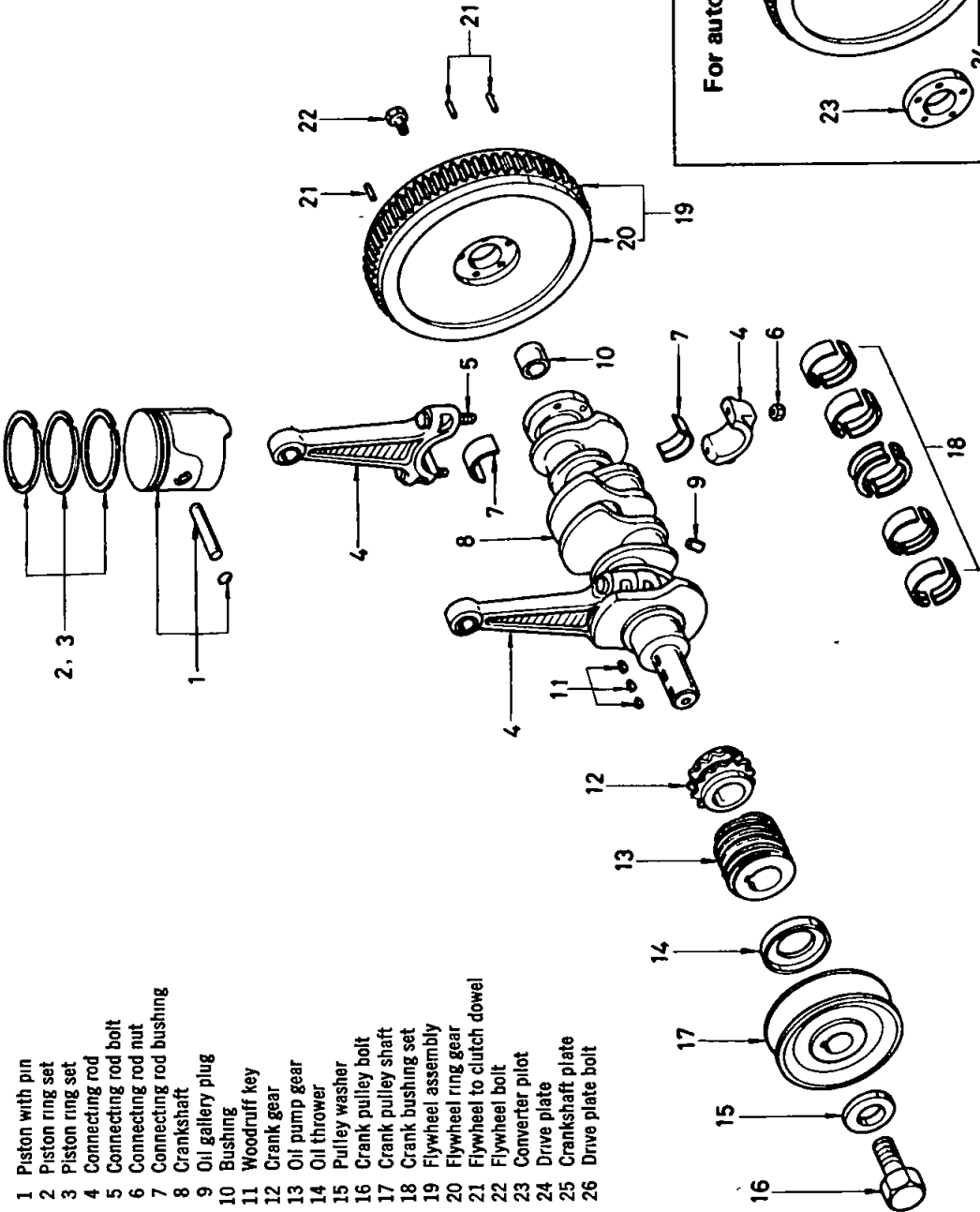
Figure 8 (page 37) is an exploded view of the valve, camshaft, and timing gear mechanism. The valve system has pivot-type rocker arms activated directly by the camshaft mechanism. The valves are fitted with dual springs.

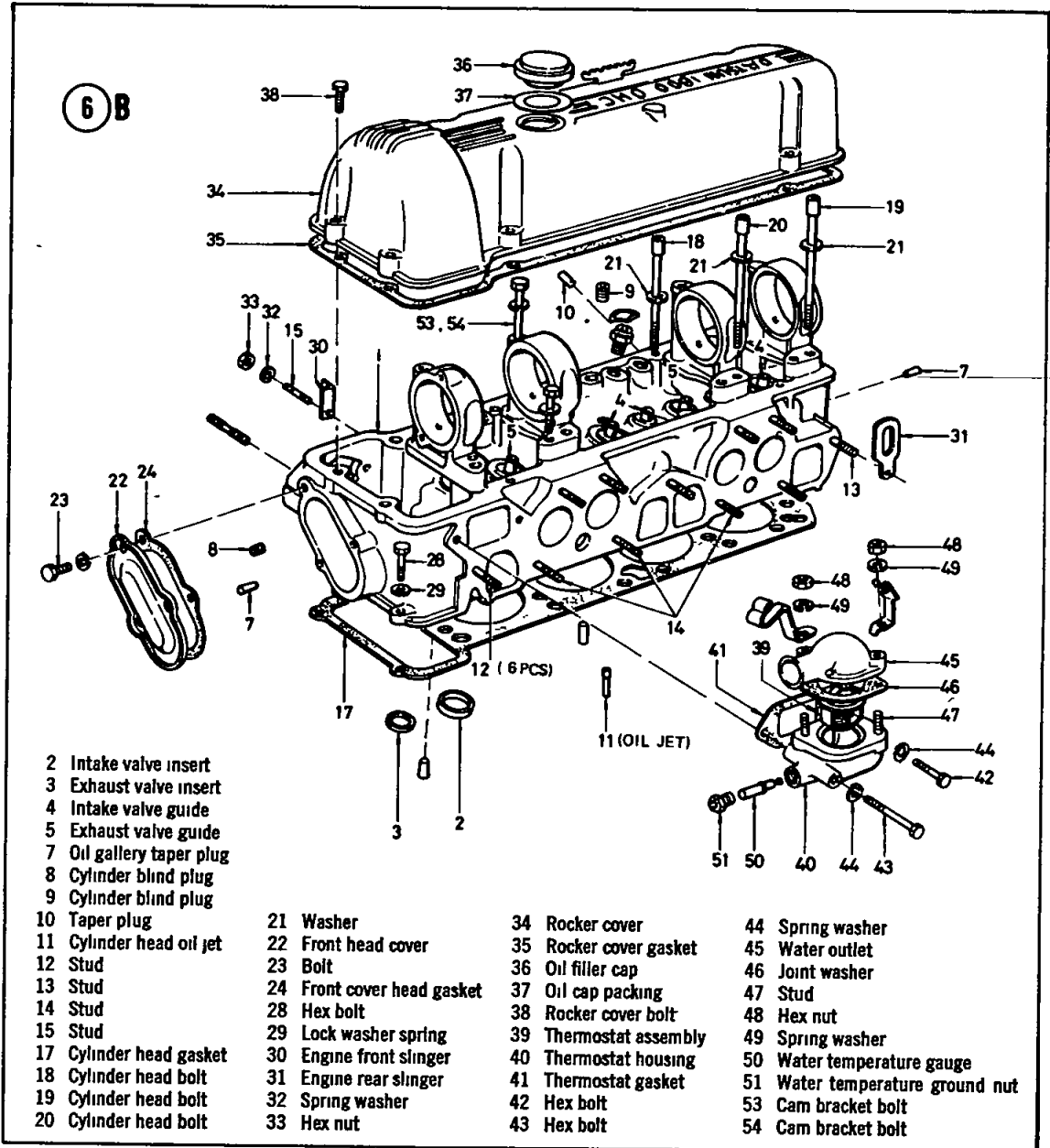
CAMSHAFT DRIVE

The camshaft is driven by a double row roller chain from the crankshaft. The camshaft drive mechanism is shown in Figure 9. The tension of the chain is controlled by a chain tensioner, operated by spring and oil pressure. A rubber



4 B





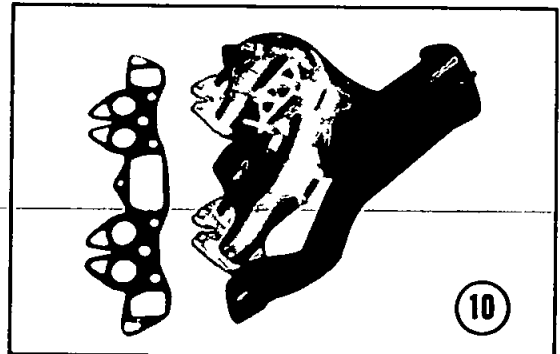
shoe type of tensioner reduces vibration and controls overall chain tension.

MANIFOLDS

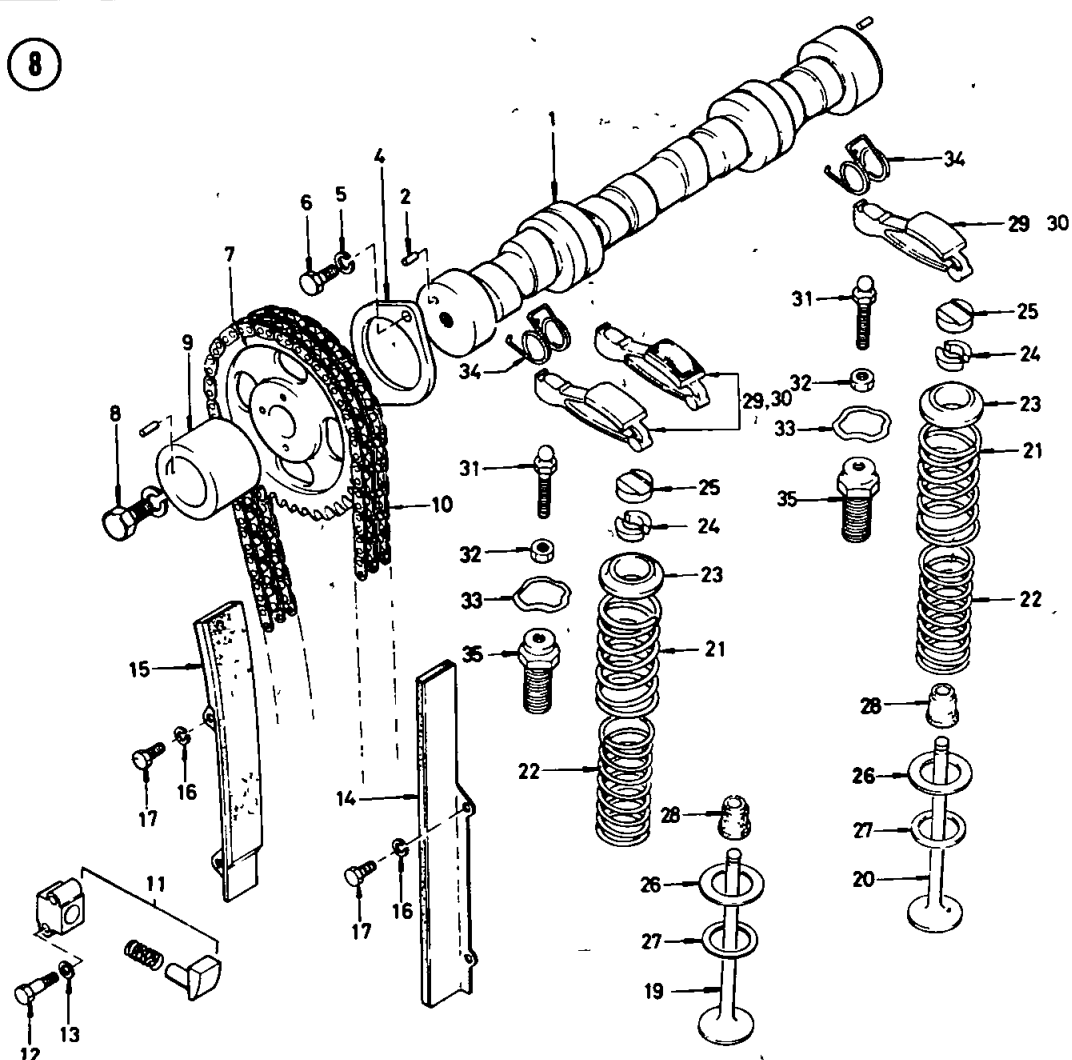
The intake and exhaust manifolds are shown in **Figure 10**. The intake manifold is made out of cast aluminum and the exhaust of cast iron.

OIL PUMP

The oil pump is mounted to the bottom left hand side of the front cover. Refer to the pre-



8



- 1 Camshaft
- 2 Camshaft dowel
- 4 Cam locating plate
- 5 Spring washer
- 6 Hex bolt
- 7 Cam sprocket
- 8 Cam gear bolt
- 9 Fuel pump cam assembly

- 10 Camshaft chain
- 11 Chain tensioner
- 12 Hex bolt
- 13 Spring washer
- 14 Chain tension side guide
- 15 Chain tension slack guide
- 16 Spring washer
- 17 Hex bolt

- 19 Intake valve
- 20 Exhaust valve
- 21 Valve spring
- 22 Valve spring
- 23 Valve retainer
- 24 Valve collet
- 25 Rocker valve guide
- 26 Valve seat

- 27 Inner valve seat spring
- 28 Valve oil seal
- 29 Valve rocker
- 30 Valve rocker with pad
- 31 Valve rocker pivot
- 32 Pivot lock nut
- 33 Rocker retainer
- 34 Rocker valve spring
- 35 Rocker bushing

vious chapter for specifications and maintenance

FUEL PUMP

The fuel pump is on the front right-hand side of the engine just below the rocker arm cover. It is a diaphragm type driven by the camshaft.

CARBURETOR

The carburetor is a single, two-barrel down-draft type. From 1968 through 1971, the carburetor on manual transmission models has a hand choke control. 1972 models are equipped with an automatic choke, much the same as has been used on all automatic transmission models.

EMISSION CONTROL DEVICES

All Datsuns have a sealed type of crankcase emission control device and an exhaust emission control device. Models sold in California since 1970 also have an evaporative emission control device. An important part of the exhaust control device is the air pump located at the bottom left hand side of the engine. It is driven by a belt off of the crankshaft pulley and supplies air to the exhaust system. In 1972, an electric blower incorporated in the air cleaner replaced the mechanical pump.

ENGINE REMOVAL

Experience has shown it is easier to remove the engine and the transmission as a single unit than to remove the engine alone. Once the engine and transmission are out of the vehicle, the transmission can be detached from the engine.

To remove the engine/transmission, proceed as follows.

- 1 Scribe alignment marks on the hood around the hinges. This will make reinstallation easier.
- 2 Remove the two bolts that secure each hinge and remove the hood. It is not necessary to remove the hood support from the engine firewall.
- 3 Disconnect the lower radiator hose from the right-hand side of the engine and at the bottom of the radiator. This will permit coolant to drain from the engine and the radiator.
- 4 Remove the drain plugs from the engine pan and transmission, and completely drain lubricants into suitable containers.
- 5 Disconnect the battery cables from the battery, loosen the two hold-down clamps, and remove the battery.

NOTE. The location and number of hoses to be removed from the air cleaner varies from model to model. It is normally easier to remove the hoses from the sources rather than try to disconnect them from underneath the air cleaner. The 1972 model will require disconnection of the electrical circuit in the air cleaner system.

- 6 Disconnect all hoses that lead to the air cleaner, remove two bolts that hold the air cleaner to its mounting bracket, unscrew the

wing nut from the top of the air cleaner, and remove the air cleaner.

- 7 Disconnect the upper radiator hose from the radiator and the thermostat housing. Remove the hose.

- 8 Disconnect the two heater hoses from the right-hand side of the engine. Tie these back so they won't interfere with removal of the engine.

- 9 Remove the radiator grille by unscrewing all mounting screws.

- 10 Remove the four mounting screws holding the fan shield to the backside of the radiator.

- 11 Remove the four mounting bolts holding the radiator in place. In automatic transmission models, disconnect the two transmission oil cooler lines from the bottom of the radiator. Pull the radiator straight up to remove. Remove the fan shield.

- 12 Loosen the adjustment and mounting bolts from the retaining brackets on the alternator and air pump (if so equipped). The alternator is located at the bottom right-hand side of the engine and the air pump on the lower left-hand side.

- 13 Loosen tension on the two drive belts, remove the belts from the alternator and air pump, and then from the fan pulleys.

- 14 Remove the bolts holding the fan and pulley to the water pump assembly, and remove the fan and pulley.

- 15 Disconnect the fuel line from the fuel pump.

- 16 Disconnect accelerator control linkage and choke wire at the carburetor.

- 17 Disconnect the wiring from the starter motor, alternator, ignition coil, oil pressure switch, and temperature transmitting unit.

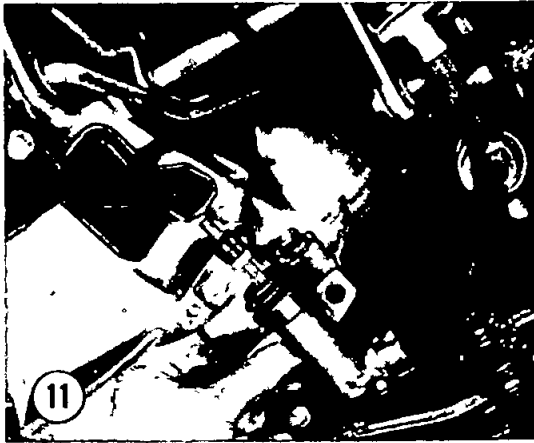
NOTE. The following steps are performed from under the car. Jack up the front of the car and position stands under the front support points to provide working room under the vehicle.

WARNING

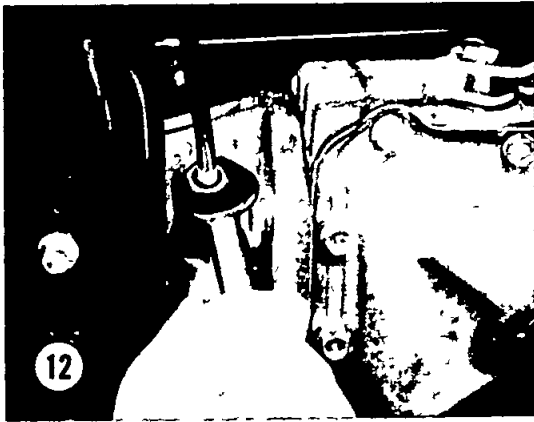
Never climb under a vehicle that is supported by the jack only. If stands are not available, sturdy wooden blocks can be used.

- 18 Remove two bolts holding the clutch operating cylinder to the flywheel housing, shown in

Figure 11 Remove the clutch return spring from its holding bracket and the clutch operating cylinder from the clutch withdrawal lever



19 Disconnect the speedometer cable from the side of the transmission, as shown in **Figure 12**



20 Disconnect the flat attaching plug connector from the reverse lamp switch on the transmission housing.

21 At the transmission housing, disconnect the shift and the select rods. Remove the cross shaft assembly by removing its bracket from the side member.

22 Disconnect the front exhaust pipe from the exhaust manifold by removing the two connecting bolts.

23 Disconnect the center exhaust pipe from the rear exhaust pipe.

24 Remove the front exhaust pipe, the pre-

muffler, and the center exhaust pipe from the vehicle.

25 Disconnect the drive shaft from the mating flange of the gear carrier.

26 Insert a jack under the transmission and jack it up just a little to remove some of the tension from the rear motor mounts.

CAUTION

Use care in the placement of the jack head to prevent transmission housing damage. A block of wood can be inserted between the jack head and transmission for protection. The block of wood should be long enough to span the transmission housing.

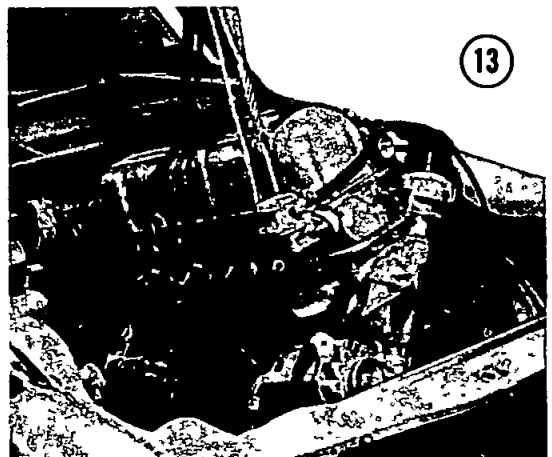
27 Remove the rear engine mounting cross member by removing the bolts holding the engine mounting insulator, the mounting cross-member, and the handbrake clamp.

28. Remove the bolts securing the front engine mounting insulators to the front cross member.

NOTE *At this time, all wires, hoses, and linkages should have been disconnected from the engine and transmission. Recheck this and make sure that no loose ends will hamper actual engine removal.*

29 Rig a chain or cable hoist to the lifting eyes (stringers) located on the right front and left rear of the cylinder head. Take up slack in the hoist.

30 **Figure 13** shows the engine being lifted. Remove the engine slowly by lowering the jack beneath the transmission gradually until it can



be removed. Hoist the engine off its mounts and adjust the chain or cable to tilt the engine as shown in the illustration. Continue to raise gradually.

31. Once the engine and transmission are clear of the vehicle, lower them to a suitable support or stand and disconnect the hoist.

32. The transmission can now be freed by removing the bolts holding the clutch assembly to the flywheel housing, and moving the clutch assembly back to disengage the drive shaft splines.

33. With the engine removed, carefully inspect the mounting insulators for signs of damage or deterioration. Replace them if necessary.

ENGINE DISASSEMBLY

This section covers disassembly of the engine once it has been removed from the vehicle. All steps would be followed for a complete engine overhaul. But since many of the procedures can be done without removing the engine from the vehicle, a complete course of action should be decided on before needless removal and disassembly.

Mount the engine on a stand or other suitable work surface before disassembly. Thoroughly clean the exterior with steam or solvent.

CAUTION

Remove the alternator, starter motor, carburetor, and distributor from the engine before cleaning to prevent damage.

Once clean, inspect the engine for signs of damage or missing parts, cracks or accumulated rust on the block (especially around the soft plugs), cracks in the clutch housing, and dents or cracks in the oil pan.

Disassemble as follows:

Alternator Removal

1. **Figure 14** shows the position of the alternator on the engine and a view of the alternator mounting parts. Remove the two bolts, lockwashers, and shims holding the alternator to the adjusting bar and the adjusting bar to the engine block.

2. Remove the two bolts and lockwashers hold-

ing the alternator to lower mounting bracket.

3. Remove the alternator and mounting brackets.

Starter Motor Removal

1. Remove two mounting bolts and lockwashers holding starter motor to clutch housing.

2. Pull starter assembly toward front of engine and remove.

Distributor Removal

1. Scribe alignment marks on the distributor shaft, the distributor mounting bracket, and the front cover so that the distributor can be replaced accurately later.

2. Remove two bolts and lockwashers holding the distributor mounting housing to the front cover.

3. Pull up on the distributor and remove it as a unit.

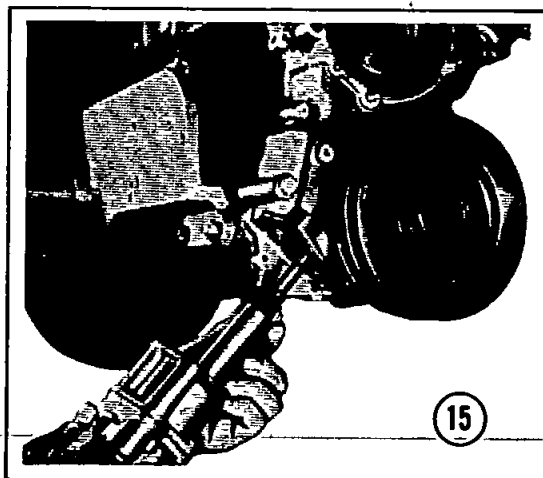
Carburetor Removal

1. Remove the four nuts and lockwashers joining the carburetor and intake manifold, then remove carburetor.

Oil Pump Removal

1. Remove the four mounting bolts and lockwashers.

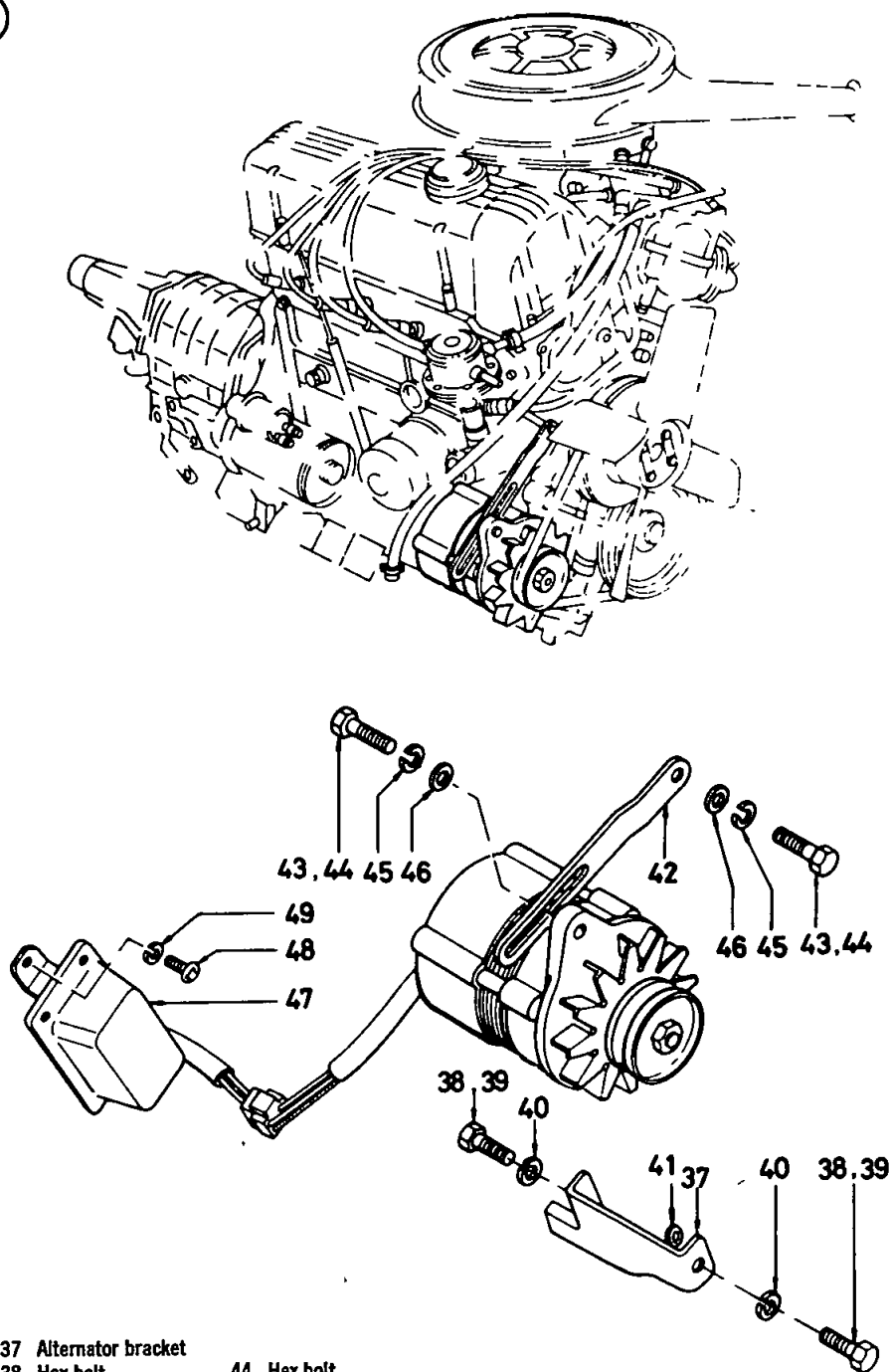
2. Withdraw the oil pump assembly from the front cover, as shown in **Figure 15**.



Air Pump Removal

1. Remove the bolt passing through the slot on

14



- | | |
|-----------------------|-----------------------|
| 37 Alternator bracket | 44 Hex bolt |
| 38 Hex bolt | 45 Lock spring washer |
| 39 Hex bolt | 46 Flat washer |
| 40 Lock spring washer | 47 Voltage regulator |
| 41 Bracket shim | 48 Phillips screw |
| 42 Adjusting bar | 49 Spring washer |
| 43 Hex bolt | |

the adjusting bar into the mounting flange of the air pump

2 Remove the bolt linking the air pump to the mounting bracket, and remove pump

3 The bracket has four bolts to the engine, the adjusting bar mounts on the front cover with two bolts. Remove these to free the front cover.

Water Pump Removal

1 Remove the bolts and lockwashers joining the water pump to the front cover. The number of bolts varies from year-to-year due to pump design changes. Remove water pump.

Fuel Pump Removal

1 Remove the two nuts and lockwashers securing fuel pump to the engine, and remove pump.

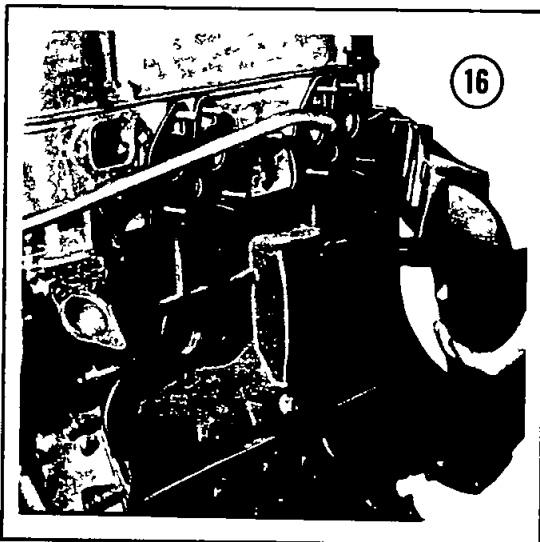
Rocker Arm Cover Removal

1 Remove six bolts holding rocker arm cover to head and lift off cover.

Intake and Exhaust Manifold Removal

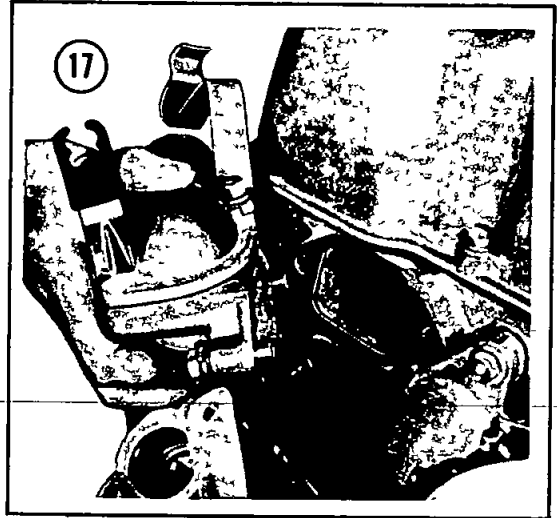
1 Remove eleven nuts and lockwashers that secure the intake and exhaust manifolds.

2 Remove intake and exhaust manifolds as shown in Figure 16.



Thermostat and Water Inlet Housings

1 Remove two bolts and lockwashers securing thermostat housing to head. Remove housing as shown in Figure 17.



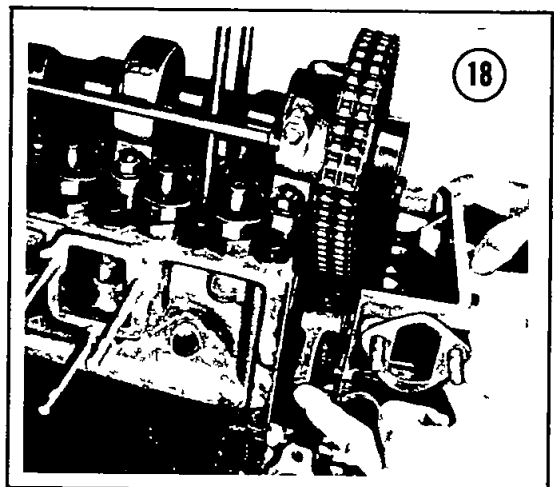
2 Remove two nuts and lockwashers from top of thermostat housing to gain access to thermostat.

3 Remove two bolts and lockwashers that hold water inlet housing to front cover and lift off housing.

Front Cover Removal

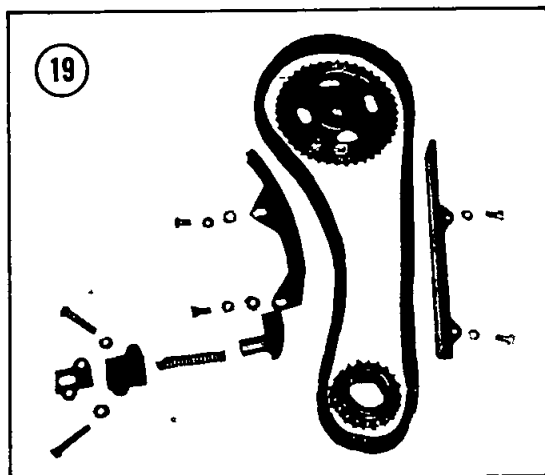
1 Remove bolt and washer from center of crank pulley. Pulley tool will be necessary for removal from crankshaft.

2 Remove nine bolts and lockwashers holding front cover to cylinder block, then remove cover as shown in Figure 18.



Chain Tensioner and Drive Chain Removal

1 Figure 19 shows the camshaft drive mechanism. Remove the two bolts and lockwashers join-

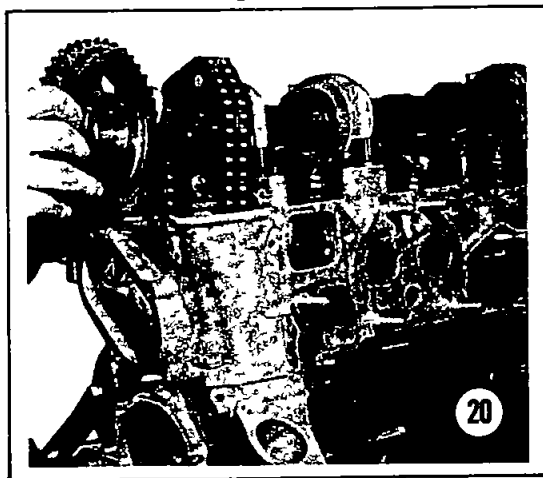


ing the chain tensioner to the block to free the spring-loaded tensioner assembly

2 Remove the four bolts and lockwashers holding the left and right side chain guides to the cylinder block. Remove the guides.

3 On the front of the camshaft, remove the bolt and lockwasher holding the fuel pump cam assembly and the cam sprocket to the cam.

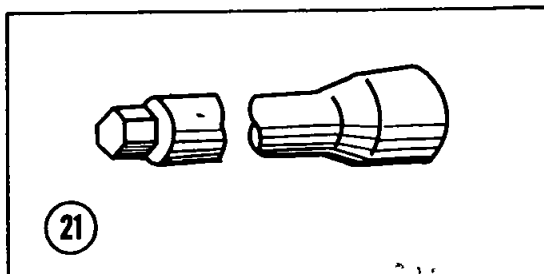
4 Lift the drive chain aside and remove the cam sprocket and fuel pump cam from the camshaft, as shown in **Figure 20**.



5 Remove the drive chain from the crankshaft drive sprocket.

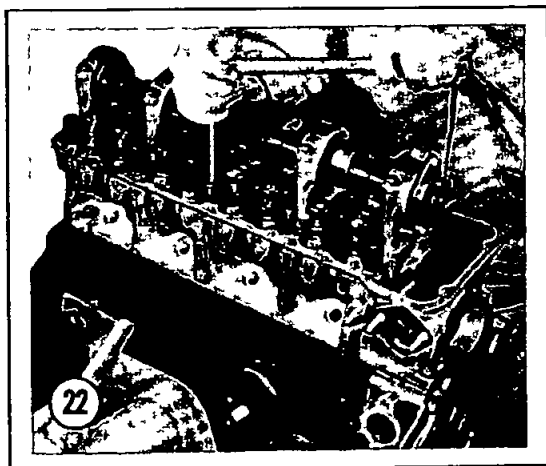
Cylinder Head Removal

NOTE Removal of the cylinder head requires a special tool identified as Datsun ST49010000 and is shown in **FIGURE 21**.



1. Using the special tool (or equivalent) remove ten bolts and washers holding cylinder head to cylinder block. See **Figure 22**.

2. Remove head from block and discard gasket.



Oil Pan and Strainer Removal

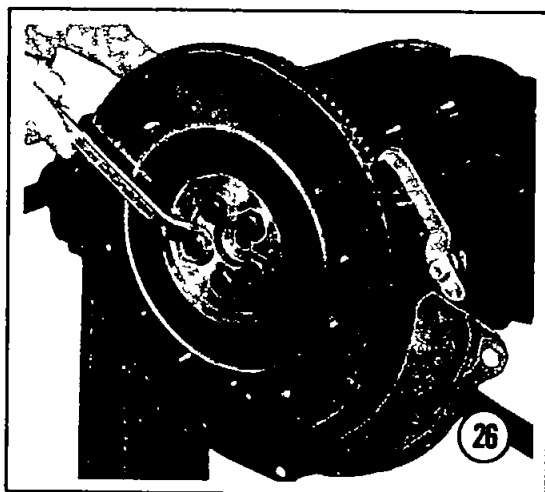
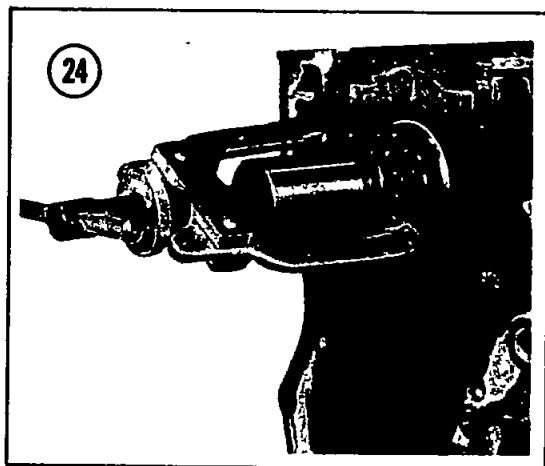
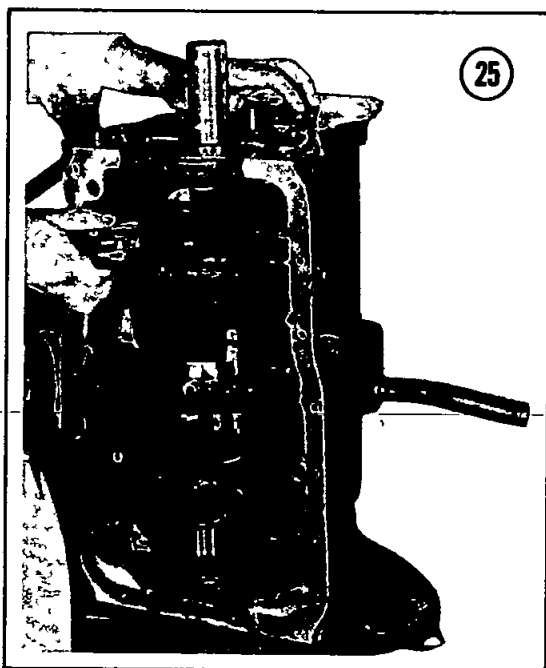
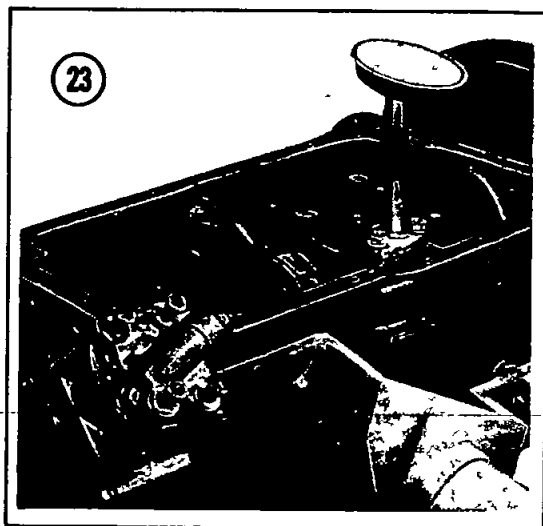
1 Invert the engine, remove 22 bolts and washers securing pan to block, and remove oil pan. On automatic transmission models, the pan bolts also hold the oil cooler hose and tube clamps in place. Discard oil pan gasket.

3 **Figure 23** shows the oil strainer mounted in the block. Remove two bolts and washers for disassembly.

Crankshaft Removal

1 Use a gear puller, as shown in **Figure 24**, to pull the oil thrower, crankshaft worm gear, and drive chain sprocket from the crankshaft. The above parts are held in place by three woodruff keys.

2. Disconnect the piston and connecting rod assemblies from the crankshaft by removing the



eight connecting rod bolts. Remove the four bottom caps along with associated rod bearings, as shown in **Figure 25**. Be certain to identify each part for later reassembly on the correct rod.

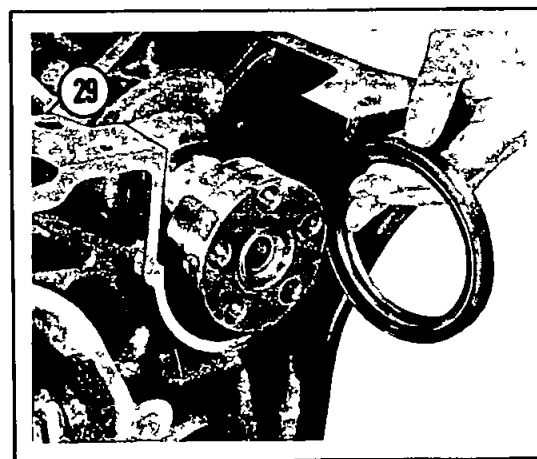
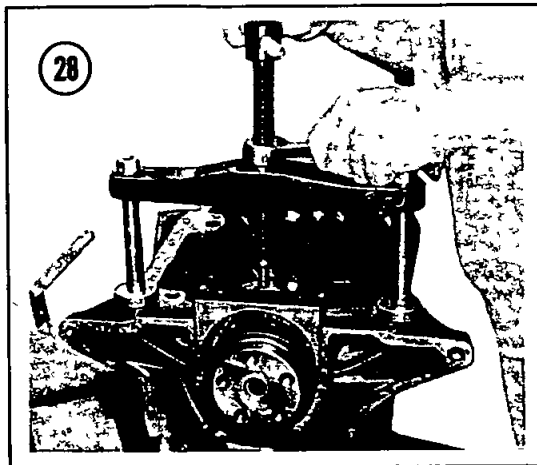
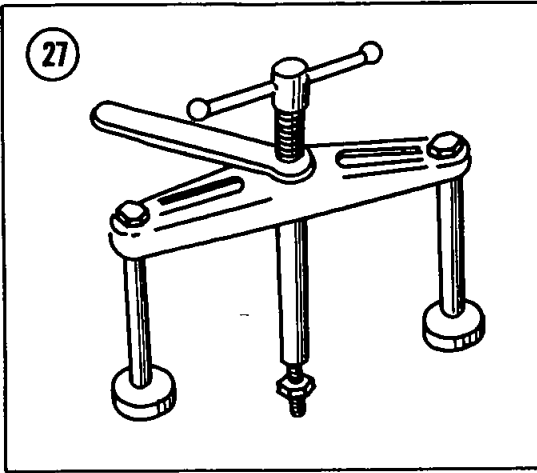
3. Gently push up each connecting rod into the cylinders far enough to clear the crankshaft. Do not push them up so far that the piston rings hit the ridge at the top of the cylinders. Remove the upper bearings and identify for later reassembly.

4. Remove the five bolts holding the flywheel to the crankshaft, as shown in **Figure 26**. For models with automatic transmission there is a converter plate in front of the drive plate (flywheel) and a crankshaft plate in back of the drive plate also attached by the five bolts.

5. Remove bolts from front main bearing cap and three center main bearings. Identify caps and bearings for reassembly.

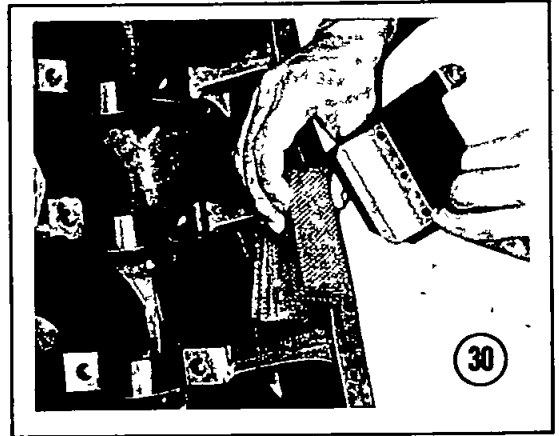
NOTE. Removal of the rear main bearing requires the use of a special tool, ST4463000D, shown in **FIGURE 27**.

6. Remove the rear main bearing cap as shown in **Figure 28**.
7. Remove the rear oil seal, as shown in **Figure 29**.
8. Remove crankshaft from cylinder block.
9. Remove and identify the main bearings from the cylinder block journals.



10. Remove the baffle plate and steel net, as shown in Figure 30.

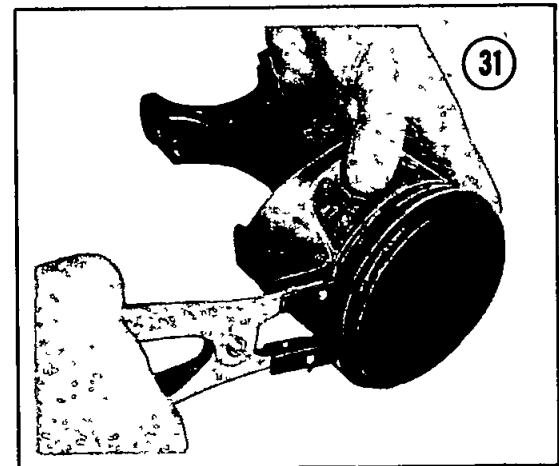
11. Carefully remove the connecting rods and pistons from the cylinders by pulling them out of the bottom of the cylinder block.



12. Inspect all parts for signs of damage or wear. Repair or replace as required.

PISTON AND CONNECTING ROD DISASSEMBLY

1. Remove the piston rings from the pistons as shown in Figure 31.



2. Removal of the piston pins from the pistons and connecting rods requires the use of a press and tool ST4484000D.

CYLINDER HEAD DISASSEMBLY

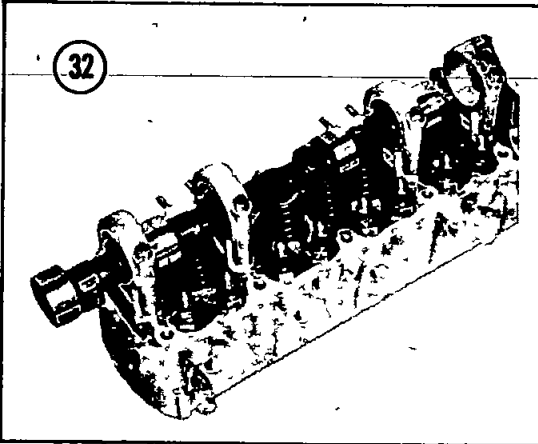
1. Remove the valve rocker springs that are looped over the top of the rocker arms.

2. Loosen the valve rocker pivot lock nut and remove the rocker arm by pressing down the valve springs on each valve. Take care not to lose the valve rocker guides located between the end of the valve stem and the rocker arm.

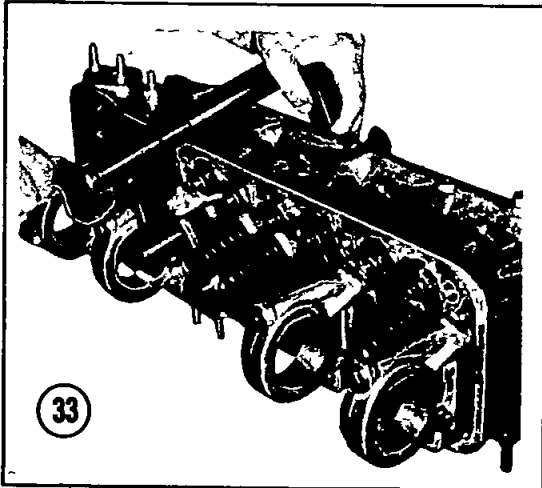
CAUTION

When removing camshaft, use extreme care not to scratch the cam bushings. Be certain to leave the camshaft bushings intact so as not to get them out of alignment.

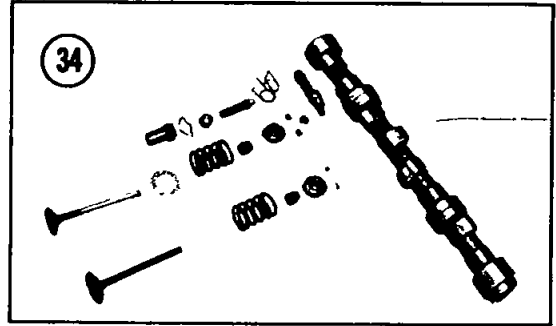
3. Remove camshaft from the cylinder head by carefully pulling it out of the camshaft bearing housings, as shown in **Figure 32**.



- 4 Use a valve lifter, as shown in **Figure 33**, to compress the valve springs so that the valve collets, located at the tops of the valve stems, can be withdrawn. Once the collets are out, all parts of the valve mechanism can be removed from the cylinder head



The valves are removed by pulling them out the bottom side of the cylinder head. Identify each upon removal to permit reinstallation in the same position. **Figure 34** illustrates the var-



ious components of the camshaft and valve assembly.

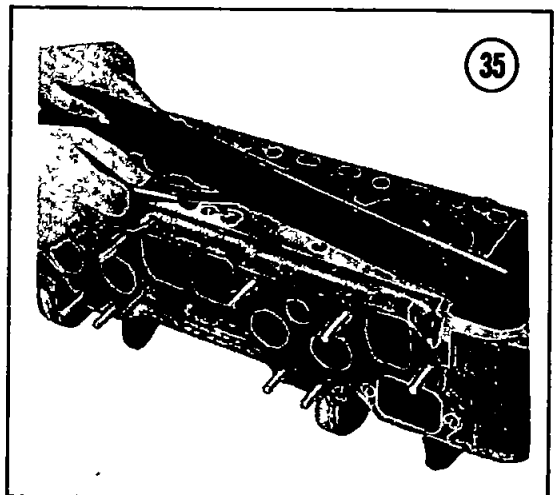
ENGINE INSPECTION AND REPAIR

Once the engine has been disassembled, clean and inspect all parts to determine their condition. Critical dimensions are listed in each section below.

Cylinder Head**CAUTION**

Use care when handling the cylinder head to make certain that the camshaft bearings are not removed or displaced.

1. Clean all foreign material from the cylinder head. Pay particular attention to removal of carbon from the combustion chambers. Scrape off as much as possible and remove the rest with a wire wheel on an electric drill.
2. Measure the machined surface of the head for warping. **Figure 35** covers the procedure. Use a straight edge and feeler gauge. Maximum

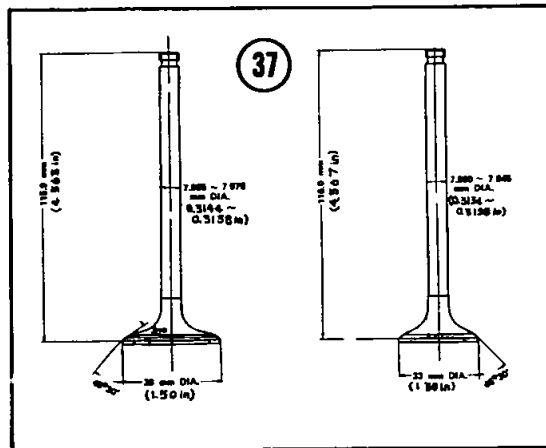
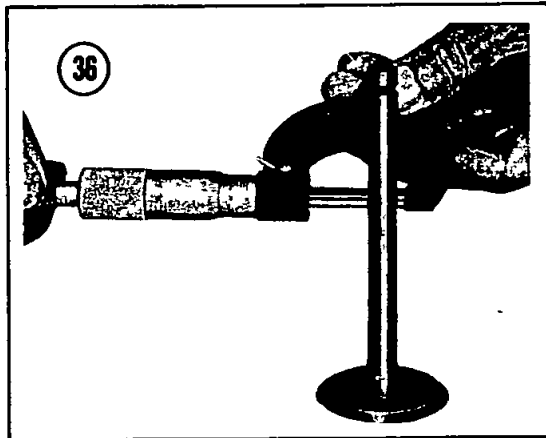


allowable warpage is 0.0039 in. (0.1mm) Standard should be less than 0.0012 in (0.03mm) In the event the measurements are out of tolerance, the cylinder head surface should be milled or resurfaced.

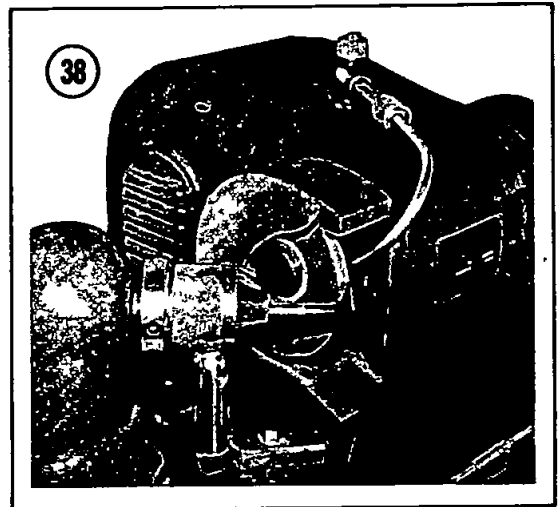
- 3. Verify that all water and oil passages are free of foreign material. Use compressed air to clean passages after scraping
- 4. Note the condition of all studs in the cylinder head. Replace damaged ones

Valve Assembly

- 1 Check intake and exhaust valve assemblies for worn, damaged, or deformed valve caps and stems. Correct or replace the valve if excessive defects exist.
- 2 Measure valve stem diameter with a micrometer, as shown in Figure 36. Figure 37 gives critical dimensions



- 3 Reface the valve face and valve stem using a valve grinder, as is shown in Figure 38



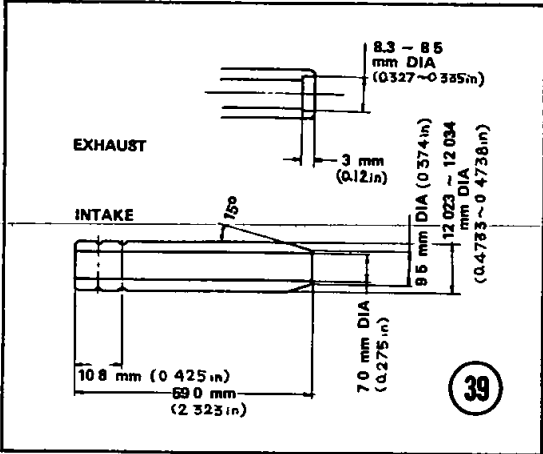
NOTE When the valve head has been reduced to 0.0197 in (0.5mm) or less in thickness, replace the valve. Grinding allowance for the valve stem end surface is 0.0197 in (0.5mm) or less

- 4. Measure the free length and tension of each valve spring. If the measured values exceed the limits specified below, replace the spring.

SPRING SPECIFICATIONS			
Free Length	Outer Spring	2.0472 in (52.0mm)	
	Inner Spring	1.7657 in (44.85mm)	
	Outer Spring	1.53 in at 63.93 ± 3.31 lb	
Valve Closed		(38.9mm at 29.0 ± 1.5 kg)	
	Inner Spring	1.38 in at 27.12 ± 1.54 lb	
		(35mm at 12.3 ± 0.7 kg)	
Valve Open	Outer Spring	1.21 in at 105.38 ± 5.29 lb	
		(30.7mm at 47.8 ± 2.4 kg)	
	Inner Spring	0.96 in at 56.21 ± 2.87 lb	
		(24.5mm at 25.5 ± 1.3 kg)	

- 5. Check the deformation of each spring with a square. Replace any spring with a deflection of 0.063 in (1.6mm) or more.
- 6. Check all working surfaces of the rocker arms for damage or wear. If defects or apparent excessive wear are found, replace them. A defective pivot requires it's replacement along with the corresponding rocker arm.
- 7 Measure the clearance between the valve guide and the valve stem. If the clearance exceeds limits, replace the worn parts or both

valves and valve guides. **Figure 39** lists specifications for the valve guides. Precise measurement requires a micrometer and a telescopic hole gauge. Insert the hole gauge into the valve guide hole and take measurements at three places, top,



center, and bottom. Subtract highest reading of valve stem diameter from valve bore measurement to obtain clearance. It should not exceed 0.0039 in (0.1mm). As an alternative measure, a valve can be inserted in the valve guide and moved from side to side. If the tip of the valve stem deflects by more than 0.0079 in (0.2mm), replace it.

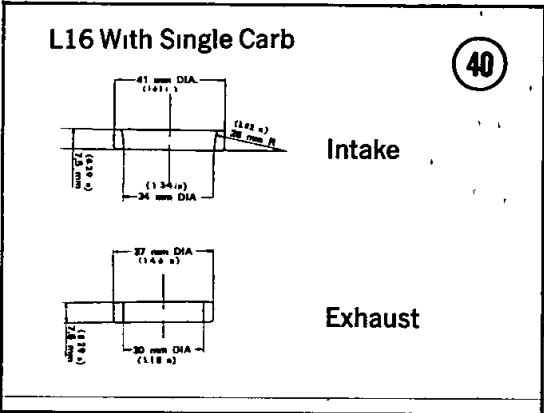
8. Replacement of valve guides should be referred to an automotive machine shop.

9. After replacement and reaming of the new valve guide, the valve seat surface in the cylinder head should be refaced by using the new valve guide for tool placement.

10. Check the valve seat inserts for evidence of pitting at valve contact surfaces. Reseat or replace the valve seat inserts depending on the overall condition. Oversize valve seat inserts are available. **Figure 40** shows the specifications for standard size valve seat inserts. Replacement is a machine shop job. Tolerances are listed in **Figure 40**.

Camshaft and Camshaft Bearings

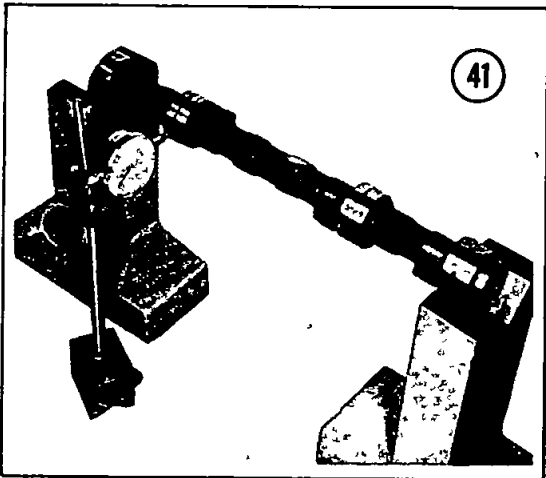
- 1. Measure the inner diameter of the camshaft bearing and the outer diameter of the camshaft journal.
- 2. Determine the actual clearances and compare them to the specifications following



	Standard	Wear Limit
Oil Clearance	0.0015 in ~ 0.0026 in (0.038mm ~ 0.076mm)	0.0039 in (0.1mm)
Camshaft Bearing Inner Diameter	1.8898 in ~ 1.8904 in (48.00mm ~ 48.016mm)	

3. Excessive wear in the camshaft bearings requires replacement of the cylinder head assembly.

4. Check the camshaft, camshaft journals, and cam surfaces for signs of bend, wear, or scoring. **Figure 41** shows the camshaft being checked for bend. Bend values are expressed in terms of half values of the readings obtained when the camshaft is rotated one full turn with a dial gauge applied to the center journal.

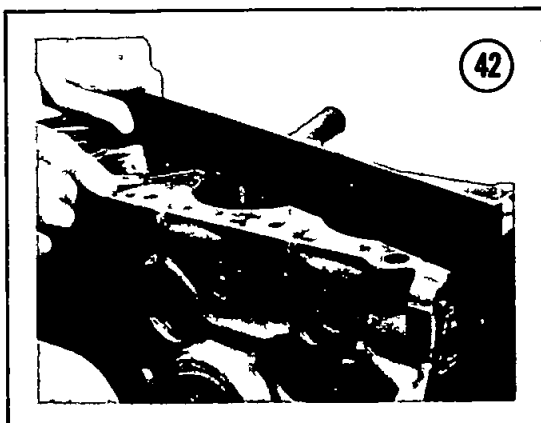


	Standard	Bend Limit
Camshaft Bend	0.0006 in (0.015mm)	0.0020 in (0.05mm)

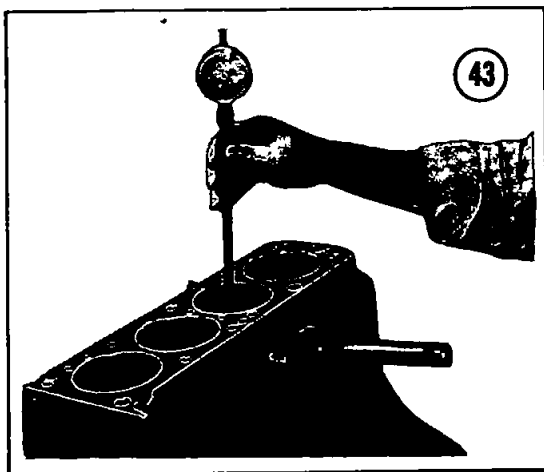
Cylinder Block

1 Check the cylinder block for defects, such as cracks, leaky soft plugs, and blocked water passages. Blow out all passages with compressed air.

2. Measure the surface of the cylinder block that mates with the cylinder head for warpage. Use a straight edge and feeler gauge to measure clearance, as shown in **Figure 42**. Surface flatness clearance should be less than 0.0020 in. (0.05mm) Maximum allowable is 0.0039 in. (0.10mm) Resurface the cylinder block if beyond limits.



3 Use a bore gauge, as shown in **Figure 43**, to measure the bore of each cylinder. Measure near the top, at the center, and near the bottom. If excessive wear, taper, or out-of-round exists, rebore the cylinders or replace the cylinder liners. Maximum wear limit of a cylinder bore is 0.0079 in. (0.2mm) Standard bore is 3.2677 (+0.0020) in. (83.000, +0.050mm). The al-



lowable error in the cylinder bore taper is 0.0006 in. (0.015mm) The difference between the four cylinder bores should not exceed 0.0020 in. (0.05mm).

NOTE: *When any cylinder needs re-boring, all four must be rebored.*

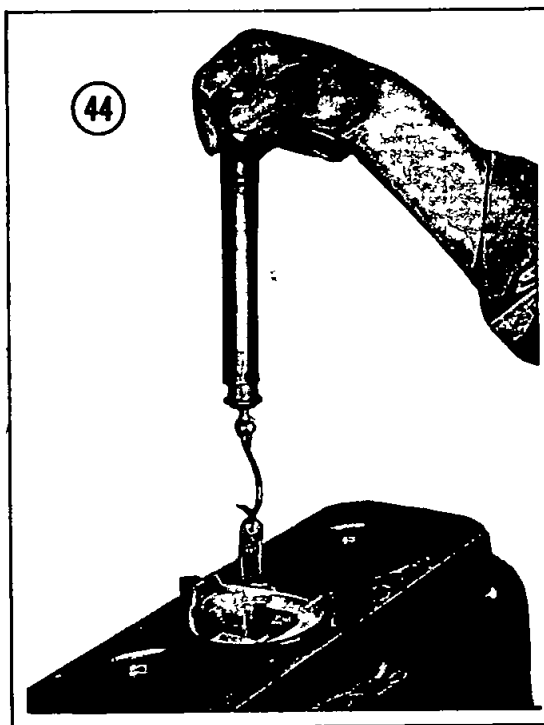
4. If the cylinder bores are within tolerances, use a ridge reamer to remove the ridge at the top of the cylinder bores, and then hone the cylinder walls to complete the reconditioning. Measure the cylinder bores when honing has been finished to verify that allowable tolerances have not been exceeded.

Measuring Bore

Below is a method for checking critical clearance between piston and cylinder wall. Unless you are familiar with such work, call in an expert. Clearance should be between 0.0010 and 0.0018 in. (0.025 through 0.045mm).

1. Insert the piston, without rings, upside down in the cylinder bore.

2 Use a feeler gauge between 0.0010 and 0.0018 inches thick. Insert it between the piston and the cylinder wall, as shown in **Figure 44**, and attach a spring gauge as illustrated.

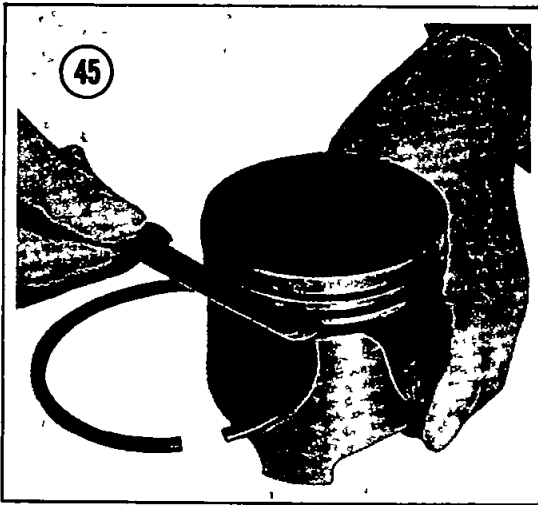


3 Pull up on the spring scale. If the force required to pull the feeler gauge out is more than 3.3 lbs, or less than 0.44 lbs, the piston skirt is either too large or small for the cylinder and must be replaced with a piston of the proper size. Either that, or the cylinder must be rebored or a new cylinder liner installed.

Piston, Piston Pin, and Piston Ring

1. Inspect all parts carefully for signs of chips, cracks, and general wear
2. Measure the side clearance of each ring in its appropriate groove, as shown in **Figure 45**. Clearances should be within the following tolerances.

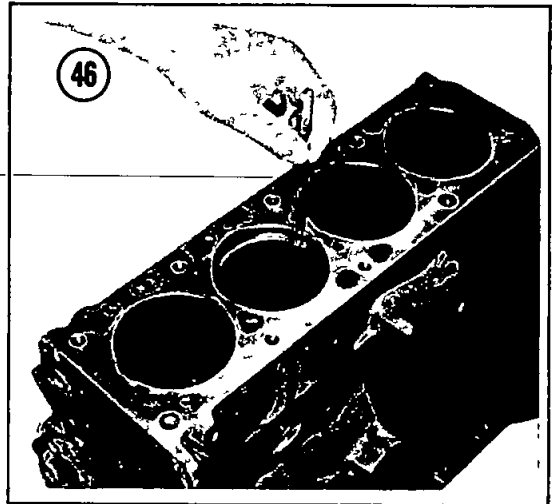
Top Ring	0.0018 through 0.0031 in (0.045 through 0.078mm)
Middle Ring	0.0012 through 0.0025 in (0.030 through 0.063mm)
Oil Ring (bottom)	0.0010 through 0.0025 in. (0.025 through 0.063mm)



3 Check the gap of each ring by inserting it about 1 inch down the bore, squaring it with the wall by tapping it with an inverted piston, and measuring the gap between the two ends of the ring (**Figure 46**). In the event the cylinders are not being rebored, measure the ring gap toward the bottom of the bore where the least wear has occurred.

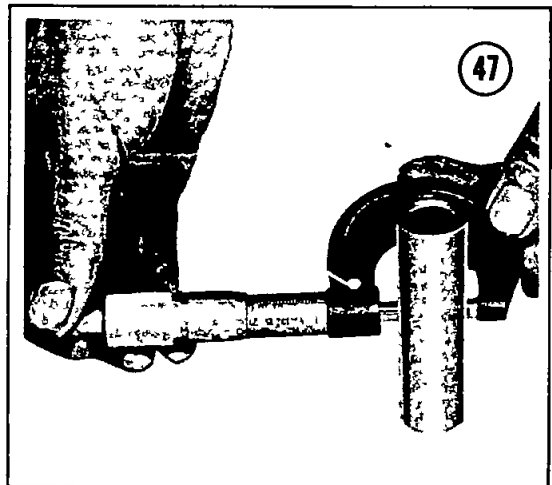
4 Ring gap should be as follows

Top Ring	0.0091 through 0.0150 in (0.23 through 0.38mm)
Middle Ring	0.0059 through 0.0118 in (0.15 through 0.30mm)
Oil Ring (bottom)	0.0059 through 0.0118 in (0.15 through 0.30mm)



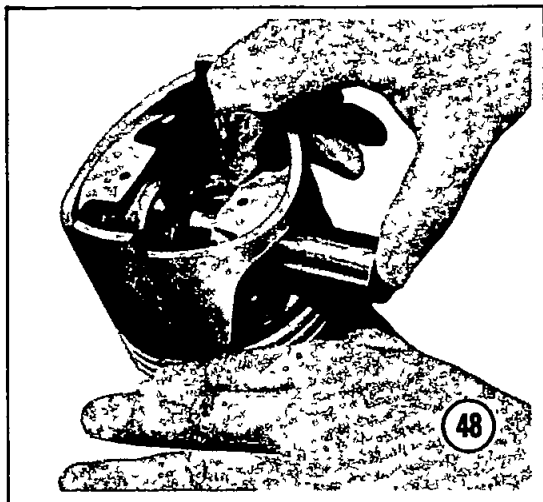
5 Measure the piston pin hole on both sides of the piston. Measurement should be between 0.8268 and 0.8271 in. (21.001 and 21.008mm).

6 Measure piston pin outside diameter with a micrometer, as shown in **Figure 47**. The measurement should be between 0.8265 and 0.8267 in. (20.993 and 20.998mm).



7 Measure piston pin length. It should be between 2.835 and 2.844 in (72.00 and 72.25mm).

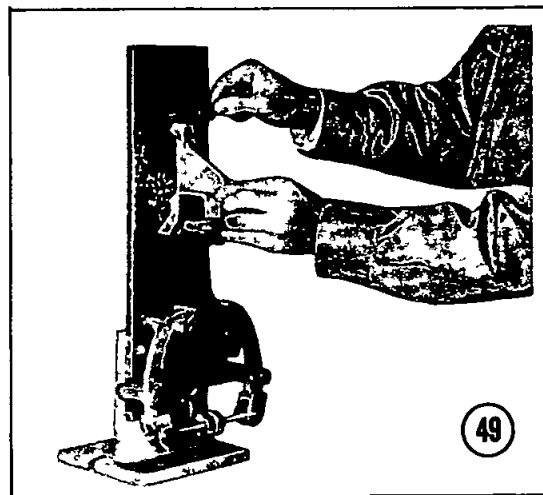
8 **Figure 48** shows the pin being inserted to make certain that it can be pressed in at room temperature by hand. Piston pin clearance to piston pin should be between 0.0003 and 0.0004 in (0.008 and 0.010mm)



NOTE The piston pin is fitted to the connecting rod with a fitting force of from 1 to 3 tons of pressure

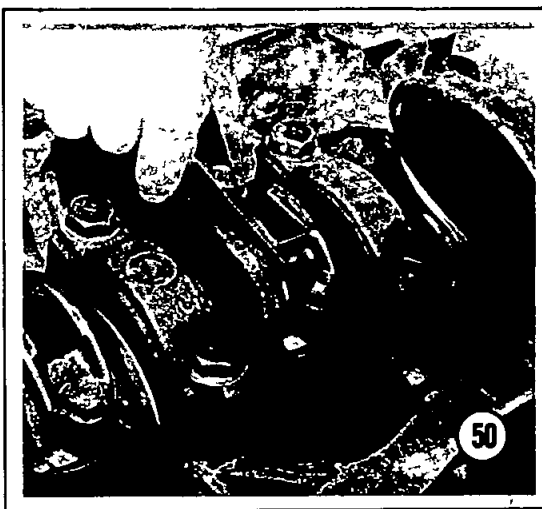
Connecting Rod

- 1 Inspect all connecting rods for flaws or obvious damage
- 2 Check for proper alignment as shown in **Figure 49**. Realign as necessary. This can be done by an automotive machine shop. Maximum allowable bend in the connecting rods is 0.0020 in (0.05mm) per 3.94 in of connecting rod length



3 Defects in the piston pin hole require replacement of the connecting rod. Select new ones so that weight difference between new and old is within 0.212 oz (6 gr).

4 Install bearings in the crankshaft end of all rods. Mount the rods on the crankshaft and replace bearings and rod caps. Install bolts and tighten. Use a feeler gauge to measure end play between the connecting rods and the crankshaft (**Figure 50**). The standard measurement should be between 0.0079 and 0.0118 in (0.2 and 0.3mm). Maximum allowable wear is 0.0118 in (0.3mm).



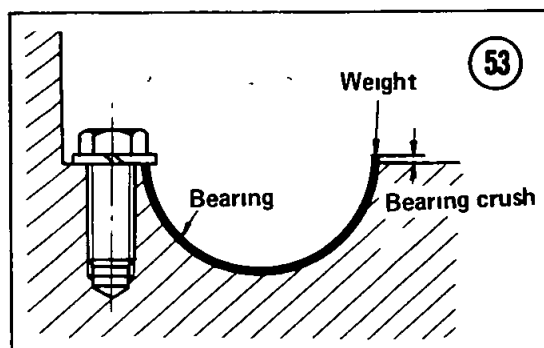
Crankshaft

- 1 Check the crankshaft journal and crank pin for cracks, obvious wear, and scratches. Repair or replace defective parts.
- 2 Check the crankshaft for bend. If the bend at the center journal exceeds 0.0020 in (0.05mm), have the crankshaft professionally straightened or replace it.
- 3 Check crankshaft journals and crank pins for out-of-round and taper. **Figure 51** lists specifications. Regrind the crankshaft if the specifications are exceeded by more than 0.0012 in (0.03mm).
- 4 Replace the connecting rod and main bearings with proper undersize bearings if the crankshaft is reground. The following table provides data for bearing replacement based on the final size of the crankshaft journals and crank pins.

the main bearing cap and the cylinder block bearing recess and tighten the cap bolts to the proper torque with a torque wrench.

Tightening torque	
Main bearings	50.6 to 57.8 ft.-lb (7.0 to 8.0 kg/m)
Rod bearings	19.5 to 23.9 ft.-lb (2.7 to 3.3 kg/m)

9 Loosen the cap bolt on one side and measure the clearance, **Figure 53**, between the cap and block side. Clearance should be within the following specifications, Main bearings 0 through 0.0024 in. (0 to 0.06mm), rod bearings 0.0012 through 0.0032 in. (0.030 to 0.0024mm).



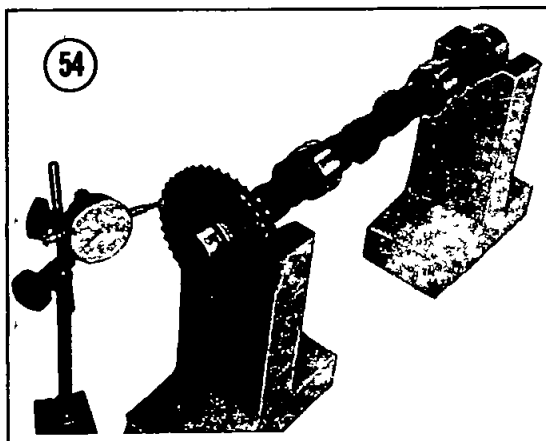
10. If bearing crush is not in tolerance, replace the bearings

Crankshaft and Camshaft Sprockets

1. Check for damaged teeth. Replace sprocket if necessary.
2. Install the camshaft sprocket and check for runout, as shown in **Figure 54**. If over 0.04331 in. (0.1mm), replace the sprocket. Check for thrust deviation at the same time. Thrust deviation should be between 0.0031 and 0.0150 in. (0.08 to 0.38mm).
3. Check the chain for damage, severe wear, and stretch at the roller links. Replace the chain if defects or excessive stretch is found.
4. Check the chain tensioner and the chain guides for wear and damage.

Flywheel

1. Check the clutch disc contact surface of the flywheel for wear and damage.



2. Measure deviation of the clutch disc contact surface using a dial gauge. If deviation exceeds 0.04331 in. (0.1mm), replace the flywheel.
3. Check flywheel teeth for damage. Consult a dealer or machine shop if in doubt.

ENGINE ASSEMBLY

This section covers assembly of the engine after corrective maintenance has been completed. Specifications and torque information are given at the end of the section. The following general precautions should be followed in assembling the engine.

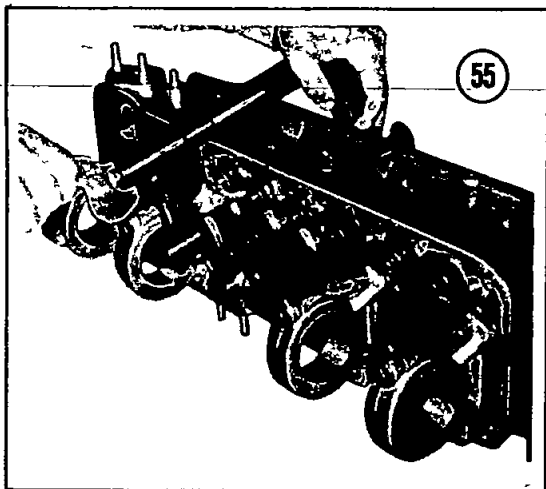
1. Make certain all parts are thoroughly cleaned and that all oil and water passages are free from foreign material.
2. All parts that slide into or through other parts should be coated with a thin film of new engine oil before assembly.
3. Don't reuse gaskets, packing, and oil seals. Complete kits are available for the entire engine, and for the cylinder head and block assemblies.
4. Keep tools and work benches clean to avoid contamination of delicate parts.
5. Be sure to follow specified torque tightening values and order of tightening, where given.
6. Unless complete rebuild of the engine has been done, valves (and associated parts), bearings, pistons, and connecting rods should be reinstalled where they were taken from.

CYLINDER HEAD

Valve and Valve Spring Assembly

1. Insert valve from bottom of block.

- 2 Set the valve spring seat in position on the top of the block and over the valve stem.
3. Place the oil seal over the valve stem.
- 4 Place the inner and outer valve springs over the valve stem.
- 5 Place the spring retainer over the springs, compress springs with spring compressor, **Figure 55**, and install valve collets around valve stem so that they lock onto stem.



- 6 Release spring compressor. If collets are firmly locked onto the groove in the valve stem, assembly is complete.
7. Install the rocker guide on top of the valve stem when assembling the rocker pivot assembly.

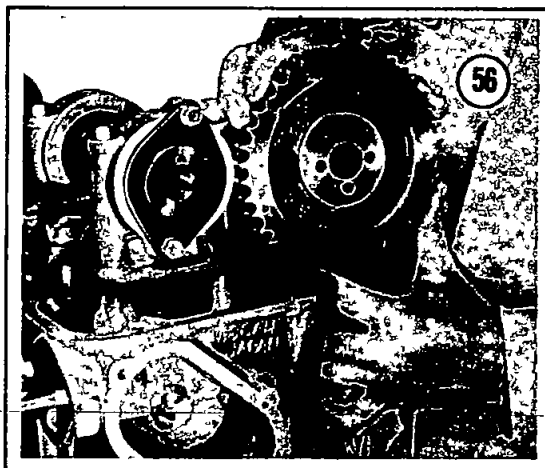
Valve Rocker Pivot Assembly

- 1 Thread lock nut onto valve rocker pivot and place rocker retainer over the valve rocker pivot.
2. Thread the above assembly into the rocker bushing protruding from the head.

Camshaft Assembly

1. Mount the locating plate on the front of the head, as shown in **Figure 56**
2. From the back of the head, carefully insert the camshaft through the four camshaft bearings, being careful not to move or damage the bearings.

NOTE: Install the camshaft sprocket onto the camshaft so that the three locating holes are at the top, left, and bottom.



3. Install the camshaft sprocket and fuel pump cam onto the front of the camshaft, and torque to specification.
4. Check the camshaft for end play using a feeler gauge as previously described

Rocker Pivot Assembly

- 1 Push down on valve spring with screwdriver and insert rocker pivot arm between camshaft and valve stem. Insert rocker valve guide onto top of valve stem at this time
- 2 Install valve rocker springs over top of rocker pivot arm

Piston and Connecting Rod Assembly

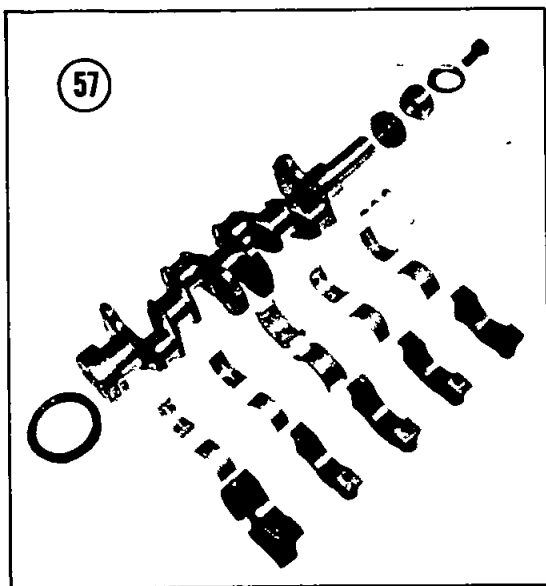
- 1 Assemble the four pistons, pins, and connecting rods. Secure piston pin. The connecting rod is press fitted onto the piston pin with from 1 to 3 tons of force.

NOTE: The pistons are marked with an *F* which should point toward the front of the engine. The connecting rods must be installed so that the oil jet in the large end is positioned toward the right side of the engine. The center of the piston pin is off-set in relation to the center of the piston, so correct assembly is critical.

- 2 Use a ring expander to install the rings onto the pistons. Install the top and middle rings with the marks up.
- 3 Lubricate the rod bearings lightly and install them into their respective connecting rods and rod caps

Cylinder Block Assembly

1 Position all crankshaft parts on a work bench. This includes the crankshaft, main bearings, rear oil seal, woodruff keys, crankshaft gear, oil pump gear, oil thrower, bolts, and bearing caps. **Figure 57** shows the arrangement.



2 Insert main bearings into appropriate cylinder block holders.

NOTE: The center (No. 3) bearing is the only flanged type of thrust bearing. Bearings No. 2 and No. 4 are identical. No. 1 and No. 5 bearing appear identical, but No. 1 has an oil hole. All bearings, except No. 1, are interchangeable as to upper and lower half.

3 Lightly lubricate the crankshaft and bearing mating surfaces, then install bearings in main bearing caps.

4 Install the crankshaft.

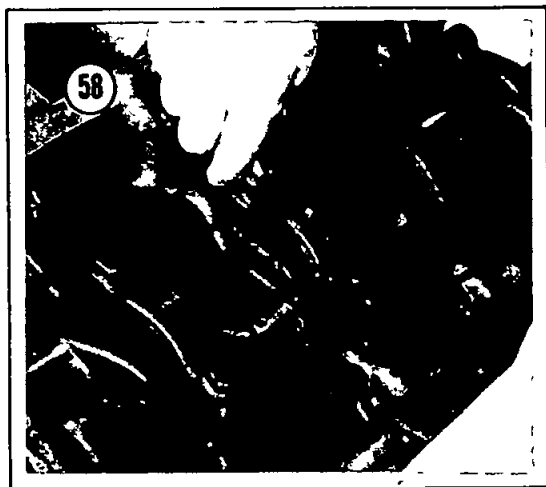
5 Install main bearing caps over crankshaft, insert main cap bolts, and tighten lightly. The main bearing caps have an arrow marked on each one. These must point to the front of the engine.

6 Gently move the crankshaft in an axial direction toward the front of the engine to verify that the main bearing caps are properly aligned and seated.

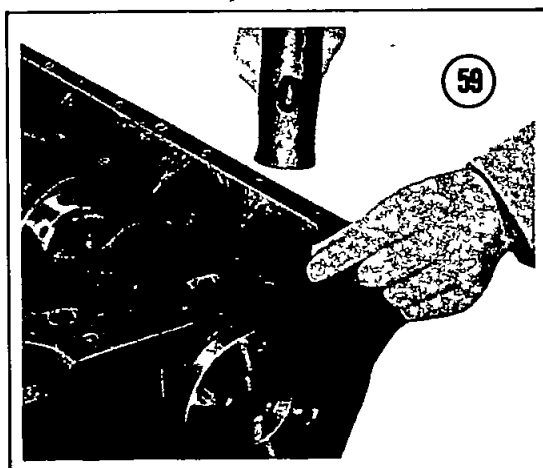
7 Use a torque wrench to tighten the cap bolts to the limits specified. The tightening operation should be done gradually in three or four separate stages, starting in the center and working outward to each end.

8 Rotate the crankshaft to make certain it isn't binding.

9 Use a feeler gauge to check the end play at the center (No. 3) bearing (**Figure 58**).



10 Install the side oil seals into the rear main cap and cylinder block, as shown in **Figure 59**.



11 Install the rear oil seal with Datsun tool ST49370000 or equivalent.

12 Install the rear end plate.

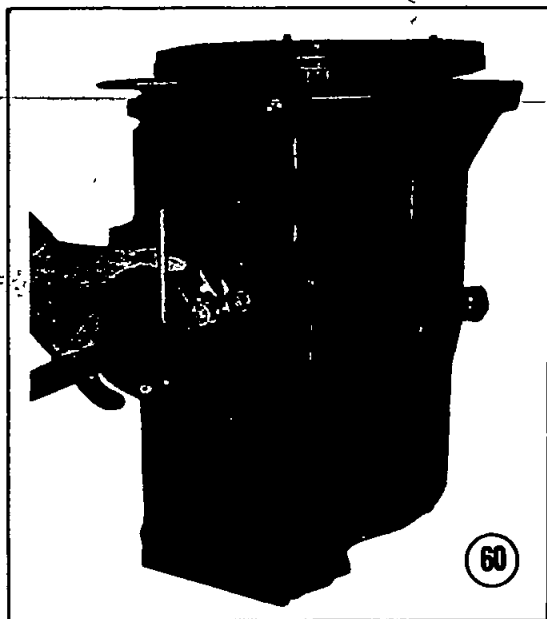
13 Install the flywheel with proper bolts and lock washers, and torque as specified.

NOTE Lubricate the cylinder walls with new engine oil prior to insertion of pistons. Make certain that the ring gaps are not in line with one another. Place the gaps 180 degrees from each other and not positioned either front-to-back or directly in line with the piston pins.

CAUTION

Use extreme care when inserting pistons so as to avoid crankshaft damage.

14 With the aid of a ring compressor, install the piston and connecting rod assemblies into the cylinder block, as shown in Figure 60. Make certain the proper piston is inserted into the proper liner, and the F on each piston faces forward.

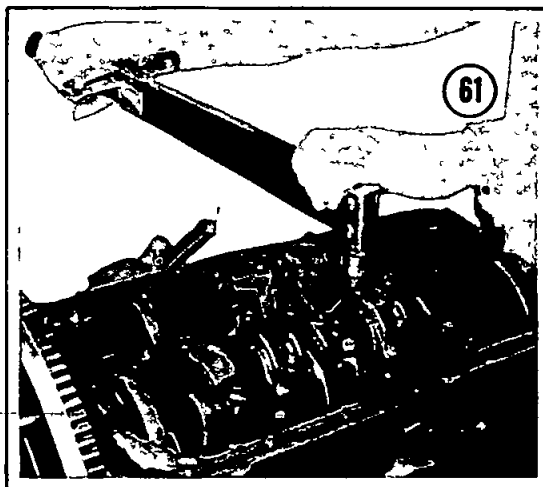


15. Install bearings into the connecting rod caps after lubricating them lightly.

16 Gently push connecting rods, with bearings installed, down the cylinder until contact is made with the crankshaft.

17. Set connecting rod caps over crankshaft and insert connecting rod bolts. Make certain that the numbers on the rods and the rod caps face in the same direction.

18 Tighten rod bolts to the proper torque specification as shown in Figure 61.



19 Check the connecting rod end play with a feeler gauge, as previously described

Cylinder Head Installation

1. Spread a suitable gasket sealing agent on the top of the cylinder block and position a new head gasket

2 Spread sealing agent on top of the gasket

CAUTION

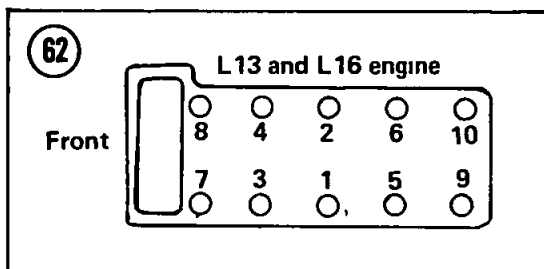
Position the crankshaft so that no piston is at top dead center. Before installing head, point the keys on the camshaft and crankshaft straight up. Once the head is installed, do not rotate the camshaft and crankshaft separately, as damage to the piston tops might result.

3. Place the cylinder gently onto the head gasket.

NOTE: Three different types of bolts are used to hold down the head. Make certain the proper ones are used in the proper places

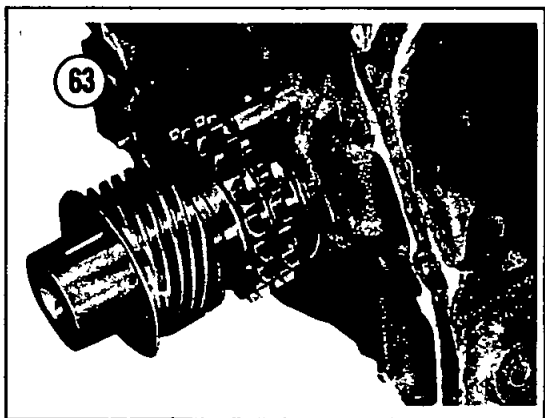
4. Insert head bolts through holes in head and thread them into the cylinder block.

5 Referring to Figure 62, use a torque wrench and Datsun tool ST49010000 (or equivalent) to tighten the head bolts to specification. Tighten them gradually in three or four stages while following the sequence diagram. Torque values are listed in the specification table.



Crankshaft and Timing Chain Assembly

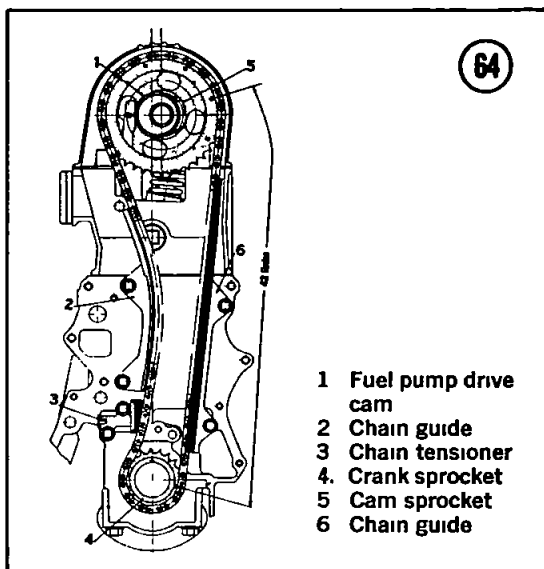
- 1 Insert a woodruff key into the crankshaft keyway and slide the crankshaft sprocket into place.
- 2 Insert a woodruff key in the middle crankshaft keyway and slide the distributor drive gear into place.
- 3 Fit the oil thrower to the crankshaft, as shown in **Figure 63**.



NOTE. Make certain that the crankshaft and camshaft keys are pointing upwards.

- 4 Install the timing chain over the crankshaft and camshaft sprockets. **Figure 64** shows the proper relationship of the timing marks on the camshaft sprocket, the timing chain, and the crankshaft sprocket. There should be 42 links of chain from timing mark to timing mark.
- 5 Install the chain guides and chain tensioner.

NOTE If the stretch of the chain roller links is extreme, adjust the camshaft sprocket location by transferring the camshaft set position of the camshaft sprocket to No. 2 or No. 3 hole. Procedures to make this adjustment are given in steps 6 through 11 below.



- 1 Fuel pump drive cam
- 2 Chain guide
- 3 Chain tensioner
- 4 Crank sprocket
- 5 Cam sprocket
- 6 Chain guide

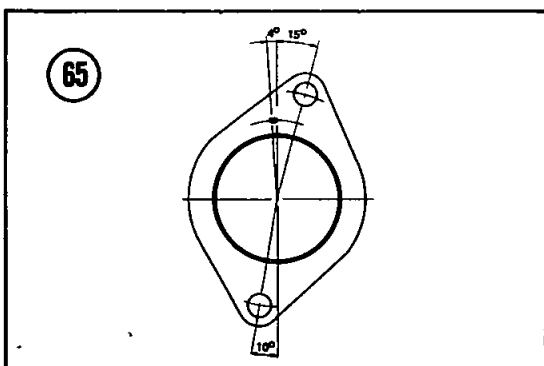
6. Set No. 1 piston at top dead center on its compression stroke.

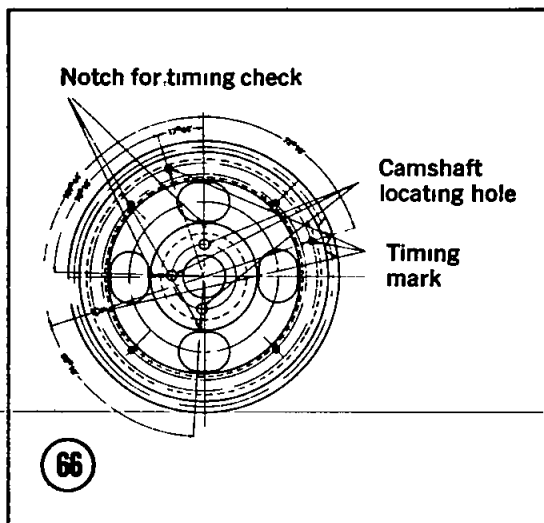
7. Refer to **Figures 65 and 66**. Figure 65 is a diagram of the camshaft locate plate and Figure 66 shows the front side of the camshaft sprocket.

8. Examine whether the camshaft location hole on the camshaft sprocket comes off the left end of the oblong groove in the camshaft locate plate. If the location hole is off the end of the groove, the stretch of the chain is beyond limit.

9. Remove the bolt holding the oil pump cam and camshaft sprocket. Move the camshaft sprocket into position so that No. 2 hole coincides with the oblong groove. No. 2 hole should be on the right end of the oblong groove.

10. If the location hole position still isn't correct, rotate the camshaft sprocket to hole No. 3, which should be on the right end of the oblong groove.





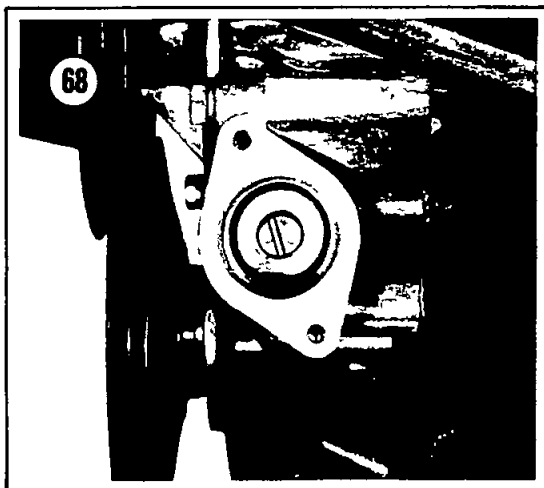
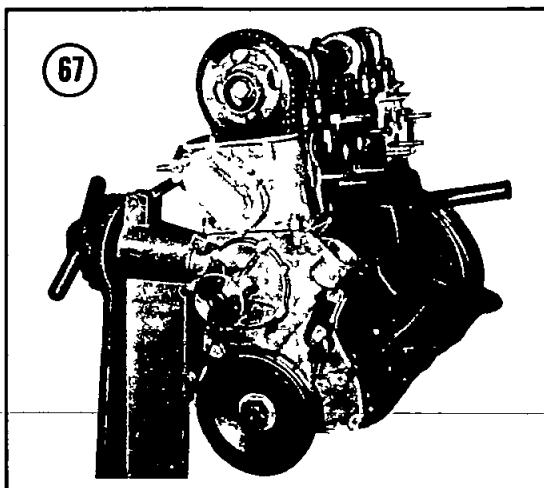
11 Should none of the above adjustments be adequate, return the camshaft sprocket to the No 1 hole and replace the oil pump cam and bolt. Under these conditions the chain must be replaced.

Front Cover, Crankshaft Pulley, And Water Pump Installation

1. Press a new oil seal into the front cover
2. Apply gasket sealing compound to both sides of the left-hand and right-hand front cover gaskets. Mount the gaskets and front cover to the block with bolts and lockwashers. Check the seal of the head gasket at the top of the front cover. Make certain to attach bolts at that location.
3. Insert woodruff key into crankshaft and slide crankshaft pulley onto crankshaft
4. Install crankshaft bolt and washer, then torque as per the specification table.
5. Coat water pump gasket on both sides with gasket compound and mount the water pump to the front cover, as shown in Figure 67.

Oil Pump Installation

1. With No 1 cylinder at top dead center on its compression stroke, install the packing for the oil pump and distributor drive spindle into the front cover.
2. Install the oil pump and distributor drive spindle. Refer to Figure 68 and make certain that the drive spindle top is located in the 11.25



a m position. The smaller portion of the spindle should be toward the front of the engine.

Fuel Pump, Water Inlet Elbow, Thermostat Housing, and Water Outlet Elbow Installation

1. Install the fuel pump with associated gasket.
2. Install the water inlet elbow, front thermostat housing, thermostat, and water outlet elbow, along with associated gaskets.
3. Bolt the front and rear lifting eyes to the right front and left rear of the cylinder block.
4. Install gasket and front cover on the front of the head

Oil Strainer and Oil Pan Installation

1. Mount the oil strainer with gasket to the bottom of the cylinder block. Torque to specification

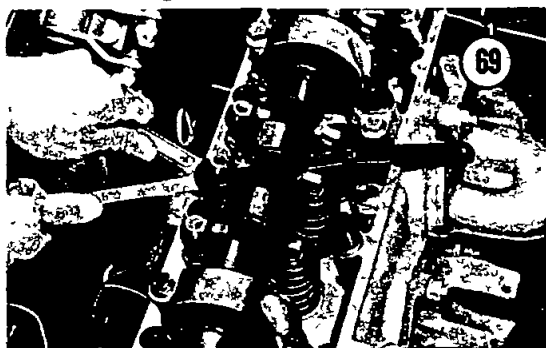
- 2 Coat the pan gasket on both sides with gasket compound and attach the oil pan to the cylinder block Torque as specified

Manifold and Carburetor Installation

1. Install the intake and exhaust manifolds, with associated gasket, to the cylinder head
- 2 Mount the carburetor and gasket to the intake manifold

Valve Adjustment

1. Refer to Figure 69



- 2 Adjust all intake and exhaust valves to the specified clearance for a cold engine

Clutch Assembly Installation

CAUTION

Take extreme care not to get grease or oil on the clutch or flywheel friction contact surfaces

1. Place the clutch disc assembly on the flywheel with the longer chamfered splined end of the disc toward the transmission.
- 2 Visually align, or use a dummy splined drive shaft, to align the disc assembly with the flywheel pilot bearing.
- 3 Install and tighten the six bolts holding the clutch cover assembly to the flywheel Tighten the bolts a turn each time by diagonal pattern until they are tight Tightening torque should be 17 4 to 18 8 ft -lbs (2 4 to 2 6 kg/m).

NOTE. *There are two dowels on the flywheel to locate the clutch cover.*

- 4 Remove dummy shaft (if used) after the above bolts are fully tightened.
- 5 Refit the release bearing and transmission case.

Miscellaneous Installation

- 1 Connect the fuel hose on the front part of the engine to the fuel pump and to the carburetor
- 2 Gap the spark plugs and install them using new gaskets.
3. Coat the rocker arm cover gasket with sealer and position it on the cylinder head.
4. Install the rocker arm cover and tighten the two thumb screws that hold it in place
- 5 Install distributor, making certain that the notch on the distributor shaft assembly mates with the drive spindle. Align the location marks made during disassembly so that the distributor is positioned as before
- 6 Install and tighten the bolts which hold the distributor to the front cover
- 7 Install points, condenser, and rotor
- 8 Replace distributor cap and attach spark plug wires in the correct sequence Make certain that all wires are firmly seated in the distributor cap and attached securely to the spark plugs
- 9 Hoist the engine assembly from the work stand.
- 10 Install the alternator bracket, alternator, and engine mounts to the block
11. Install the ignition coil, oil filter, oil pressure switch, dipstick, and water drain plug.
- 12 Connect the vacuum line between the distributor and carburetor.
- 13 Connect the transmission to the engine prior to installation in the vehicle.

Engine Installation

Installation is the reverse of the procedures followed in removal Be certain that all battery connections are made, that water hoses are secured, wiring is connected properly, and that all required bolts and mounts are installed and tightened. Replace the radiator, fan belts, and radiator shroud Fill the engine with the proper grade of oil and the radiator with recommended coolant Install the hood to the hinges according to the marks made during removal.

SERVICE DATA AND SPECIFICATIONS

Table 1 covers service data and engine specifications

Table 1 ENGINE SERVICE DATA AND SPECIFICATIONS

GENERAL SPECIFICATIONS	
Cylinder Arrangement	4 in-line
Displacement	97.3 cu. in. (1595cc)
Bore and Stroke	3.2677 x 2.9016 in. (83 x 73.7mm)
Valve Arrangement	Overhead Camshaft
Maximum Brake Horsepower	96 @ 5,600 rpm
Maximum Gross Torque	110 ft.-lb. (13.8 kg/m) @ 3,600 rpm
Firing Order	1-3-4-2
Engine Idle	
Single Point	600 rpm
Dual Point	700 rpm
Compression Ratio	8.5:1
Engine Idle Manifold at Idle rpm	17.7 in. /Hg (450mm/Hg)
Oil Pressure (hot @ 2,000 rpm)	54 to 60 lb./in. ² (3.8 to 4.2 kg/cm ²)
TIGHTENING TORQUE – ft.-lb. (kg/m)	
Cylinder Head Bolts	
1st turn	32.5 (4.5)
2nd turn	39.8 (5.5)
Flywheel Fixing Bolts	68.7 to 75.9 (9.50 to 10.39)
Main Bearing Cap Bolts	32.5 to 39.8 (4.5 to 5.5)
Camshaft Gear Bolt	36.2 to 43.4 (5.0 to 6.0)
Oil Pan	2.9 to 5.1 (0.4 to 0.7)
Oil Pump	10.8 to 15.2 (1.5 to 2.1)
Oil Strainer	5.8 to 8.7 (0.8 to 1.2)
Crank Pulley Bolt	115.7 to 130.1 (16.0 to 18.0)
SPECIFICATIONS – in. (mm)	
Valve Mechanism	
Valve Clearance Hot	0.118 (0.30)
Valve Clearance Cold	0.0098 (0.25)
Valve Head Diameter Intake	1.50 (38.0)
Valve Head Diameter Exhaust	1.30 (33.0)
Valve Stem Diameter Intake	0.31 (8.0)
Valve Stem Diameter Exhaust	0.31 (8.0)
Valve Length Intake	4.56 (115.9)
Valve Length Exhaust	4.57 (116.0)
Valve Lift	0.3937 (10.0)
Valve Spring Free Length Outer	2.05 (52.0)
Valve Spring Free Length Inner	1.77 (44.96)
Valve Spring Loaded Length Outer	1.21 @ 105.4 lb. (30.7 @ 47.8 kg)
Valve Spring Loaded Length Inner	0.96 @ 56.2 lb. (24.5 @ 25.5 kg)
Valve Spring Assembled Height Outer	1.53 @ 63.9 lb. (38.9 @ 29.0 kg)
Valve Spring Assembled Height Inner	1.38 @ 27.1 lb. (35 @ 12.3 kg)
Valve Spring Effective Turns Outer	4.5
Valve Spring Effective Turns Inner	5.5
Valve Guide Length Intake	2.32 (59.0)
Valve Guide Length Exhaust	2.32 (59.0)
Valve Guide Height from Head Surface	0.409 to 0.417 (10.4 to 10.6)
Valve Guide Inner Diameter Intake	0.315 to 0.3154 (8.0 to 8.018)
Valve Guide Inner Diameter Exhaust	0.315 to 0.3154 (8.0 to 8.018)
Valve Guide Outer Diameter Intake	0.4718 to 0.4723 (11.985 to 11.996)
Valve Guide Outer Diameter Exhaust	0.4718 to 0.4723 (11.985 to 11.996)
Valve Guide to Stem Clearance Intake	0.0006 to 0.0018 (0.015 to 0.045)
Valve Guide to Stem Clearance Exhaust	0.0016 to 0.0028 (0.040 to 0.070)
Valve Seat Width Intake	0.055 to 0.071 (1.4 to 1.8)
Valve Seat Width Exhaust	0.063 to 0.079 (1.6 to 2.0)

Table 1 ENGINE SERVICE DATA AND SPECIFICATIONS (continued)

SPECIFICATIONS — in (mm) (continued)

Valve Seat Interference Fit Intake	0 0031 to 0 0043 (0 08 to 0 11)
Valve Seat Interference Fit Exhaust	0 0024 to 0 0039 (0 06 to 0 10)
Valve Guide Interference Fit	0 0011 to 0 0019 (0 027 to 0 049)
Camshaft and Timing Chain	
Camshaft End Play	0 0031 to 0 0150 (0 08 to 0 38)
Camshaft Lobe Lift	0 261 (6 63)
Camshaft Journal Diameter	1 8877 to 1 8883 (47 949 to 47 962)
Camshaft Bend	0 0020 (0 05)
Camshaft Bearing Inner Diameter	1 8898 to 1 8904 (48 0 to 48 016)
Camshaft Journal to Bearing Clearance	0 0015 to 0 0026 (0 038 to 0 076)
Rocker Arm Lever Ratio	1 5
Connecting Rod:	
Center Distance	5 507 to 5 509 (139 87 to 139 93)
Standard Bearing Thickness	0 0588 to 0 0593 (1 493 to 1 506)
Big End Play	0 0079 to 0 0118 (0 20 to 0 30)
Connecting Rod Bearing Clearance	0 0006 to 0 0022 (0 014 to 0 056)
Connecting Rod Bend per 3 937 in (100mm)	0 0012 (0 03)
Crankshaft and Main Bearing	
Journal Diameter	2 1631 to 2 1636 (54 942 to 54 955)
Journal Taper and Out-of-Round	less than 0 0012 (0 03)
Crankshaft Free End Play	0 002 to 0 0059 (0 05 to 0 15)
Crank Pin Diameter	1 9670 to 1 9675 (49 961 to 49 975)
Crank Pin Taper and Out-of-Round	less than 0 0012 (0 03)
Main Bearing Thickness	0 0717 to 0 0722 (1 822 to 1 835)
Main Bearing Clearance	0 0008 to 0 0028 (0 020 to 0 072)
Crankshaft Bend	0 0019 (0 05)
Piston	
Standard Diameter	3 267 to 3 269 (82 99 to 83 04)
Ellipse Difference	0 013 to 0 014 (0 32 to 0 35)
Ring Groove:	
Top	0 08 (2 0)
Second	0 08 (2 0)
Oil	0 16 (4 0)
Piston to Bore Clearance	0 0010 to 0 0018 (0 025 to 0 045)
Piston Pin Hole Offset	0 0394 ± 0 0020 (1 0 ± 0 05)
Piston Pin	
Piston Pin Diameter	0 8266 to 0 8268 (20 995 to 21 000)
Piston Pin Length	2 8346 to 2 8445 (72 00 to 72 25)
Piston Pin to Piston Clearance	0 0003 to 0 0004 (0 008 to 0 010)
Interference Fit of Piston Pin to Connecting Rod Bushing	0 0006 to 0 0013 (0 015 to 0 033)
Piston Ring	
Ring Height:	
Top	0 0787 (2 0)
Second	0 0787 (2 0)
Oil	0 1575 (4 0)
Side Clearance:	
Top	0 0018 to 0 0031 (0 045 to 0 078)
Second	0 0012 to 0 0025 (0 030 to 0 063)
Oil	0 0010 to 0 0025 (0 025 to 0 063)
Ring Gap:	
Top	0 0091 to 0 0150 (0 23 to 0 38)
Second	0 0059 to 0 0118 (0 15 to 0 30)
Oil	0 0059 to 0 0118 (0 15 to 0 30)

CHAPTER SEVEN

FUEL SYSTEM

The fuel system includes the fuel tank, strainer, pump, carburetor, air cleaner, and necessary lines. Inspect components for leaks and deterioration, whenever maintenance is done. The fuel strainer should be inspected periodically and cleaned.

AIR CLEANER

The air filter element is viscous paper and does not require cleaning. Replace it every 24,000 miles, or more frequently under harsh conditions.

Several minor differences exist between vehicles depending on the type of emission control device used. **Figure 1** shows location of the air cleaner on the engine and parts comprising the cleaner system on model years through 1969. **Figure 2** shows the changes for 1970 and later. Warm air is supplied to the air cleaner from the exhaust manifold to prevent carburetor icing.

AIR CLEANER REMOVAL AND REPLACEMENT

1. Unthread the wing nut atop the cleaner assembly.
2. Remove the two bolts holding the air cleaner to the support.
3. Disconnect the air cleaner duct from the base of the cleaner intake throat.

4. Lift off the air cleaner body and remove the air filter, as shown in **Figure 3**.

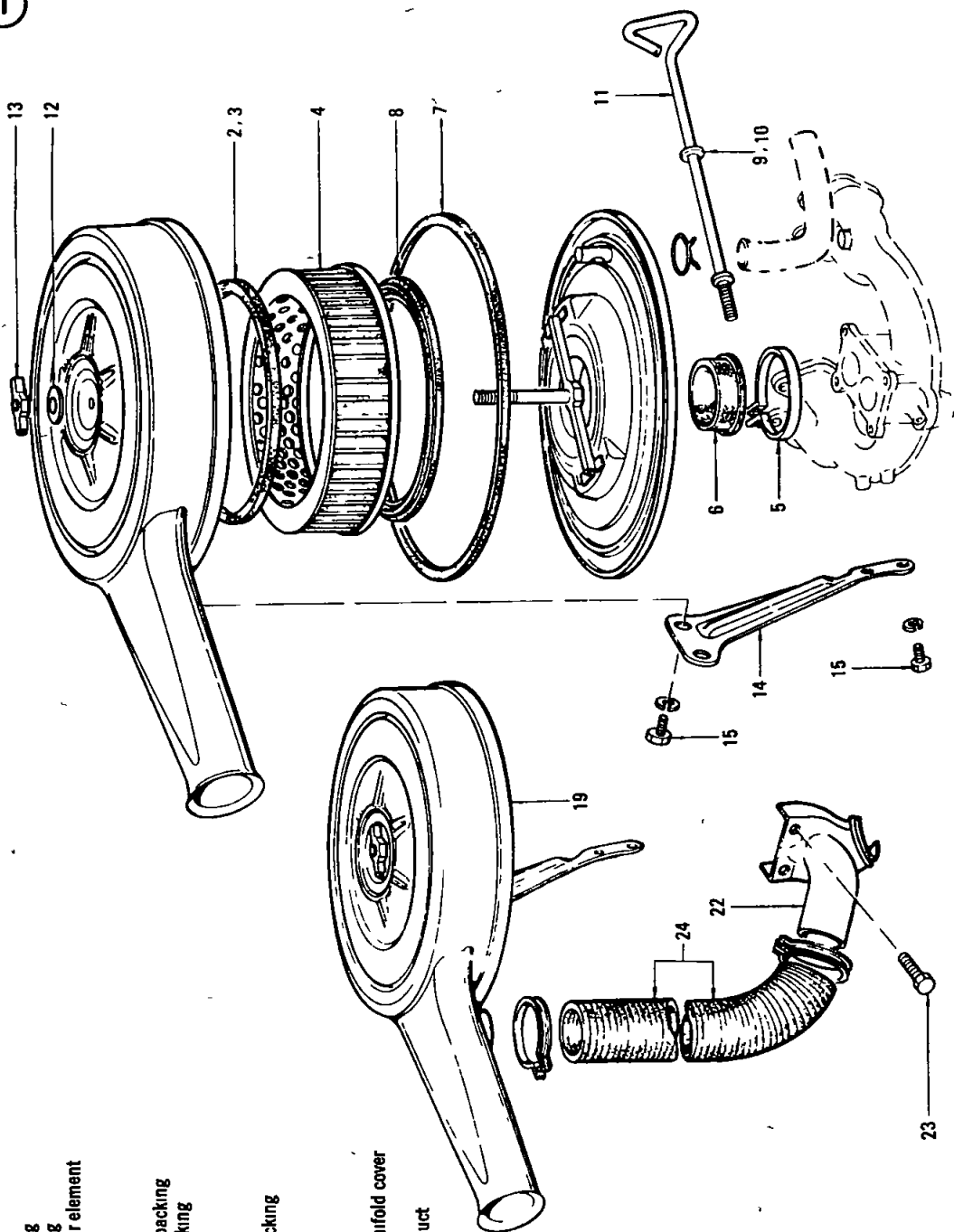
To remove the air cleaner, proceed as follows:

1. Perform steps 1 through 4 above.
2. Unscrew the band bolt at the base of the air cleaner.
3. Disconnect all hoses leading to the air cleaner.
4. Pull up on the body of the air cleaner and remove from carburetor.
5. Except for the air filter element, thoroughly clean all parts.
6. Reverse the steps above for reassembly.

FUEL STRAINER

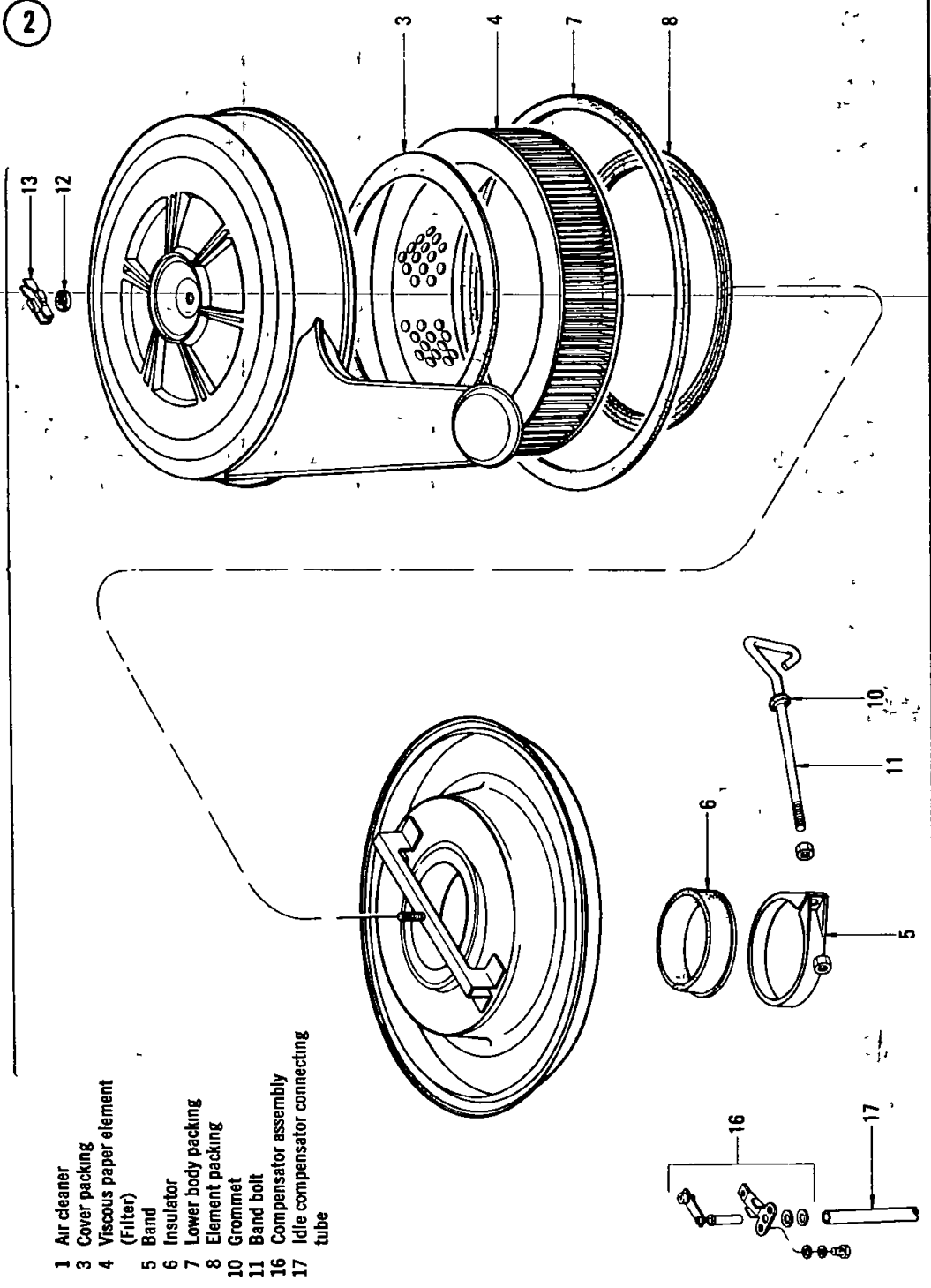
The fuel strainer is located on the right-hand side of the engine compartment. **Figure 4** shows the fuel strainer, hoses, clamps, and the mounting clip that holds the fuel strainer in place. The fuel strainer is of the cartridge type and uses a fiber mat and nylon as strainer elements. The fuel strainer should be inspected frequently for foreign material and replaced at least every 24,000 miles.

1. Disconnect the inlet and outlet hoses from the fuel strainer. Make certain that the inlet hose (bottom) is not permitted to fall below the level of the fuel tank or leakage will occur.

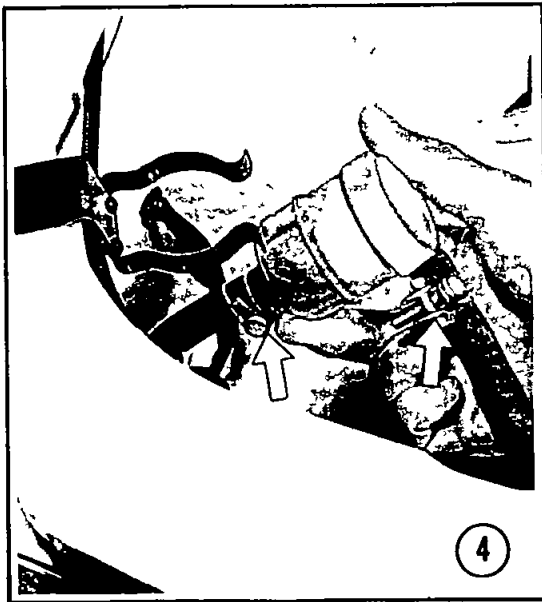
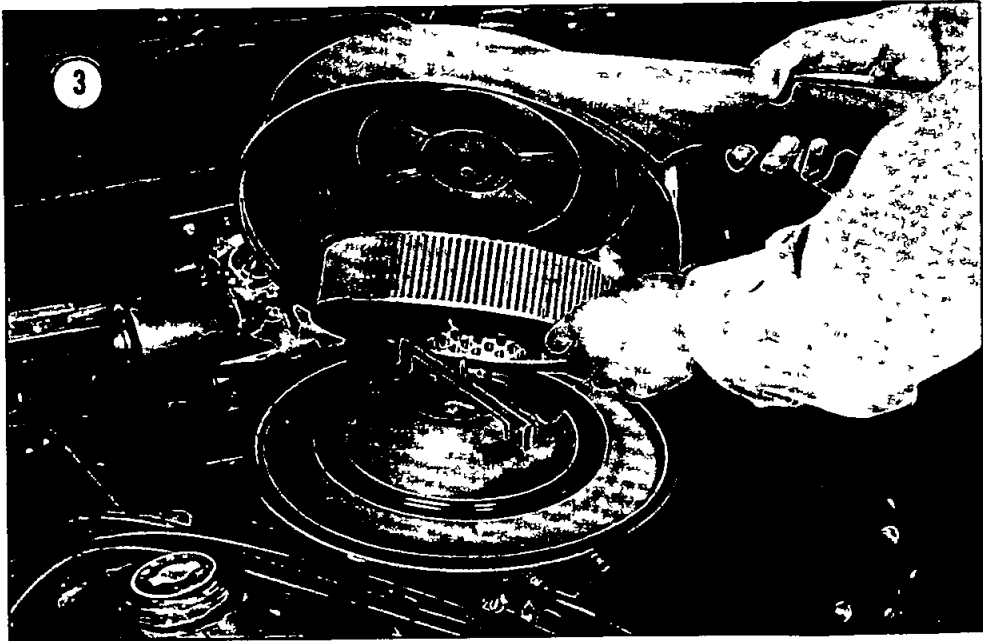


- | | |
|----|-----------------------------------|
| 2 | Cover packing |
| 3 | Cover packing |
| 4 | Viscous paper element
(Filter) |
| 5 | Band |
| 6 | Insulator |
| 7 | Lower body packing |
| 8 | Element packing |
| 9 | Grommet |
| 10 | Grommet |
| 11 | Band bolt |
| 12 | Wing nut packing |
| 13 | Wing nut |
| 14 | Support |
| 15 | Bolt |
| 19 | Air cleaner |
| 22 | Exhaust manifold cover |
| 23 | Bolt |
| 24 | Air cleaner duct |

2



- 1 Air cleaner
- 2 Cover packing
- 3 Viscous paper element (Filter)
- 4 Insulator
- 5 Band
- 6 Lower body packing
- 7 Element packing
- 8 Grommet
- 9 Band bolt
- 10 Compensator assembly
- 11 Idle compensator connecting tube
- 12 Compensator connecting tube
- 13 Compensator connecting tube
- 14 Compensator connecting tube
- 15 Compensator connecting tube
- 16 Compensator connecting tube
- 17 Compensator connecting tube



- 2 Remove the fuel strainer from its mounting clip
3. Replace the fuel strainer, as required.
4. Reconnect the intake and outlet fuel lines.

FUEL PUMP

The fuel pump consists of a body, rocker arm and link assembly, diaphragm, diaphragm spring, seal, and inlet and outlet valves. The

rocker arm is driven by a pump cam mounted on the camshaft in the front part of the rocker arm/front cover assembly

Figure 5 shows the fuel pump for all models through 1970 Figure 6 illustrates the fuel pump for 1971 and later models.

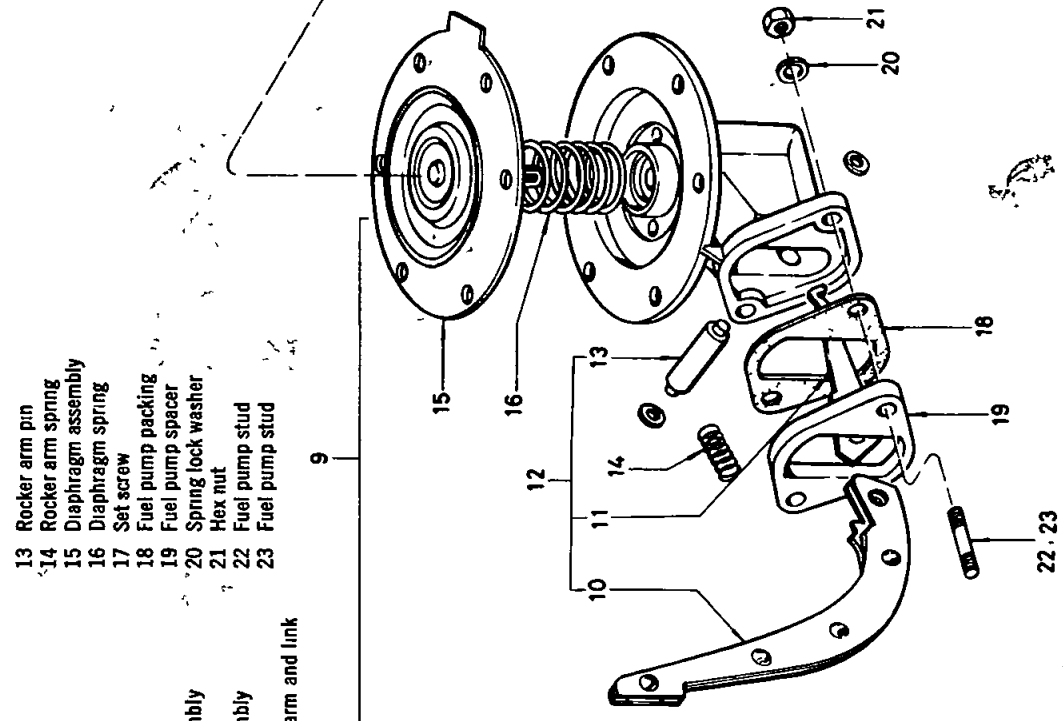
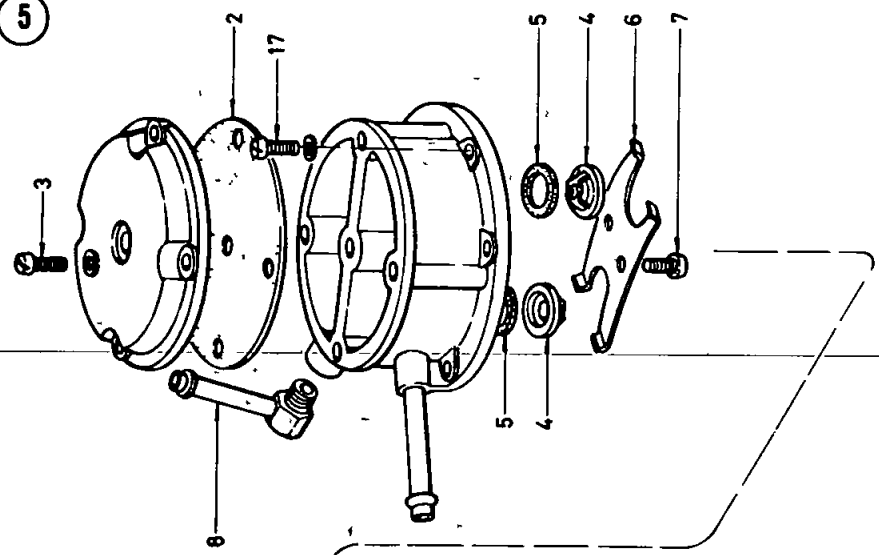
Fuel pump Testing

Fuel pump pressure and fuel pump capacity testing are performed in tests described below. Both tests are performed with the fuel pump mounted to the engine.

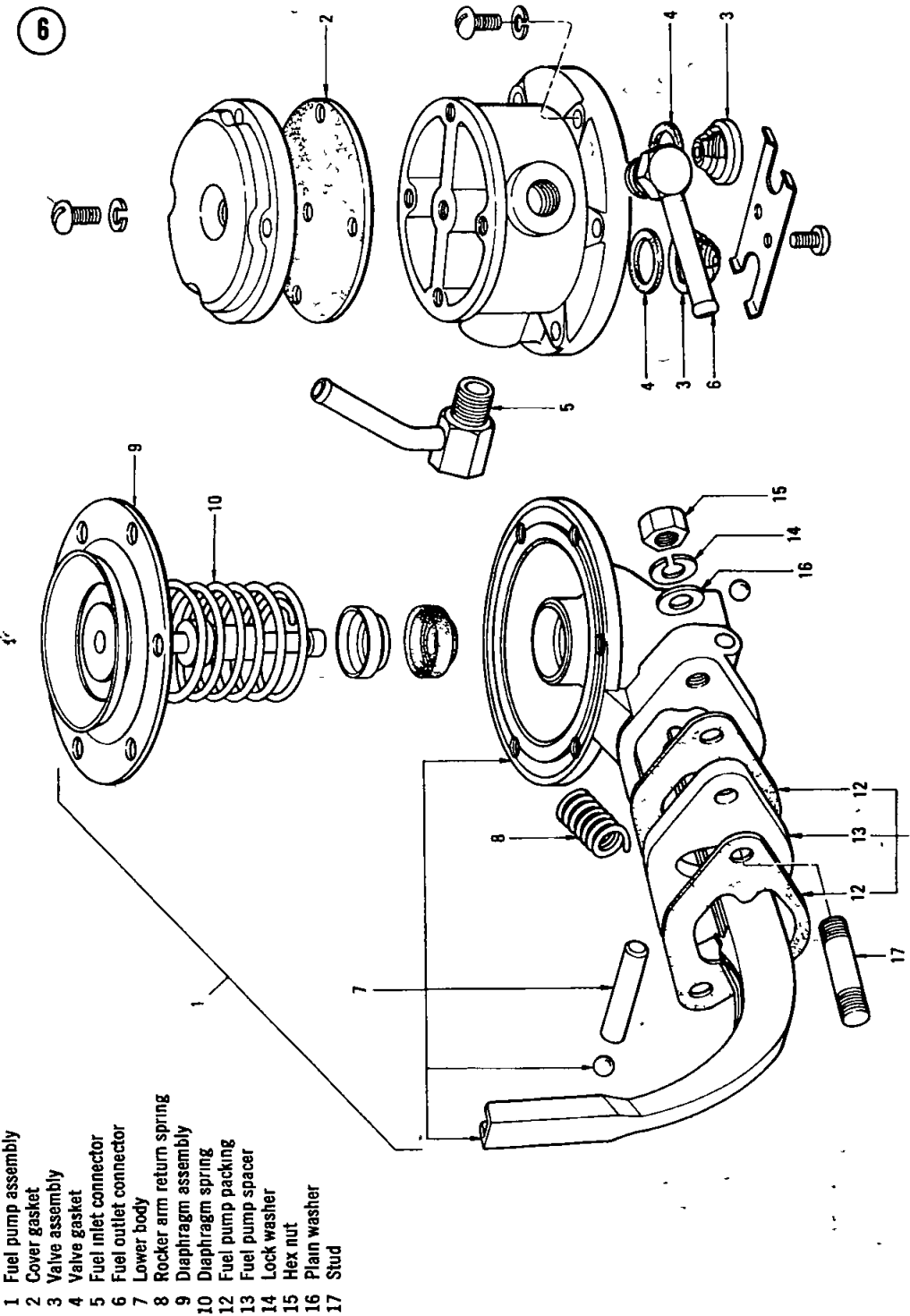
Static Pressure Test

- 1 Disconnect the carburetor fuel line at the carburetor
2. Install an adapter and a "tee" fitting to the fuel line and attach a suitable pressure gauge.
3. Connect adapter to carburetor
- 4 Start and run engine at varying speeds.
- 5 The gauge reading is static fuel pressure. It should remain between 2.56 and 3.41 lb/in.² (0.18 to 0.24 kg/cm²). Pressure below the lower limit indicates extreme wear on one part or general wear on several pump parts. Pressure above the upper limit indicates an excessively strong diaphragm spring or a diaphragm that is too tight. Both conditions require the removal of the fuel pump for necessary repair or replacement.

5



- 2 Cover gasket
- 3 Set screw
- 4 Valve assembly
- 5 Valve gasket
- 6 Valve retainer
- 7 Retainer screw
- 8 Elbow connector
- 9 Lower body assembly with arm
- 10 Rocker arm assembly
- 11 Rocker arm link
- 12 Complete rocker arm and link
- 13 Rocker arm pin
- 14 Rocker arm spring
- 15 Diaphragm assembly
- 16 Diaphragm spring
- 17 Set screw
- 18 Fuel pump packing
- 19 Fuel pump spacer
- 20 Spring lock washer
- 21 Hex nut
- 22 Fuel pump stud
- 23 Fuel pump stud



Capacity Test

Perform the capacity test only when the static pressure test is within acceptable limits

1. Disconnect the fuel line at the carburetor.
2. Place a suitable container at the end of the fuel line.
3. Start the engine and run at 1,000 rpm.
4. The fuel pump should deliver fuel into the container at a rate slightly over two pints per minute.

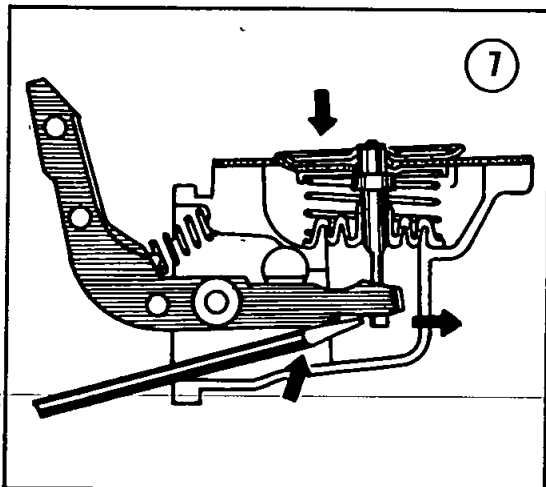
If no gasoline, or only a little appears, the fuel line is clogged or the fuel pump defective. Before removing the fuel pump, remove the gas tank filler cap, disconnect the inlet and outlet fuel lines, and blow through them with compressed air to make certain they are clear. Reconnect the fuel lines and retest the flow. If still insufficient, the fuel pump requires servicing or replacement.

Fuel Pump Removal and Disassembly

1. Unscrew the two mounting nuts holding fuel pump to the cylinder head.
2. Disconnect the inlet and outlet lines.
3. Remove the fuel pump from the cylinder head.
4. Place the pump on a work bench and remove the screws joining the upper and lower bodies.
5. Remove the cap and gasket by removing the cap screws.
6. Unscrew the elbow and connector
7. Remove the valve retainer by unscrewing the two valve retainer screws. The two valves are then easily removed
8. To remove the diaphragm, spring, lower body seal washer, and lower body seal from the lower body, press the diaphragm down. While doing this, cant the diaphragm so that the rectangular part in the lower end of the pull rod unhooks from the rocker arm link. This action is shown in Figure 7.
9. Drive out the rocker arm pin by using a drive drift and hammer.

Fuel Pump Inspection

1. Check the upper and lower bodies for cracks.
2. Check the valve assembly for wear on valves and springs.



3. Check the diaphragm for small holes, cracks, and wear.
4. Check the rocker arm for wear where it contacts the camshaft
5. Check the rocker arm pin for wear. A worn pin may cause oil leakage.
6. Check all other parts for abnormalities or defects. Replace with new parts as required. Repair kits are available from Datsun dealers and parts outlets

Fuel Pump Assembly

1. Assembly of the fuel pump is the reverse of disassembly.
2. Use new gaskets during assembly and installation.
3. Lubricate the rocker arm, the rocker arm link, the rocker arm pin, and the lever pin before installation
4. To test the operation of the fuel pump before reinstallation, connect a three foot piece of fuel line or hose between the fuel filter and the fuel pump. Hold the fuel pump at the end of the fuel line considerably above the level of the fuel strainer. Operate the rocker arm by hand. If fuel is drawn up to the pump soon after the pumping action is started, the pump is satisfactory.
5. Install the fuel pump to the cylinder head and secure the mounting nuts to the studs
6. Reconnect the inlet and outlet fuel lines
7. Check the operation of the fuel pump by running pressure capacity tests, as described previously.

CARBURETOR

The carburetor is an Hitachi Type DAF328. Several variations are used depending on the model year, type of transmission, and the emission control system. The different models are the same as far as basic operation is concerned. Therefore, the following discussion covers a typical carburetor. The automatic choke is used on automatic transmission and 1972 models only. All other chokes are manual.

Refer to **Figure 8**. The carburetor consists of a primary system used in normal running, and a secondary system used for high speed or heavy load operations.

CARBURETOR ADJUSTMENT

Idling Adjustment

Idle adjustment is made by the throttle adjust and idle adjust screws, both of which are located at the bottom of the carburetor.

1 Screw the idle adjust screw all the way in to the fully closed position. Do not over-tighten.

2 Unscrew the idle adjust screw approximately three complete turns.

3 Screw in the throttle adjust screw two or three turns and start the engine.

4 Screw out the throttle adjust screw slowly until the onset roughness following a gradual speed drops.

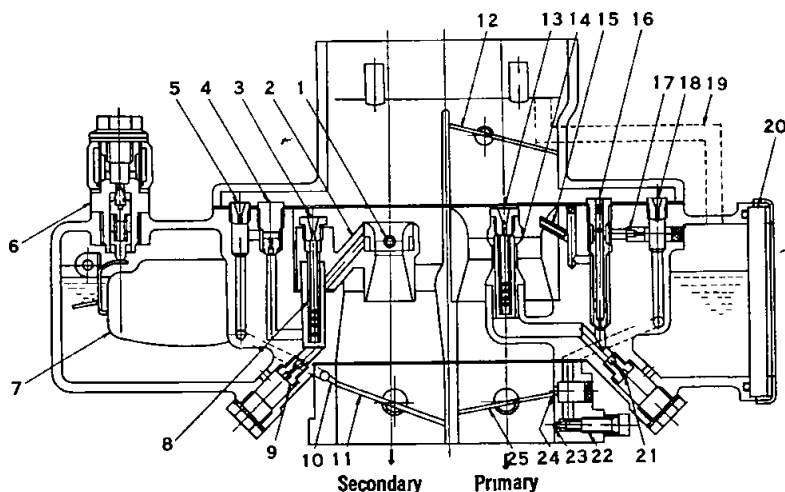
5 Screw in the idle adjust screw until the engine runs smoothly at the highest speed.

6 Readjust the throttle screw to drop the engine speed. Repeat these adjustments until a smooth engine speed at the proper idle rpm is achieved. Refer to the tune-up chapter for proper rpm.

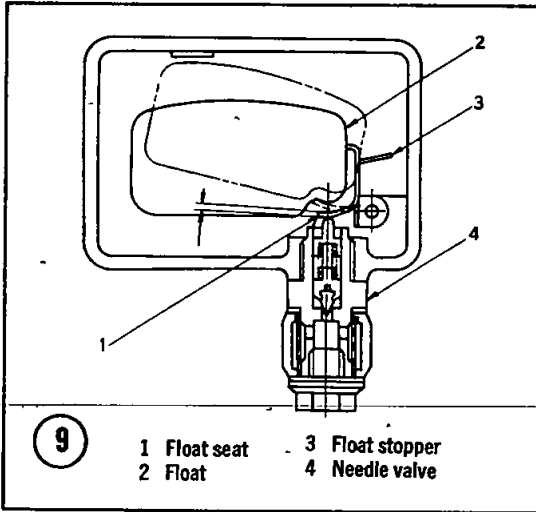
Fuel Level Adjustment

Constant fuel level is maintained by the float and the needle valve. **Figure 9** shows the fuel level system within the carburetor. If the level is at the line on the fuel reservoir, level is properly set. If not, adjust it by bending the float seat. Adjust the gap between the valve stem and the float seat to .00591 in (1.5mm) with the float fully lifted up by bending the float stopper.

8

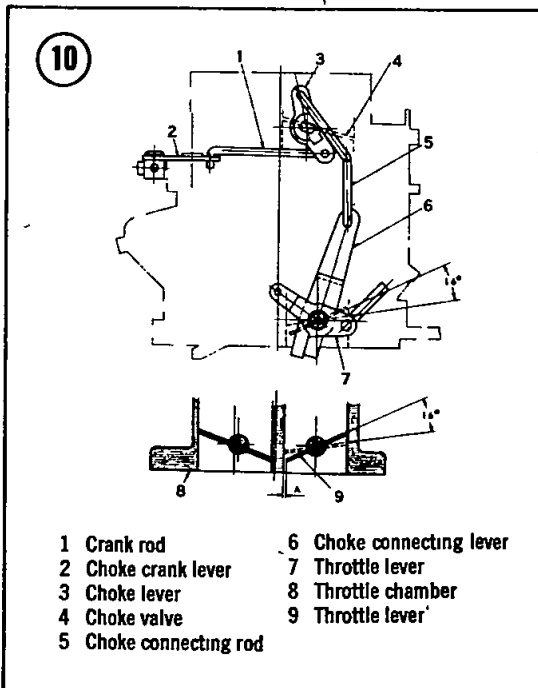


- | | | |
|----------------------------|-----------------------------|---------------------------|
| 1 Secondary main nozzle | 10 Secondary bypass hole | 18 Primary slow air bleed |
| 2 Secondary small venturi | 11 Secondary throttle valve | 19 Air vent |
| 3 Secondary main air bleed | 12 Choke valve | 20 Level gauge |
| 4 Secondary slow jet | 13 Primary main air bleed | 21 Primary main jet |
| 5 Secondary slow air bleed | 14 Primary main nozzle | 22 Idle limit screw |
| 6 Needle valve | 15 Economizer bleed | 23 Idle hole |
| 7 Float | 16 Primary slow jet | 24 Bypass hole |
| 8 Secondary emulsion tube | 17 Primary economizer | 25 Primary throttle valve |
| 9 Secondary main jet | | |



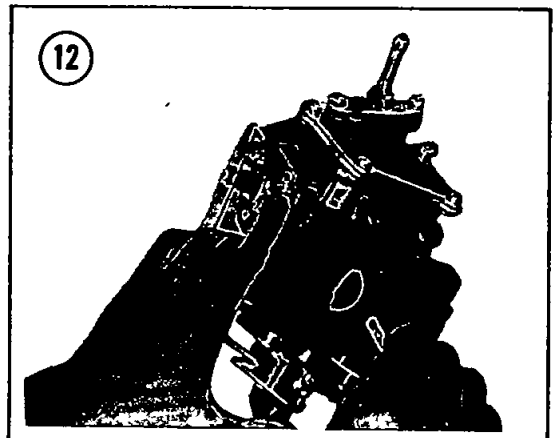
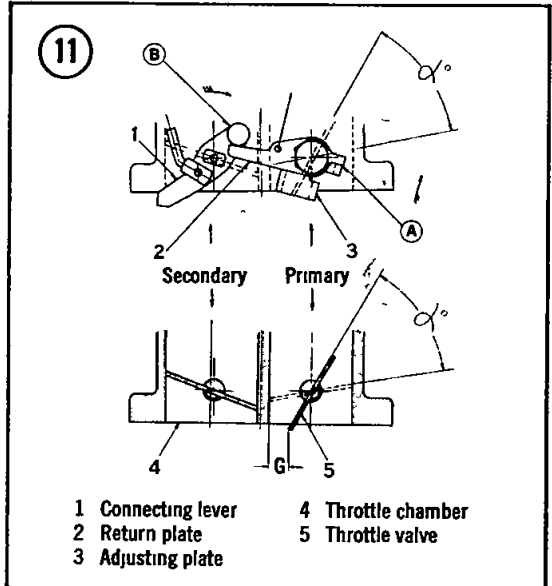
Starting Interlock Valve Opening Adjustment

Figure 10 shows the interlock valve opening mechanism. The choke valve at a full closed position automatically opens the throttle valve at a 16 degree angle for starting. After reassembly, or to set the interlock opening angle, bend the choke connecting rod so that a fully closed choke valve will leave a clearance of 0.0512 in. (1.3mm) between the choke valve and the throttle chamber. This is shown as dimension A in Figure 10.



Interlock Opening of Primary and Secondary Throttle Valves

Refer to Figure 11. The primary throttle valve should be at α degrees. When the adjust plate fixed to the primary throttle valve is open to α degrees, it comes in contact with the connecting lever at point A. When the throttle valve is opened further, where the connecting lever is in contact with the stopper (point B), the connecting lever detaches and the secondary system is actuated. The linkage between the primary and secondary throttles operates properly if the distance between the throttle valve and inner wall of the throttle chamber, G, amounts to the following α degrees is 59 degrees, Dimension G is 0.3583 in. (9.10mm). Figure 12 shows the measurement being checked.



Dash Pot Adjustment

The adjustment of the dash pot is done by warming up the engine properly and checking if the throttle lever touches the dash pot stem as the engine reaches 1,800 and 2,000 rpm under no load conditions. Proper contact between the throttle lever and the dash pot stem produces a normal dash pot performance. Should a normal increase in engine speed not occur, adjust the dash pot as follows:

- 1 Loosen the dash pot locknuts.
- 2 Rotate the dash pot right and then left.
- 3 Adjust the dash pot so that the throttle lever hits the stem between 1,800 and 2,000 rpm.
- 4 Fasten the lock nuts securely.
- 5 The clearance between the throttle valve and the throttle chamber wall should be 0.0709 in. (0.8 mm) or 10 degrees in throttle valve angle.

MAJOR CARBURETOR SERVICE PROCEDURES

A carburetor in good operating condition will deliver the proper gasoline and air ratios for all engine running speeds. A gradual decline in smoothness, response, and power will occur as the carburetor slips from adjustment and its delicate parts become dirty and worn. Overhaul should only be attempted by an experienced mechanic.

Accurate calibration of passages and discharge holes requires that extreme care be taken in disassembly, cleaning, and reassembly. Use only a high-grade carburetor cleaner and compressed air to clean parts and passages. Never use wire or other pointed instruments for cleaning. Calibration of the carburetor will be affected. The procedures below are generally true for all models. As an aid, **Figures 13 and 14** are typical examples of the carburetors used.

Carburetor Removal

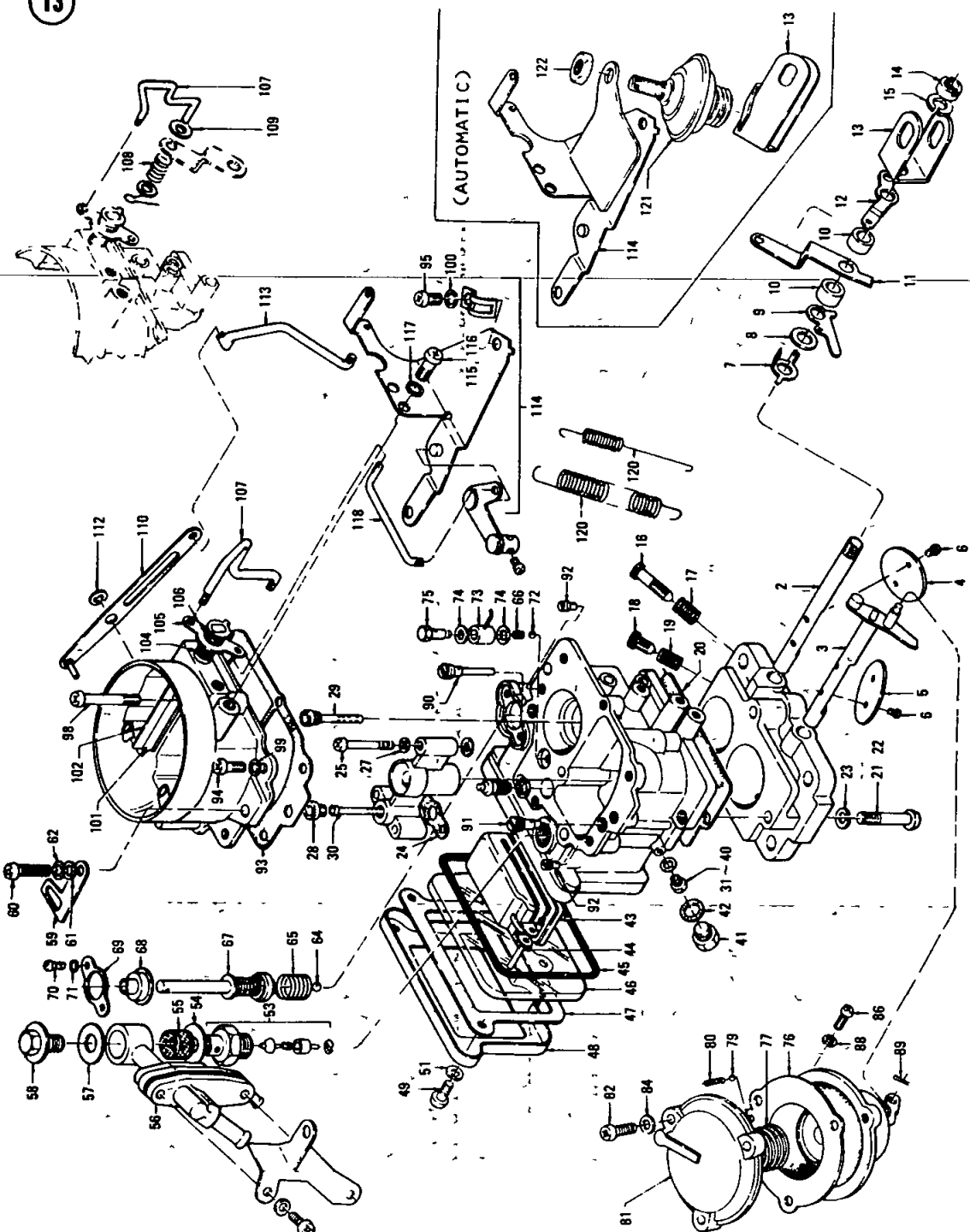
- 1 Remove the air cleaner by disconnecting all hoses attached to it, removing the two bolts holding the air cleaner to the support, and loosening the band bolt at the base of the air cleaner.
- 2 Disconnect fuel line, vacuum line, and choke wire (if equipped) from the carburetor.

- 3 Remove the throttle lever.
- 4 Remove four nuts and washers holding carburetor to manifold.
- 5 Lift carburetor off of manifold.
- 6 Remove and discard carburetor-to-manifold gasket.
- 7 Place carburetor on clean workbench.

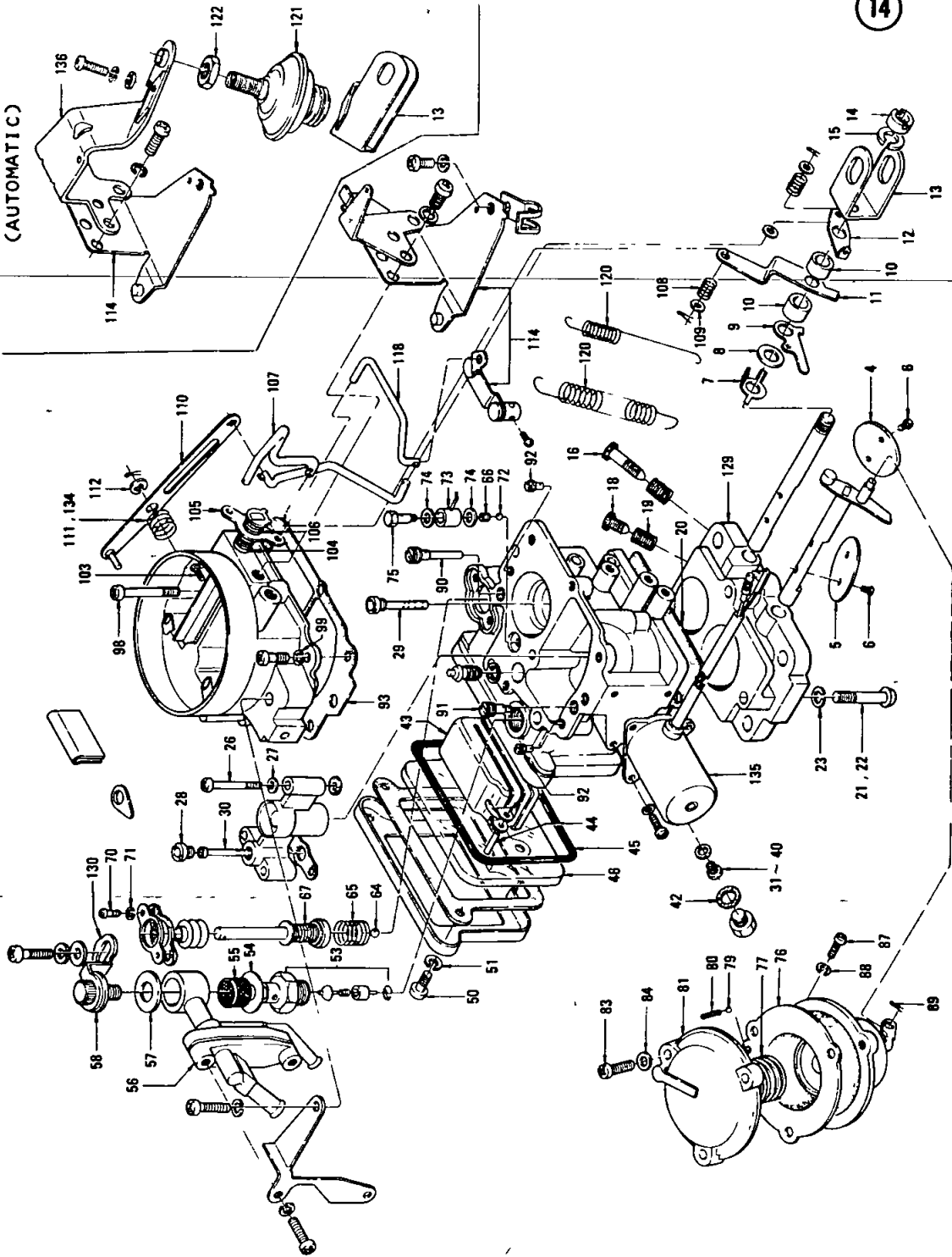
Carburetor Disassembly

- 1 The main jets, slow jets, and needle valves on both the primary and secondary systems are accessible from outside the carburetor. Refer to **Figures 13 and 14** for location.
- 2 The choke chamber can be detached by removing the connecting rod, pump connecting rod, return spring, stop pin, and the set screws that hold it in place.
- 3 The primary and secondary emulsion tubes can be disassembled by removing the main air bleeds on the respective sides.
- 4 To check the accelerator pump, remove the cylinder cover. Be careful not to lose the return spring and inlet valve at the lower part of the piston during disassembly.
- 5 Detach the throttle chamber from the float chamber by removing the rod linking the diaphragm with the secondary throttle valve, and the four screws that hold it. However, it is preferable to leave the throttle valve intact unless absolutely required. If it is necessary to disassemble the valve, it should be installed so that the secondary throttle valve will be gap-free. Otherwise, stable idle and good slow speed performance will suffer.
- 6 To check the float, the float chamber cover must be removed.
- 7 The diaphragm is disassembled by removing the set screws holding the diaphragm chamber cover. In reassembling the diaphragm, be careful not to turn the edge of the diaphragm up.
8. In disassembling and reassembling the interlocking links, take care so that each linkage has a smooth action and that parts are not forced into position.
- 9 For vehicles equipped with an automatic choke, remove the bimetal case by releasing the set screws. The bimetal is extremely sensitive.

13



2	Primary throttle shaft	45	Float cover gasket	82	Screw
3	Secondary throttle shaft	46	Float cover	84	Spring washer
4	Primary throttle valve	47	Float cover gasket	86	Screw
5	Secondary throttle valve	48	Float cover holder	88	Spring washer
6	Screw	49	Screw	89	Stopper pin
7	Throttle adjust lever	51	Spring washer	90	Slow jet
8	Washer	53	Needle valve assembly	91	Slow jet
9	Return plate	54	Washer	92	Slow air bleed
10	Sleeve	55	Filter	94	Screw
11	Connecting lever	56	Fuel vapor discharge connector	95	Screw
12	Throttle lever	57	Washer	98	Screw
13	Throttle lever	58	Washer	99	Spring washer
14	Nut	59	Filter set screw	100	Spring washer
15	Spring washer	60	Fuel return clamp	101	Choke shaft
16	Throttle adjust screw	61	Screw	102	Choke valve
17	Throttle adjust spring	62	Plain washer	104	Choke lever spring
18	Idle adjust screw	64	Washer	105	Choke lever
19	Adjust screw spring	65	Ball	106	Choke valve spring
20	Throttle camber gasket	66	Piston return spring	107	Choke connecting rod
21	Screw	67	Pump injector spring	108	Rod pump spring
22	Screw	68	Piston	109	Rod choke washer
23	Spring washer	69	Pump cover	110	Pump lever
24	Venturi gasket	70	Cylinder plate	112	Ring
25	Screw	71	Screw	113	Pump rod
27	Spring washer	72	Spring washer	114	Choke wire holder assembly
28	Main air bleed	73	Ball	115	Screw
29	Main air bleed	74	Washer	116	Screw
30	Secondary emulsion tube	75	Pump injector	117	Spring washer
31	Primary main jet	76	Injector set screw	118	Crank rod
32-40	Secondary main jet	77	Diaphragm assembly	120	Throttle return spring
41	Drain plug	79	Diaphragm spring	121	Dash pot assembly
42	Packing	80	Ball	122	Nut
43	Float assembly	81	Valve spring		
44	Collar		Diaphragm cover		



4	Primary throttle valve	23	Spring washer	55	Filter	80	Valve spring	108.	Rod pump spring
5	Secondary throttle valve	26	Screw	56	Fuel vapor discharge connector	81	Diaphragm cover	110	Pump lever
6	Screw	27	Spring washer	57	Washer	83	Screw	111	Pump lever spring
7	Throttle adjust lever	28	Main air bleed	58	Filter set screw	84	Spring washer	112	Ring
8	Washer	29	Main air bleed	64	Ball	87	Screw	114	Choke wire holder assembly
9	Return plate	30	Secondary emulsion tube	65	Piston return spring	88	Spring washer	118	Crank rod
10	Sleeve	31	Primary main jet	66	Pump injector spring	89	Stopper pin	120	Throttle return spring
11	Connecting lever	32	Secondary main jet	67	Piston	90	Slow jet	121	Dash pot assembly
12	Throttle lever	42	Packing	70	Screw	91	Slow jet	122	Nut
13	Throttle lever	43	Float assembly	71	Spring washer	93	Choke chamber gasket	129	Throttle chamber assembly
14	Nut	44	Collar	72	Ball	98	Screw	130	Union bolt clamp
15	Spring washer	45	Float cover gasket	73	Pump injector	99	Spring washer	134	Pump lever spring
16	Throttle adjust screw	46	Float cover	74	Washer	103	Screw	135	Solenoid valve assembly
18	Idle adjust screw	49	Screw	75	Injector set screw	104	Choke lever spring	136	Dash pot bracket
19	Adjust screw spring	51	Spring washer	76	Diaphragm assembly	105	Choke lever		
20	Throttle camber gasket	52	Spring washer	77	Diaphragm spring	106	Choke valve spring		
21	Screw	53	Needle valve assembly			107	Choke connecting rod		
22	Screw	54	Washer	79	Ball				

and delicate. Therefore, do not attempt to force it. Improper handling will cause distortion.

10 In assembling the bimetal, place the thermostat cover gasket gently in place and install the thermostat cover after making sure that the lever on which the bimetal hangs moves smoothly.

11 After tightening completely, bend and adjust the bimetal rod so that the upside of the bimetal case is level within 0.02 in (0.5mm) of the slit on the bimetal rod. Be sure the bimetal rod operates smoothly.

12 Adjust the choke valve opening to 0.0709 in (1.8mm) by bending the connecting rod.

Carburetor Cleaning and Inspection

Dirt, gum, water, or carbon contamination of critical parts is often responsible for unsatisfactory carburetor performance. Careful cleaning and inspection is therefore essential.

1 After disassembly, submerge all parts in a special carburetor cleaner. Be certain to follow the manufacturer's instructions in using the cleaner.

2 After cleaning, blow all passages and castings with compressed air. Make certain all parts are completely dry.

3 Carefully inspect parts for signs of wear. Visible wear is sufficient cause to replace a part.

4 Pay special attention to condition of the float seat and needle, the throttle and choke shaft bores in the throttle body and cover castings, and to the idle adjusting needles.

5 Inspect all gaskets to see if they are hard or brittle, or if the edges are torn or distorted. It is sound practice to replace them whenever the carburetor is disassembled.

6 Check the filter screen for dirt or lint. If, after cleaning, it is not completely clean, replace it.

7 Check all linkages for smooth operation. Correct as required.

8 Check operation of the acceleration pump by putting gas in the float chamber and operating the throttle lever by hand. Fuel should be pumped from the acceleration nozzle if the unit is satisfactory.

9 Carefully inspect the diaphragm for holes or leaks. Replace if defective.

Carburetor Assembly

Assembly is the reverse of disassembly. Make certain all gaskets are mounted flat. Be careful not to use force in assembly. Make certain that all interlock links operate smoothly.

FUEL TANK

Description

Figures 15, 16, 17, and 18 are exploded views of the fuel tanks used on the sedan and wagons.

Figure 15 is for sedans through model year 1969.

Figure 16 applies to sedans from 1970 with evaporative control system.

Figure 17 shows the station wagon through 1969.

Figure 18 applies to the station wagon with evaporative control system from 1970. The fuel tank for the pick-up is shown in **Figure 19**.

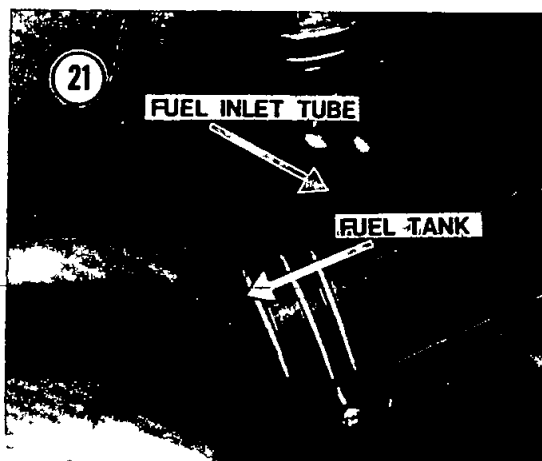
A fuel return system from the carburetor to the fuel tank keeps fuel from becoming overheated in the carburetor float chamber. When the normal level in the float chamber is exceeded, a pressure valve opens and returns the excess fuel to the tank.

Removal (Sedans)

1. Remove drain plug in bottom of fuel tank and drain the fuel into a suitable safe container.
2. Detach rear seat and seat back. See **Figure 20**.
3. Open trunk lid and remove the trunk finishing board.



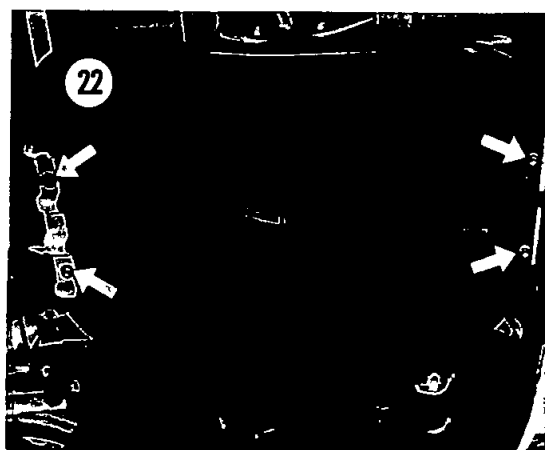
4. Disconnect wire leading to fuel gauge unit.
5. Disconnect and remove the fuel inlet tube. See **Figure 21**.



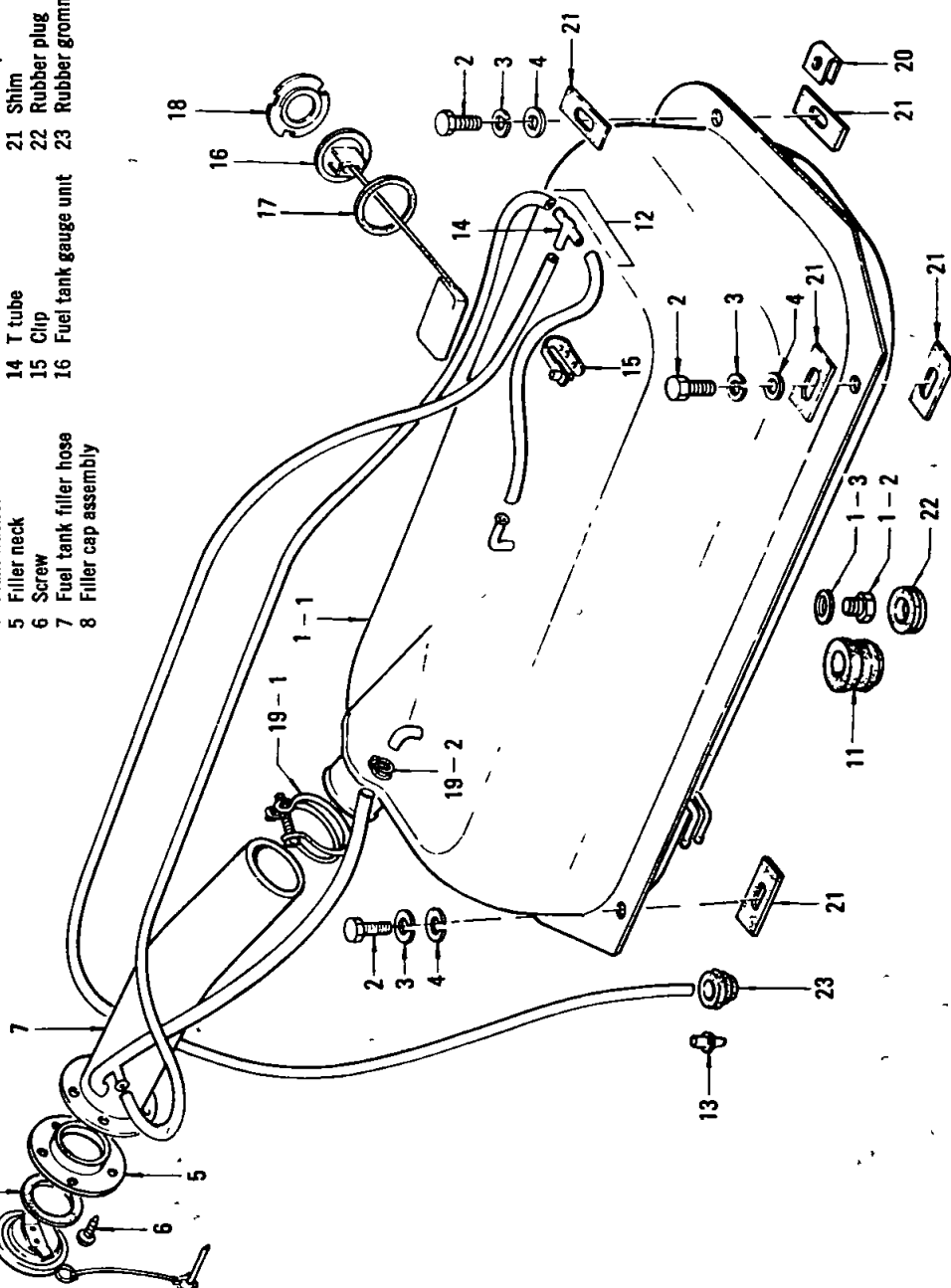
6. Disconnect rubber tubes of fuel outlet and fuel return lines from the tank.
7. Remove four fixing bolts and lock washers from edge of fuel tank.
8. Remove fuel tank from vehicle.

Removal (Wagon)

1. Remove drain plug from bottom of fuel tank and drain the fuel into suitable safe container.
2. Disconnect wire leading to fuel gauge unit.
3. Disconnect and remove fuel inlet tube.
4. Disconnect rubber tubes of fuel outlet and fuel return lines.
5. Refer to **Figure 22**. Remove four fixing bolts holding tank in place.
6. Remove fuel tank from vehicle.



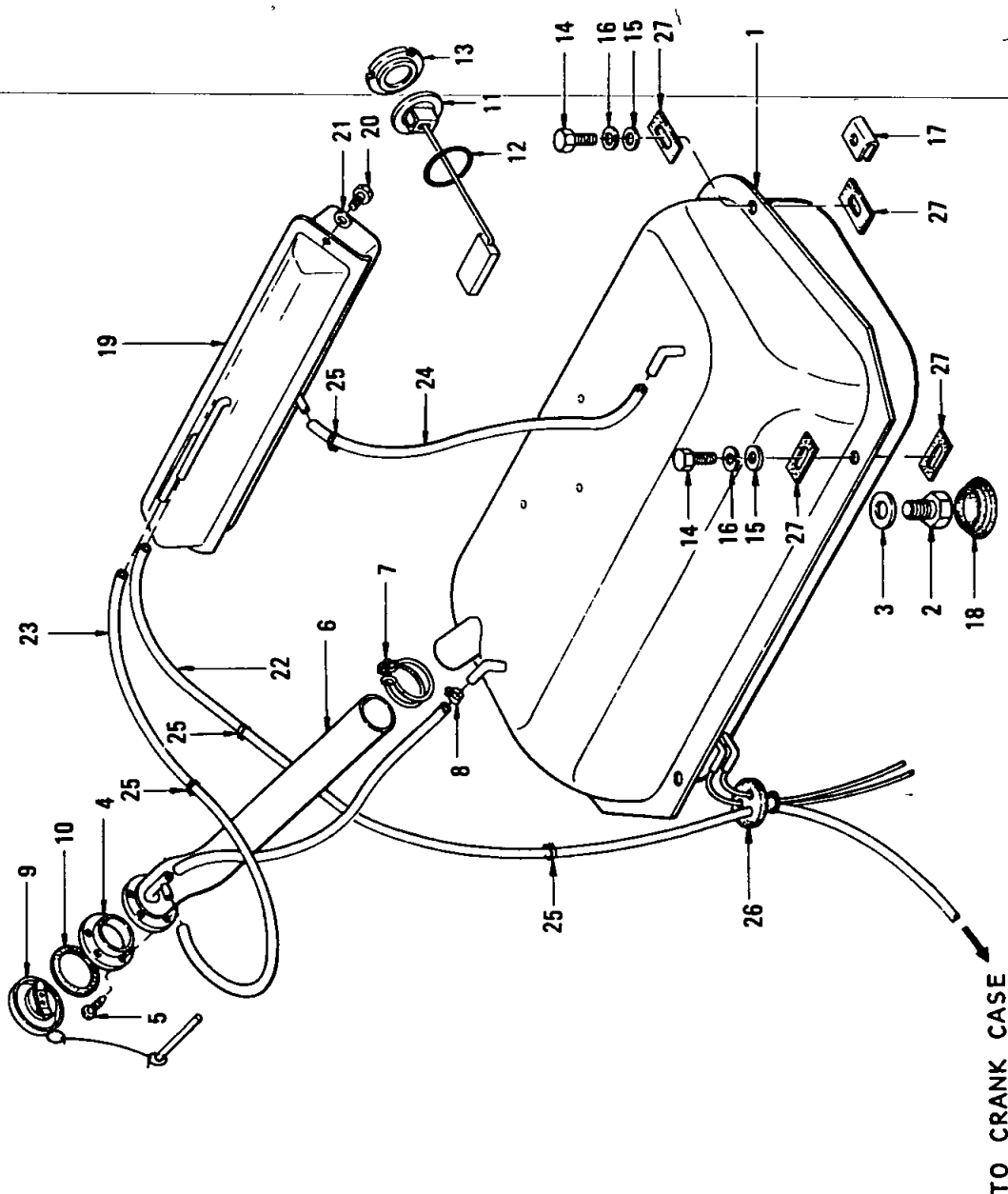
- | | | |
|-------------------------|-------------------------|---------------------------------|
| 1 Fuel tank assembly | 9 Packing | 17 Fuel gauge O-ring |
| 2 Fuel tank fixing bolt | 11 Floor plug | 18 Fuel gauge lock plate |
| 3 Fuel tank lock washer | 12 Breather tube | 19 Hose clamp |
| 4 Plain washer | 13 Connector | 20 Earth plate mounting bracket |
| 5 Filler neck | 14 T tube | 21 Shim |
| 6 Screw | 15 Clip | 22 Rubber plug |
| 7 Fuel tank filler hose | 16 Fuel tank gauge unit | 23 Rubber grommet |
| 8 Filler cap assembly | | |



15

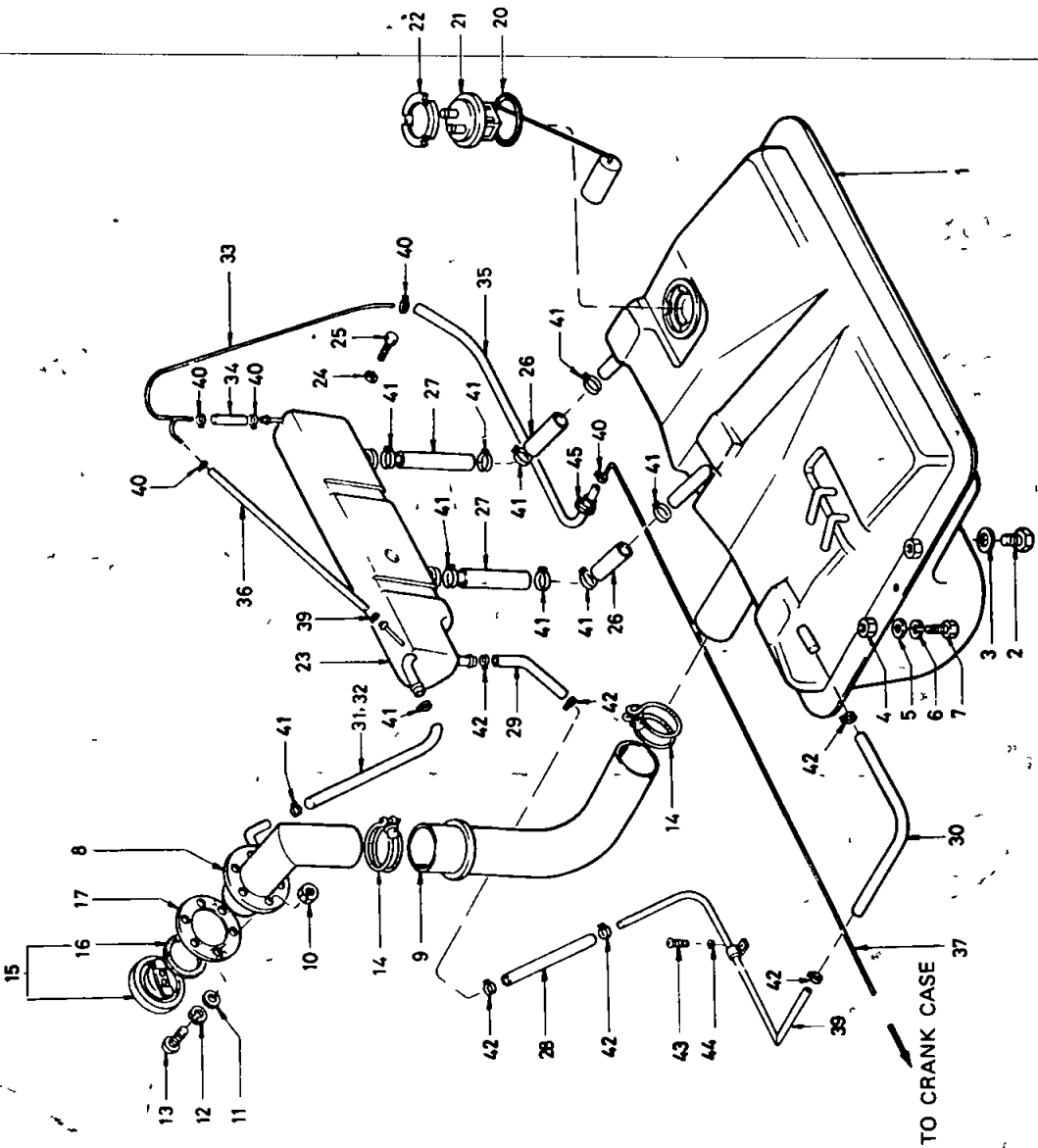
16

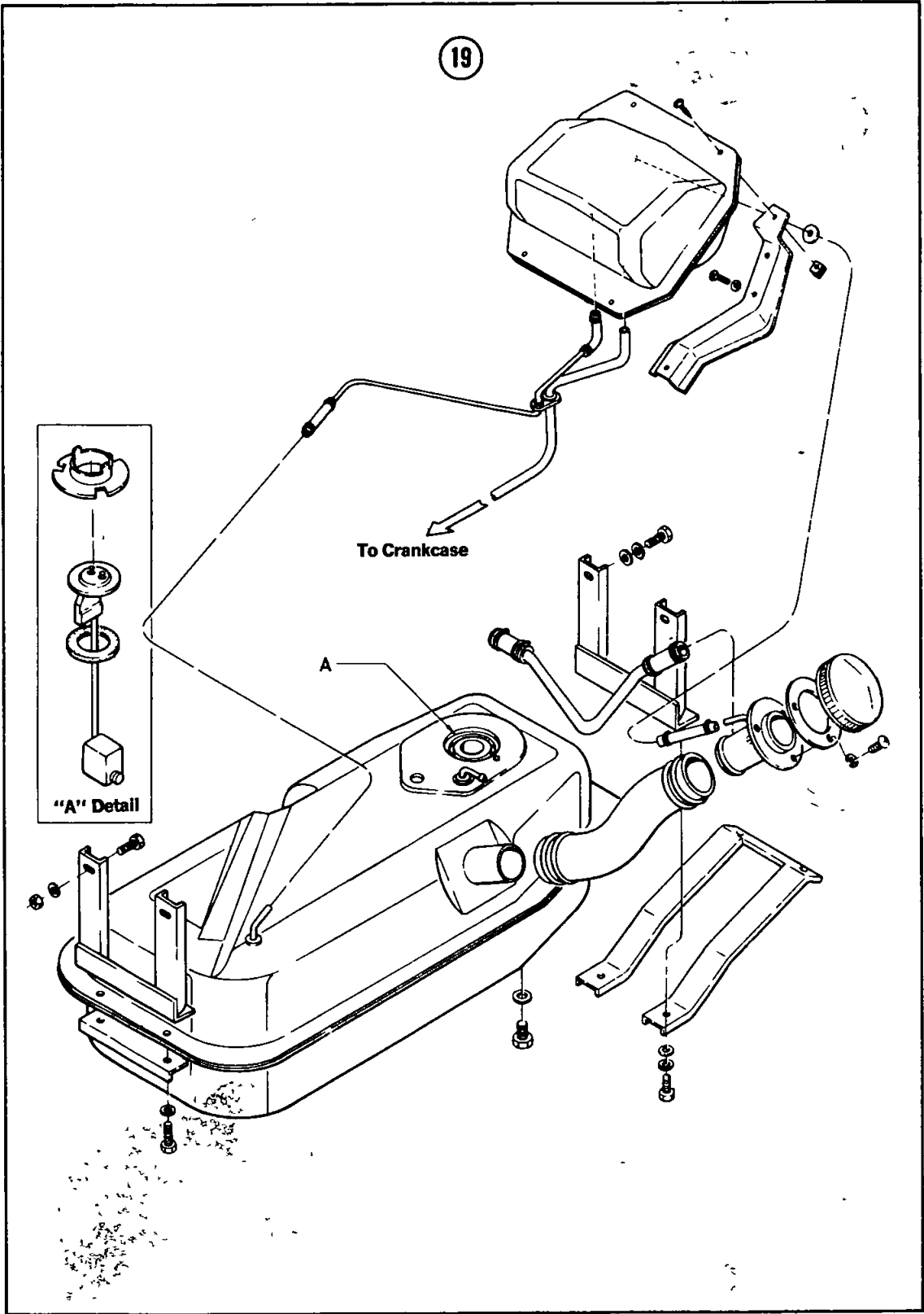
- 1 Fuel tank assembly
- 2 Drain plug
- 3 Drain packing
- 4 Fuel tank filler neck
- 5 Screw
- 6 Fuel tank filler hose
- 7 Hose clamp
- 8 Hose clamp
- 9 Filler cap assembly
- 10 Filler cap packing
- 11 Fuel tank gauge unit
- 12 O ring
- 13 Fuel gauge lock plate
- 14 H-bolt
- 15 Plan washer
- 16 Spring washer
- 17 Fuel gauge earth plate
- 18 Rubber plug
- 19 Tank reservoir assembly
- 20 H-bolt with washer
- 21 Plan washer
- 22 Breather tube
- 23 Breather tube
- 24 Breather tube
- 25 Nylon clip
- 26 Rubber grommet
- 27 Shim



18

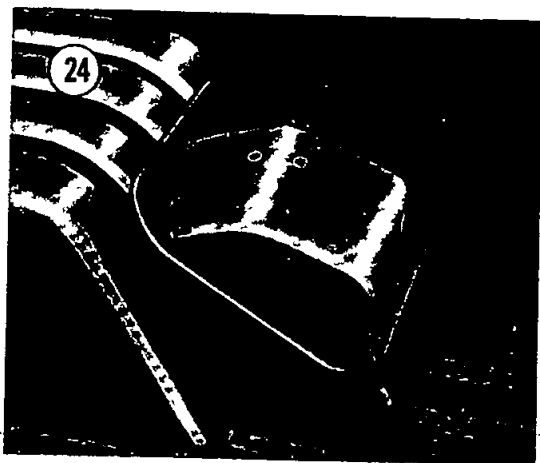
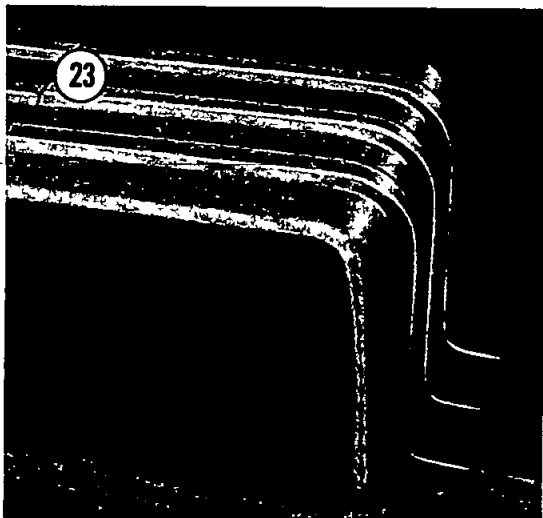
- 1 Fuel tank assembly
- 2 Fuel tank drain plug
- 3 Packing
- 4 Weld nut
- 5 Plain washer
- 6 Spring washer
- 7 Hex bolt
- 8 Upper filler tube assembly
- 9 Filler hose assembly
- 10 Hex nut
- 11 Plain washer
- 12 Spring washer
- 13 Machine screw
- 14 Hose clamp
- 15 Filler cap assembly
- 16 Filler cap packing
- 17 Filler neck packing
- 20 Fuel gauge O-ring
- 21 Fuel tank gauge unit
- 23 Tank reservoir assembly
- 24 Spring washer
- 25 Screw
- 26 Breather tube
- 27 Breather tube
- 28 Breather tube
- 29 Breather tube
- 30 Breather tube
- 31 Breather tube
- 32 Breather tube
- 33 Breather tube assembly
- 34 Flexible hose
- 35 Flexible hose
- 36 Flexible hose
- 37 Fuel tank to crankcase tube
- 39 Reservoir pipe assembly
- 40 Hose clamp
- 41 Hose clamp
- 42 Hose clamp
- 43 Machine screw
- 44 Spring washer
- 45 Rubber grommet





Removal (Pick-up)

The fuel tank is installed along with the vapor-liquid separator. A cover in front of the left rear wheel protects the vapor-liquid separator from damage. **Figure 23** shows the cover installed, and **Figure 24** shows it removed.



- 1 Remove drain plug from bottom of fuel tank and drain the fuel into suitable safe container
- 2 Disconnect wire leading to fuel gauge unit
- 3 Disconnect and remove fuel inlet tube
- 4 Disconnect rubber tubes of fuel outlet and fuel return lines

- 5 Disconnect tube leading to vapor-liquid separator
- 6 Remove fixing bolts holding tank in place.
- 7 Remove fuel tank from vehicle

Inspection

Inspect the fuel tank and connecting lines for sign of damage or leaks. If dirt is found in the carburetor or fuel pump upon disassembly, blow out the fuel lines using compressed air.

Repair

Fuel tank leaks may be repaired by soldering or brazing the fuel tank.

WARNING

A fuel tank is a potential bomb capable of killing anyone nearby should it explode. Always observe the following safety precautions when repairing the fuel tank.

- 1 Remove all fuel and have the tank steam cleaned inside and out
- 2 Fill the tank with inert gas such as carbon dioxide or nitrogen, or with water
- 3 Have a properly rated fire extinguisher handy, and never work near the vehicle

After the repair is made, pour the water out or release the gas, then put about a quart of gasoline in the tank and slosh it around. Pour the gasoline out, blow the tank out with compressed air, then replace tank in vehicle.

Installation

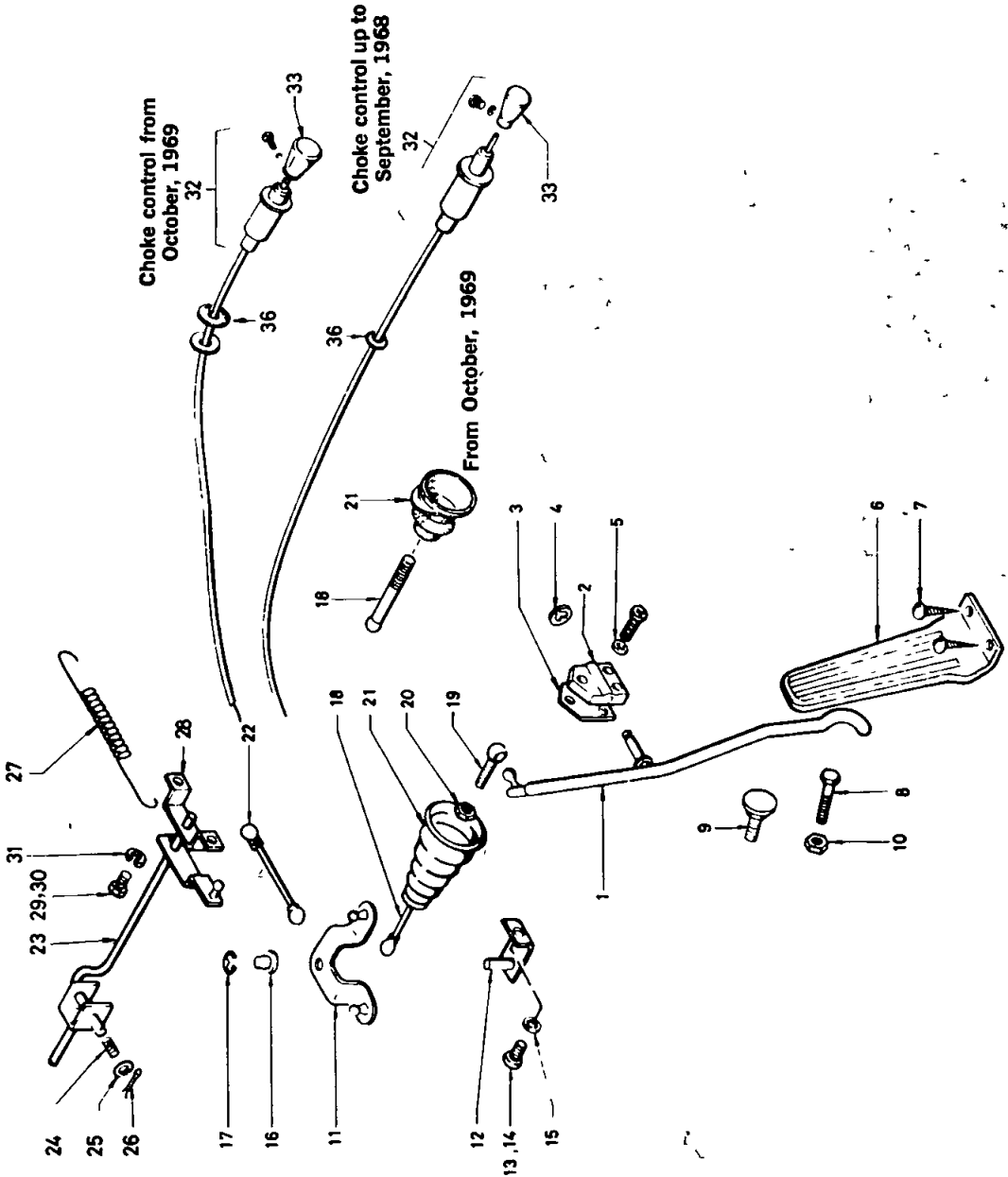
To install the fuel tank, reverse the procedures used during removal. After installation, check carefully for leaks.

Choke and Accelerator Linkages

Figure 25 is an exploded view of the linkages used on the accelerator and choke controls. To disassemble, replace, and install the linkages, refer to the illustration and proceed as required.

25

- 1 Accelerator pedal arm assembly
- 2 Accelerator pedal bracket
- 3 Packing
- 4 Snap ring
- 5 Washer
- 6 Foot rest
- 7 Screw
- 8 Bolt
- 9 Accelerator pedal stopper bolt
- 10 Nut
- 11 Bell crank assembly
- 12 Bell crank bracket
- 13 Machine screw
- 14 Screw machine
- 15 Lock washer
- 16 Nylon bushing
- 17 Snap ring
- 18 Ball joint assembly
- 19 Ball joint assembly
- 20 Lock nut
- 21 Accelerator rod boot
- 22 Ball joint assembly
- 23 Torsion shaft
- 24 Accelerator shaft spring
- 25 Plain washer
- 26 Cotter pin
- 27 Return spring
- 28 Accelerator shaft support assembly
- 29 Bolt
- 30 Bolt
- 31 Spring washer
- 32 Choke control wire
- 33 Choke wire knob
- 36 Rubber grommet



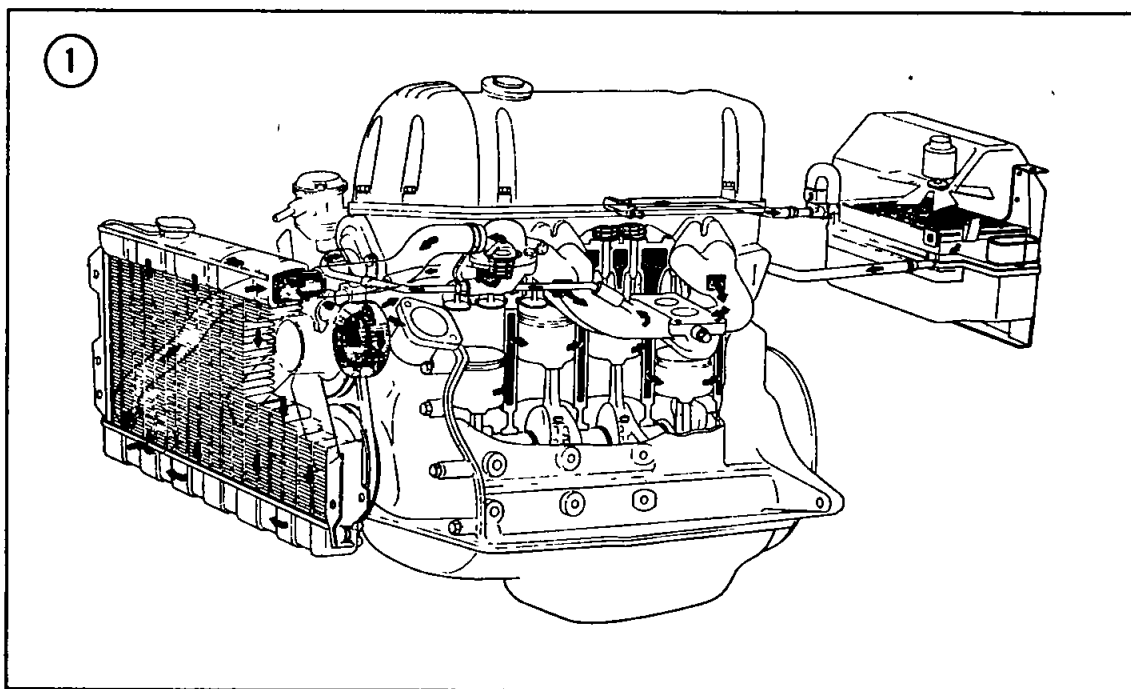
CHAPTER EIGHT

COOLING SYSTEM

The cooling system is of the closed pressure type. Coolant flows through passages in the cylinder head and block and is cooled by the radiator, water pump, and thermostat. **Figure 1** indicates normal flow.

The radiator is a corrugated fin type, while the thermostat is a pellet design. The water pump is centrifugal and has an aluminum diecast body.

Several changes have been made in the water pump assembly over the years, primarily because of changing emission control requirements. The discussion and procedures that follow cover 1970 and 1971 models. However, complete illustrative material is given for all model years so that differences can readily be identified. In the models with air conditioning



and in those with exhaust and evaporative emission control devices, a fan clutch is combined with the thermostat to detect temperature in the engine compartment. When the temperature rises, the thermostat detects the change and the fan clutch engages, thereby helping to cool the engine.

WATER PUMP

Figure 2 (page 86) is an exploded drawing of the water pump and fan assembly for 1970 to 1971. The top half of the illustration applies to those models with exhaust and evaporative emission control systems. The bottom half covers models with a crankcase emission control device only.

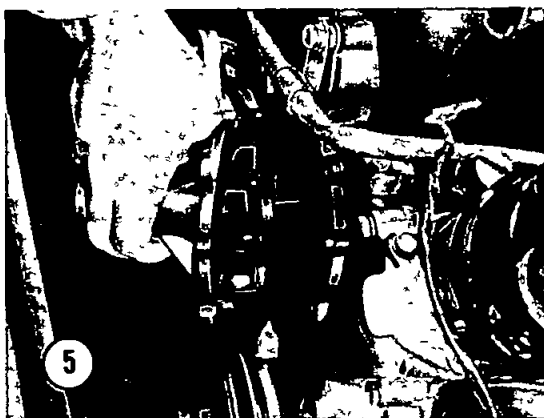
Figure 3 (page 87) is an exploded drawing of the water pump and fan assembly for 1968 models without exhaust or evaporative controls. **Figure 4** (page 88) shows the 1968 model with emission control device. As can be seen from the illustrations, most differences exist within the fan clutch assembly.

Water Pump Removal

- 1 Remove upper and lower radiator hoses from the thermostat housing and cylinder block, respectively. Drain coolant from radiator and cylinder block.
- 2 Loosen the alternator mounting bolt and the adjusting bolt on the alternator mounting bracket.
- 3 Move the alternator toward the cylinder block until slack is evident in the fan belt. Remove fan belt from alternator, water pump, and crankshaft pulley.
- 4 It is difficult to remove the water pump from the front housing with the radiator and top shroud in place, so remove them.
- 5 Remove the bolts holding the fan assembly to the water pump, and remove the fan assembly.
- 6 Remove the bolts holding the water pump to the front housing as shown in **Figure 5**.

Water Pump Disassembly, Repair and Assembly

Disassembly or attempted repair of the water pump assembly is not recommended. If the pump assembly is corroded, the vanes are dam-



aged, or the bearings are noisy, replace the entire unit.

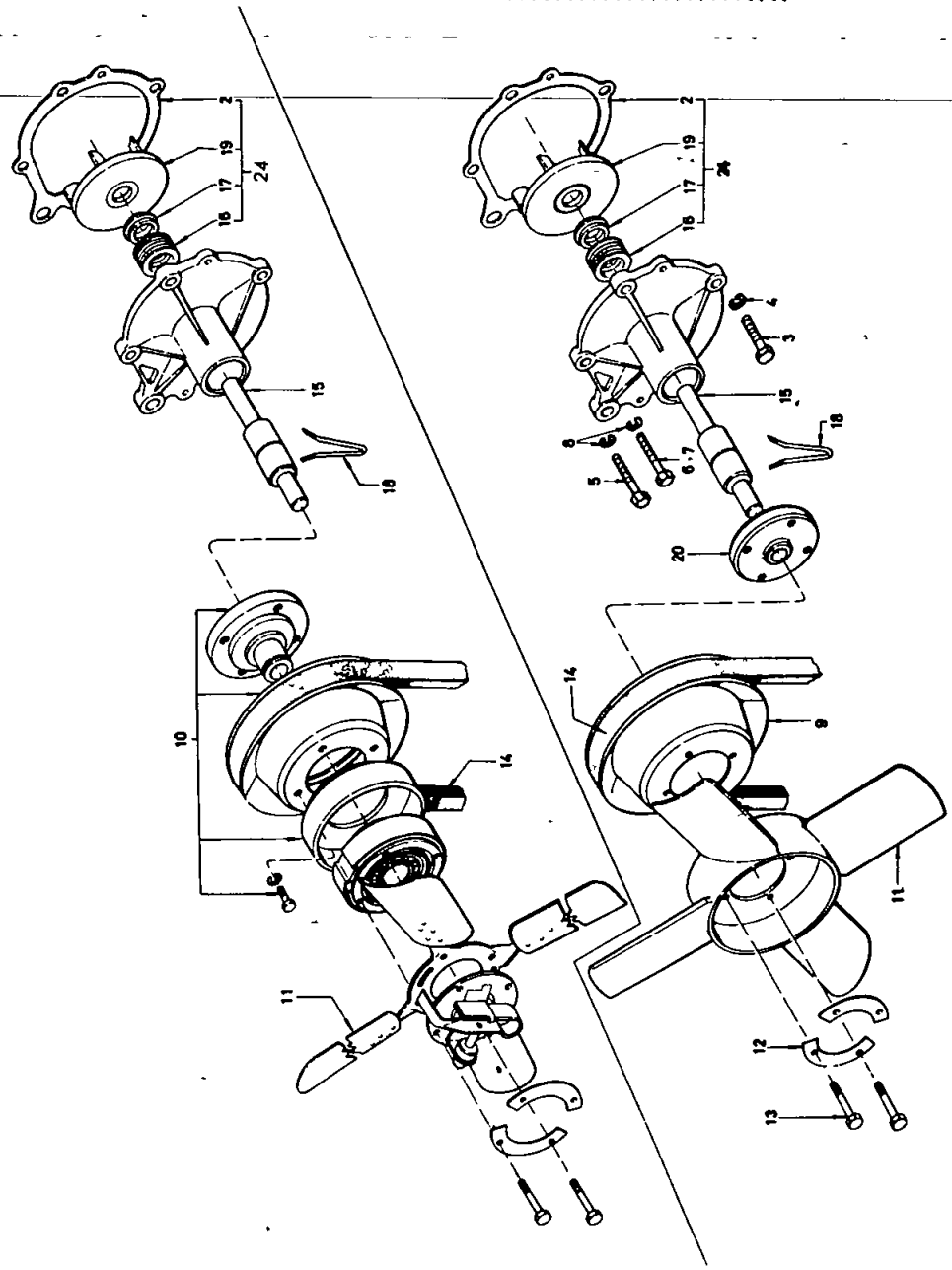
- 1 Inspect the water pump assembly and replace if required.
- 2 If the water pump assembly is still serviceable, clean it thoroughly before installation.
- 3 Assemble the water pump assembly in the front cover in the reverse order for disassembly. Do not reuse old gaskets.
- 4 Replace the fan assembly on the water pump, and install the radiator and top shroud.
- 5 Inspect the fan belt carefully for signs of wear or cracks. Discard it if in doubt.
- 6 Install the fan belt around the crankshaft pulley, water pump pulley, and the alternator pulley.
- 7 Adjust the alternator on its bracket so there is no more than 0.5 in. deflection of the fan belt when pushed in by thumb pressure.
- 8 Tighten alternator bracket adjusting bolt and alternator mounting bolt securely.
- 9 Install the upper and lower radiator hoses, and tighten securely.
- 10 Refill the radiator and cooling system with approved coolant or water.

NOTE Because of the many aluminum parts in the engine, a high quality anti-freeze compound should be used in the cooling system.

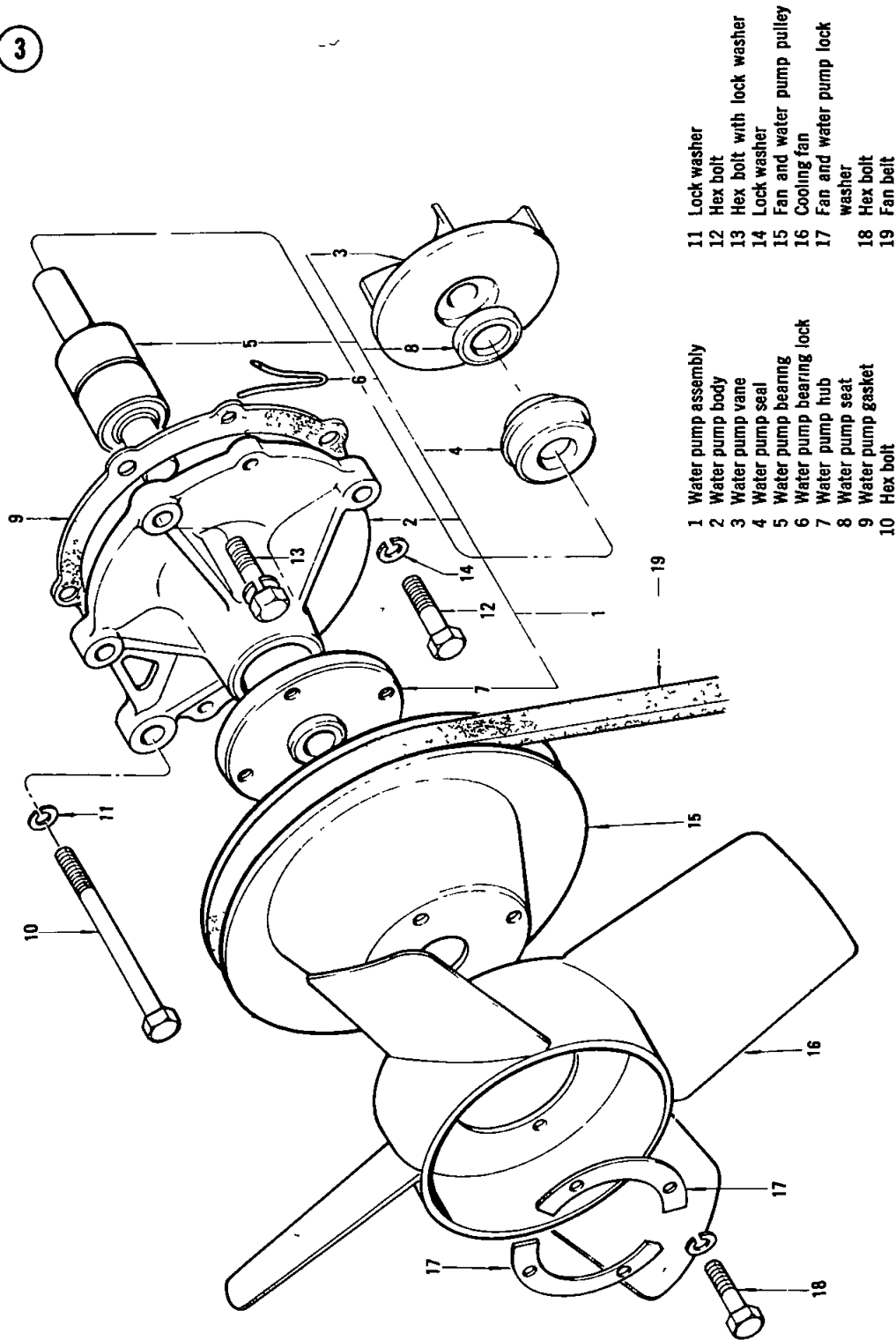
- 11 Start the engine and run until operating temperature is reached or until you're sure the thermostat has opened and coolant is circulating throughout the entire cooling system. Top up radiator as required.

2

- 2 Water pump gasket
- 3 Water pump fixing bolt
- 4 Lock washer
- 5 Water pump fixing bolt
- 6 Hex bolt
- 7 Hex bolt
- 8 Lock washer
- 9 Fan pulley
- 10 Fan clutch assembly
- 11 Cooling fan
- 12 Fan lock washer
- 13 Hex bolt
- 14 Fan belt
- 15 Bearing assembly
- 16 Seal assembly
- 17 Seat assembly
- 18 Lock wire
- 19 Vane assembly
- 20 Hub pulley
- 24 Water pump seal kit

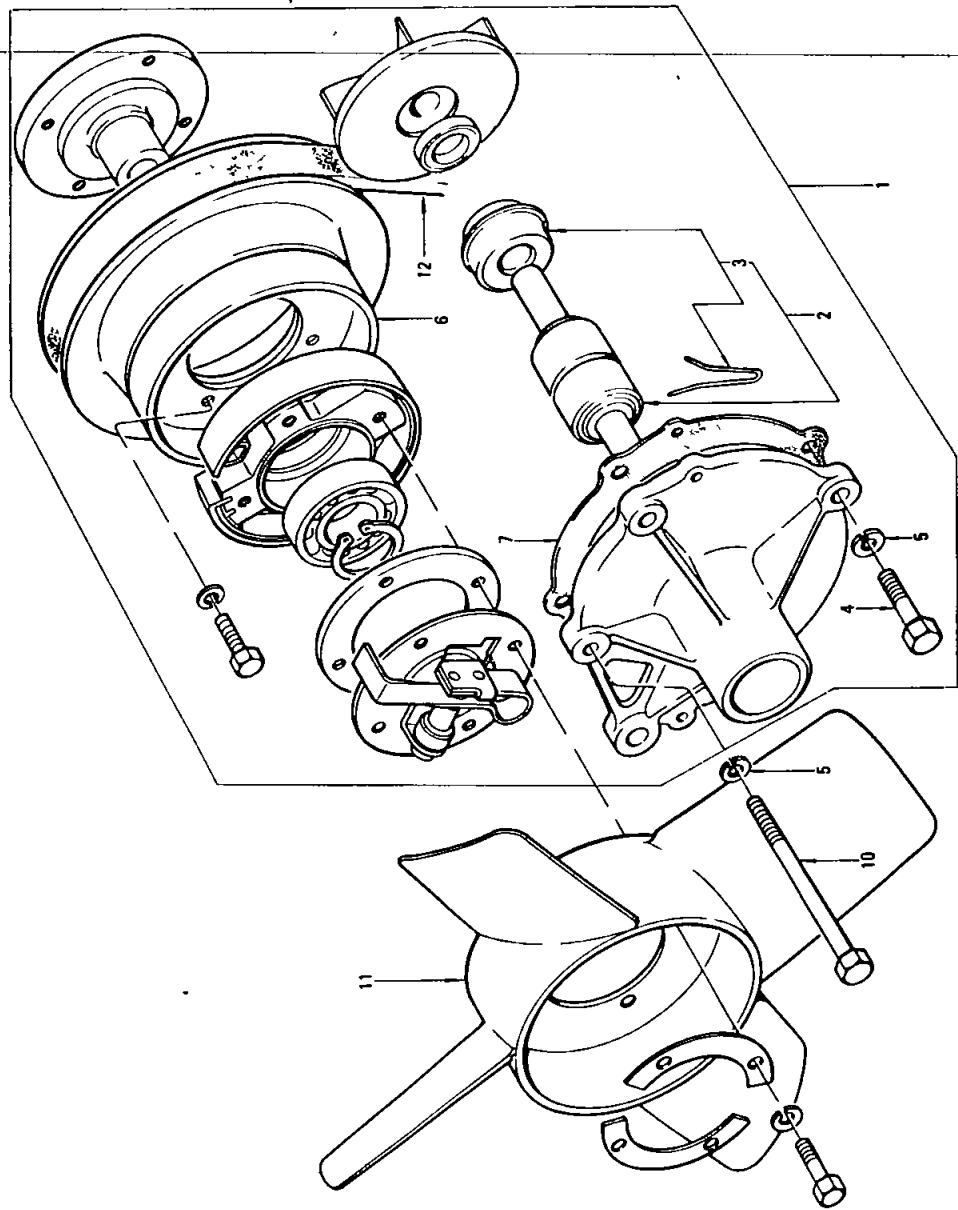


3



4

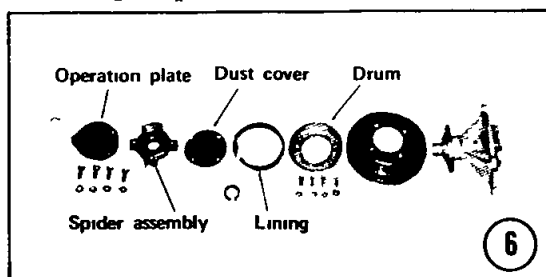
- 1 Water pump and clutch assembly
- 2 Bearing and seal set
- 3 Seal and wire set
- 6 Pump and pulley assembly
- 7 Water pump gasket
- 11 Cooling fan



FAN CLUTCH

Fan Clutch Operation and Inspection

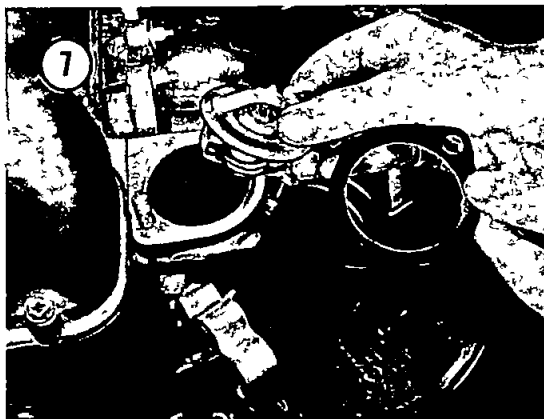
Figure 6 shows a typical fan clutch disassembled. Check the unit whenever the water pump is removed or whenever troubles are suspected in the assembly. Operation of the fan clutch should be observed when the vehicle is at running temperature.



- 1 Warm up the engine
- 2 Maintain engine speed at 2,500 rpm
- 3 Using a thermometer, measure the temperature close to the fan clutch assembly on the fan
- 4 The clutch should engage when the temperature reaches 117 degrees F (65 degrees C). Conversely, the clutch should deenergize when the temperature drops to 97 degrees F (54 degrees C).
- 5 Take the measurements at least twice since the thermostat has somewhat of a time lag.
- 6 If the fan clutch fails to operate properly, it should be disassembled and serviced.

Fan Clutch Disassembly

- 1 Follow the instructions as previously given to remove the fan and clutch assembly from the water pump.
- 2 Refer to the appropriate exploded illustration for your model and to Figure 7, which shows a typical fan clutch assembly.
- 3 Disassemble unit and inspect all parts for signs of wear or breakage.
- 4 To check the operation of the fan clutch thermostat, submerge the operation plate with the thermostat in hot water of 126 degrees F (70 degrees C) for two to three minutes. Replace if it fails to operate.
- 5 Assemble the fan clutch in the reverse order of disassembly.



THERMOSTAT

The system thermostat is located inside the water outlet elbow on the upper left-hand portion of the cylinder head. The temperature sensing device is threaded into the base of the thermostat housing and is connected electrically to the temperature gauge within the vehicle dashboard.

The wax pellet in the thermostat expands when heated and contracts when cold. The pellet is connected through a piston to a valve. Expansion pressure is exerted against a rubber diaphragm which forces the valve to open and permit coolant to flow through the entire system. As the pellet cools, contraction allows a spring to close the valve.

Thermostat Removal

- 1 Open the drain cock on the bottom of the radiator and drain out enough coolant so that the level in the radiator is below the bottom of the upper radiator hose.
- 2 Disconnect the upper radiator hose from the water outlet elbow.
- 3 Remove the two nuts holding the water outlet elbow to the thermostat housing.
- 4 Remove the gasket and thermostat from the housing, as shown in Figure 7.

Thermostat Inspection and Replacement

- 1 Submerge the thermostat in a pan of water. Heat the water and monitor the temperature.
- 2 The thermostat should start to open at 179.6 ± 2.7 degrees F (82 ± 1.5 degrees C). Maximum opening should occur at 203 degrees F (95

degrees C) The maximum width of the thermostat opening should be 0.315 in. (8mm)

3 If the thermostat is defective, or if you have any doubts about it, install a new one.

4. When installing the thermostat in the housing, be certain to place the spring end down. Coat both sides of the gasket with sealer to prevent leaks, and tighten the mounting nuts securely.

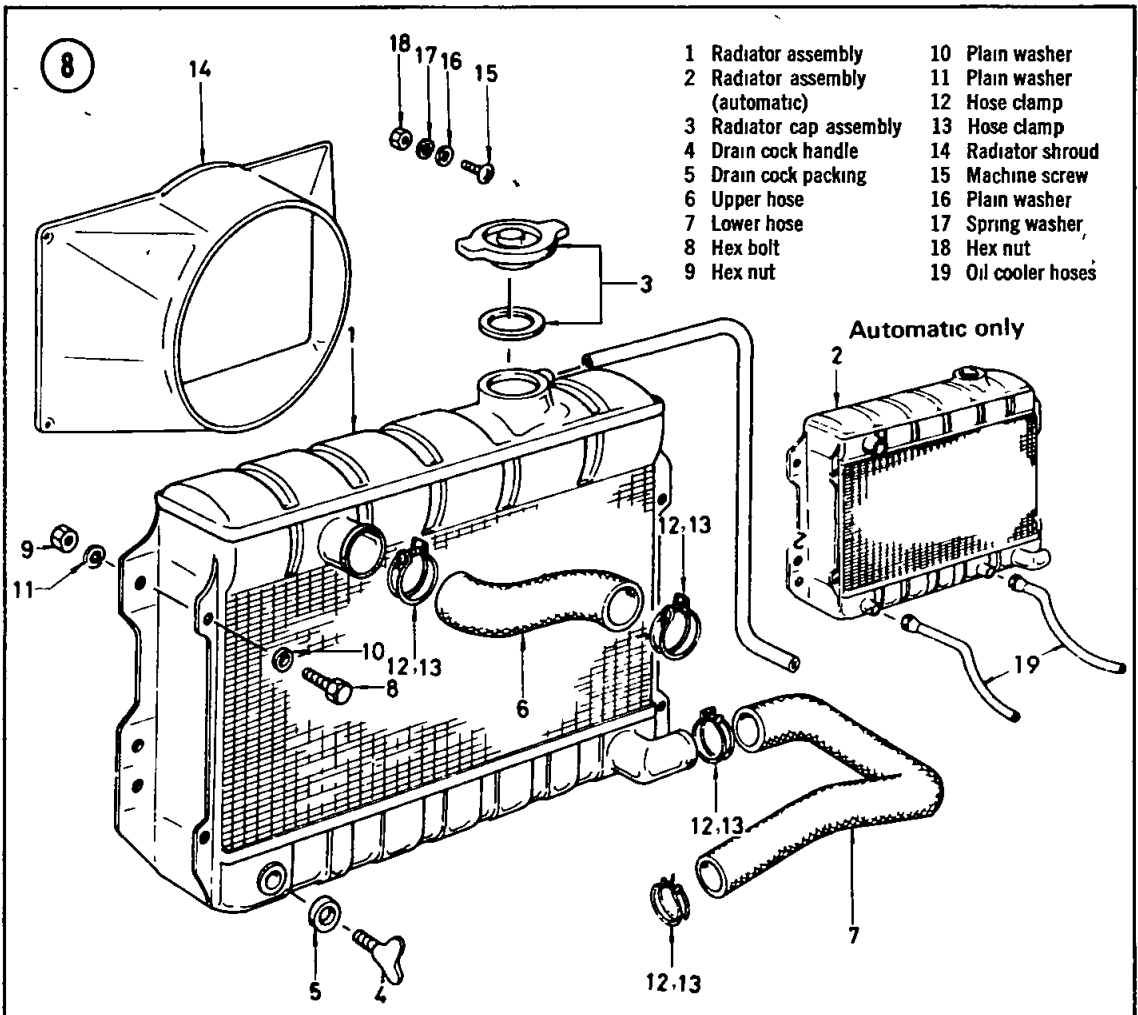
RADIATOR

The radiator is of conventional design. A drain cock is provided at the bottom back to permit draining. The system is pressurized and the relief valve, incorporated in the filler cap, maintains the pressure at approximately 12.8 lb/in² (0.9 kg/cm²). Coolant capacity is 1.691 gallons (6.4 liters). **Figure 8** shows radiator com-

ponents. Note that vehicles equipped with automatic transmission have provisions for connecting the oil cooler lines to the bottom of the radiator.

Radiator Removal, Inspection and Replacement

- 1 Remove the upper and lower radiator hoses to drain coolant.
- 2 Remove four machine screws securing radiator shroud.
3. Remove four hex bolts securing radiator to mounting bracket.
4. Remove shroud and radiator from vehicle.
- 5 Inspect radiator for signs of leaks. Repair or replace as required.
- 6 Installation is the opposite of removal.



CHAPTER NINE

ENGINE ELECTRICAL SYSTEM

The electrical system has undergone slight yearly changes, the most significant being in the distributor. Some models have a single contact point while others have a dual point system. Details are covered in the distributor section. The electrical system is a 12-volt negative type.

OPERATION

Figure 1 shows the starter motor. When the ignition switch is turned to the start position, current flows through the series and shunt coils of the magnetic switch and magnetizes it. The plunger is pulled into the switch, operating the shift lever to engage the drive pinion with the flywheel ring gear and to close the magnetic switch.

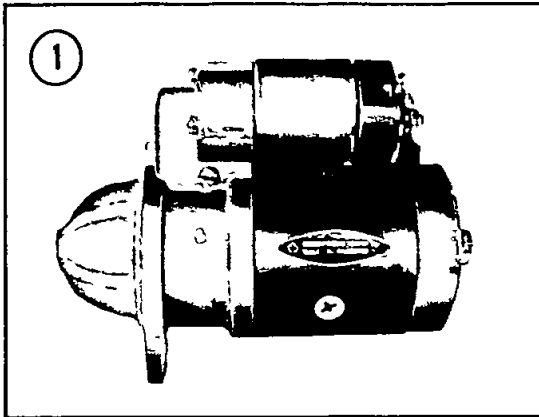
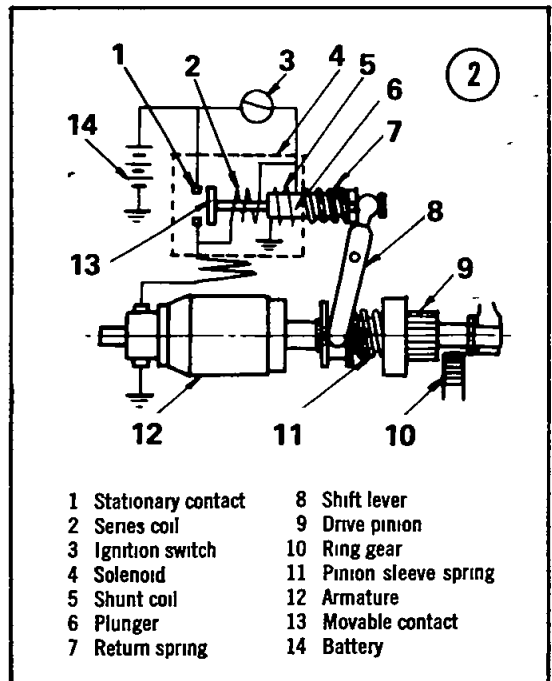


Figure 2 shows the starter motor circuit. Closing of the stationary and movable contacts cause the motor to crank the engine and cut out the series coil of the magnetic switch. The magnetic pull of the shunt coil is sufficient to hold the pinion in mesh with the flywheel ring gear after meshing has occurred. After the engine starts, and the ignition key is released to the "on" posi-



tion, the series coil demagnetizes against the shunt coil. The return spring causes the plunger to return to the original position, stopping the starter. The overrunning clutch provides for positive meshing and unmeshing of the pinion gear and flywheel ring gear, and permits the pinion to overrun the armature after the engine has started.

CONSTRUCTION

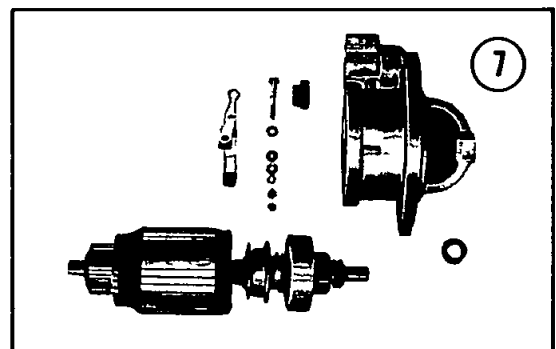
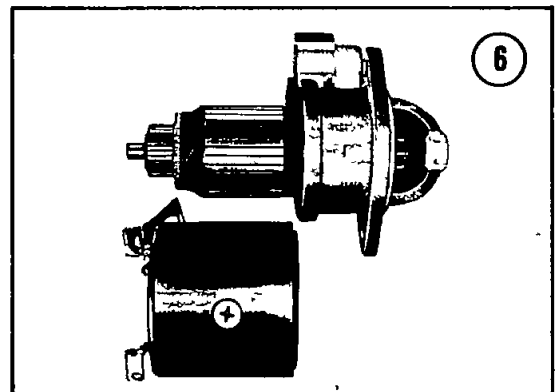
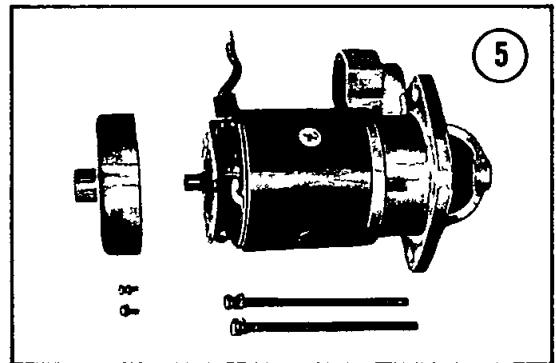
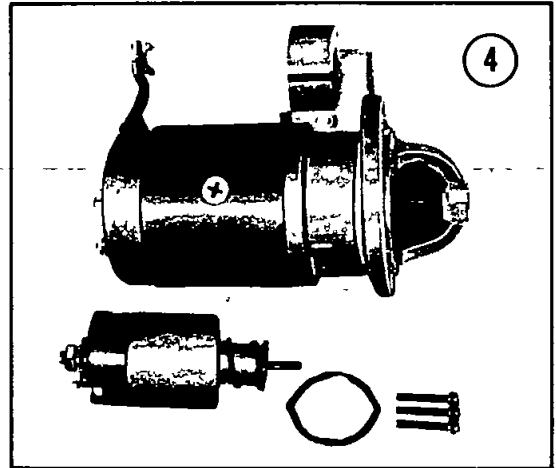
A typical Datsun starter motor is shown in **Figure 3**. The example is for 1971 models, but about the only differences existing between it and other models are the number of elements used in the dust cover and the number of thrust washers.

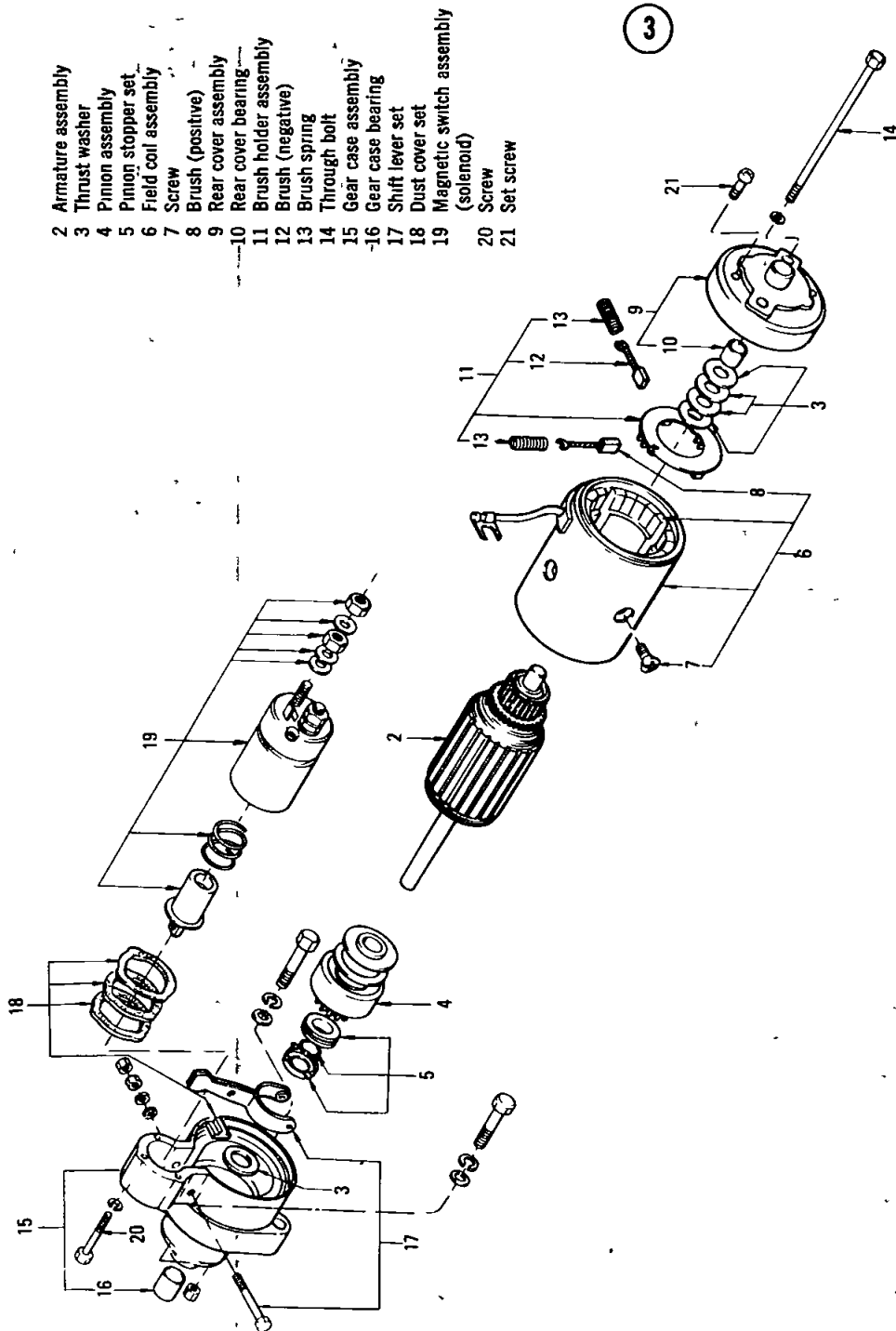
Removal

- 1 Disconnect the battery ground cable.
- 2 Disconnect the black/yellow wire from the magnetic switch terminal on the solenoid.
- 3 Disconnect the black battery cable and red wire from the battery terminal on the solenoid.
- 4 Remove two bolts holding the starting motor to flywheel housing. The battery ground cable is attached to the flywheel housing bottom bolt.
- 5 Pull starter motor toward front of engine and remove.

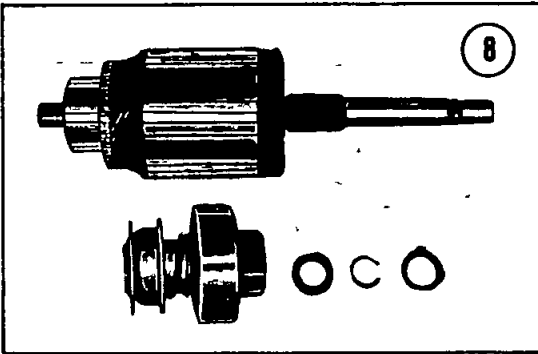
Disassembly

- 1 Remove the nut holding the electric wire to the magnetic switch M terminal. Disconnect the wire.
- 2 Remove three screws securing magnetic switch assembly to yoke. Remove magnetic switch assembly and dust cover(s), **Figure 4**.
3. Remove two through bolts and brush cover assembly, as shown in **Figure 5**.
4. Remove the yoke assembly by tapping lightly, as in **Figure 6**.
- 5 Remove bolt, nut, and washers at base of yoke to free shift lever. Withdraw the armature and shift lever, as shown in **Figure 7**.
- 6 Remove the pinion stop ring located at the end of the armature shaft. To remove the stop ring, push the stop ring to the clutch side, remove the snap ring, and withdraw the stop ring and

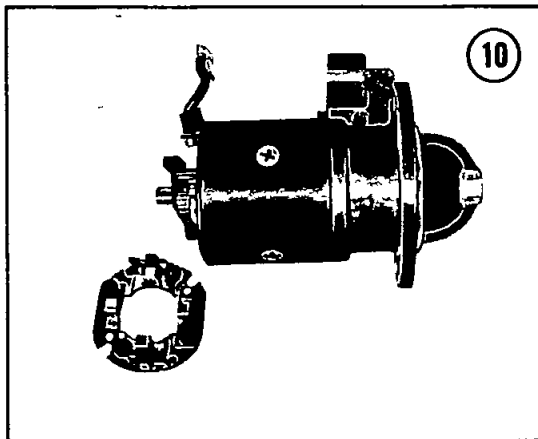
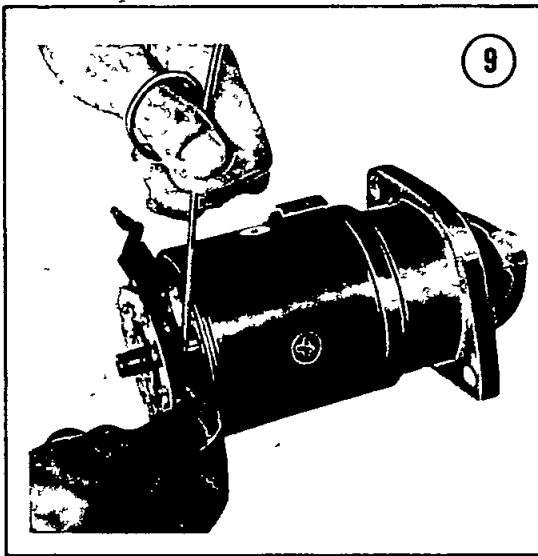




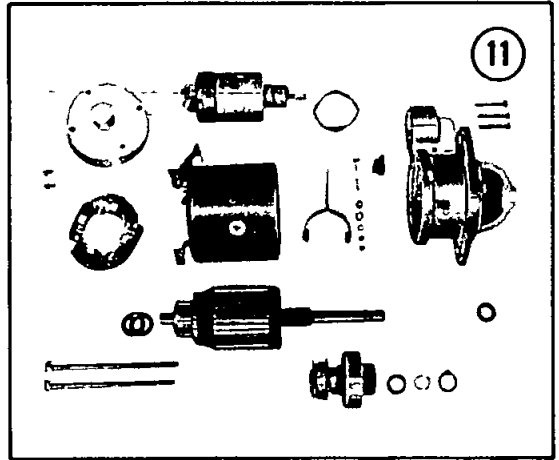
clutch Withdraw the overrunning clutch assembly from the armature shaft, as shown in Figure 8



7 Remove the brushes, shown in Figure 9, by unsoldering with a soldering iron. Figure 10 shows the brush holder after removal



8 Figure 11 shows the starter motor after disassembly.



CLEANING, INSPECTION, AND REPAIR

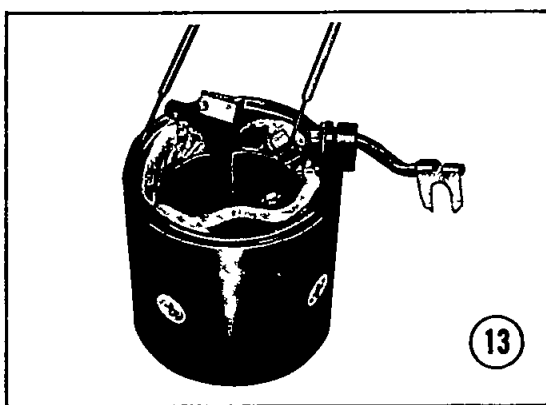
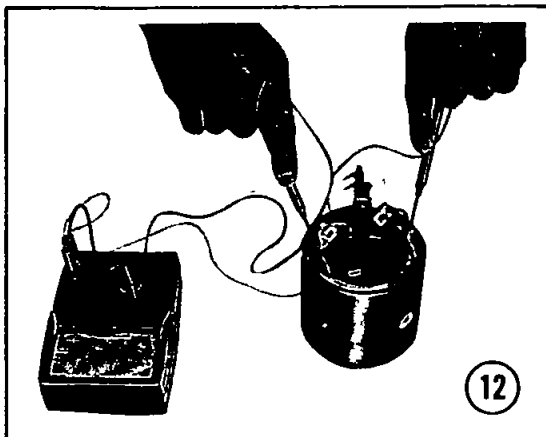
Clean all disassembled parts thoroughly. Do NOT use grease-dissolving solvents on the overrunning clutch, armature assembly, magnetic switch assembly, or field coils, since it would dissolve grease packed in the clutch mechanism and damage the coils or other insulators. Check all parts carefully for damage or wear. Replace as required.

TERMINALS

Check all electrical terminals and wires for signs of damage, wear, and deterioration. Replace as required.

FIELD COIL

- 1 Check insulation on the field coil. If damaged or worn, replace the coil.
- 2 Test the field coil for continuity after referring to Figure 12. Connect the test probe of a circuit tester or an ohmmeter to the field coil positive terminal. Connect the other probe to the positive brush holder. If the tester shows no conduction, the field circuit or coil is open and should be replaced.
- 3 To test for grounding, place one probe on the yoke and the other on the positive terminal of the field coil lead. Figure 13 shows this test being performed. If very little resistance is read, the field coils are grounded and must be replaced.



4 Test the coils for shorts by unsoldering the connections of each coil and repeating the test given in step 3. If a defective coil is found, it must be replaced.

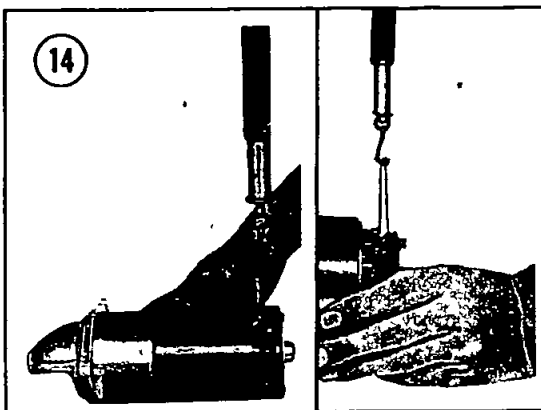
BRUSHES AND BRUSH LEAD WIRE

1 Check condition of the brush contact surface and general wear of the brush. If the brush is worn to under 0.2362 in (6.0mm) in length, replace it. Inspect all connections carefully for looseness or cracks. Replace or repair as required.

2 Check the connection of the lead clip and wire.

3 Check brush holders and spring clips for damage. Replace if they will not hold the brushes against the commutator properly. Clean all brushes and brush holders thoroughly.

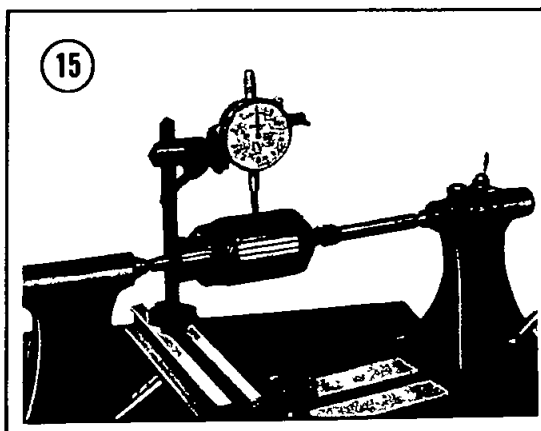
4 Check brush spring tension with a spring scale as shown in Figure 14. The reading should be 1.76 lbs. (0.8 kg). Replace the spring if the tension is under 1.54 lbs (0.7 kg).



ARMATURE ASSEMBLY

1 Check external appearance of the armature and commutator.

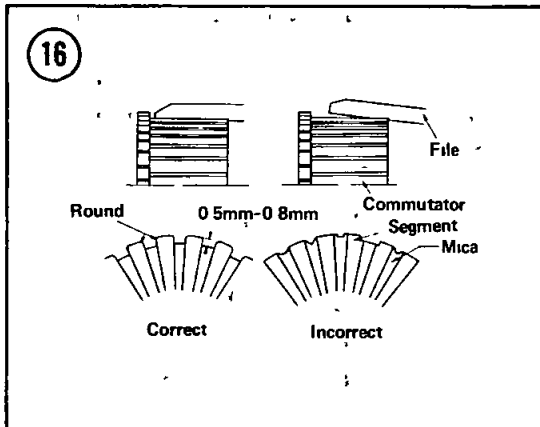
2 Use a dial gauge, Figure 15, to measure the armature shaft for bend. Replace the armature shaft if the bend exceeds 0.001 in (0.08mm).



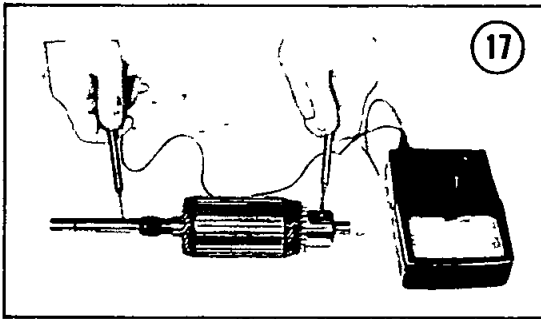
3 Inspect the commutator. If the surface is rough, sand it with No. 500 emery paper until smooth. Use a dial gauge to check the commutator. If out-of-round is more than 0.0079 in (0.2mm), or the depth of the insulating mica is less than 0.0079 in (0.2mm) from the commutator surface, the commutator should be turned on a lathe. Out-of-round should be less than 0.0020 in (0.05mm). Insulating mica should be undercut, as shown in Figure 16, to a depth of from 0.0197 to 0.0315 in (0.5 to 0.8mm).

4 Inspect the soldered connection of the armature lead and the commutator. If the connection is loose, resolder it.

5 Using a circuit tester, test the armature for



ground. As shown in Figure 17, place one test probe onto the armature shaft and the other probe onto each commutator bar. Continuity indicates a ground, and the armature must be replaced.



6 Check the armature for shorts by placing it on a holding fixture, holding a hack saw blade over the core, and rotating the armature. If the saw blade vibrates, the armature is shorted and must be replaced.

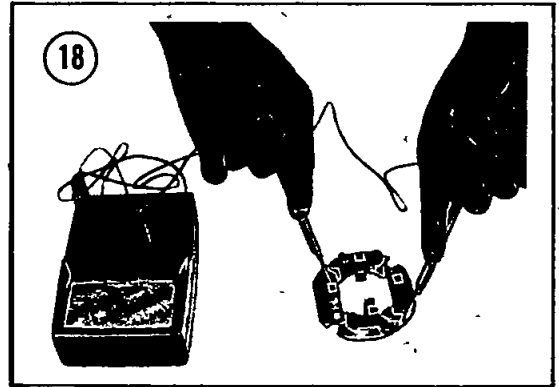
7 Check for continuity by placing the probes of a tester on two side-by-side segments of the armature. No current passage indicates an open circuit. The armature must be replaced. If readings are inconsistent, replace the armature.

OVERRUNNING CLUTCH ASSEMBLY

- 1 Inspect the pinion assembly and screw sleeve. The screw sleeve must slide freely along the armature shaft. If damage is detected or if it does not move freely, replace it. Inspect the pinion teeth for damage and wear. Replace if required.
- 2 Inspect the teeth on the flywheel ring gear for missing or damaged teeth. If defective, the flywheel must be replaced.

BRUSH HOLDER

- 1 Using a circuit tester, as shown in Figure 18, place one test probe on the rear cover and the other on the positive side of the brush holder. If the tester shows conduction, the brush holder is shorted to ground or the insulator is defective. Replace the brush holder.



STARTER MOTOR BEARINGS

- 1 Inspect the bearings at either end of the rear cover and the gear case assembly. If they show signs of scoring or other damage, replace them. Check the clearance of the armature shaft to the bearings. It should be less than 0.0079 in. (0.2mm).
- 2 If the bearings are replaced, new bearing clearance should be 0.0012 to 0.0039 in. (0.03 to 0.10mm).

MAGNETIC SWITCH ASSEMBLY

- 1 Inspect the magnetic switch contacts for defects and damage, replace if necessary.

ASSEMBLY

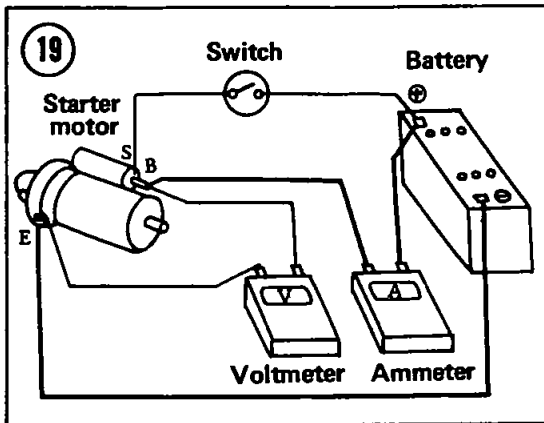
To reassemble the starter motor, reverse the procedures used during disassembly. When assembly has been completed, perform the following tests.

Testing

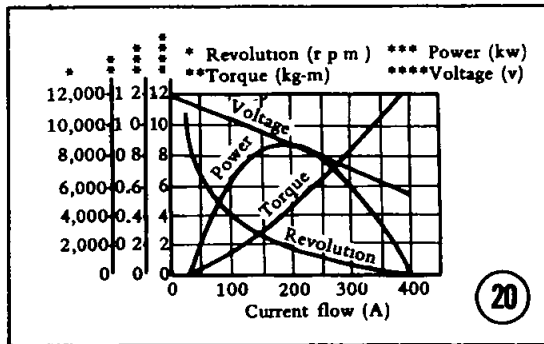
The starter motor should be subjected to a no-load test and a lock torque test following overhaul to ensure that its performance will be satisfactory when installed on the engine. These tests are also helpful in determining the cause of problems before disassembly.

No-Load/Lock Torque Test

1 Connect the starter motor in series with a 12-volt battery and ammeter, as shown in **Figure 19** The ammeter should be capable of indicating 1,000 amps.



- 2 Use torque testing equipment to determine the torque the motor develops.
3. Connect a voltmeter and a variable resistor, which is used to regulate the voltage, into the circuit
4. Close the switch and regulate the voltage as required **Figure 20** provides power, voltage, amperage, and torque information that, if followed, will indicate the condition of the starter motor.



Test Diagnosis

- 1 Low speed with high current draw might result from tight, dirty, or worn bearings, bent armature shaft, loose field coil; or a shorted armature
2. Failure to operate with high current draw may result from a grounded or open field coil,

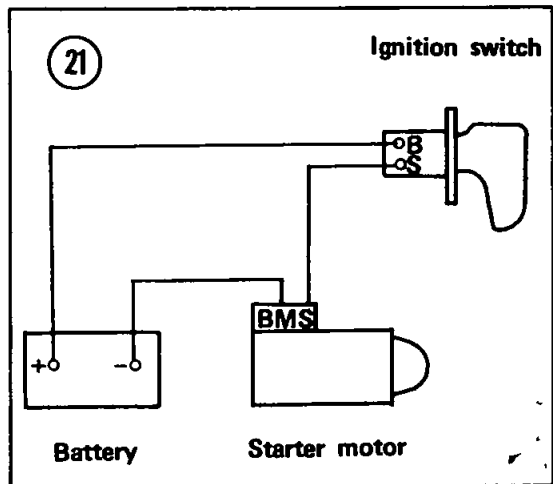
a defective armature coil, or a burned out commutator bar.

3. Low torque, low current draw, and low speed would be caused by high internal resistance due to loose connections, dirty commutator, defective leads, and a burned out commutator bar.
4. High speed with low torque would be caused by a grounded field coil.

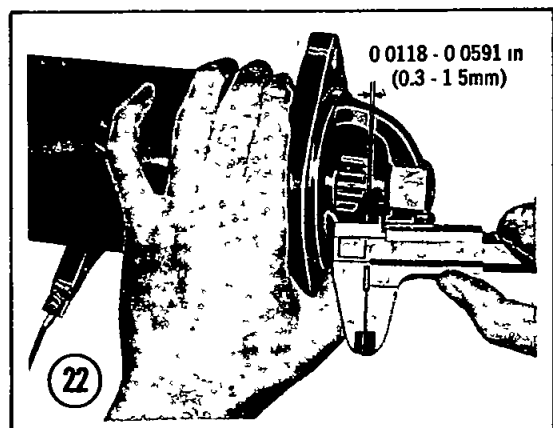
Magnetic Switch Assembly Test

If the above tests are satisfactory, check the magnetic switch assembly as follows

- 1 Connect jumper cables between the negative battery terminal and the starter motor M terminal, as shown in **Figure 21** Also, connect the positive battery terminal to the S terminal and place a switch in series in the circuit.



- 2 Close the switch and measure the dimension given in **Figure 22** The dimension should be as specified.



CHARGING CIRCUIT

Figure 23 is a schematic diagram of the charging circuit, which includes the battery, alternator, voltage regulator, and associated wiring.

#14108

ALTERNATOR

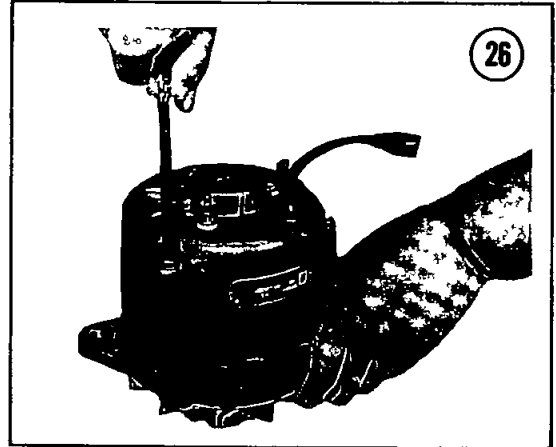
Figures 24 and 25 (page 100) provide exploded views of the alternator and the relative location of all parts. In an alternator the magnetic pole turns and the armature is fixed. The magnetic field is induced by the rotor which consists of alternator shaft, field coil, pole pieces, and slip rings. The slip ring pressed in the shaft conducts only a small field current. Output current is generated in the armature coils located in the stator. The stator has three windings and generates three-phase alternating current. Six diodes are installed into a heat sink. They rectify alternator output to direct current for use by all electrical systems in the vehicle.

Removal

- 1 Disconnect the negative battery terminal.
- 2 Remove two nuts holding electric leads to back of alternator and remove the wire leads.
- 3 Unplug the electric connector from the back of the alternator.
- 4 Loosen the adjusting bolt and the mounting bolt holding the alternator in position.
- 5 Remove the alternator drive belt from the alternator pulley.
- 6 Remove the bolts holding the alternator.
- 7 Remove the alternator from the vehicle.

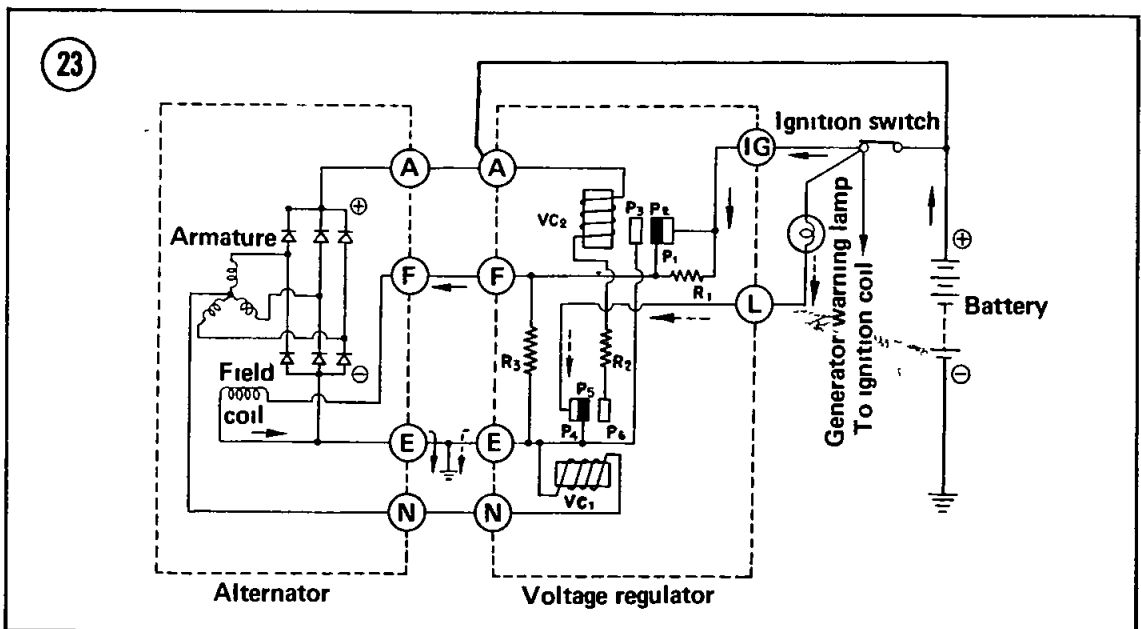
Disassembly

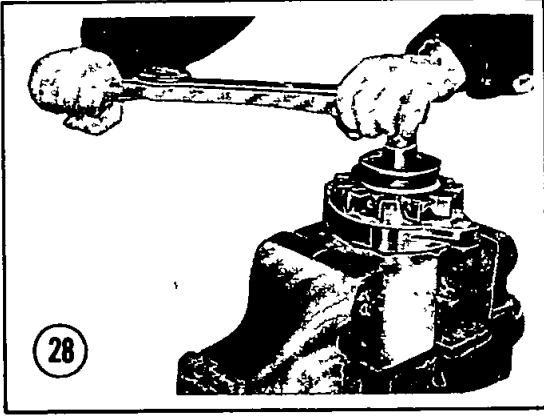
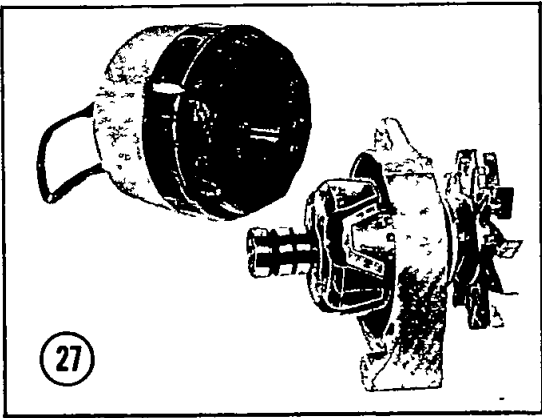
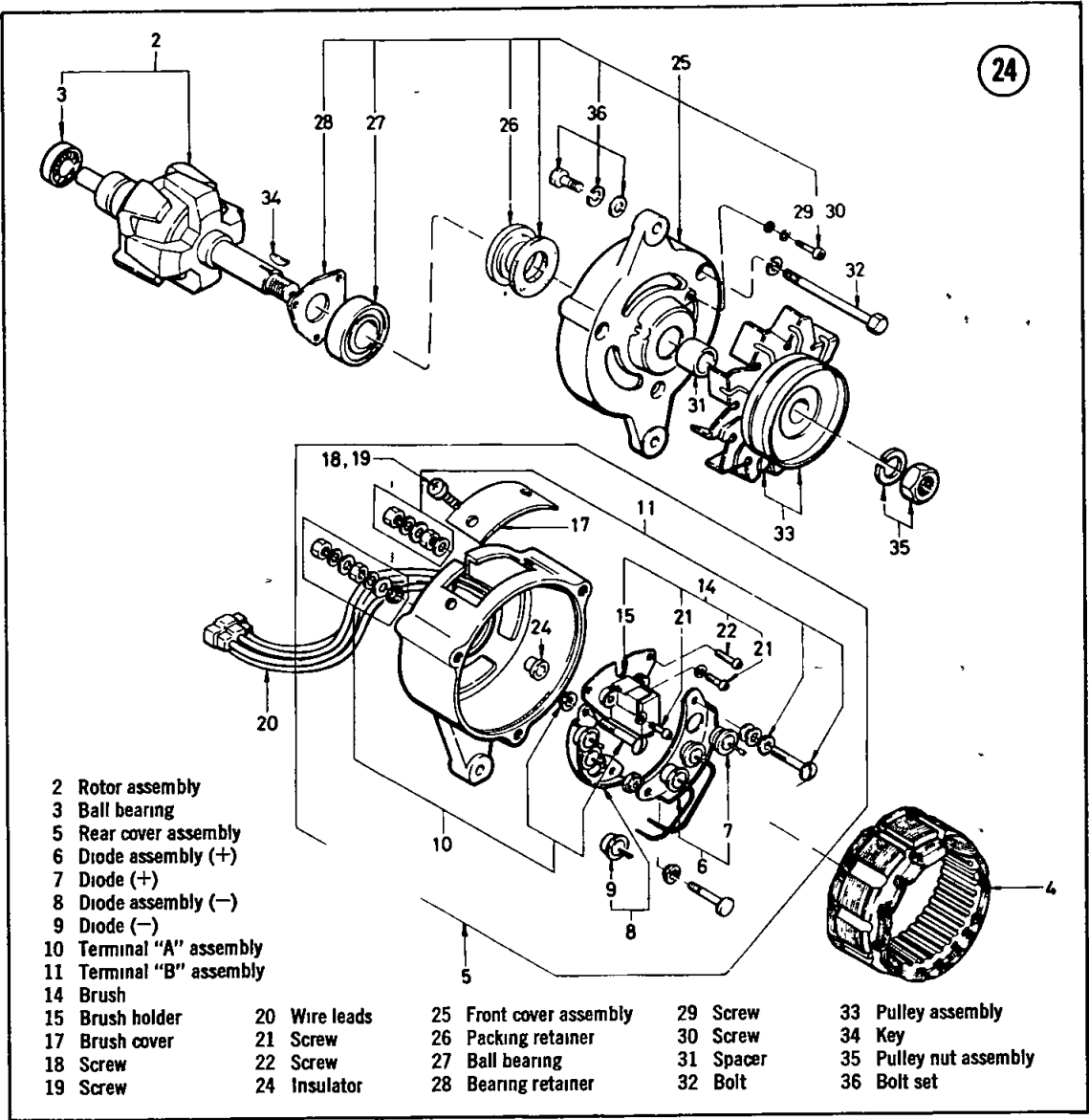
- 1 Unscrew and remove the through bolts as shown in **Figure 26**.

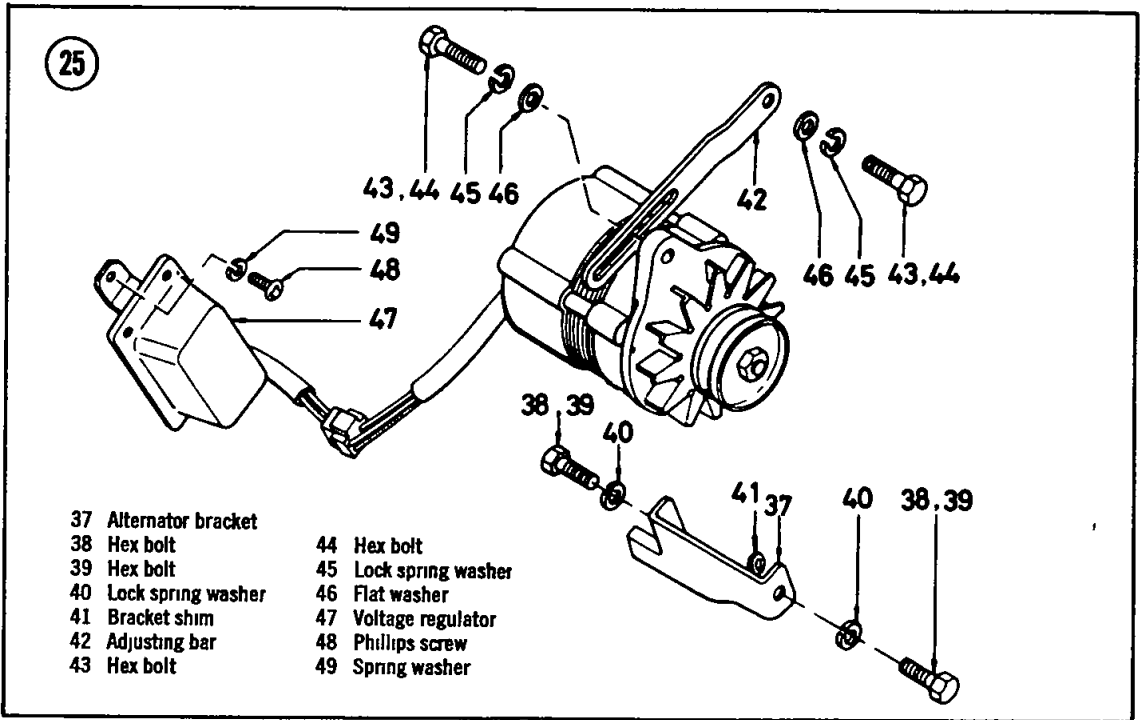


- 2 Separate the diode end housing from the drive end housing assembly by hitting the front bracket lightly with a wooden hammer. See **Figure 27**.

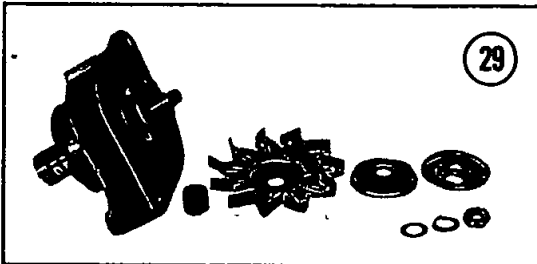
- 3 Using soft jaws on a vise, place the drive end housing in the vise and remove the pulley nut as shown in **Figure 28**.



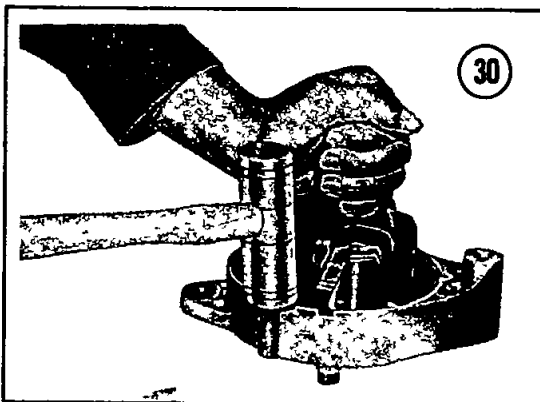




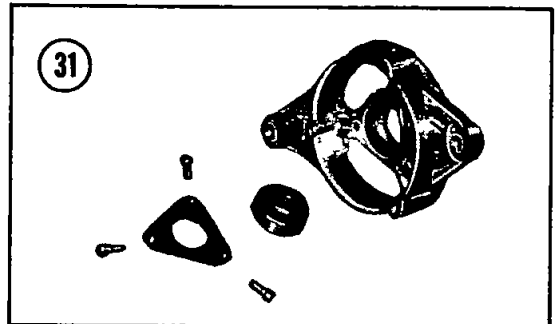
4. Remove the pulley nut, pulley rim, fan, and spacer from the housing. See Figure 29.



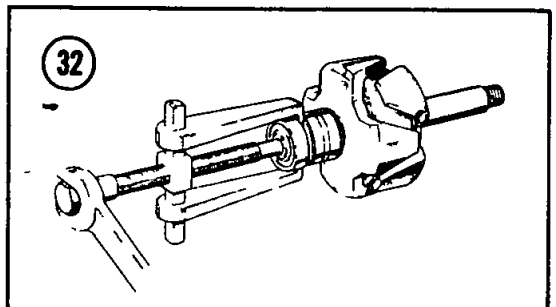
5. Remove the rotor from the drive end housing by tapping lightly with a wooden hammer. Refer to Figure 30.



6. Remove the bearing retainer by unscrewing three set screws and push out the bearing with an arbor press. See Figure 31.



7. Pull the rear bearing from the rotor assembly by using an arbor press or bearing puller, as shown in Figure 32.



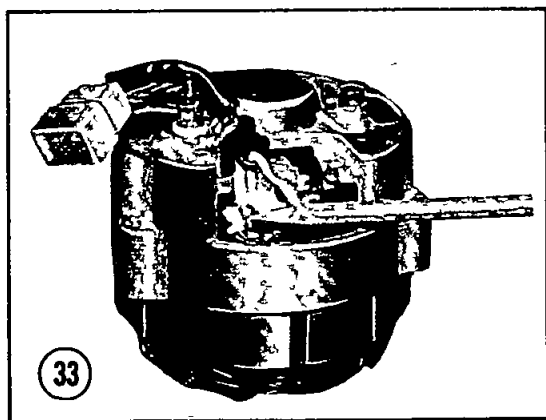
8 To separate the stator from the diode end housing assembly, unsolder the three negative diodes from the three coil lead wires. The negative diodes are marked with black figures and the positive ones with red figures.

CAUTION

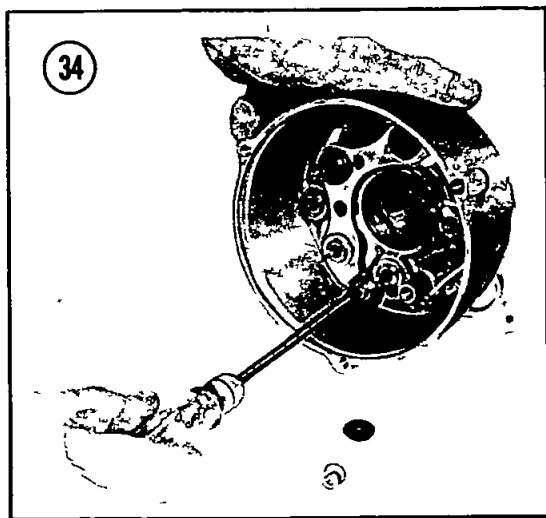
Use extreme care when unsoldering the diodes to prevent excessive heat from damaging them. Use a 100 to 200 watt soldering iron for no more than two seconds at the diode junction.

9 Remove the brush cover by unscrewing the two set screws

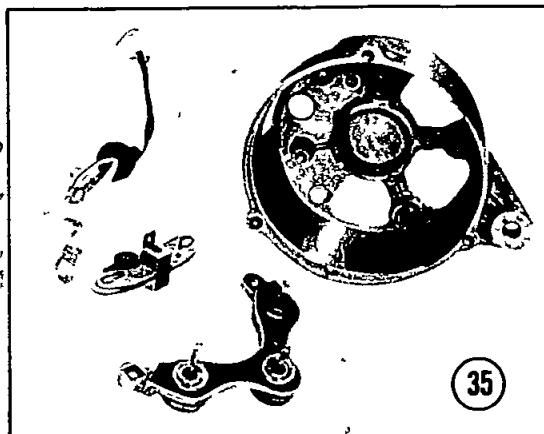
10 Unsolder the negative terminal lead wire. Separate diode end from stator, **Figure 33**



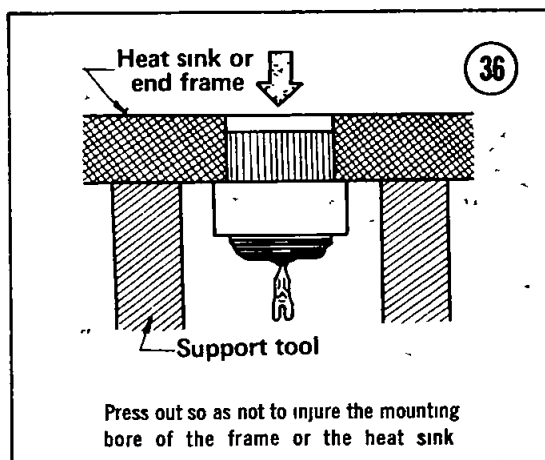
11 Remove the heat sink and the brush holder from the rear cover by unscrewing the setscrews, as shown in **Figure 34**.



12 Disassemble the brush holder by unsoldering the F lead wire (black/white), E lead wire (black), and the negative and positive brush holder wires. **Figure 35** shows the brush holder disassembled



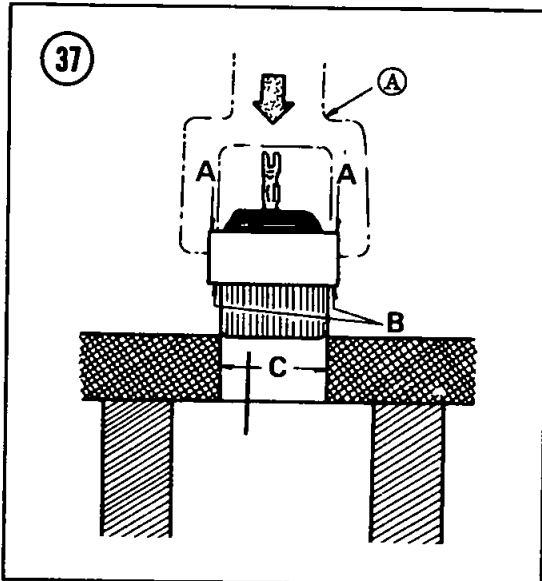
13 To remove a diode from the heat sink, support the heat sink with a suitable stand, **Figure 36**, and push out the diode with an arbor press. Do not attempt removal with a hammer as the shock may damage all the diodes in the heat sink.



14 To replace a diode in the heat sink, support the heat sink with a suitable stand and press the diode into place, as shown in **Figure 37**.

Inspection and Repair

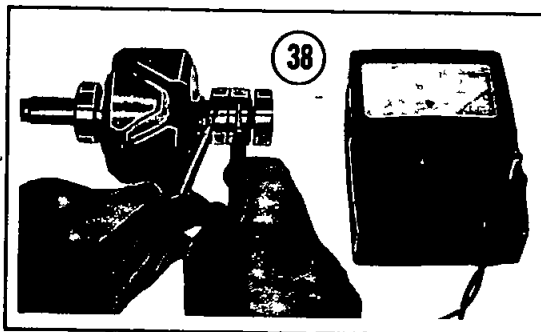
Inspection of the alternator includes electrical testing and mechanical inspection of all parts for damage or excessive wear. An electrical tester providing resistance and continuity testing is required. Before disassembly of the alternator,



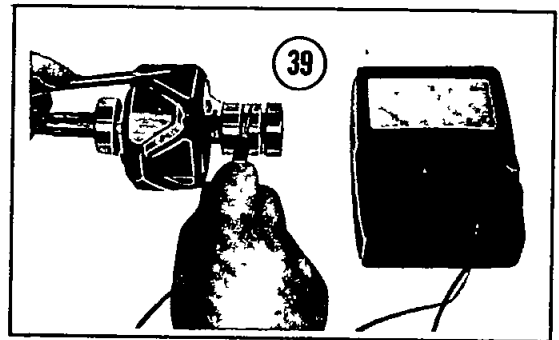
it should be tested by connecting the probes of the tester to the F lead wire (black/white) and the E lead wire (black). The resistance should read between 5 and 6 ohms. If the resistance is incorrect, the alternator must be disassembled and tested further, as described below.

ROTOR INSPECTION

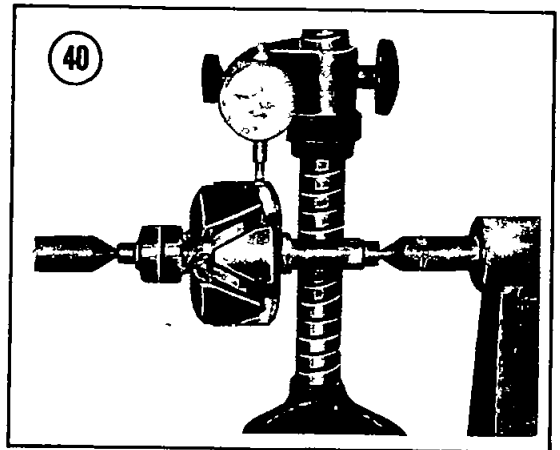
1. To test continuity of the field coil, connect the tester between the slip rings of the rotor. **Figure 38** shows the connection. No continuity indicates the field coil is defective and must be replaced. Normal reading should be approximately 4.47 ohms resistance.



2. To perform the ground test of the field coil, check continuity between the slip ring and the rotor core, as shown in **Figure 39**. Low resistance indicates that the field coil or the slip ring is grounded and the rotor assembly should be replaced.

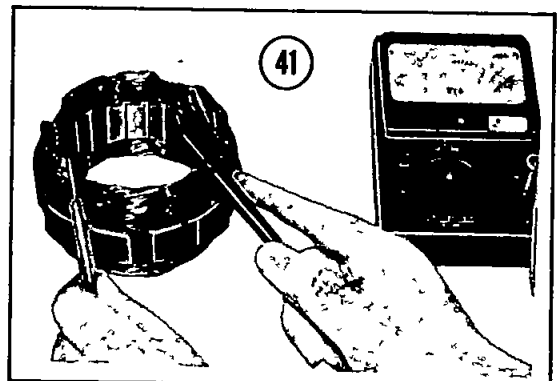


3. Check the eccentricity of the rotor with a dial gauge, as shown in **Figure 40**. Repair or replace the rotor if the eccentricity is more than 0.0039 in (0.10mm).

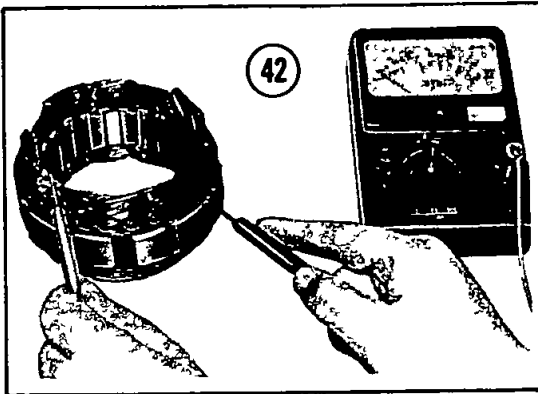


STATOR INSPECTION

1. Check continuity of the stator by placing the test probes to the N lead wire (yellow) and each lead wire of the armature coil. If current passes at all points, the stator is acceptable. No continuity shows the circuit to be open. Replace the stator. **Figure 41** shows the connection.



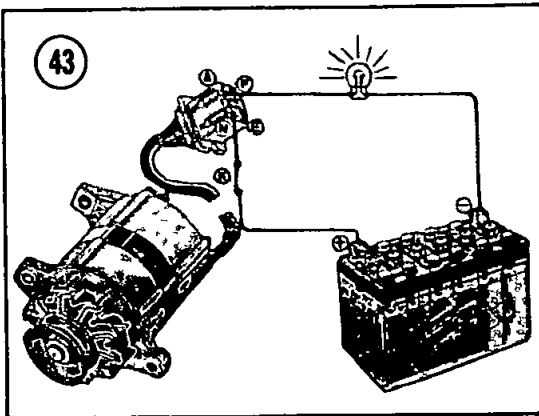
2 Check the lead wires of the armature coil, including the neutral wire, for ground, as shown in **Figure 42**. High resistance (no current flow) indicates good condition. If not, the stator must be replaced.



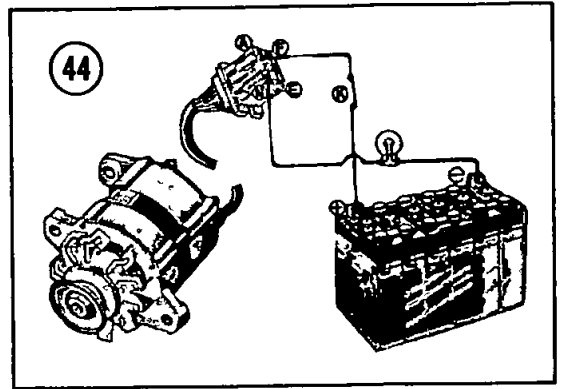
DIODE INSPECTION

The diodes can be inspected through the use of a lamp and battery or with a tester. The lamp and battery test can be made without disassembling the alternator, while the tester should be used when the diodes are directly accessible.

1 **Positive Diode Test** Connect the battery negative terminal with the connector A terminal (white) and the battery positive terminal with the connector N terminal (yellow) as shown in **Figure 43**. The lamp in the circuit should light.



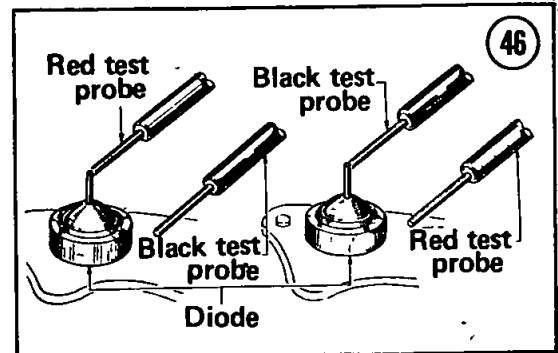
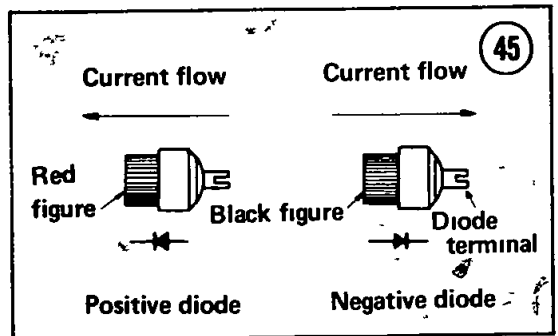
Reverse the connection, as shown in **Figure 44**. If the lamp does not light, the positive diodes are satisfactory. If the lamp does light, one or all of the positive diodes are defective and must be replaced.



2 **Negative Diode Test** Connect the battery negative terminal to the connector N terminal (yellow) and the battery positive terminal to the connector E terminal (black). The lamp in the circuit should light. Reverse the connections, if the lamp does not light the negative diodes are satisfactory. If the lamp does light, one or all of the negative diodes are defective and must be replaced.

To test the individual diodes with a tester, proceed as follows:

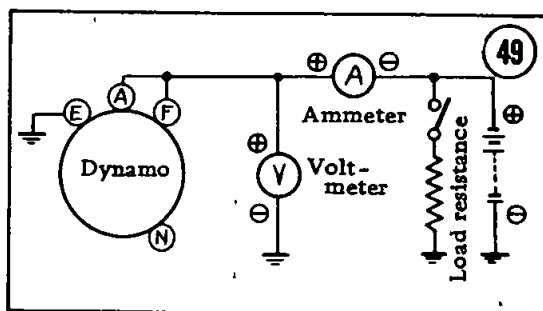
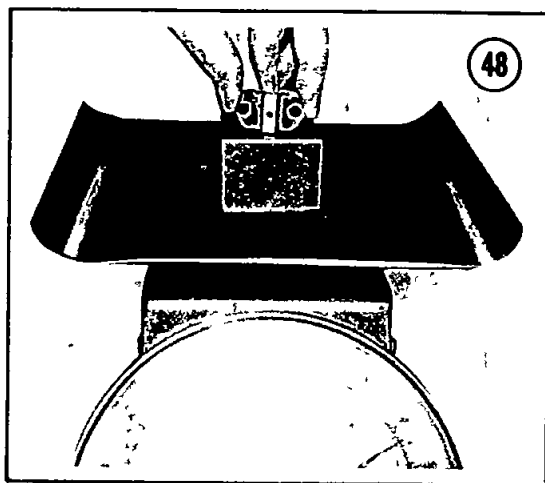
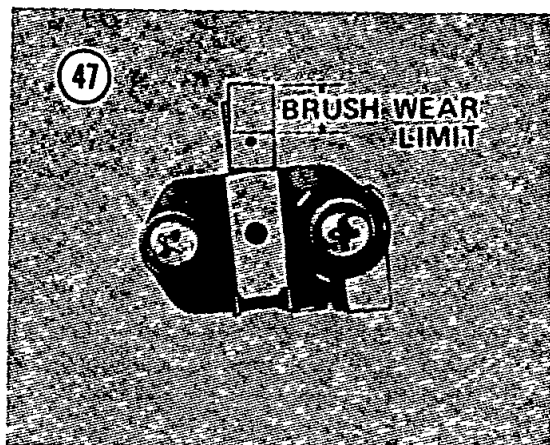
1. There are two kinds of diodes, as shown in **Figure 45**. Check diode resistance, using a tester, in both directions, as shown in **Figure 46**.



2 When one side shows low resistance and the other shows high resistance, the diode is satisfactory. If both sides are low, there is a short circuit. If both sides are high, there is an open circuit. All diodes with open or short circuits must be replaced.

BRUSH INSPECTION

1 Visually check the brushes for signs of wear or damage. If wear is greater than the wear limit shown in **Figure 47**, replace the brush.



2. Check the movement of the brush for smoothness. If unsmooth, check and clean the brush holder.

3 To check spring pressure, place a suitable block on a platform scale and press down the brush holder with the brush and spring on the block until the brush sinks in the holder to 0.0394 in (1mm) height from the holder. Subtract the block weight from the reading to derive the spring pressure. It should be 0.77 lbs. (0.35 kg). If the reading is under 0.44 lbs (0.2 kg), replace the spring. **Figure 48** shows this test being performed.

ALTERNATOR OUTPUT INSPECTION

To check alternator output, remove the alternator from the vehicle and connect wiring as shown in **Figure 49**. Drive the alternator with a motor. Through the circuits shown in the illustration, current flows from the battery to the field coil of the alternator. Raise the speed of the alternator slowly to the point where no reverse flow exists. This point should be about 2 amps

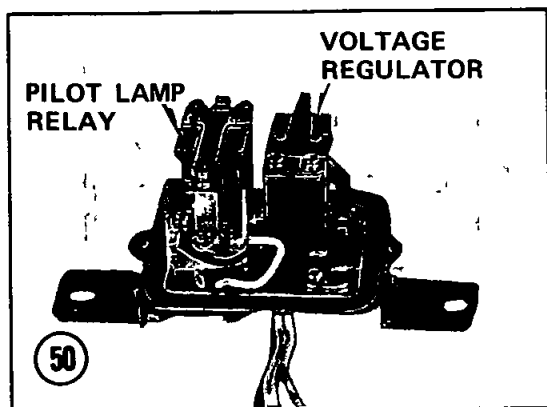
at 1,000 rpm. Increase the load resistance until the load current is almost stopped and turn off the switch. Raise the load current slowly and increase the speed of the alternator. Observe that the output current increases as the speed of the alternator increases. If the output is within the above specification at the proper rpm the alternator is satisfactory.

ALTERNATOR ASSEMBLY

To assemble the alternator, reverse the procedures given for disassembly. The use of an arbor press to install diodes and bearings is essential so that parts are not damaged.

VOLTAGE REGULATOR

The voltage regulator is mounted to the right-hand engine compartment side wall and has a removable cover. **Figure 50** shows the regulator with the cover removed. Adjusting the voltage regulator requires special equipment not ordinarily available to the home mechanic. If trouble seems to be in the regulator, refer service to a Datsun dealer or competent garage.



REMOVAL

To remove the voltage regulator, disconnect the 6-way multiple electrical connector and the screws holding the regulator to the side wall.

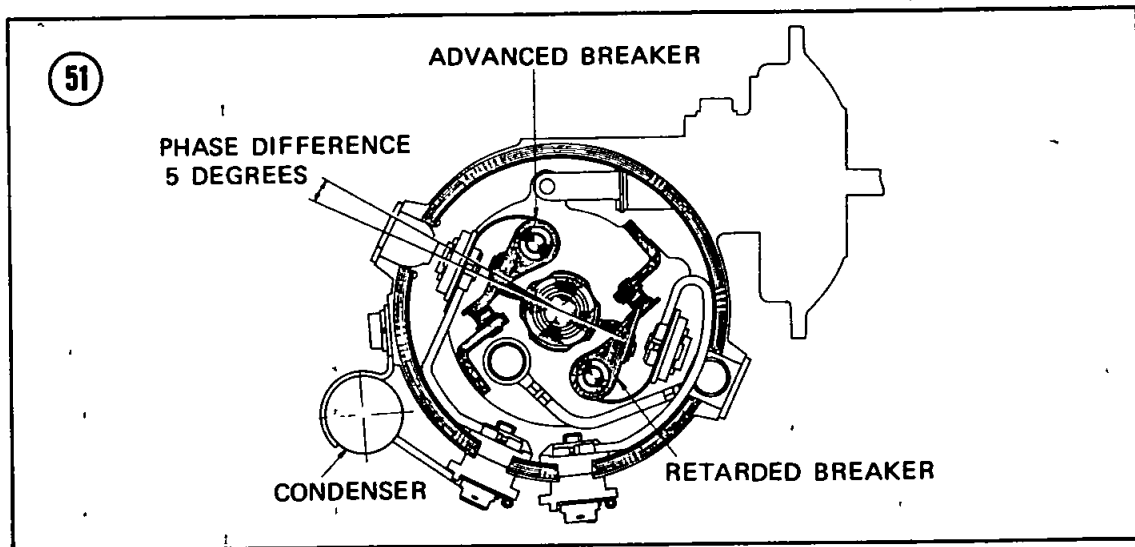
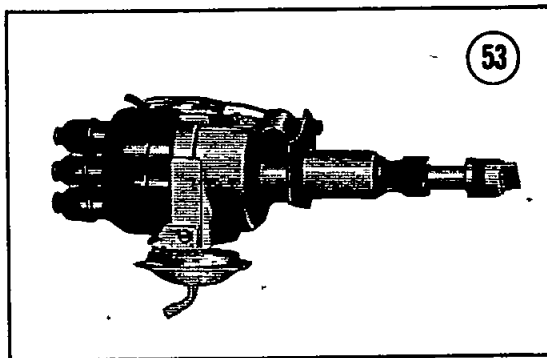
↓ TURNS CCWISE FROM DISTRIBUTOR ABOVE

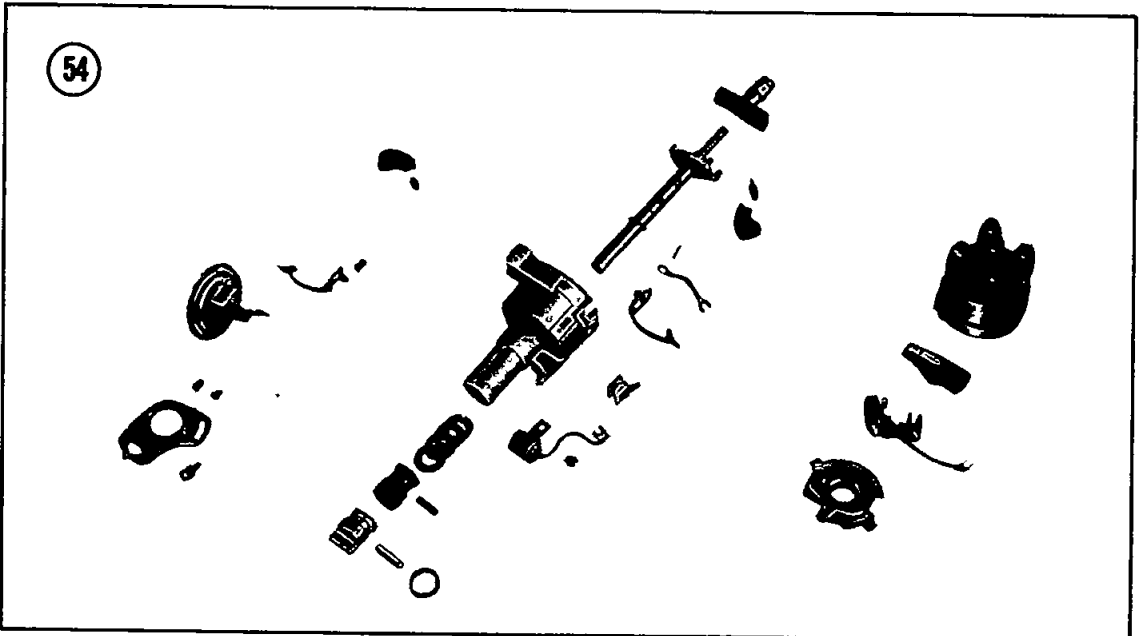
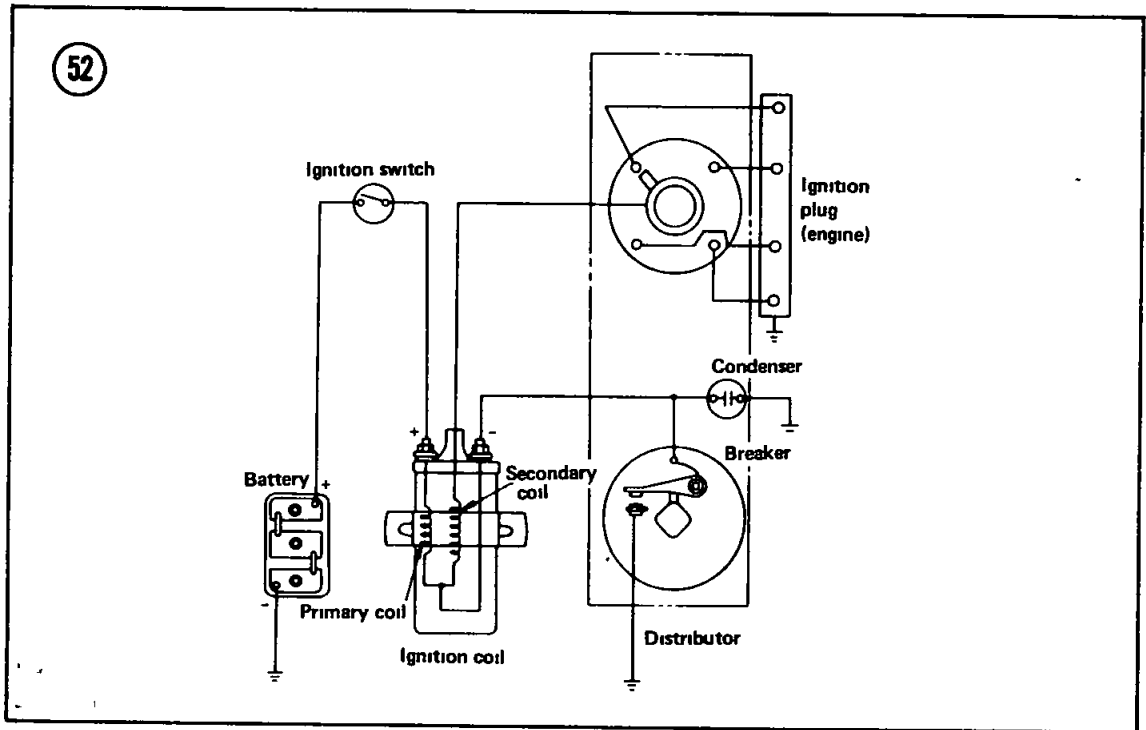
Distributors used on models covered in this manual are similar, except that some have a dual contact point system rather than a single contact system. The dual point system applies to 1970 and newer models equipped with the exhaust and evaporative emission control device. The points are placed in parallel in the circuit so that there is a phase difference in their operation. Phase difference is 5 degrees on 1970-1971 models and $3\frac{1}{2}$ degrees on 1972 models. This can be adjusted with the adjusting screw on what is called the retarded breaker.

Figure 51 shows the dual point distributor. Functionally, the distributor consists of the high voltage electrical system, the ignition switch, the centrifugal advance mechanism, a vacuum advance mechanism, and a mechanical driving mechanism. Figure 52 (next page) is an ignition diagram that shows parts of the ignition circuit. The distributor shown is typical of the single contact point system.

CONSTRUCTION

Figure 53 shows a typical distributor used and Figure 54 shows the distributor in an exploded view. Figures 55 (page 107) and 56 (page 108) provide detailed exploded views of the high tension cable system and the single point contact system. Figure 57 (page 109) covers distributors with the dual point system. The descriptions given below for disassembly and repair apply especially to the single point system, but are generally true for the dual point system.





CHECKING AND ADJUSTMENT

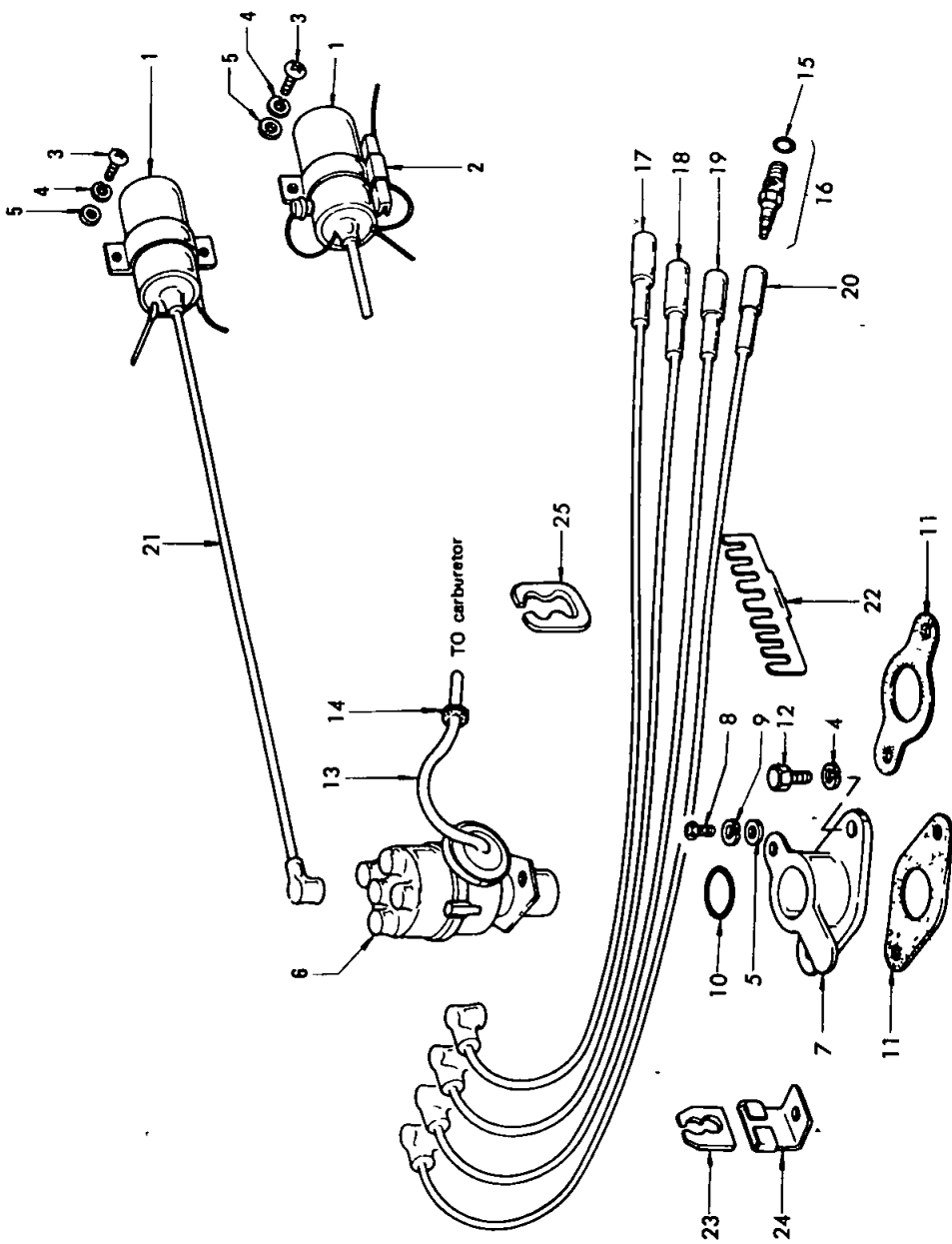
Cap and Rotor Head

The cap and the rotor head must always be kept clean to prevent high voltage leaks. Inspect the cap periodically for signs of carbon buildup,

foreign material, or cracks. Clean the cap thoroughly. Replace it if cracks are found. Inspect the high tension cables to see that all connections are firmly made and that the cables are not cracked. Replace any defective cables. Do not try to tape or mend them.

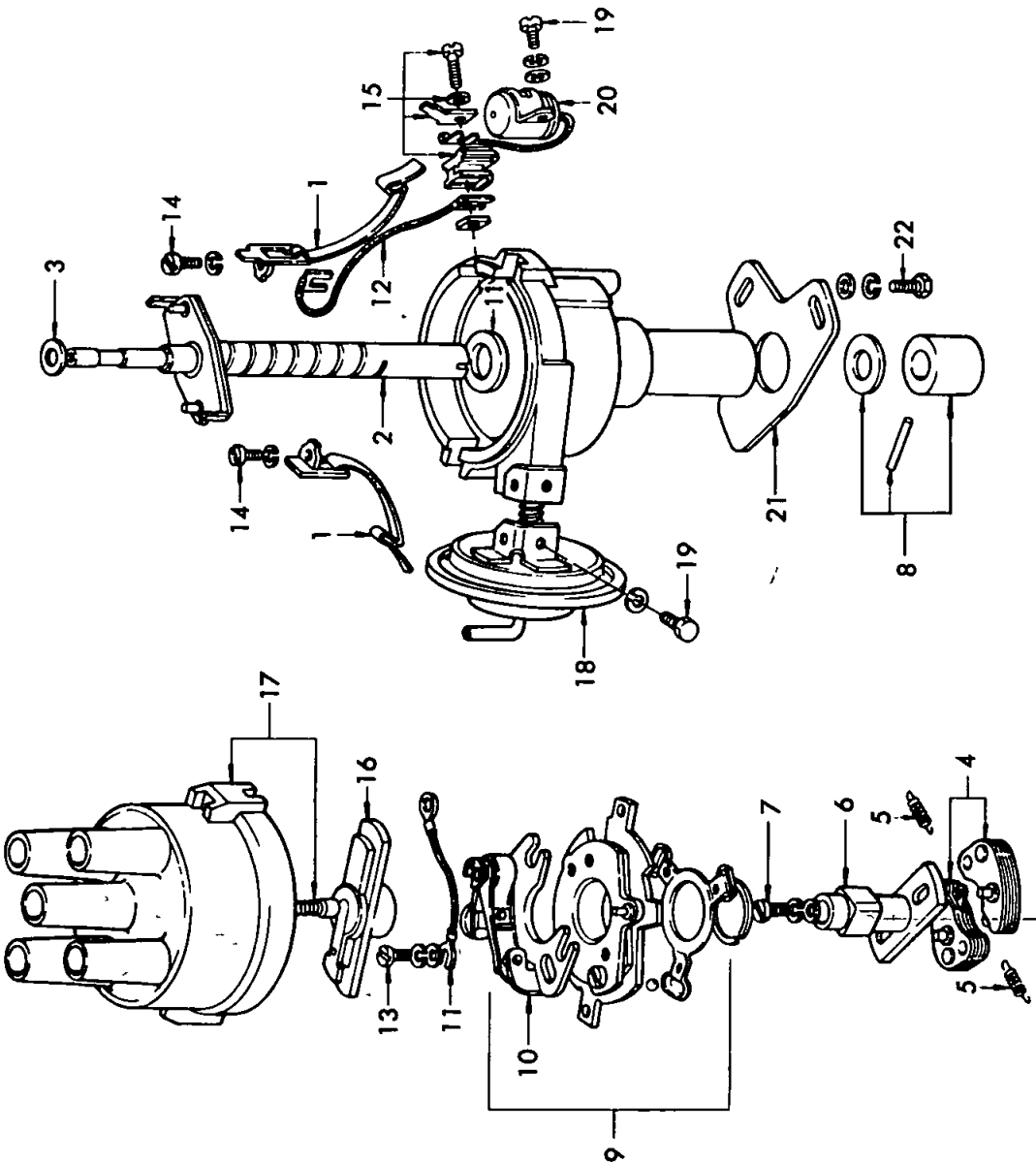
55

- 1 Ignition coil
- 2 Ignition coil resistor
- 3 Phillips screw
- 4 Spring washer
- 5 Plain washer
- 6 Distributor assembly
- 7 Distributor support
- 8 Screw
- 9 Spring washer
- 10 O ring
- 11 Distributor gasket
- 12 Bolt
- 13 Vacuum control tube
- 14 Vacuum tube grommet
- 15 Spark plug washer
- 16 Spark plug
- 17 High tension cable
- 18 High tension cable
- 19 High tension cable
- 20 High tension cable
- 21 High tension cable
- 22 Cable holder
- 23 Cable clamp
- 24 Cable clamp holder
- 25 Cable clamp



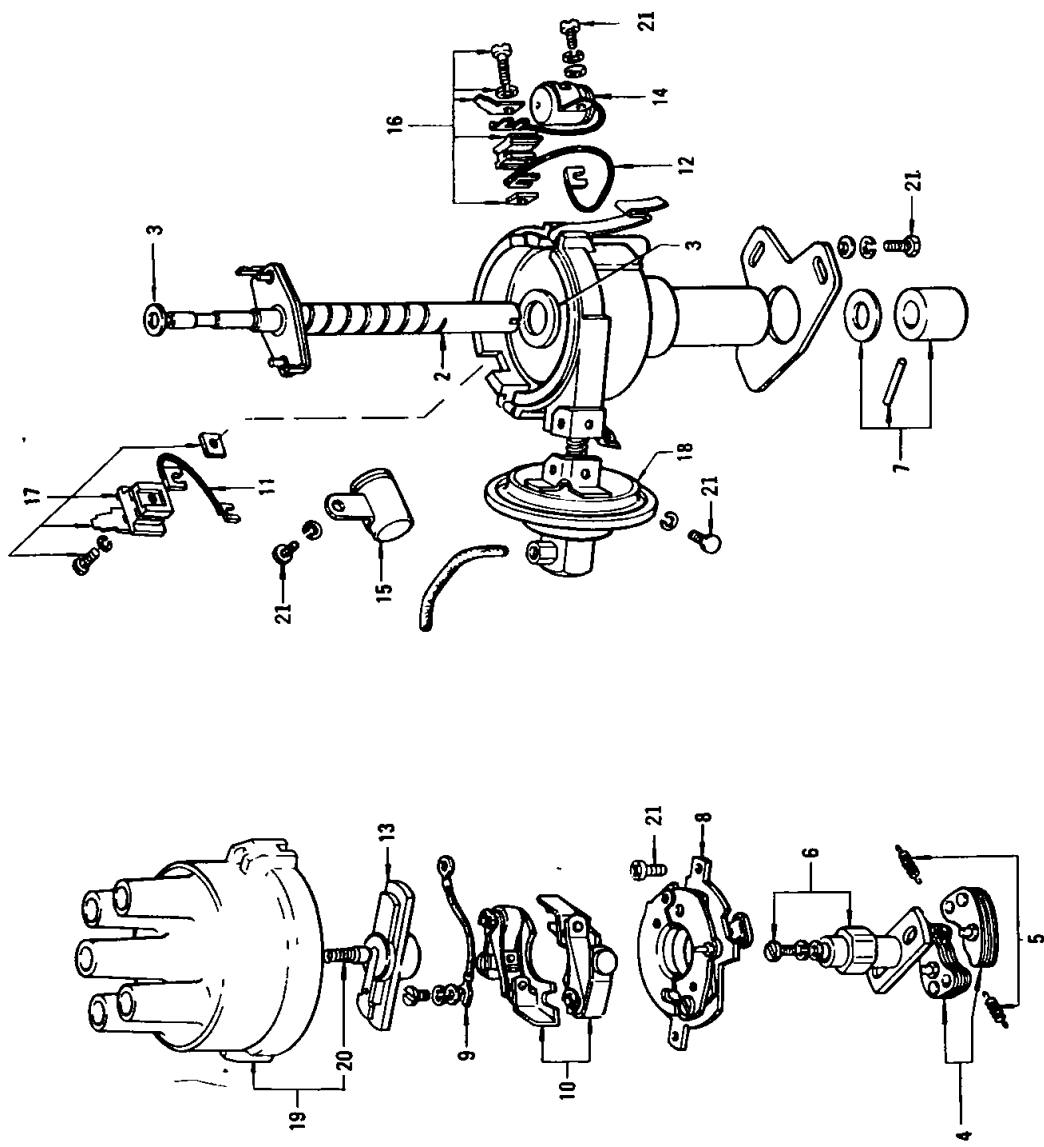
56

- 1 Distributor cap clamp
- 2 Shaft assembly
- 3 Thrust washer
- 4 Governor weight assembly
- 5 Governor spring
- 6 Cam assembly
- 7 Screw
- 8 Shaft coupling assembly
- 9 Breaker assembly
- 10 Contact point assembly
- 11 Ground wire assembly
- 12 Lead wire assembly
- 13 Point set screw
- 14 Screw
- 15 Terminal assembly
- 16 Rotor head assembly
- 17 Distributor cap assembly
- 18 Vacuum control
- 19 Screw
- 20 Condenser
- 21 Fixing plate
- 22 Bolt



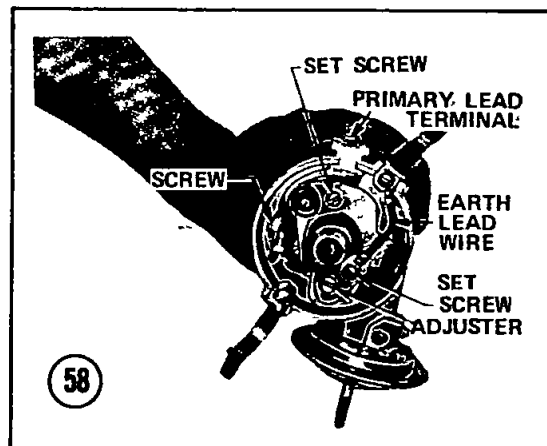
57

- 1 Distributor assembly
- 2 Shaft assembly set
- 3 Thrust washer set
- 4 Governor weight
- 5 Governor spring set
- 6 Cam assembly set
- 7 Collar set
- 8 Breaker plate assembly
- 9 Earth wire assembly
- 10 Contact set
- 11 Lead wire assembly
- 12 Lead wire assembly
- 13 Rotor head assembly
- 14 Condenser assembly
- 15 Condenser assembly
- 16 Terminal assembly
- 17 Terminal assembly
- 18 Vacuum control assembly
- 19 Cap assembly
- 20 Carbon point assembly
- 21 Set screw



Points

Figure 58 gives details of the single point system. The points should be inspected periodically for condition and wear. At the same time the point gap should be checked and reset if necessary. Points should be checked at least every 2,500 miles.



- 1 Unhook the two clamps holding the distributor cap to the distributor
2. Remove the distributor cap and pull the rotor off of the center shaft
- 3 Carefully note or mark the position of the distributor relative to the fixing plate at the bottom of the distributor
- 4 Loosen the hold down bolt at the bottom of the distributor and rotate the distributor until the rubbing arm that rests on the distributor cam is at a high point of the cam. At that point, the points should have a gap between them.
- 5 Inspect the general condition of the points for wear, pitting, and smoothness. Points that are worn excessively or are badly pitted must be replaced. Points in good condition can be resurfaced with a point file, number 600 sand paper, or with a small whetstone.
- 6 To replace or remove the points from the distributor, loosen the screws at the contact arm and primary lead connection. Do not remove the screw. Pull up on the primary lead to disconnect the terminal from the contact arm.
- 7 Loosen the screw holding the ground wire to the point assembly, and remove it.
8. Loosen and remove the screws holding the point assembly to the distributor breaker plate.

Remove the point assembly from the distributor. Inspect condition of the points and recondition or replace as required.

9 Replace the points. Make certain to reconnect the ground wire and the primary lead. Apply a trace of cam lubricating grease to the cam upon reassembly.

10 With the points open, adjust gap. It should be between 0.0177 to 0.0217 in. (0.45 to 0.55 mm).

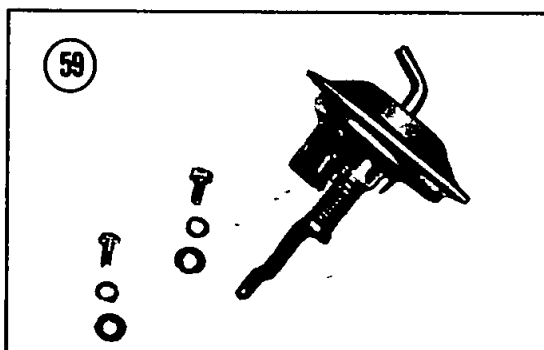
11. Install the rotor, put the cap on the distributor, secure the clamps, and return the distributor to its original position. Tighten the hold down bolt.

CONDENSER

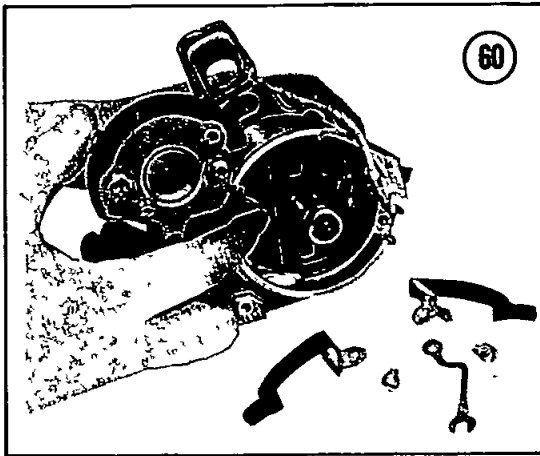
Periodically check the condenser electrical lead wire and the set screw connection. As a matter of good practice, replace the condenser whenever the points are replaced.

DISTRIBUTOR DISASSEMBLY

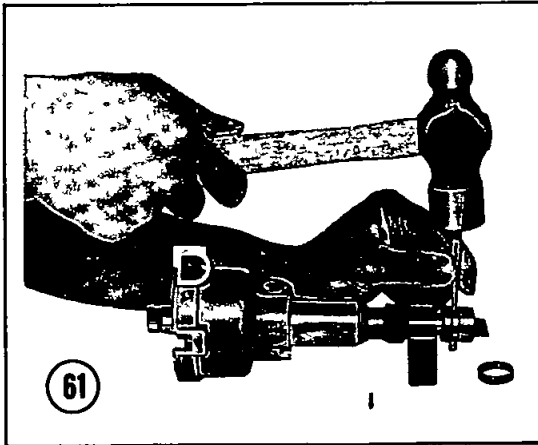
1. Take off the distributor cap and remove the rotor.
- 2 Disconnect the vacuum line from the vacuum controller.
- 3 Mark the position of the distributor relative to the housing, remove the bolts, and lift the distributor off.
- 4 Take off the vacuum controller, as shown in Figure 59.



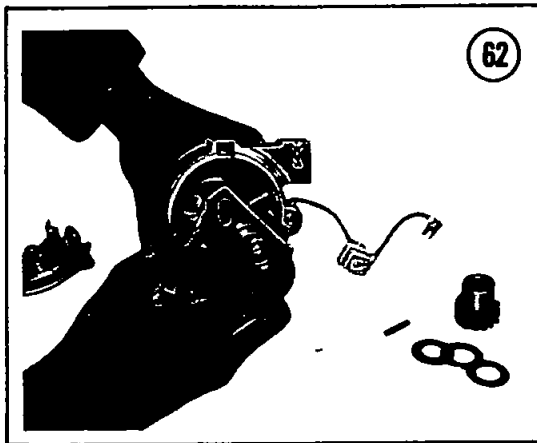
- 5 Remove the contact point assembly as previously described.
- 6 Remove the contact breaker assembly, Figure 60, by removing the clips that hold it in place. Be careful not to lose the steel balls located between the breaker plate and breaker springs.



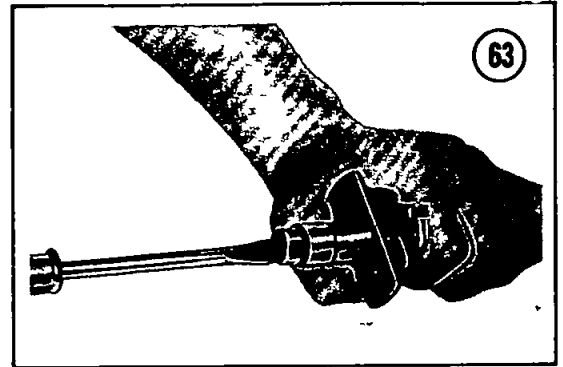
7 With a hammer and punch, knock out the pin holding the collar set to the shaft. Be certain to mark the relative location of the collar set to the shaft before removal. See **Figure 61**.



8 Remove the shaft and cam as shown in **Figure 62**.

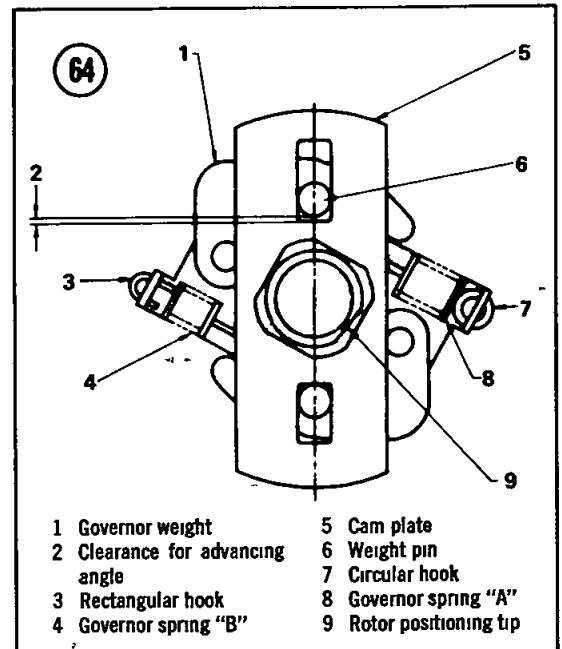


9 Remove the cam by removing the set screw at the top of the shaft and pulling the cam off. Be certain to mark the cam location relative to the shaft before removal. See **Figure 63**.



10 Inspect all parts carefully for signs of wear or damage. Replace defective parts.

Assembly of the distributor is the reverse of disassembly. Make certain all parts are reinstalled in the same relative location to the shaft as when removed. Refer to **Figure 64** for setting the governor springs and cam. See **Table 1** (page 112) for Distributor Specifications.

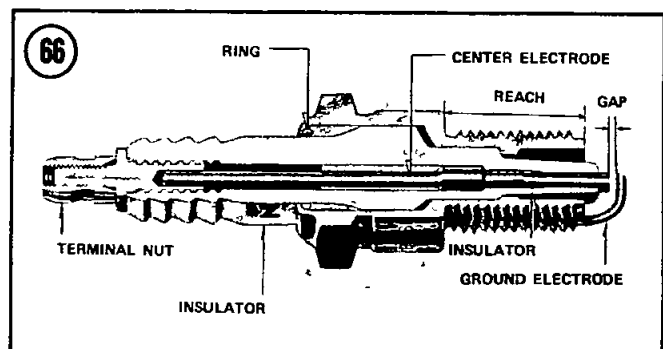
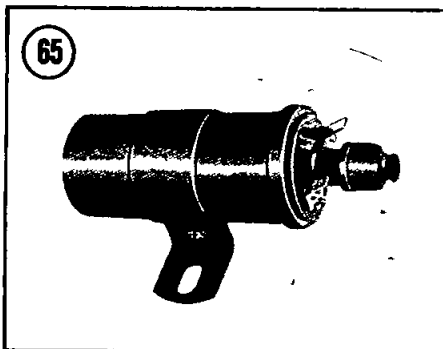


IGNITION COIL

The ignition coil is shown in **Figure 65**, and is a Hitachi model C14-51. Repair of the ignition

Table 1 DISTRIBUTOR SPECIFICATIONS

	Inches	Millimeters
Point gap	0 0177-0 0217	0 45-0 55
Point pressure	1 10-1 43 lbs	0 50-0 65 kg
Shaft diameter (lower part)	0 4902 $-0\ 0004$ $-0\ 0008$	12 45 $-0\ 010$ $-0\ 020$
Housing inner diameter	0 4902 $+0\ 0007$ 0	12 45 $+0\ 018$ 0
Clearance between shaft and housing	0 0004-0 0015	0 010-0 038
Amendment limit of clearance	0 0031	0 08
Shaft diameter (upper part)	0 3150 $-0\ 0002$ $-0\ 0006$	8 $-0\ 005$ $-0\ 014$
Cam inner diameter	0 3150 $+0\ 0006$ 0	8 $+0\ 015$ 0
Clearance between shaft and cam	0 0002-0 0011	0 005-0 029
Weight pivot diameter	0 1969 $-0\ 0004$ $-0\ 0010$	5 $-0\ 010$ $-0\ 028$
Weight hole diameter	0 1969 $+0\ 0007$ 0	5 $+0\ 018$ 0
Clearance between pivot and hole	0 0004-0 0018	0 01-0 046



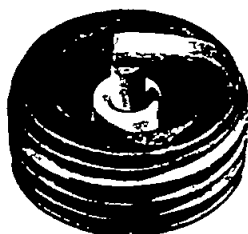
coil is not possible, and it must be replaced if found defective. Inspect the connections to the coil to make certain they are clean and tight. Inspect the top of the coil for signs of cracks or damage and replace if necessary. The ignition coil is located on the left side wall of the engine compartment and is held in place by two screws and washers.

SPARK PLUGS

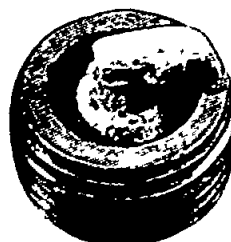
The following spark plugs, or their equivalent, are recommended for the L16 engine: Champion No. N10Y, Autolite No. AG32A, AC No. 44XL, and NGK No. BP-6E. Figure 66 shows spark plug construction. They should be re-

moved periodically and inspected for general condition, cleaning or replacement, and regapping.

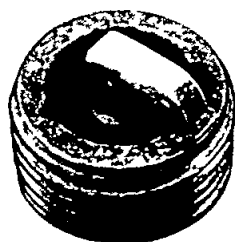
Figure 67 is a series of photos that show the appearance of and possible causes of spark plug problems. If the spark plugs are still usable, they should be cleaned thoroughly with a sand blasting type cleaner. The electrodes should then be filed flat and the plug regapped. The proper gap is 0 031 to 0 035 in. (0 8 to 0 9mm). Never use a spark plug that has a damaged or cracked insulator. Use extreme care when removing and installing spark plugs to keep from cracking the insulator. Always bend the ground electrode when setting the plug gap. Never bend the center electrode.



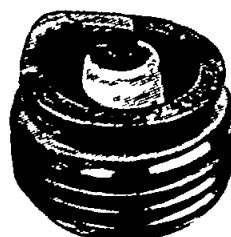
Normal plug appearance noted by the brown to grayish-tan deposits and slight electrode wear. This plug indicates the correct plug heat range and proper air/fuel ratio.



Red, brown, yellow and white coatings caused by fuel and oil additives. These deposits are not harmful if they remain in a powdery form.



Carbon fouling distinguished by dry, fluffy black carbon deposits which may be caused by an over-rich air/fuel mixture, excessive hand choking, clogged air filter or excessive idling.



Shiny yellow glaze on insulator cone is caused when the powdery deposits from fuel and oil additives melt. Melting occurs during hard acceleration after prolonged idling. This glaze conducts electricity and shorts out the plug.



Oil fouling indicated by wet, oily deposits caused by oil pumping past worn rings or down the intake valve guides. A hotter plug temporarily reduces oil deposits, but a plug that is too hot leads to pre-ignition and possible engine damage.



Overheated plug indicated by burned or blistered insulator tip and badly worn electrodes. This condition may be caused by pre-ignition, cooling system defects, lean air/fuel ratios, low octane fuel or over advanced ignition timing.

Spark plug condition photos courtesy of AC Spark Plug Division, General Motors Corporation

CHAPTER TEN

EMISSION CONTROL SYSTEM

This chapter covers emission control and exhaust systems. The emission devices used include crankcase emission controls, an exhaust emission system, and evaporative emission controls.

EXHAUST EMISSION CONTROL SYSTEM

Two methods of exhaust emission control are used on the Datsun. One is an air injection system, the other consists of engine modifications. Datsuns were equipped with the air injection system only through 1970. Since then, all models have combined air injection with engine modifications. Emission servicing is complex, and should be left to qualified professionals.

Figure 1 illustrates the system used through model year 1969. Figure 2 is the system used after 1970. Figures 3 through 7 offer details of various emission components.

Maintenance and Testing

Periodic inspection and service should be done every 12 months or 12,000 miles. The engine must be in good working order to maintain a low level of harmful emissions. Therefore, perform a general tune-up as specified in Chapter Four before following the procedures below.

CRANKCASE EMISSION CONTROL SYSTEM

The crankcase emission control system is shown in Figure 8. It is a closed system that prevents crankcase gases from escaping to the atmosphere. Blowby gases are directed to the intake manifold through the ventilation control valve. Normally, capacity of the valve is sufficient to handle the blowby gas plus a small amount of ventilating air, drawn from the air cleaner through a tube leading to the crankcase. Under full throttle conditions, manifold vacuum is insufficient to draw the blowby through the valve. When this happens, blowby flows through the system in the reverse direction.

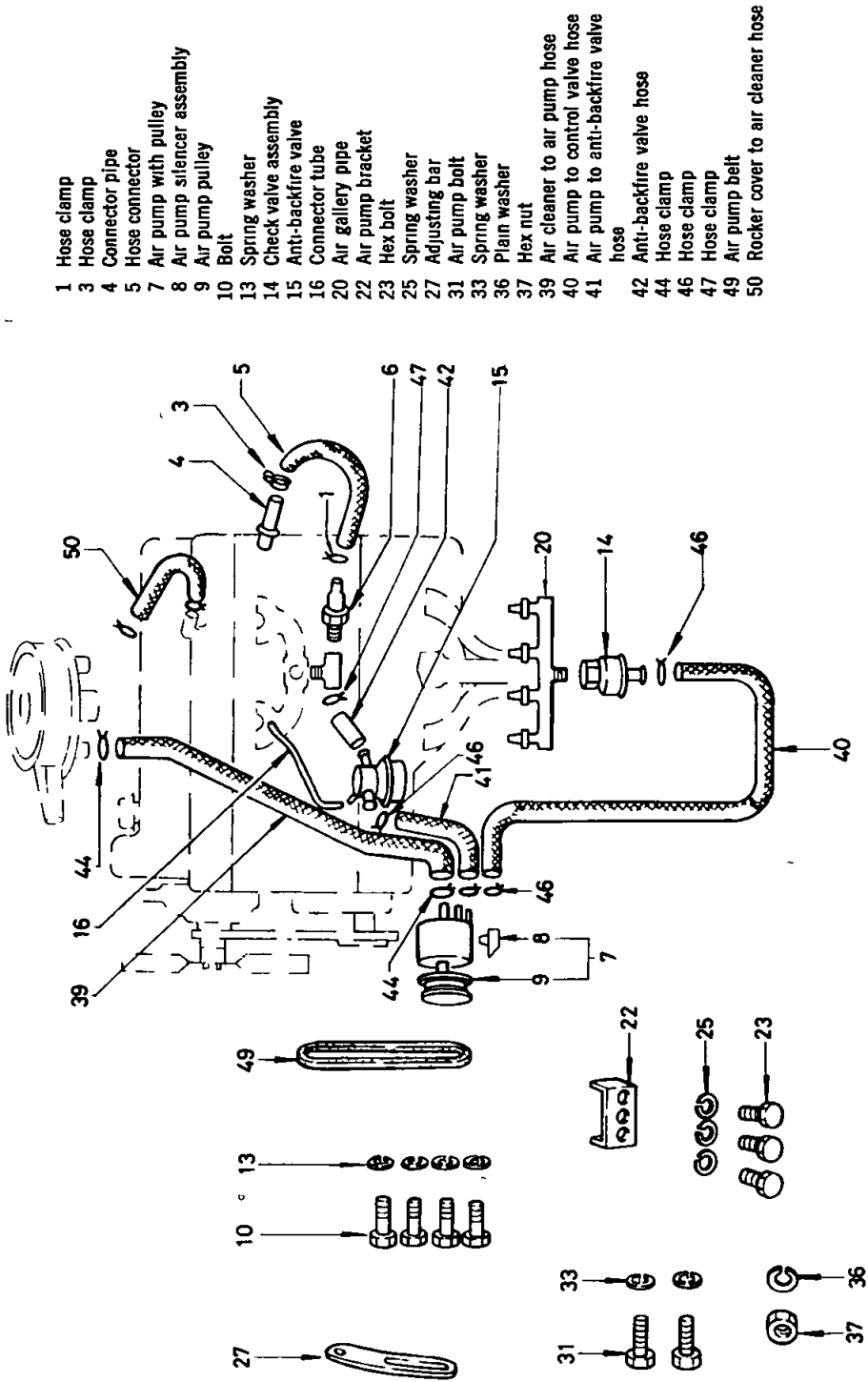
General

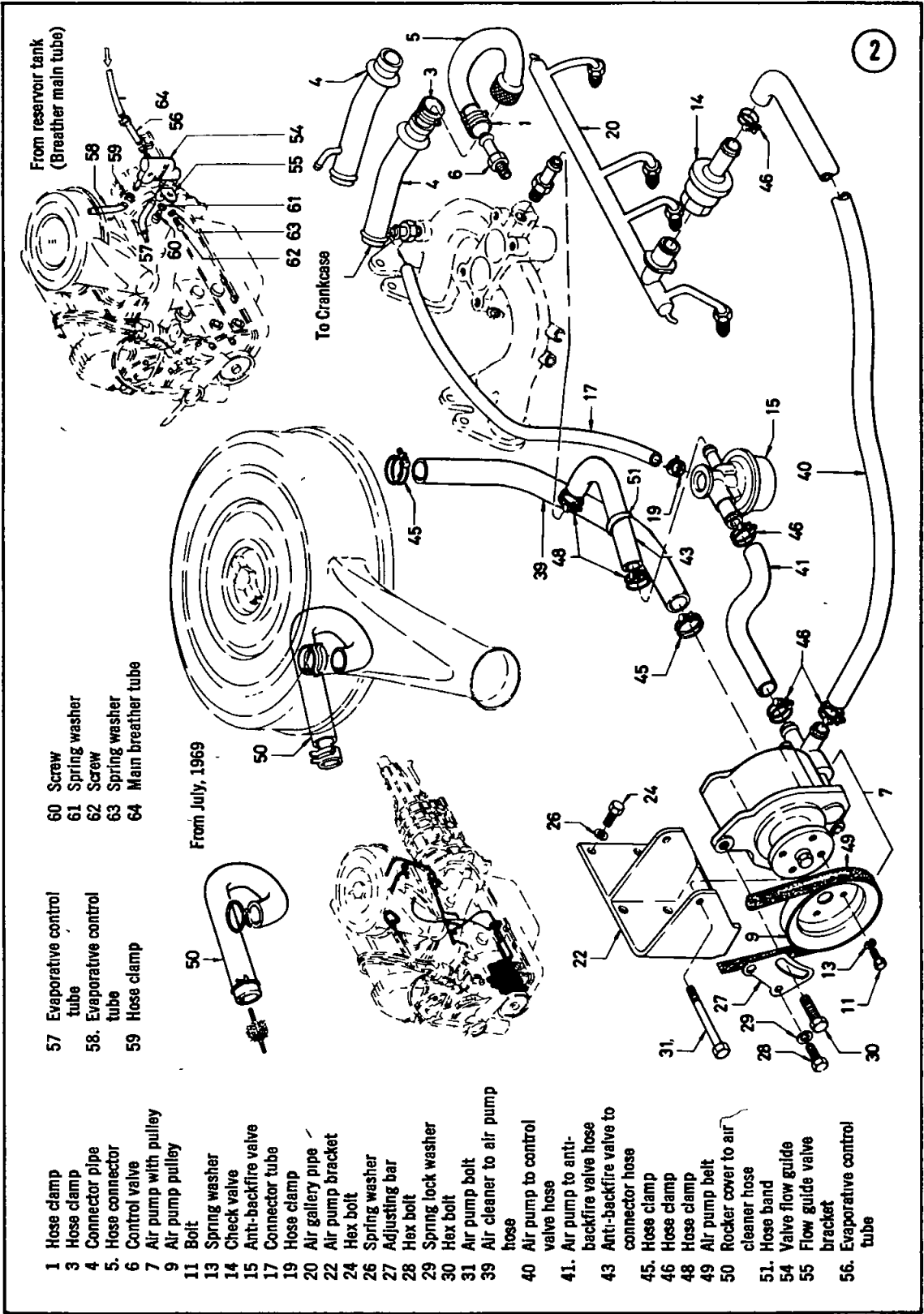
1. Start the engine and bring up to operating temperature.
2. Check hoses and hose connections for leaks.
3. Examine the hoses for signs of cracks or deterioration. Replace as required.

Crankcase Ventilation Control Valve

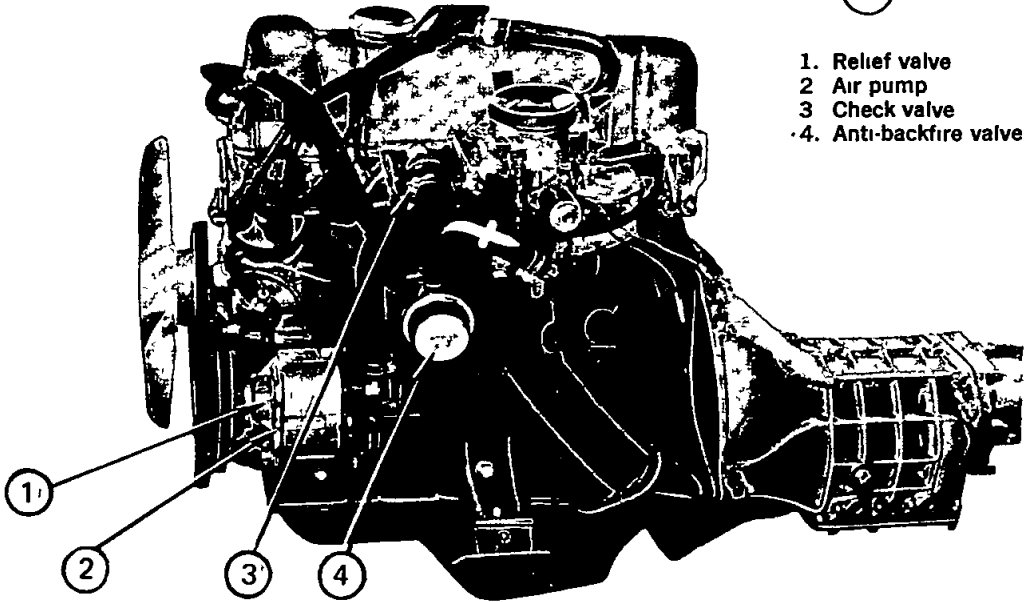
1. Start the engine.
2. Remove the ventilator hose from the crankcase ventilation control valve. A hissing noise

1

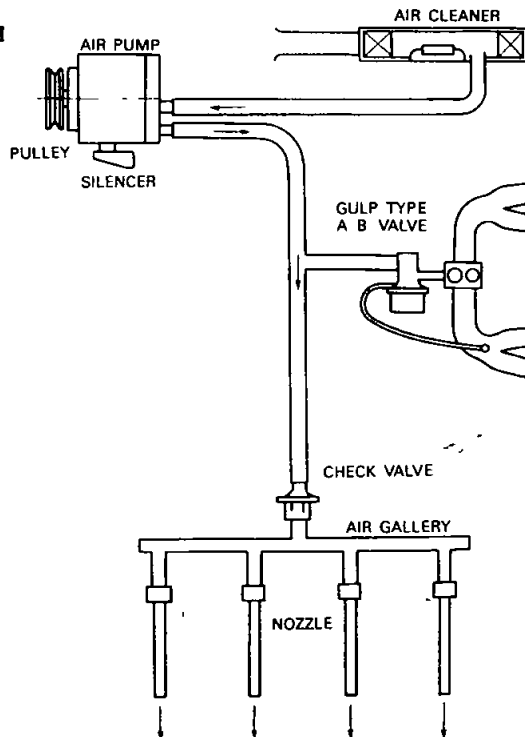


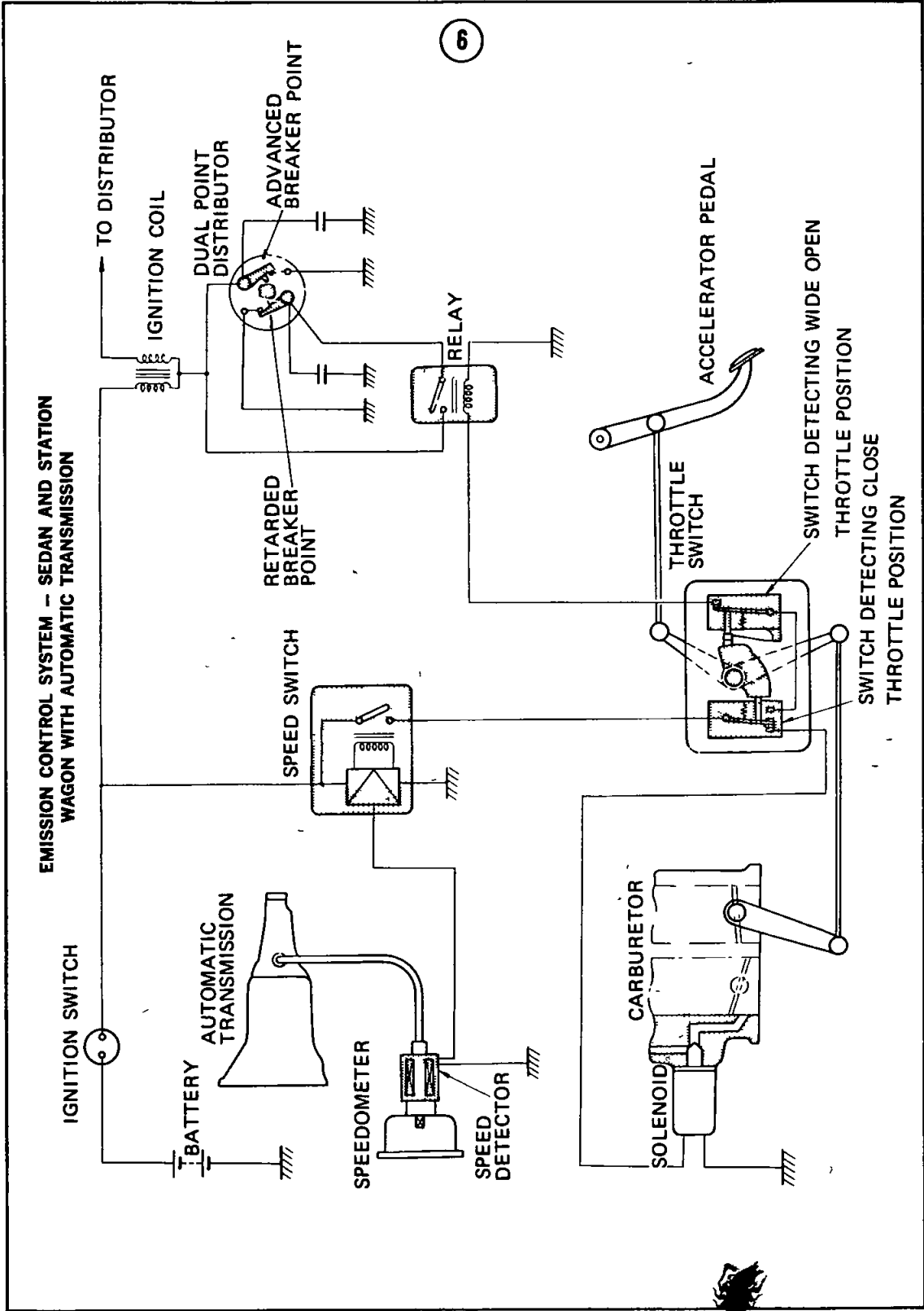


ENGINE EMISSION CONTROL COMPONENTS



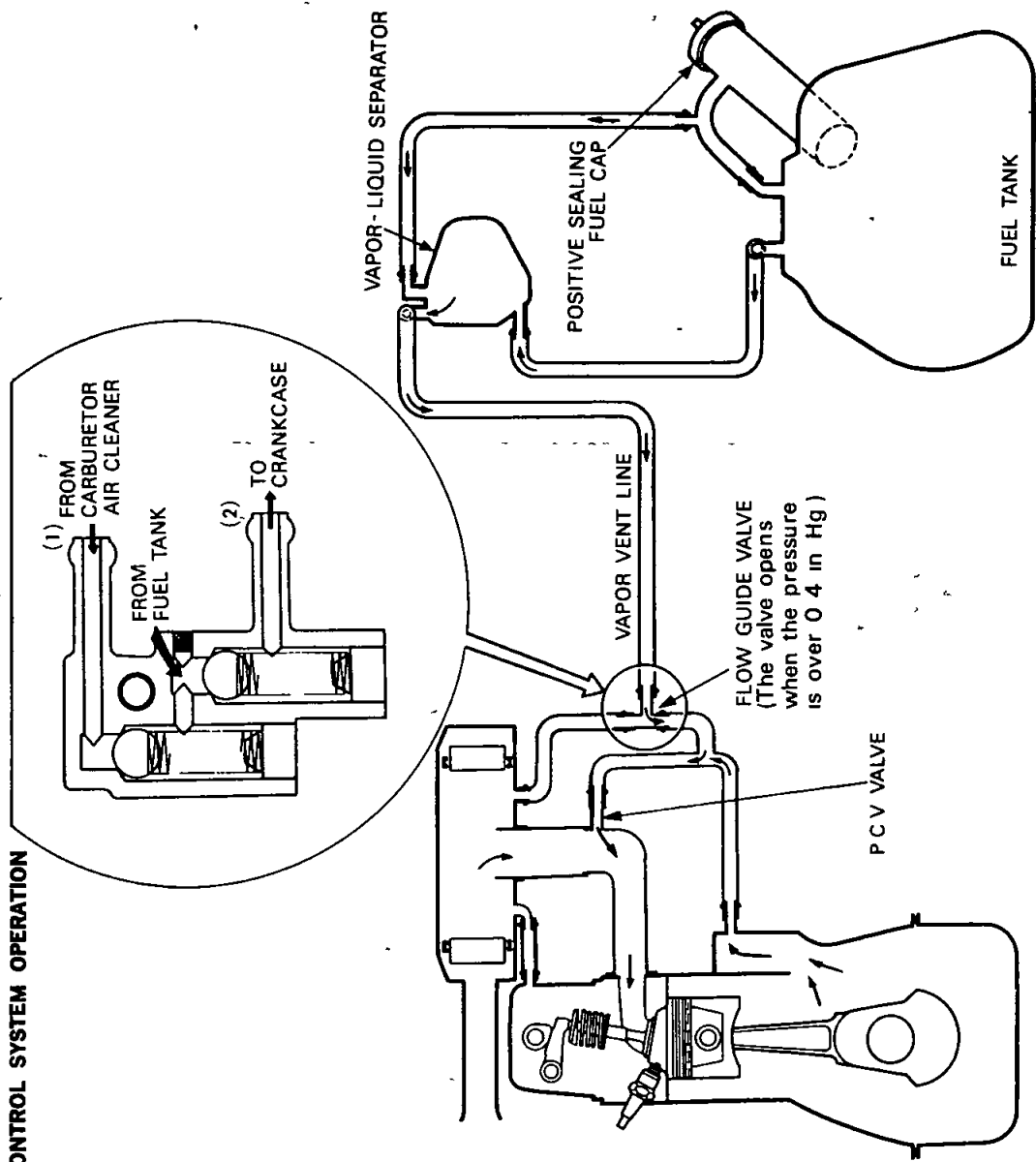
AIR INJECTION SYSTEM

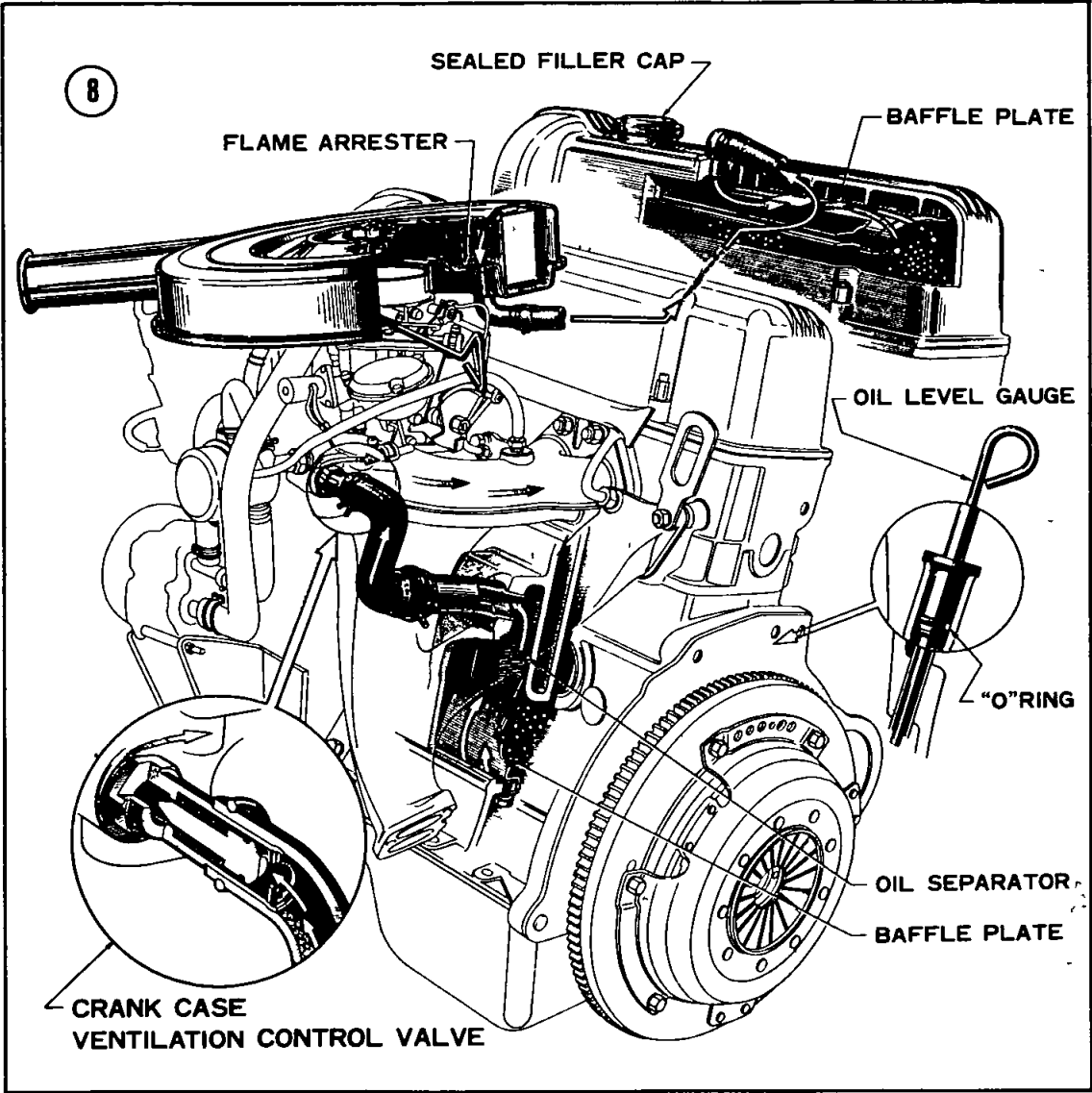




7

EMISSION CONTROL SYSTEM OPERATION





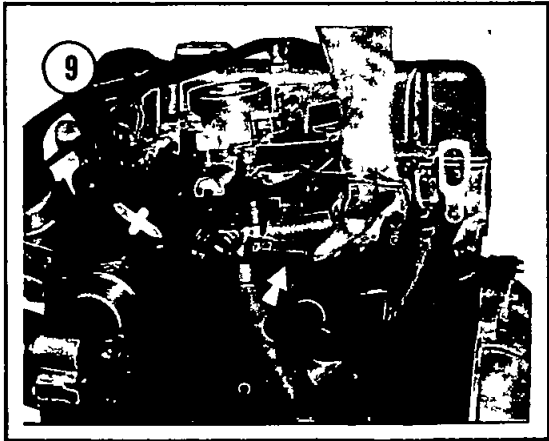
will be heard if the valve is working. Place a finger over the valve inlet, as shown in **Figure 9**. A strong vacuum should be felt. If the valve is not operating properly, replace it. Do not attempt to clean it.

3. Check the ventilator hose for obstructions and cracks. Clean with solvent or replace as required.

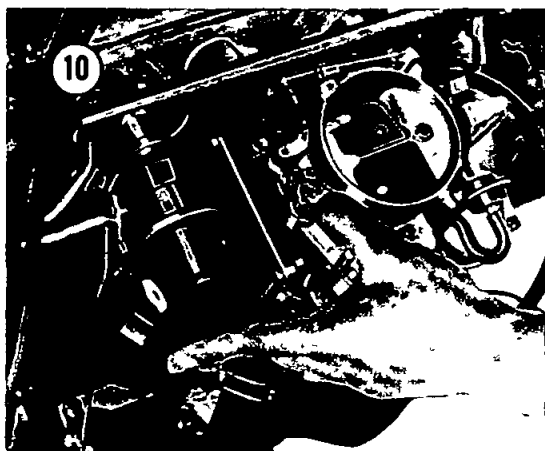
AIR INJECTION SYSTEM

Check Valve

This test can be performed at the same time as the air pump test.



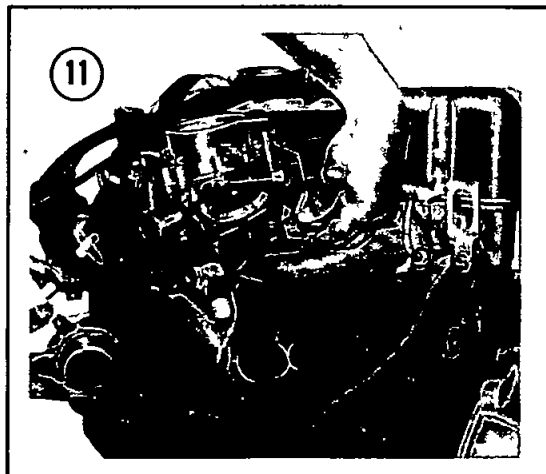
- 1 Start the engine and bring it up to normal operating temperature
- 2 Inspect all hoses and connections for leaks and deterioration. Shut off the engine. Replace any defective hoses
3. Remove the hose attached to the check valve
- 4 Visually inspect the position of the valve plate inside the valve body. See **Figure 10**. It should be lightly positioned against the valve seat away from the air distributor manifold.



- 5 Insert a probe into the valve connection on the check valve. Depress the valve plate. It should return freely against the valve seat when released.
- 6 Leave the hose disconnected and start the engine.
- 7 Slowly increase engine speed to 1,500 rpm. Watch for exhaust gas leakage at the check valve. There should not be any. The valve may flutter or vibrate at idle speeds. This is normal. Replace the valve if defective.

Anti-Backfire Valve

- 1 Start the engine and bring to operating temperature
- 2 Inspect all hoses and hose connections for leaks and deterioration. Replace as required.
- 3 Disconnect the hose at the anti-backfire valve leading to the intake manifold. Insert a plug in the hose and fasten securely.
- 4 Open and close the throttle valve rapidly. See **Figure 11**. Place a finger over the valve outlet to the intake manifold. If air flow is felt for one to



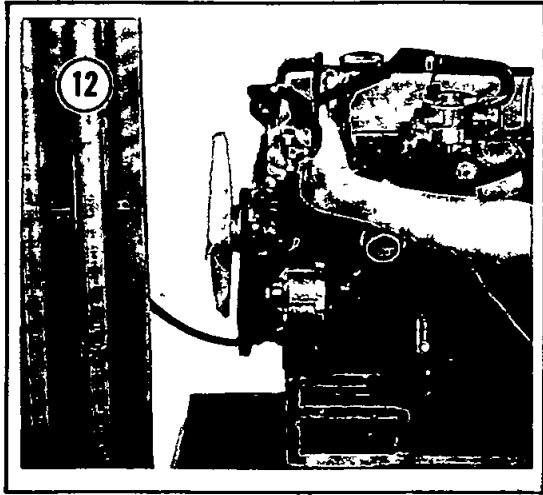
two seconds, the valve is functioning properly. If there's no air, or if the flow is felt for more than two seconds, the valve is defective and must be replaced.

- 5 Connect the air hose to the intake manifold, after removing the plug.

- 6 Disconnect the air inlet hose from the air pump at the anti-backfire valve. If the engine idle speed changes excessively, the valve is defective and must be replaced.

Air Pump

1. Check the air injection pump belt tension. Deflection of the belt should be 0.5 in. when pushed in by thumb pressure. Adjust belt if necessary.
2. Operate the engine until normal temperature is reached.
3. Inspect all hoses, hose connections, and the air gallery for signs of leaks or deterioration. Replace as required.
- 4 Disconnect the air supply hose at the check valve.
- 5 Insert the open pipe end of a pressure test gauge adapter into the air supply hose. See **Figure 12**. Clamp the adapter firmly to the hose. Install the pressure test gauge to the adapter. Position the adapter and test gauge so that the air blast emitted through the drilled pipe plug will be harmlessly dissipated.
6. Install a tachometer on the engine. With the engine speed set to 1,500 rpm, observe the pressure reading. Air pressure should be 0.47 in. Hg (16mm Hg).



7 If the pressure does not meet requirements, disconnect the air supply hose to the anti-backfire valve. Clamp a plug into the hose and repeat the pressure test.

8 If the air injection pump does not meet the pressure specification, it should be replaced.

NOTE Repair of the air injection pump is possible, but have the job done by your dealer.

9 Close the hole of the test gauge by finger with the engine running at 1,500 rpm. See Figure 13. If a leaking sound is heard or leaking air is felt at the relief valve, the relief valve is defective. Repair or replace as required.



ENGINE MODIFICATIONS SYSTEM

Testing and maintenance of the switches, relays, and solenoids comprising the engine modifications requires special knowledge and test equipment. If the mechanic suspects that troubles exist in these parts, check with a dealer. Maintenance of the distributor breaker points and timing of engines is covered in Chapter Four.

EVAPORATIVE EMISSION CONTROL SYSTEM

Detailed information on the fuel tank and connecting fuel lines is given in Chapter Seven.

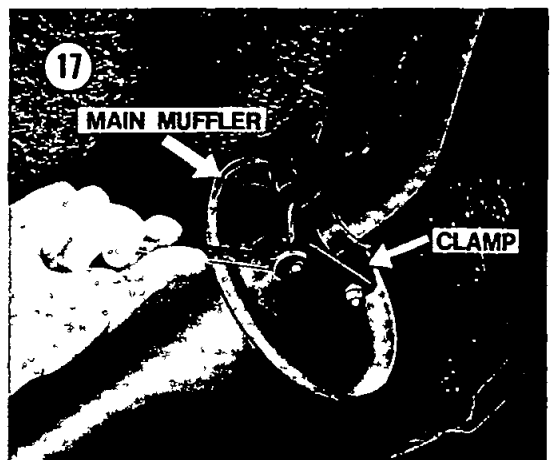
EXHAUST SYSTEM

Figures 14 (next page), 15 (page 125), and 16 (page 126) are exploded views of the exhaust systems. Figure 14 applies to the sedan, Figure 15 to the wagon, and Figure 16 to the pick-up.

The system in sedans and wagons consists of the front tube, pre-muffler, center tube, rear tube, main muffler, and tail pipe. The pick-up exhaust system includes the front tube, muffler, and rear tube.

Removal (Sedan and Wagon)

1 Loosen clamps at the front tube, center tube, and main muffler connections. See Figure 17.

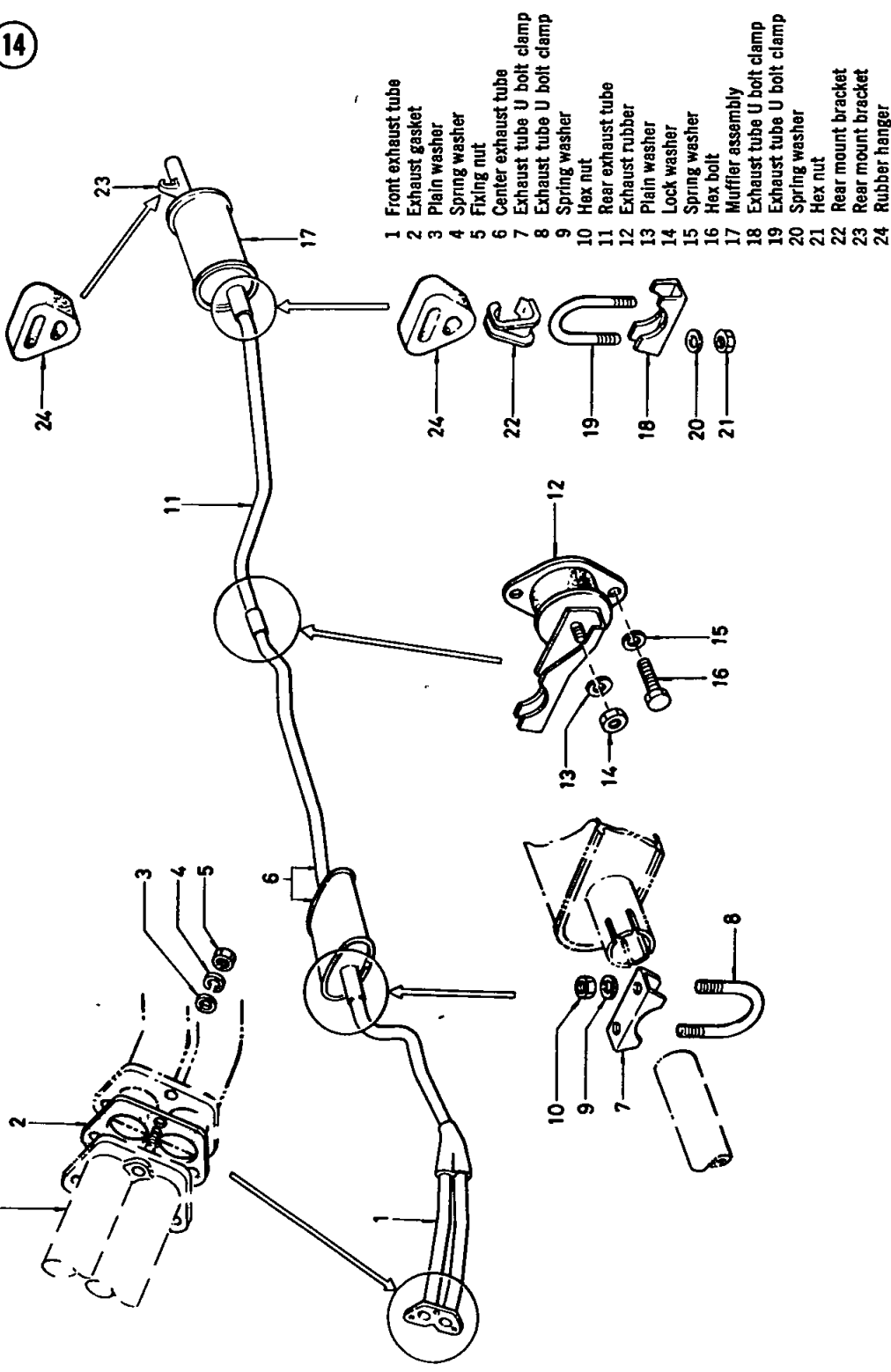


2 Disconnect front tube and exhaust manifold flange connection.

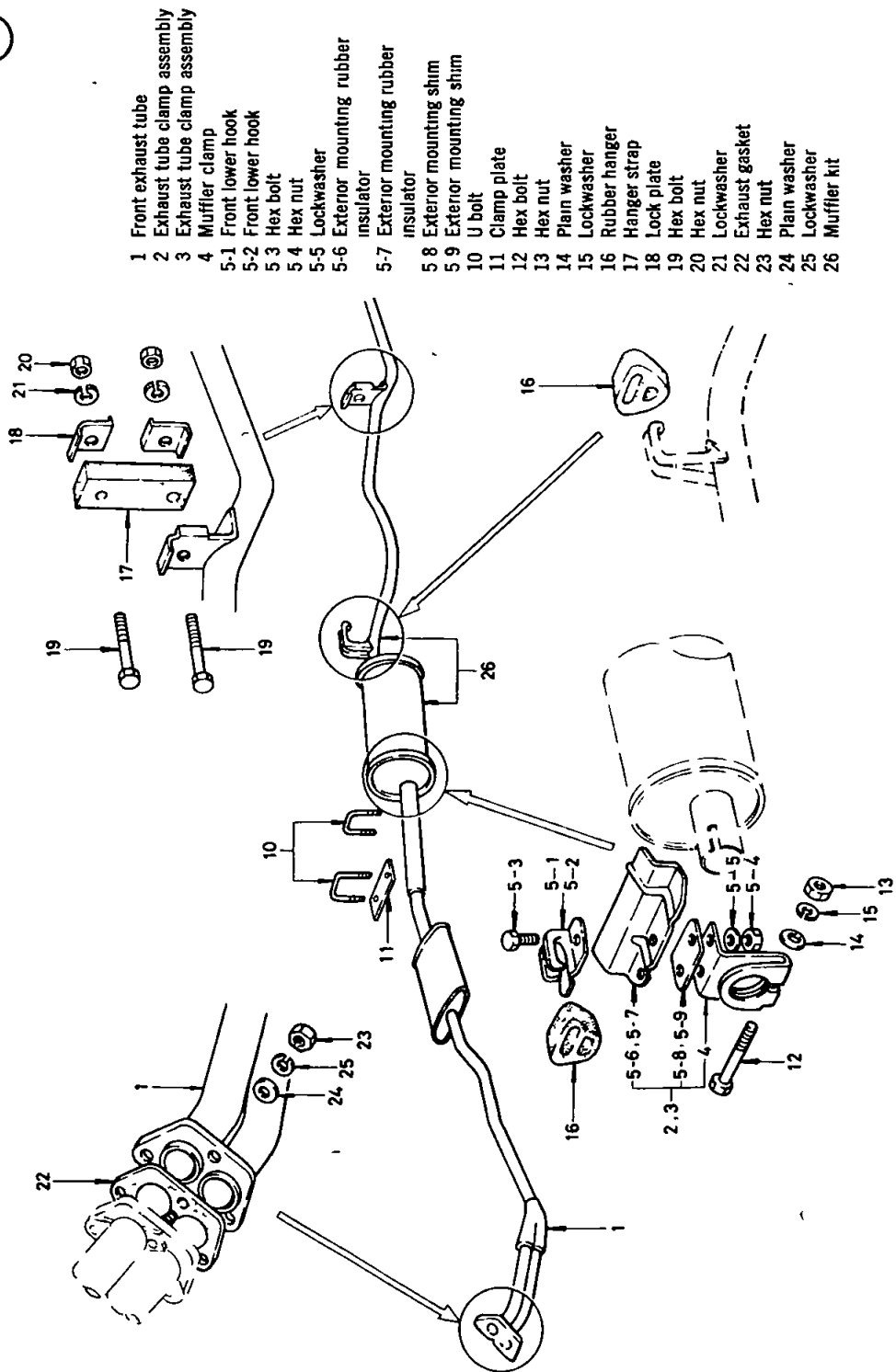
3. Remove units from vehicle.

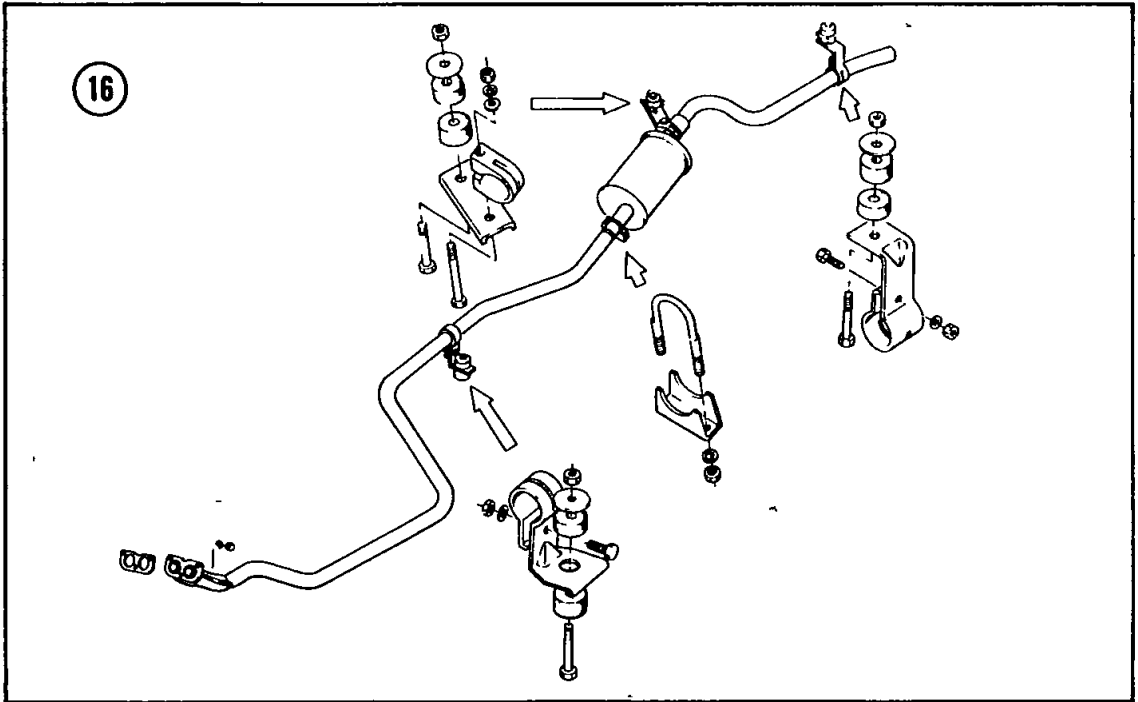
14

EXHAUST MANIFOLD



15





Removal (Pick-up)

- 1 Remove mounting clips and U bolt See Figure 16
- 2 Disconnect front tube and exhaust manifold flange connection.
- 3 Remove exhaust system from vehicle.

Inspection

1. Check for damage at tube flanges Replace if defective

2 Check for distortion, damage, or deterioration of tubes and mufflers. Replace or repair as required

3 Check for damage to hanger straps, mounting clips, U bolts, and rubber insulators Remove and replace as required.

Installation

Install the units in the reverse of removal After installation, run the engine and check for exhaust gas leaks

CHAPTER ELEVEN

CLUTCH, TRANSMISSION, AND DRIVESHAFT

CLUTCH

Description

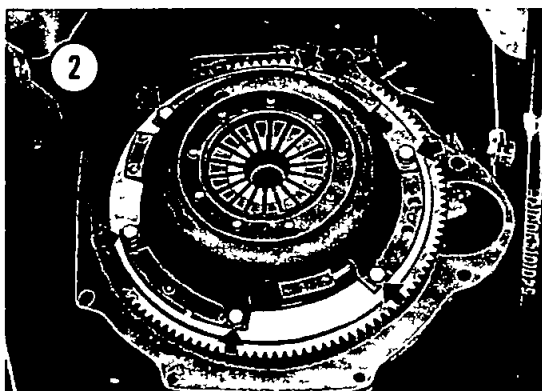
Datsun uses a single, dry-disc clutch with diaphragm spring. The major components are clutch cover, pressure plate, diaphragm spring, and wire rings. The clutch disc has riveted plates on both surfaces and coil springs arranged in a link. The coil springs absorb shock to soften and smooth clutch engagement. **Figure 1** (next page) is an exploded diagram of the clutch assembly.

Clutch Removal

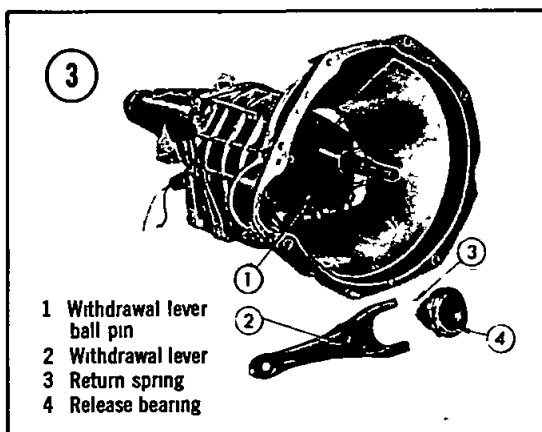
The transmission must be separated from the engine to remove the clutch assembly. This can be done by removing the transmission and engine from the vehicle as a unit or by removing the transmission separately. Removal of the engine and transmission is described in Chapter Six. Removal of the transmission only is described later in this chapter.

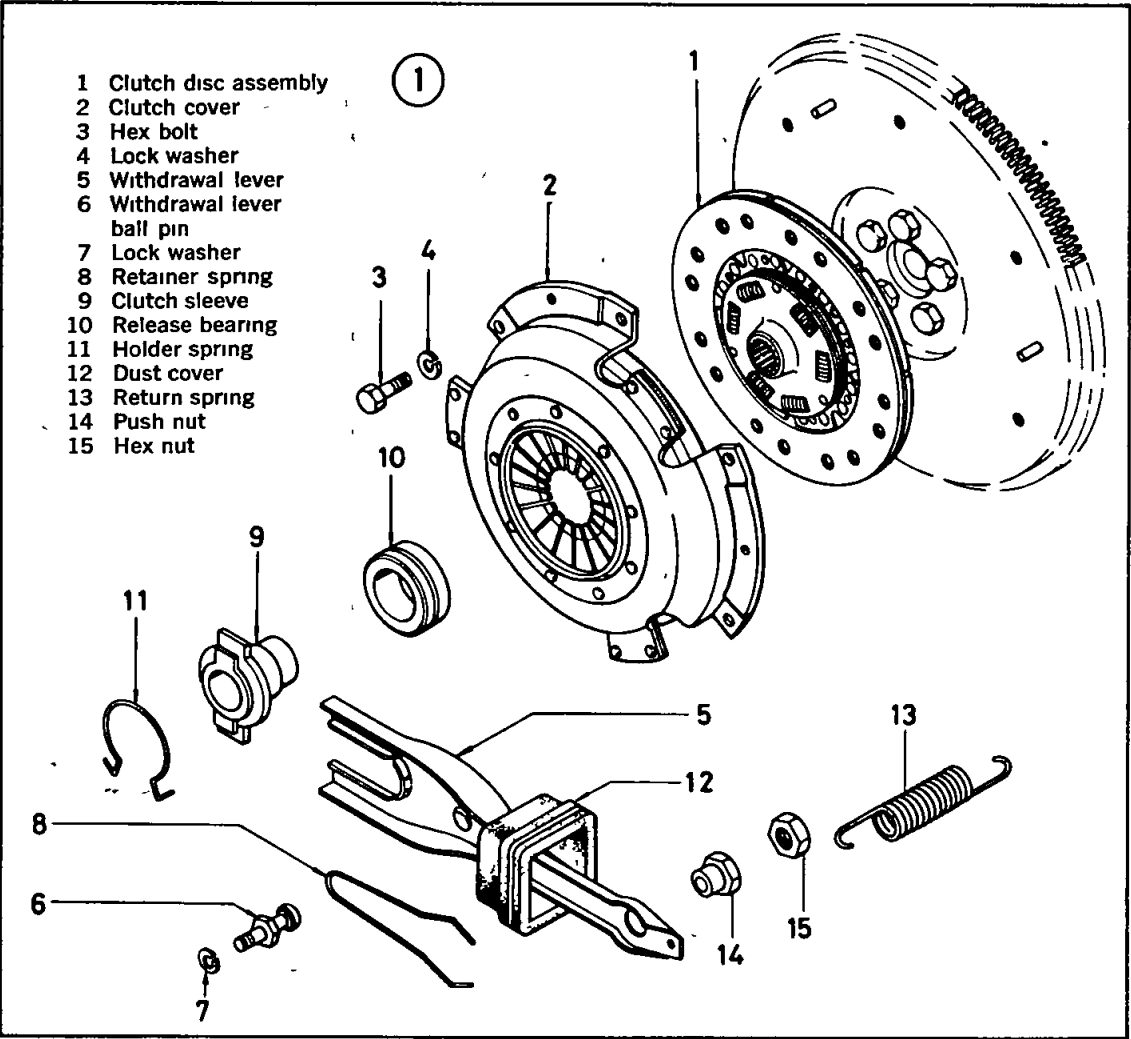
Clutch Disassembly

- 1 Separate clutch assembly from flywheel. Loosen and remove bolts diagonally and gradually, as shown in **Figure 2**.
2. Remove dust cover from clutch housing.
- 3 Remove return spring from bearing sleeve. Separate the withdrawal lever from bearing sleeve.

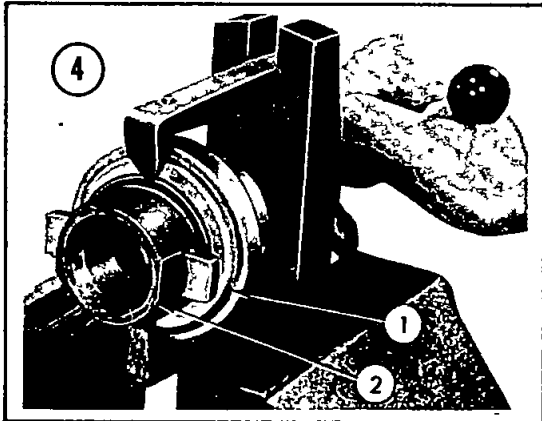


- 4 Remove release bearing and bearing sleeve from front cover. Remove withdrawal lever ball pin, **Figure 3**.





5 Use a bearing puller to separate the release bearing from the bearing sleeve, as shown in Figure 4



Clutch Inspection and Repair

- 1 Thoroughly clean all disassembled parts, except for the disc assembly and release bearing, in a suitable solvent
- 2 Check all parts carefully for wear, cracks, and other defects
- 3 Check the clutch disc for oil-soaked or cracked facings, warping, loose rivets, excessive wear, and broken springs.
- 4 Check the pressure plate for scoring, burn marks (blue tinted areas), and cracks

If any of the above conditions are found, replace the clutch disc and/or the pressure plate. Replace disc assembly if facing is worn so that the facing height above the rivet is less than 0.0118 in (0.3mm). Very minor burn marks and

scratches on the pressure plate may be removed with crocus cloth.

If the source of clutch trouble is still not evident, take the pressure plate and disc to a competent garage to check the pressure plate finger release height and runout. Never attempt to adjust the fingers or dismantle the pressure plate without proper tools and experience.

Check the release bearing by holding the inner race and rotating the outer race with light pressure applied. If the bearing is rough or noisy, replace it.

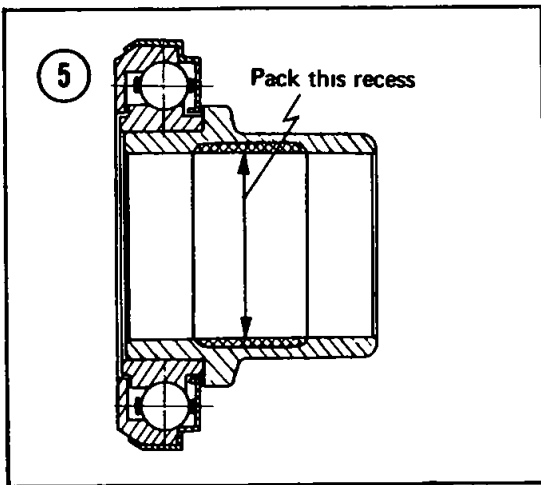
CAUTION

Never clean the release bearing in solvent. It is prelubricated at the factory. Simply wipe with a lint-free cloth.

If the release bearing shows any signs of loss of lubricant, install a new bearing. Replace the sleeve if signs of wear are evident.

Clutch Reassembly

- 1 Be sure your hands are clean for the initial assembly.
- 2 Inspect the clutch facings, pressure plate, and flywheel to be sure they are free from grease, oil, and other foreign material.
3. Tightly fit release bearing onto the bearing sleeve. When bearing is installed, turn bearing with a finger to make sure it operates smoothly.
- 4 Apply multi-purpose grease to the bearing sleeve inside groove. See Figure 5



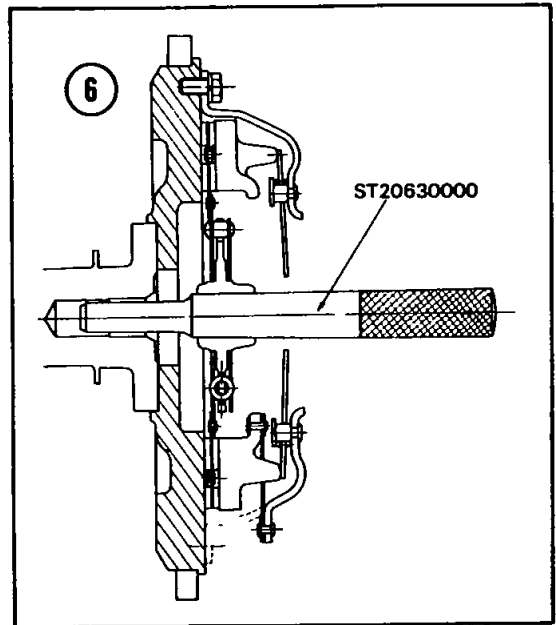
5. Apply multi-purpose grease to the withdrawal lever and bearing sleeve contact point,

and to the withdrawal lever ball pin and withdrawal lever contact point.

- 6 Clean the clutch pilot bushing, and fill it with multi-purpose grease.

- 7 Mount the withdrawal lever, release bearing, and bearing sleeve to the clutch housing. Install dust cover on clutch housing and connect return spring to withdrawal lever.

8. Place the pressure plate and clutch disc in position on the flywheel. Make certain the pressure plate is in the same position relative to flywheel as when removed. Use a clutch aligning bar (Special Tool ST20630000, Figure 6) to align the clutch disc spline to the pilot bearing.



NOTE: *If the special tool is not available, cut an input shaft from a junk transmission.*

9. Install the pressure plate mounting bolts. Tighten the bolts diagonally opposite each other one turn at a time to prevent warping. Torque the bolts to 10.8 to 15.9 ft.-lbs. (1.5 to 2.2 kg/m). Remove dummy shaft.
10. Install the clutch housing to the engine.

Clutch Control

Datsuns have a hydraulic clutch control system. It consists of a pendant clutch pedal,

master cylinder, operating cylinder, and withdrawal lever. **Figure 7** shows all components, while **Figures 8 and 9** are exploded views of the master cylinder and operating cylinder for models since 1970. Prior models are similar in construction.

MASTER CYLINDER

Master Cylinder Removal (Sedans and Wagons)

1. Remove clevis pin installed at the pushrod.
2. Disconnect clutch hose from the master cylinder and drain fluid.
3. Remove bolts to free master cylinder.

Master Cylinder Removal (Pick-up)

1. Disconnect pushrod from clutch pedal.
2. Disconnect clutch hose from master cylinder and drain fluid.
3. Remove bolts to free master cylinder.

Master Cylinder Disassembly

1. Remove filler cap and drain fluid.
2. Pull back dust cover and remove snap ring.
3. Remove stopper, pushrod, piston assembly, cup, and return spring.

Master Cylinder Inspection

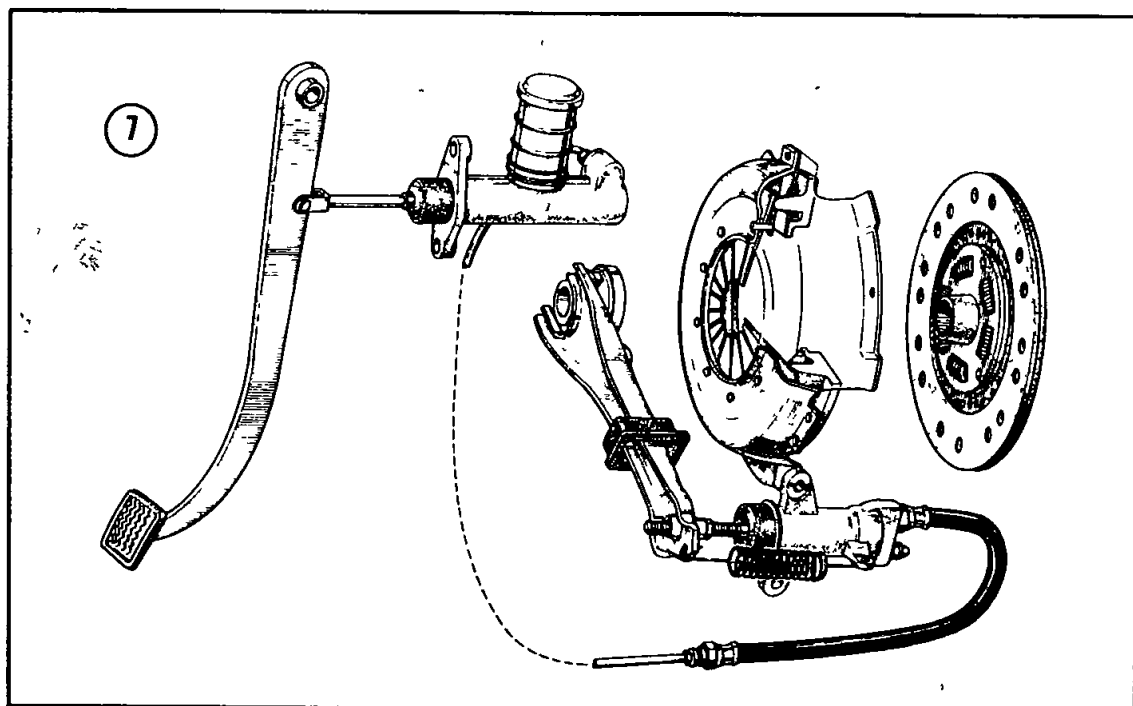
1. Clean all parts thoroughly in clean brake fluid.
2. Check cylinder and piston for wear or damage. Replace as required.
3. Check the clearance between cylinder and piston. If clearance is larger than 0.005 in (0.13mm), replace the cylinder.
4. Replace the piston cup whenever it is removed from the cylinder, or when it shows signs of wear or damage.
5. Check all other parts for wear or damage and replace as required.

Master Cylinder Assembly

1. Soak piston cup in brake fluid.
2. Install piston cup.
3. Coat the cylinder and piston thoroughly with brake fluid and assemble.
4. Replace other parts in the reverse order of removal.

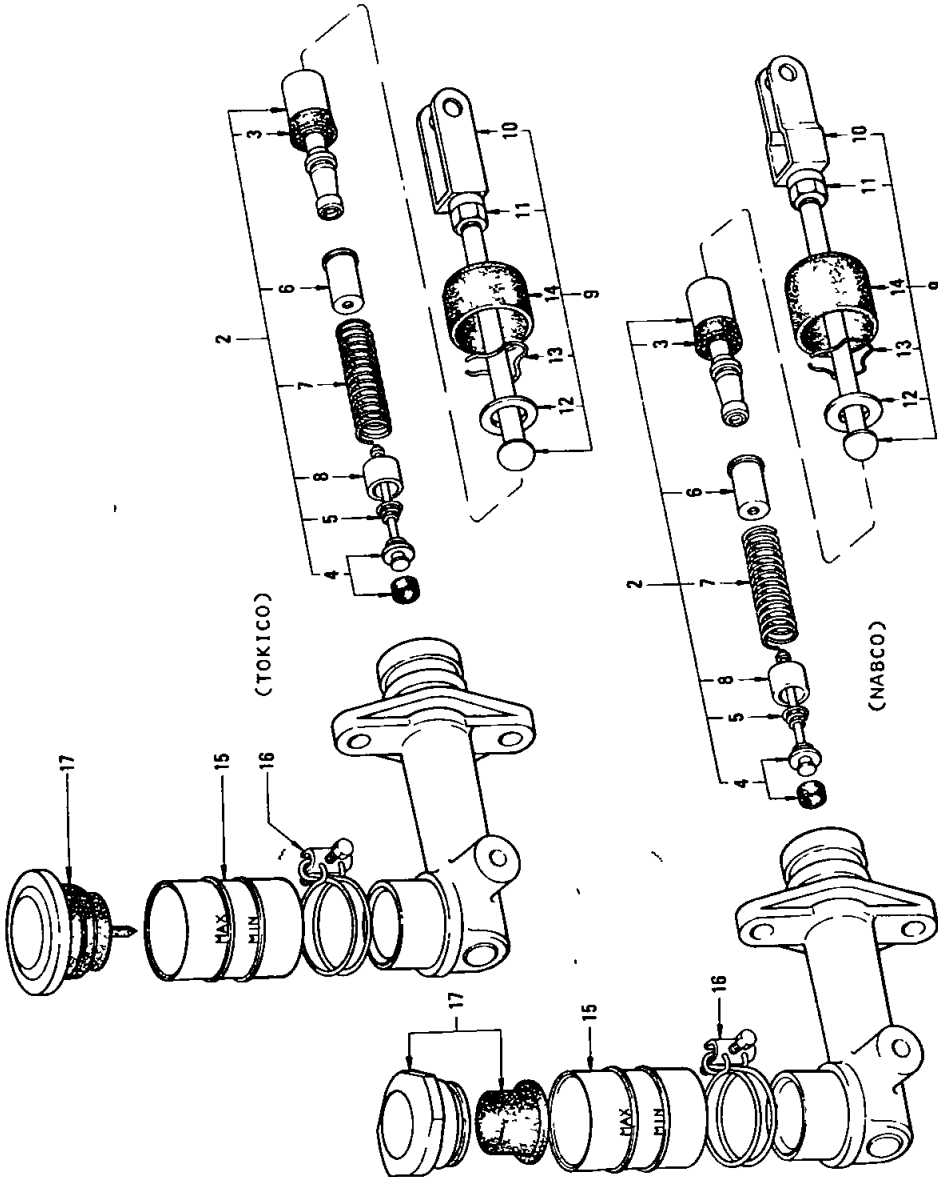
Master Cylinder Installation

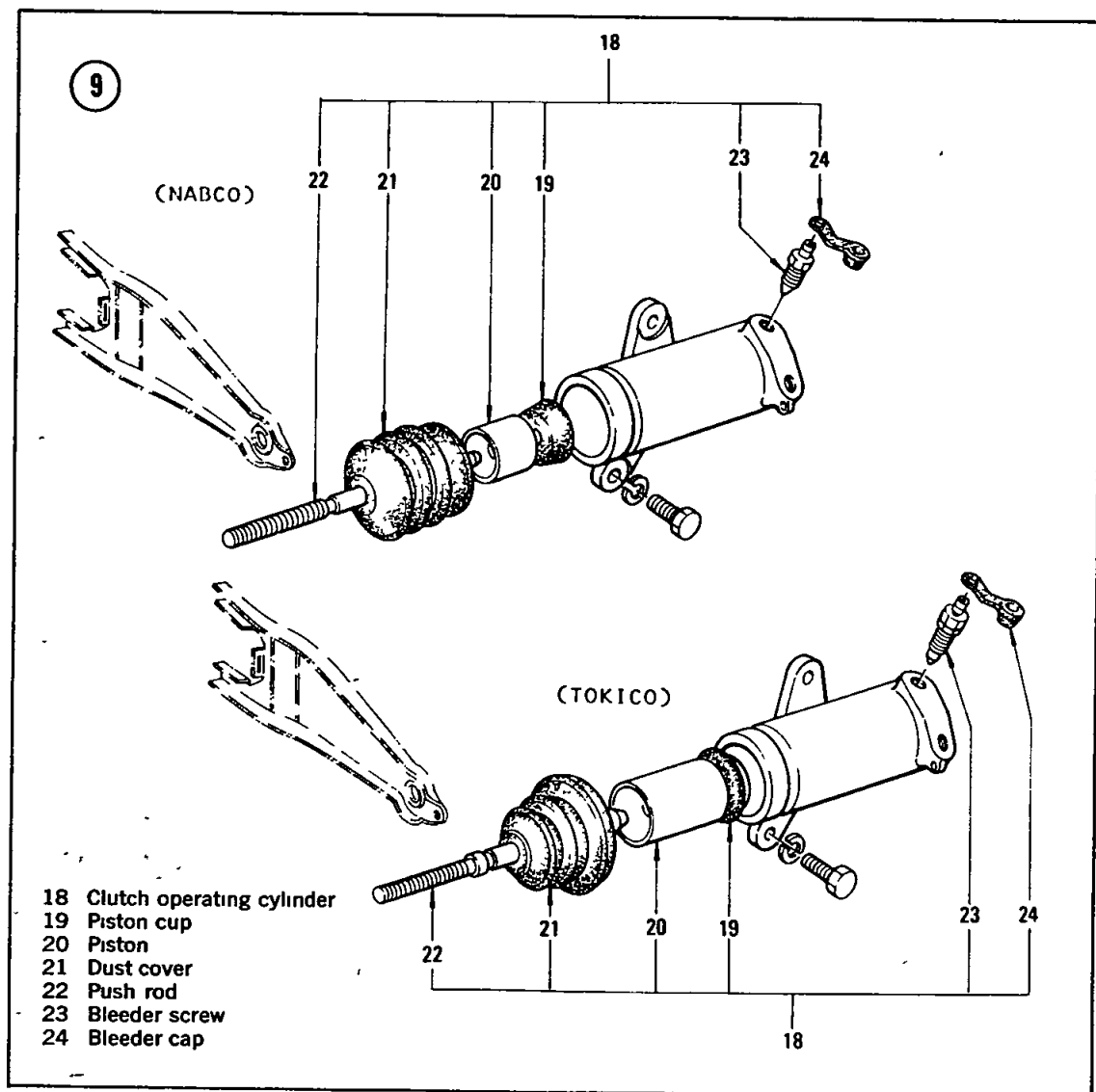
1. Bolt the master cylinder into position.
2. Adjust clutch pedal height by adjusting the pushrod length. Pedal height from floorboard.



8

- 2 Piston assembly
- 3 Piston cup
- 4 Valve assembly
- 5 Valve spring
- 6 Spring seat
- 7 Return spring
- 8 Spring seat
- 9 Push rod assembly
- 10 Push rod head
- 11 Nut
- 12 Stopper
- 13 Stopper ring
- 14 Dust cover
- 15 Oil reservoir
- 16 Reservoir band assembly
- 17 Reservoir cap





should be 8 150 in. (207mm) for the sedan and wagon. Pedal height should be 5 91 in (150mm) for the pick-up.

3 Apply multi-purpose grease to all pivot points.

4 Bleed all air out of the system as discussed below.

OPERATING CYLINDER

Operating Cylinder Removal

1 Remove return spring.

2 Disconnect clutch line from operating cylinder.

3 Disconnect pushrod from withdrawal lever.

4 Release two bolts holding operating cylinder to clutch housing.

5. Remove operating cylinder from clutch housing.

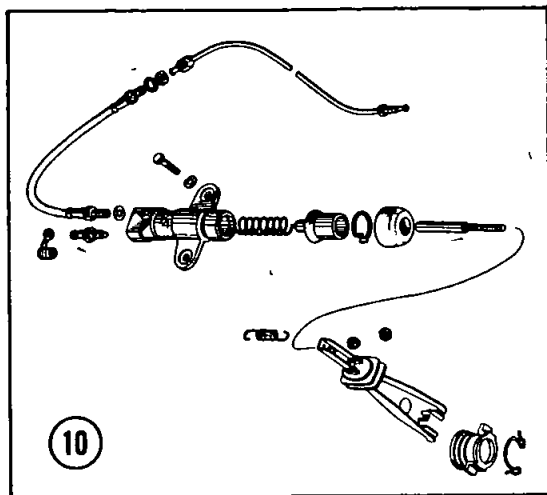
Operating Cylinder Disassembly

1 Remove dust cover.

2 Remove snap ring. All other parts can now be removed. See Figure 10.

Operating Cylinder Inspection

Check all parts, especially the piston cup, for wear and damage. Replace if defects are found.



Operating Cylinder Reassembly

- 1 Soak piston cup in brake fluid and install it in the same position as before removal.
2. Apply brake fluid to the cylinder and piston before installing piston.
- 3 Replace all parts in the reverse order of removal

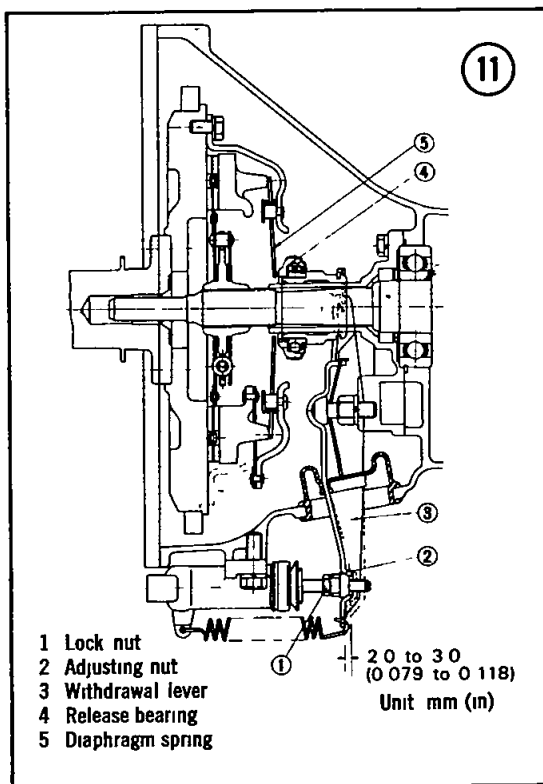
Operating Cylinder Installation

- 1 Reinstallation is the reverse of removal
- 2 Bleed air from the hydraulic system
- 3 Adjust the pushrod so that withdrawal lever end play is 0.0787 to 0.1181 in. (2.0 to 3.0mm). Procedures for the adjustment are given below.

WITHDRAWAL LEVER ADJUSTMENT

Correct adjustment of the clutch withdrawal lever is essential. Insufficient free travel between the release bearing and diaphragm fingers can cause the clutch to slip. Excessive free travel can prevent full disengagement of the clutch. Refer to **Figure 11**.

- 1 Loosen lock nut.
2. Screw in the pushrod fully with the adjusting nut.
- 3 Unscrew adjusting nut $1\frac{3}{4}$ turns. Tighten lock nut.
- 4 Check the end play of the withdrawal lever. End play should be 0.0787 to 0.0906 in. (2.0 to 2.3mm). The correct end play will give a clearance of 0.0512 in. (1.3mm) between the release bearing and diaphragm fingers.



5. If the above adjustment does not result in satisfactory clutch operation, the clutch disc is probably worn excessively and will require replacement, as previously discussed.

BLEEDING CLUTCH SYSTEM

Air in the clutch hydraulic system makes shifting gears extremely difficult, if not impossible. To bleed the system, proceed as follows.

- 1 Remove the bleed screw dust cap from the operating cylinder.
- 2 Attach a bleeder hose to the bleed screw. Immerse the other end of the hose in a container of hydraulic brake fluid.
- 3 Check to see that clutch master cylinder reservoir is full of brake fluid. Replenish if necessary.
- 4 Open the bleeder screw three-quarters of a turn and have an assistant pump the clutch pedal slowly. Pump the clutch until the fluid entering the container is clean and free from bubbles.
5. Tighten bleed screw. Replace dust cap. Refill the fluid reservoir.

CLUTCH SERVICE DATA AND SPECIFICATIONS

Table 1 provides service data and specifications for the clutch system

TRANSMISSION

Description

Datsuns are equipped with either an automatic or manual transmission. Due to the complexity of the unit and the need for special tools and knowledge, overhaul of the automatic transmission is not covered in this manual. Automatic transmission checks and adjustments are given later in this chapter. Repair and maintenance should be referred to a Datsun dealer or qualified mechanic.

The manual transmission is a four-forward

speed unit controlled with a floor mounted lever. It consists of transmission case, rear extension housing, and gear assembly. The clutch housing and transmission case are a single unit. The rear extension housing is detachable. **Figure 12** shows the 4-forward speed transmission.

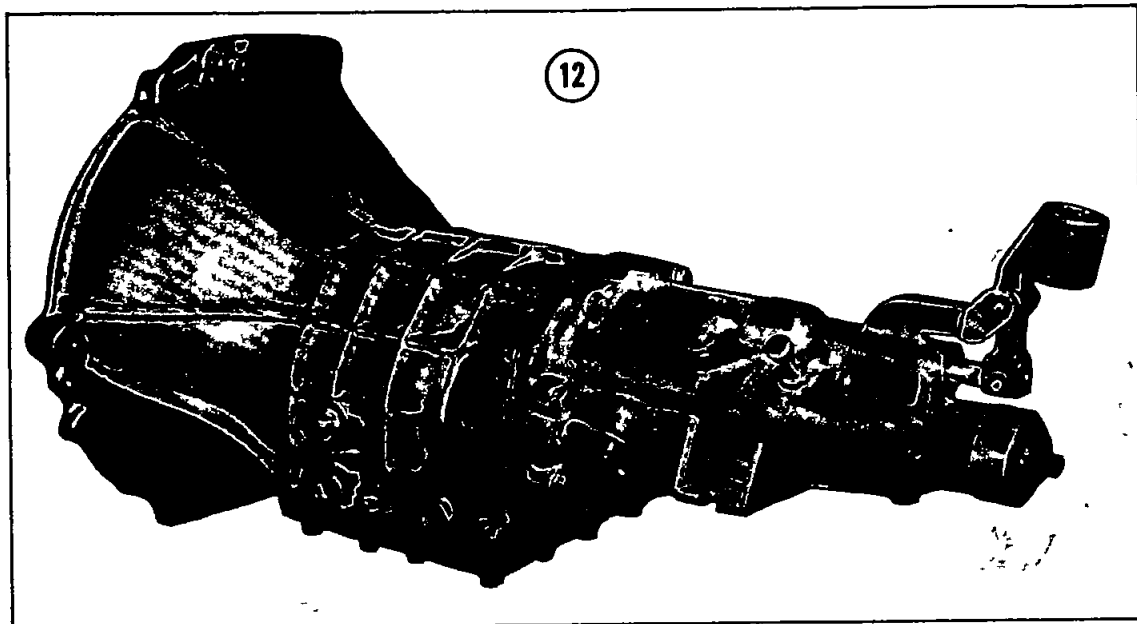
Transmission Removal

Removal of the transmission from different models varies according to the different structures involved. The following procedures generally apply to all types. Important differences are noted.

1. From inside the vehicle, remove the floor covering around the gear shift so that the shift lever can be removed.
2. Jack up the vehicle and support it with four

Table 1 CLUTCH SERVICE DATA AND SPECIFICATIONS

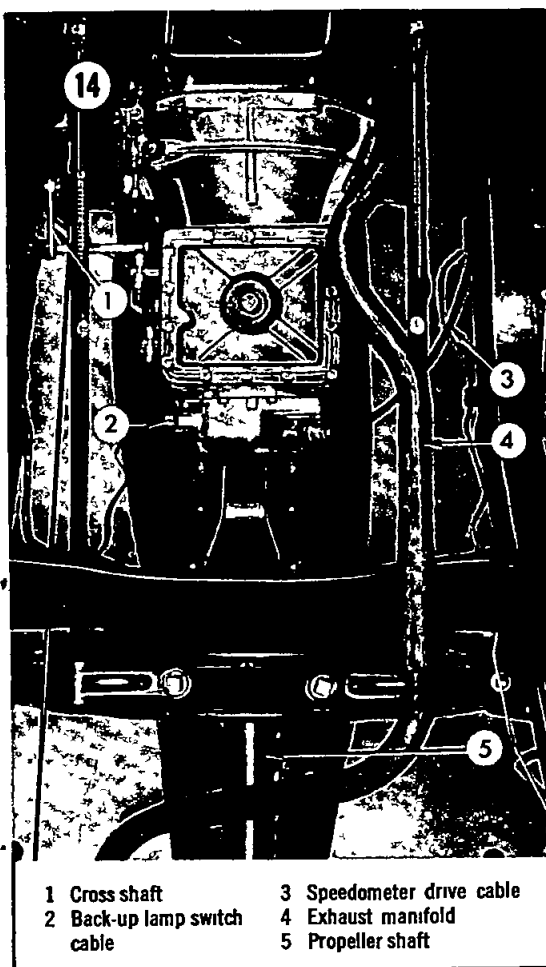
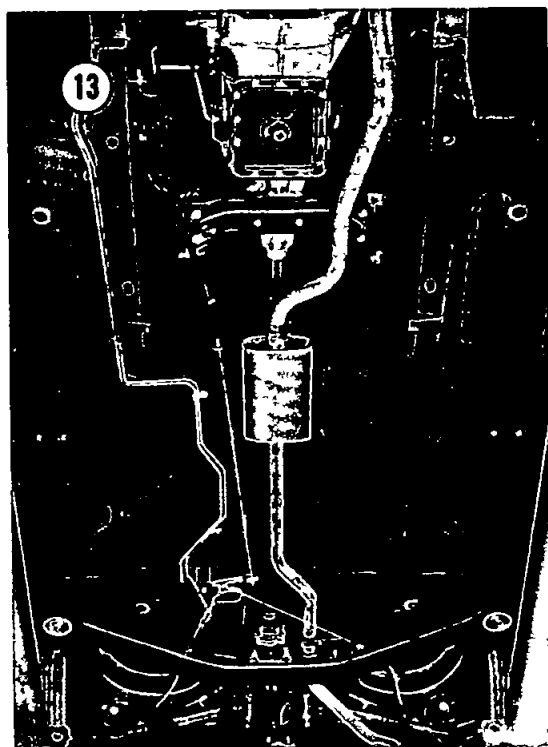
Pressure Spring	
Free length	2 059 in (52 3mm)
Fitted length and load	1 149 in /97 ± 4 4 lb (29 2mm/44 ± 2 kg)
Out-of-right angle	0 1968 per 3 937 in (5 per 100mm)
Minimum spring force	15%
Clutch Release Lever	
Release bearing-to-diaphragm clearance	0 0472 to 0 0551 in (1 2 to 1 4mm)
Diaphragm spring-to-flywheel height	1 732 ± 0 0394 in (44 0 ± 1 0mm)
Release lever-to-flywheel height	1 988 ± 0 0197 in (50 5 ± 0 05mm)
Clutch Disc	
Facing size	
Outer diameter x inside diameter x thickness	7 87 x 5 120 x 0 0140 in (200 x 130 x 3 5mm)
Thickness	
Free	0 3386 to 0 3543 in (8 6 to 9 0mm)
Compressed	0 3012 to 0 3130 in (7 65 to 7 95mm)
Number of torsion springs	6
Minimum depth of rivet head from facing surface	0 0118 in (0 3mm)
Allowable facing runout	0 097 in (0 5mm)
Allowable spline free play	0 0157 in (0 4mm)
Pressure Plate	
Allowable refacing limit	0 0394 in (1 0mm)
Clutch Pedal	
Height when not depressed	8 150 in (207mm)
Free stroke of pedal head	0 984 in (25mm)
Pressing strength at full stroke	33 lb (15 kg)
Clutch Master Cylinder	
Diameter	0 625 in (15 87mm)
Maximum clearance between cylinder and piston	0 0051 in (0 13mm)
Tightening Torque	
Clutch assembly securing bolt	17 4 to 18 8 ft -lb (2 4 to 2 6 kg/m)



stands If possible, the use of an open pit or hydraulic hoist is recommended.

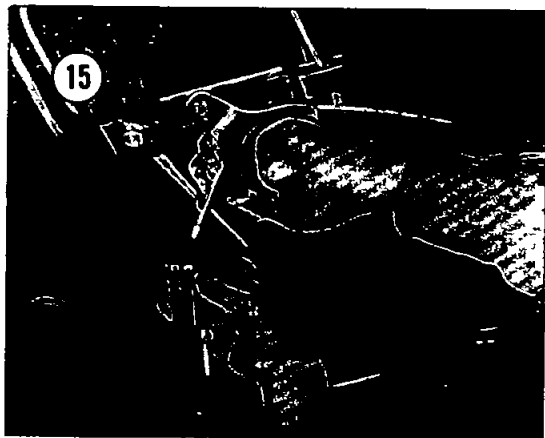
3 Figure 13 shows the underside of the sedan and station wagon Figure 14 is the pick-up.

4 Disconnect negative battery cable from terminal

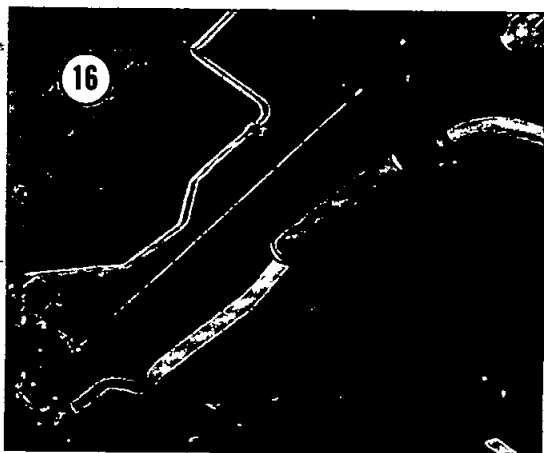


5 Disconnect and remove starter motor from flywheel housing as described in Chapter Nine

6 Disconnect handbrake wire at equalizer pivot. See **Figure 15** (sedan and wagon).



7 Loosen the two exhaust center pipe clamps and turn the pre-muffler complete with center pipe to the left as shown in **Figure 16** (sedan and wagon)

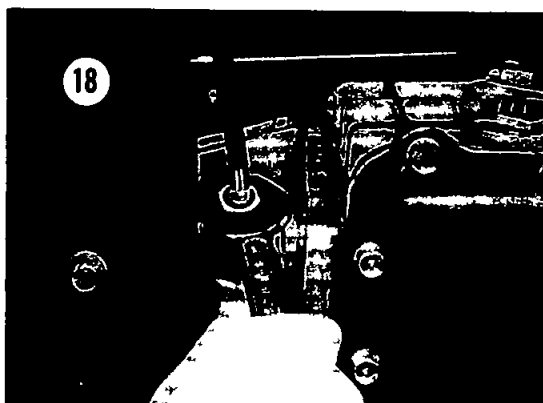


8. Disconnect front exhaust tube from exhaust manifold. (pick-up).

9 Remove four bolts from companion flange of gear carrier, and detach drive shaft. See **Figure 17** Seal the end of rear extension housing to prevent oil leakage

10. Disconnect speedometer drive cable from rear extension, as shown in **Figure 18**.

11. On models so equipped, disconnect neutral gear switch, third gear switch, and reverse gear switch as shown in **Figure 19** (next page).

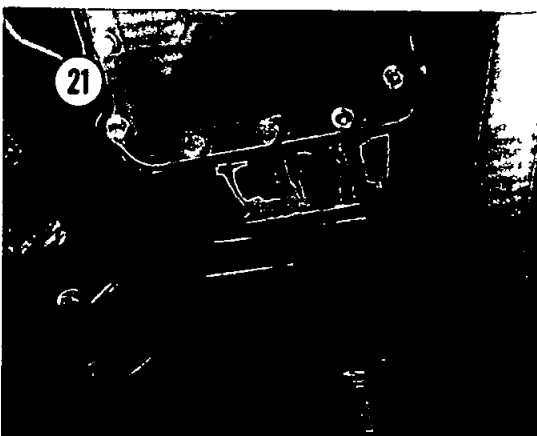


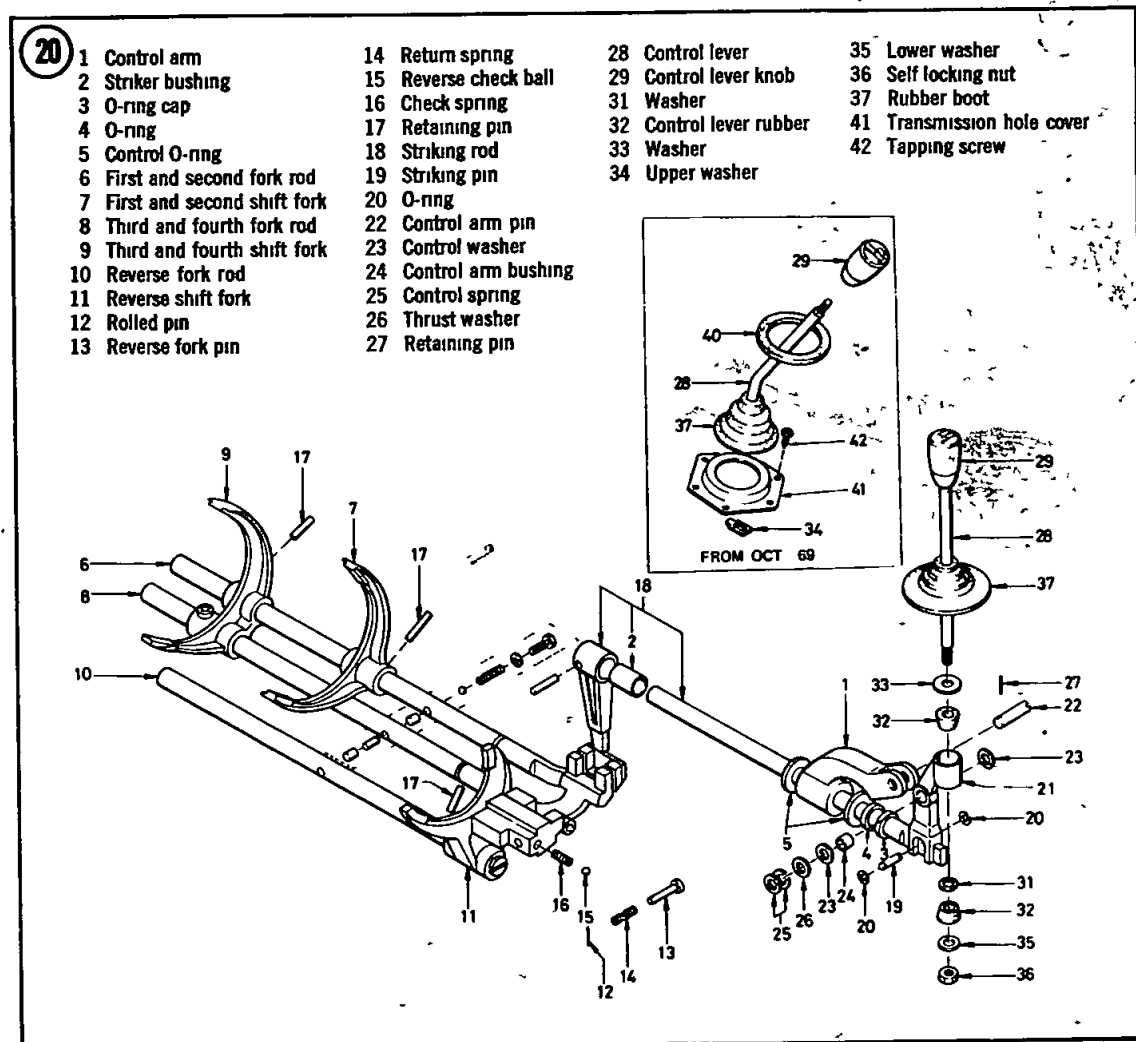
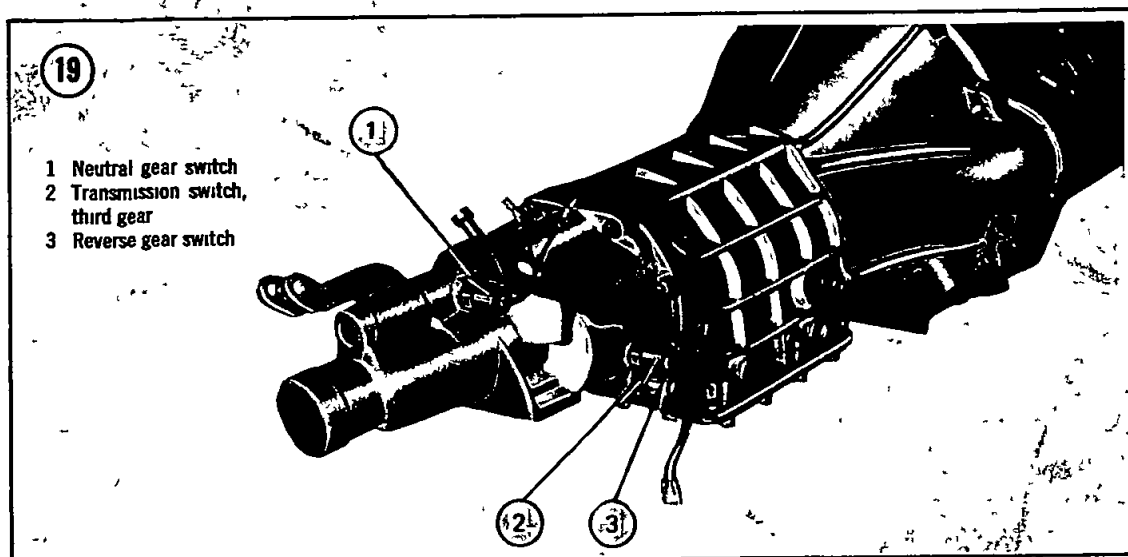
12 Refer to **Figure 20**, which is an exploded view of the gear shift lever and control system. Depending on the model, disconnect the shift lever as shown.

13. Remove cross shaft assembly from transmission case. See **Figure 21**.

14 Remove clutch operating cylinder from clutch housing

15 Place a jack beneath the engine oil pan and support the engine. Do not apply jack pressure





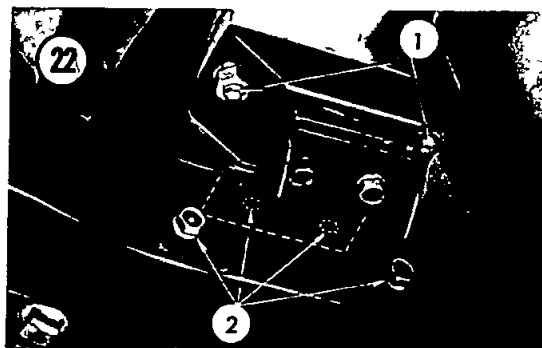
to drain plug. Use a block of wood between the oil pan and the jack

16 Remove two bolts attaching the transmission to the rear engine mount. Place a jack under the transmission and support the transmission. Remove four bolts holding the rear engine cross member to the body (sedan and wagon).

17 Place a jack under the transmission and support the transmission. Remove rear engine mount from transmission and cross member, as shown in Figure 22 (pick-up)

18. Lower the supporting jacks to incline the engine downward, and there is sufficient room to remove the transmission

19. Pull the transmission towards the rear until the drive shaft spline is clear of the clutch pressure plate. Be careful not to damage the splines or the pressure plate.

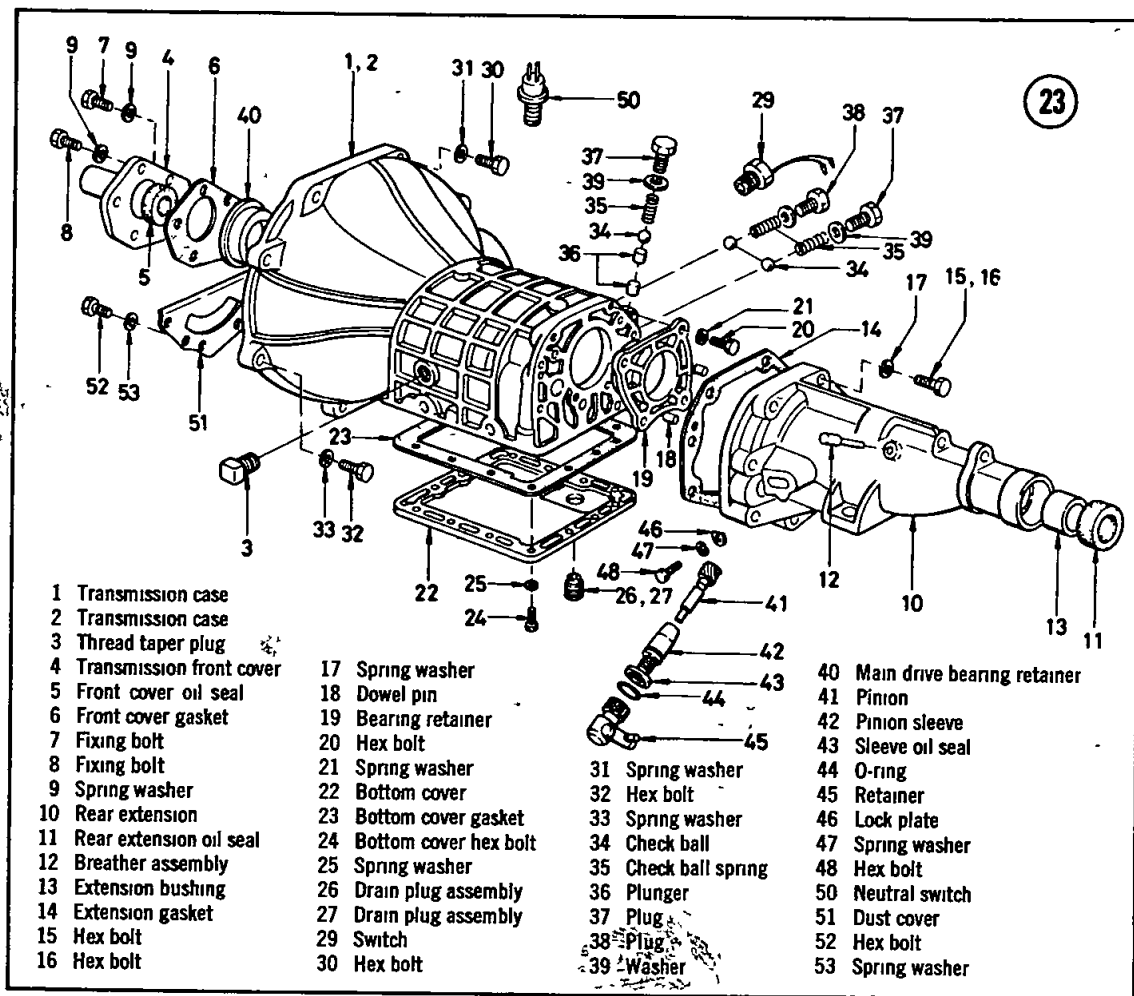


1 Rear extension mounting bolts
2 Rear engine mounting bolts

20 Remove the transmission by lowering the transmission jack.

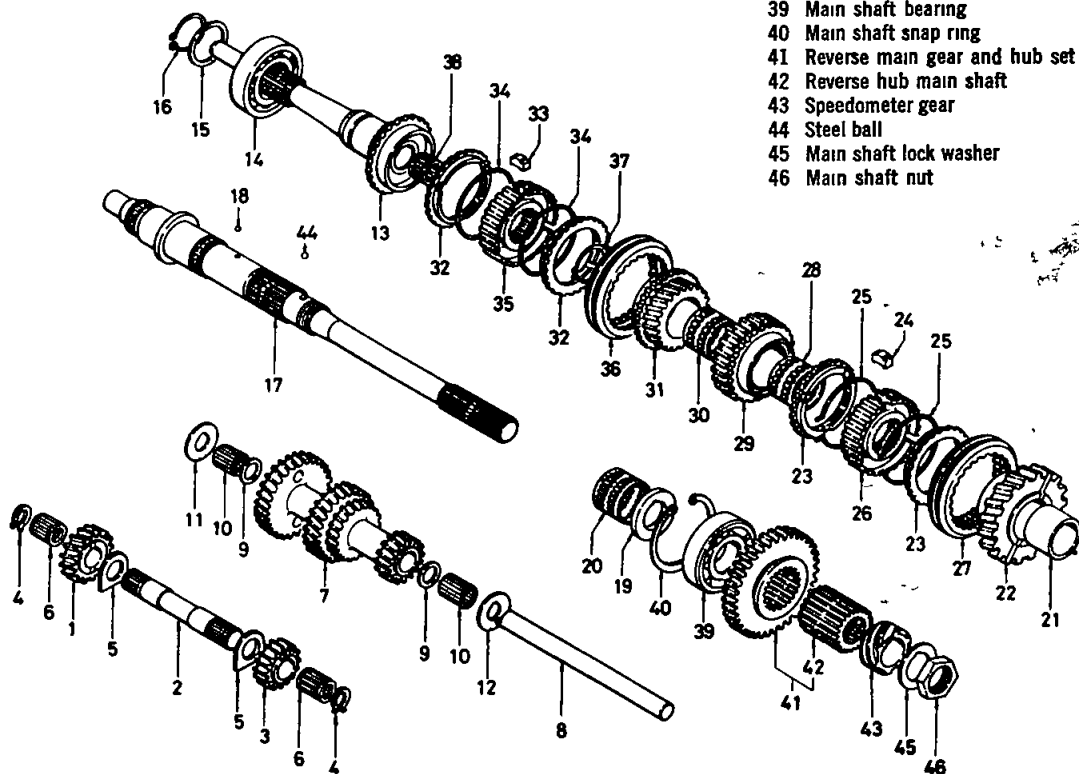
Transmission Disassembly

Figures 23 and 24 are exploded views of the transmission case and gear assembly



24

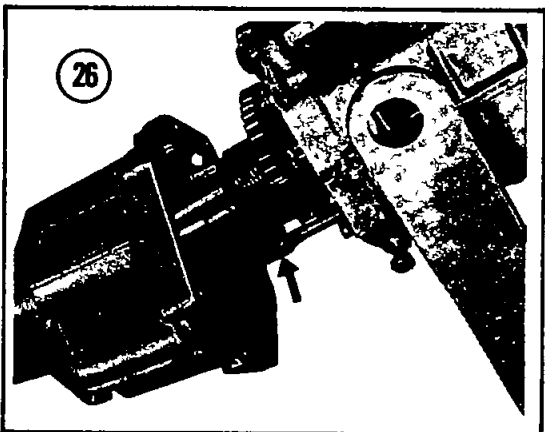
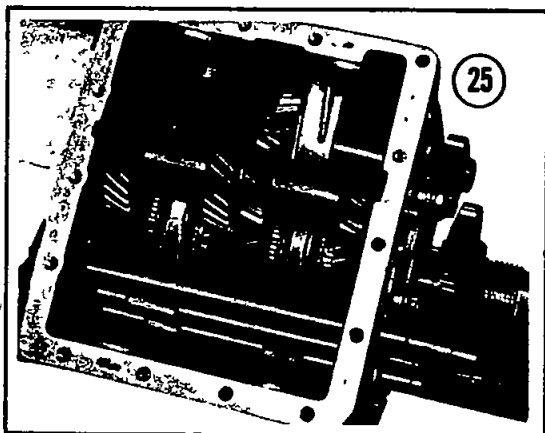
- | | | |
|-------------------------------|------------------------------|----------------------------------|
| 1 Reverse gear | 13 Main drive gear | 26 Synchronize hub |
| 2 Reverse shaft | 14 Main drive bearing | 27 Coupling sleeve |
| 3 Reverse gear | 15 Main drive spacer | 28 Main shaft needle bearing |
| 4 Snap ring | 16 Main drive snap ring | 29 Second gear assembly |
| 5 Thrust washer | 17 Main shaft | 30 Main shaft needle bearing |
| 6 Reverse gear needle bearing | 18 Steel ball | 31 Third speed gear |
| 7 Counter gear | 19 Thrust washer | 32 Baulk ring |
| 8 Counter shaft | 20 Main shaft needle bearing | 33 Shifting insert |
| 9 Counter spacer | 21 Main shaft bushing | 34 Spread spring |
| 10 Needle bearing assembly | 22 Main shaft first gear | 35 Synchro hub |
| 11 Thrust washer | 23 Baulk ring | 36 Sleeve coupling |
| 12 Thrust washer | 24 Shifting insert | 37 Snap ring |
| | 25 Spread spring | 38 Main shaft pilot bearing |
| | | 39 Main shaft bearing |
| | | 40 Main shaft snap ring |
| | | 41 Reverse main gear and hub set |
| | | 42 Reverse hub main shaft |
| | | 43 Speedometer gear |
| | | 44 Steel ball |
| | | 45 Main shaft lock washer |
| | | 46 Main shaft nut |



- 1 Remove the drain plug and drain the transmission gear oil into a suitable container.
- 2 Remove the dust cover and release the retainer spring securing the withdrawal lever. Remove the lever and release bearing from the clutch housing.
3. Remove the pin securing the striking rod to the control lever and remove the control lever.
- 4 Remove five front cover securing bolts and the front cover.
- 5 Remove 14 hex bolts and washers from bottom cover. Remove bottom cover from trans-

mission case **Figure 25** shows the transmission with the bottom cover removed

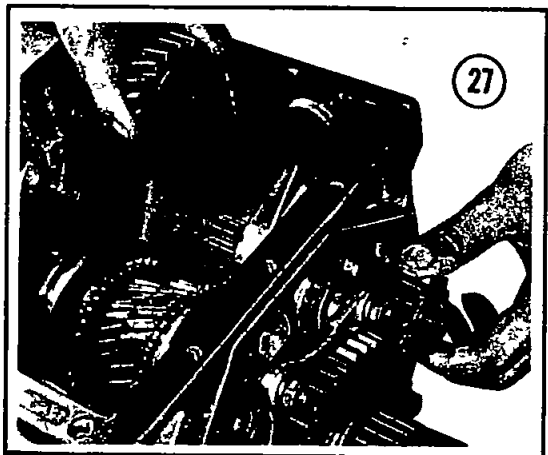
- 6 Remove speedometer drive pinion assembly.
- 7 Remove hex bolts holding rear extension housing to transmission case. Remove rear extension housing, as shown in **Figure 26**
8. Disengage striking rod from fork rod gates.
9. Unscrew three check ball plugs, and remove springs and balls.
- 10 Drive out retaining pins used to secure forks to fork rods, and remove rods and forks.
11. Move the 1st-2nd and 3rd-4th coupling



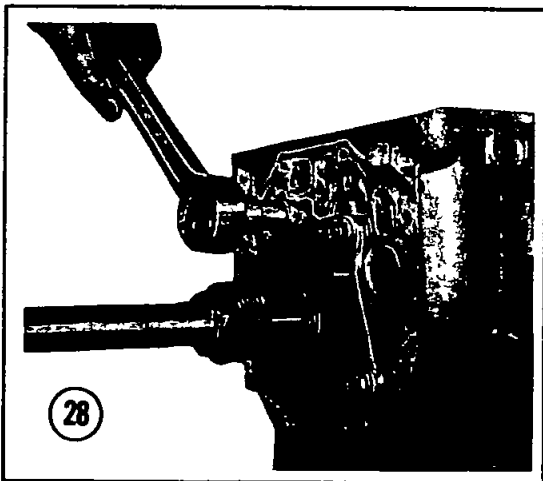
sleeve into gear at the same time. This will lock the main shaft. Release the main shaft nut.

12. Withdraw the counter shaft and remove the counter gear with the two needle roller bearings and spacers.

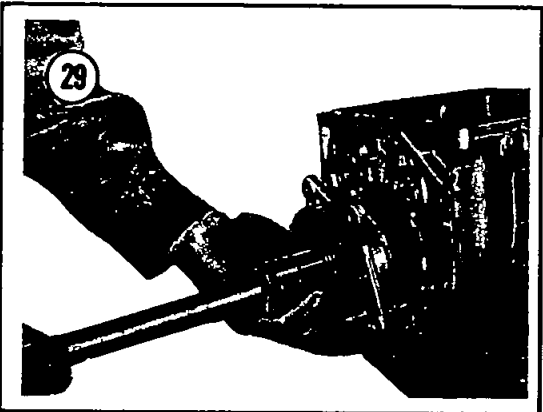
13. Refer to Figure 27. Release reverse idler gear snap ring. Remove reverse idler gears and shaft.



14. Remove four bolts holding main shaft bearing retainer to transmission case, as shown in Figure 28.



15. Withdraw the main shaft assembly from transmission case See Figure 29.



16. Release the snap ring securing the 3rd-4th synchronizer and hub. Remove the hub complete with coupling sleeve.

17. Remove the 3rd speed gear and needle roller bearings from main shaft.

18. Unscrew the main shaft nut and remove the nut and locking plate.

19. Remove the speedometer drive gear and steel ball.

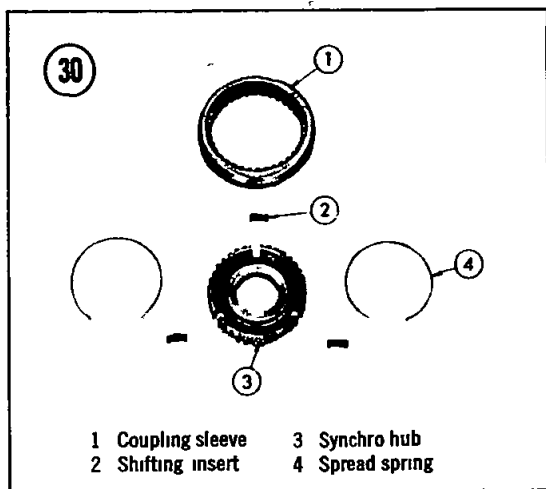
20. Withdraw the main shaft reverse gear and hub.

21. Press off the main shaft bearing complete with the bearing retainer.

22 Remove the thrust washer and main shaft 1st speed gear complete with needle roller bearing. Be careful not to lose the small steel ball which locates the thrust washer. Remove main shaft 1st gear bushing.

23 Remove the main shaft 2nd speed gear and needle roller bearing.

24 To disassemble synchronizer assembly, remove springs from both ends. Figure 30 shows the synchronizer disassembled.



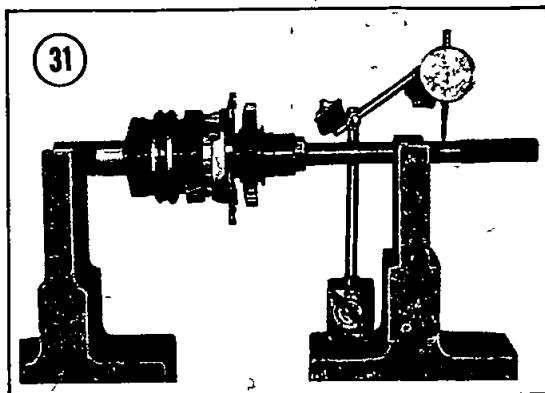
25 Disassemble the main drive gear by removing the snap ring. Use snap ring pliers.

26 Remove main drive gear bearing with bearing puller and arbor press.

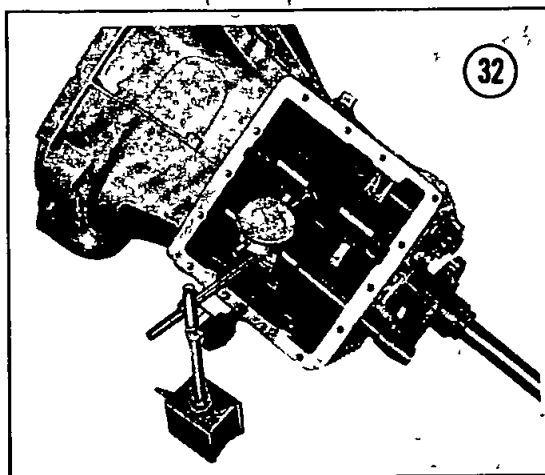
Transmission Inspection and Repair

1. Thoroughly clean all disassembled parts with solvent. Check all parts carefully for wear, damage, or other defects.
2. Check the mounting faces carefully for pitting or burrs that could cause oil leaks. Make certain to clean off all old gaskets and gasket adhesive.
3. Repair or replace dowel pin if bent or damaged.
4. Inspect rear extension bushing for signs of interior wear. Replace as required.
5. Inspect ball bearings for signs of damage to inner or outer race. Rotate the ball bearing and feel for signs of friction or dragging. If ball bearings are defective in any way, replace them.
6. Replace needle bearings if worn or damaged.
7. Check the main shaft and gears for wear,

damage, or cracks. Replace defective parts as required. Check the main shaft for straightness with a measuring gauge as shown in Figure 31. Maximum runout is 0.0059 in. (0.15mm).



8 Measure the backlash of each gear. See Figure 32. Standard backlash is 0.0020 to 0.0039 in. (0.05 to 0.10mm). Gear wear limit is 0.0079 in. (0.20mm). If the gears are worn beyond limit, both the drive and driven gears should be replaced as a set.

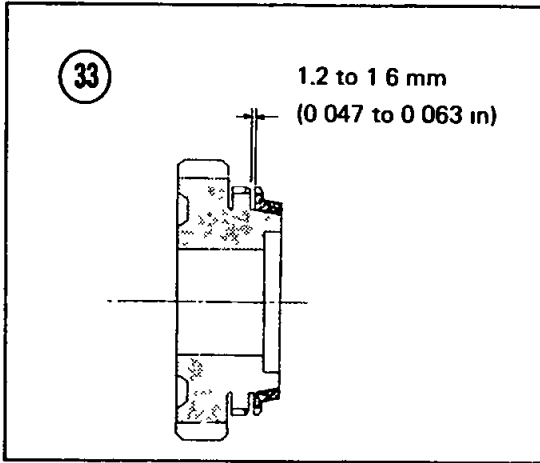


9 Check the end play of all gears with a feeler gauge. End play should be between 0.0020 to 0.0059 in. (0.05 to 0.15mm). If end play is not correct, shims of various thicknesses are available to correct the condition.

10 Check balk rings for wear, pitting, and burrs. Replace if defective.

11 Place balk ring in position on cone of each gear. Push the balk ring onto the gear and check gap between balk ring end face and clutch tooth.

face See Figure 33 When the gap is less than 0.031 in (0.8 mm), replace the balk ring.



12. Check the shifting insert for damage or wear. Replace as required.

13. Check the oil seal for deformation, wear, or cracks. Replace if defective.

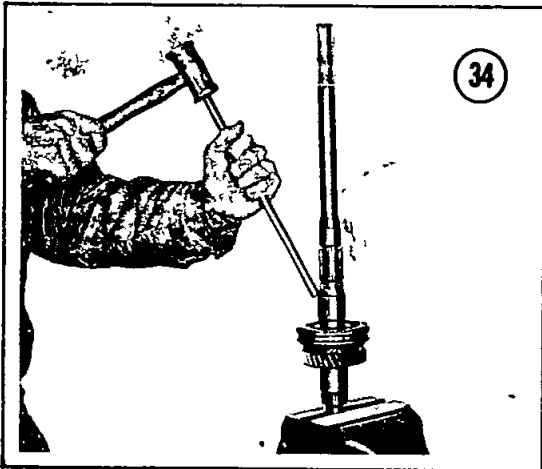
14. Check the rear engine mount insulators. Replace if worn or defective.

Transmission Reassembly and Adjustment

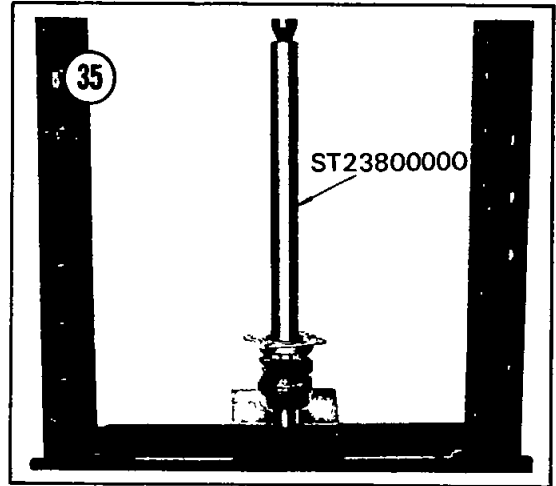
Reassemble the transmission in the reverse sequence used in disassembly. The following items should be observed during reassembly.

1. Be certain that the 1st-2nd and 3rd-4th synchronizer hubs are facing in the correct direction.

2. Use a brass drift to fit the 1st gear needle bearing collar to the shaft, as shown in Figure 34.

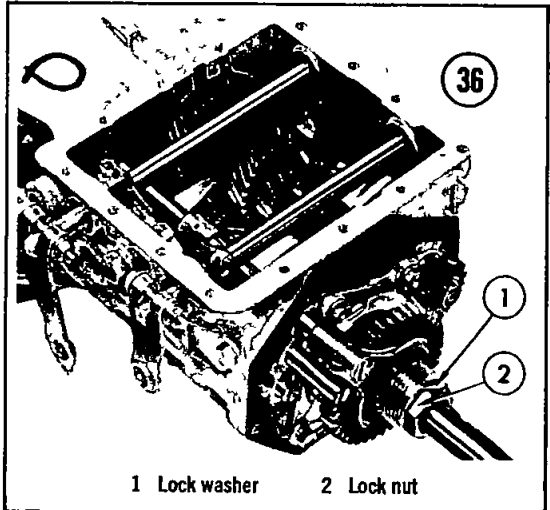


3. Use a hollow drift and press arbor to fit the main shaft ball bearing to the shaft, as shown in Figure 35.



4. To hold synchronizer hub end play to a minimum, snap rings of various thicknesses are available.

5. To lock the main shaft in the transmission case, double-mesh the gears, and insert the assembly in the case. Install the lockwasher and lock nut on the main shaft. Torque the lock nut to 57.8 to 79.5 ft-lb (8.0 to 11.0 kg-m). Firmly bend the lock washer around the lock nut as shown in Figure 36.

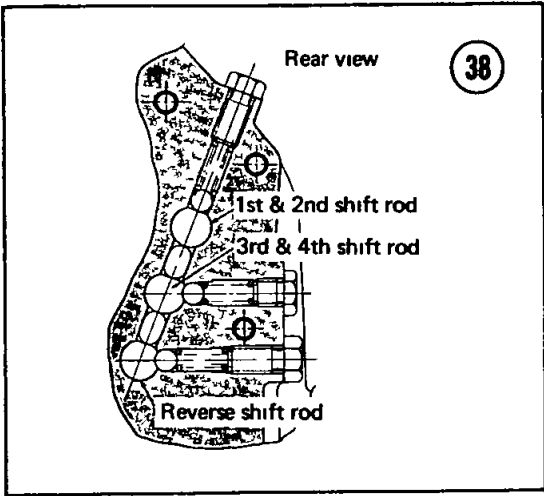


6. Assorted thickness snap rings and thrust washers are available to maintain proper end play after assembly. This applies to the main

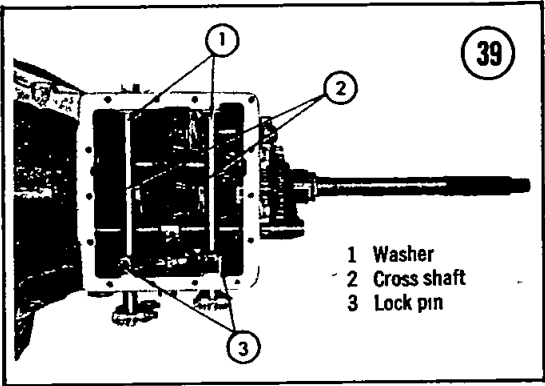
drive gear, counter gear, and reverse idler gear.

7 Reassemble the shift fork and operating lever correctly Refer to **Figure 37**. Be certain there is no gap between fork rod and shift fork.

8 Install each fork rod together with check ball plug, check ball, check ball spring, and interlock plunger Position so that fork rod check ball groove coincides with the ball When installed correctly, the upper surface of plug is flush with upper surface of adapter Install a suitable locking agent on the threads of the plugs during assembly **Figure 38** shows the check ball layout.



9. Install operating lever in correct position See **Figure 39** Assemble thrust washer, snap ring, and operating lever in case Install lock pin. Torque the lock pins to 0.2 to 0.3 in.-lb. (0.3 to 0.4 kg/cm).



Transmission Installation

Install the transmission in the reverse order used during removal Make certain that all bolts, wires, and parts are reinstalled

TRANSMISSION SERVICE DATA AND SPECIFICATIONS

Table 2 provides the service data and specifications for the sedan, wagon, and pick-up.

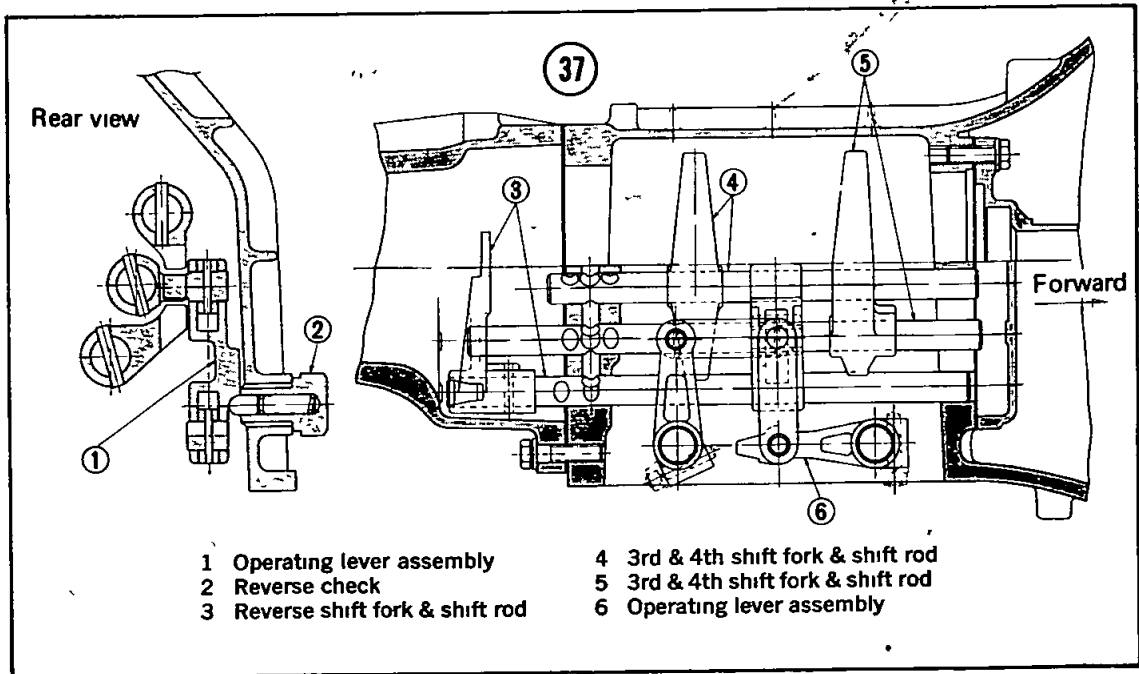


Table 2 TRANSMISSION SERVICE DATA AND SPECIFICATIONS

General Specifications		<i>Speedometer gear drive pinion in 510 has 17 teeth</i>
Gear Ratio		
1st	3 657	
2nd	2 558	
3rd	1 419	
4th	1 000	
Reverse	3 638	
Oil capacity	3 6 pints	
Detail Specifications		
Gear backlash	0 0020 to 0 0039 in (0 05 to 0 10mm)	
Replacement standard	0 0079 in (0 20mm)	
Gear end play	0 0020 to 0 0059 in (0 05 to 0 15mm)	
Bolt ring/cone clearance	0 0472 to 0 0630 in (1 2 to 1 6mm)	
Replacement standard	0 0315 in (0 8mm)	
Tightening Torque ft -lb (kg/m)		
Engine/transmission installation bolt	17 4 to 20 2 (2 4 to 2 8)	
Front cover/transmission installation bolt	5 8 to 7 2 (0 8 to 1 0)	
Rear extension/transmission installation bolt	10 1 to 13 0 (1 4 to 1 8)	
Main shaft tightening bolt	57 8 to 79 5 (8 0 to 11 0)	
Companion flange tightening nut	72 3 to 101 2 (10 0 to 14 0)	
Rear engine mount installation bolt	23 9 to 27 5 (3 3 to 3 8)	
Filler plug	18 1 to 25 3 (2 5 to 3 5)	
Drain plug	14 5 to 21 7 (2 0 to 3 0)	
Back-up lamp switch	14 5 to 21 7 (2 0 to 3 0)	
Bottom cover bolt	5 8 to 7 2 (0 8 to 1 0)	
Speedometer pinion bolt	2 2 to 2 9 (0 3 to 0 4)	
Interlock plug	12 3 to 15 2 (1 7 to 2 1)	
Operating lever	2 2 to 2 9 (0 3 to 0 4)	
Reverse check	14 5 to 21 7 (2 0 to 3 0)	
Control lever installation bolt	13 7 to 15 9 (1 9 to 2 2)	

DRIVE SHAFT

Description

The drive shaft on the sedan and wagon is a single-piece tubular steel unit. The pick-up uses a two-piece unit joined by a journal assembly (universal joint). Universal joints connect the drive shaft ends to the transmission and differential. The joints consist of the journal assembly, yoke sleeve, and yoke flange. **Figure 40** is an exploded view of the drive shaft used on the sedan and wagon. **Figure 41** (page 146) shows the drive shaft used on the pick-up.

The pick-up has a grease nipple on the drive shaft to lubricate the drive shaft spline. The sedan and wagon are not so equipped. The universal joints should be removed and lubricated every 24,000 miles.

Removal

- 1 Release the handbrake

- 2 Jack up the rear of the vehicle and support on stands.

- 3 Loosen the end clamps on the exhaust pipe and turn the exhaust pipe and pre-muffler to the left so that drive shaft can be removed (sedan)

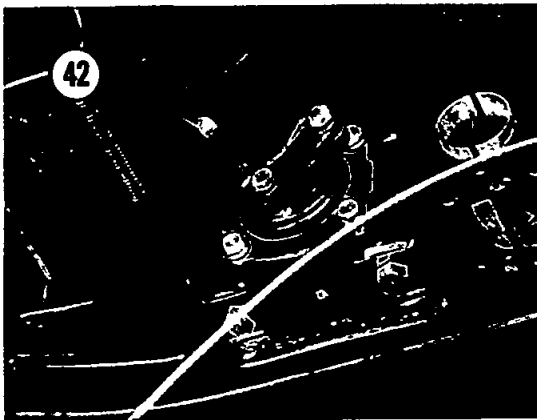
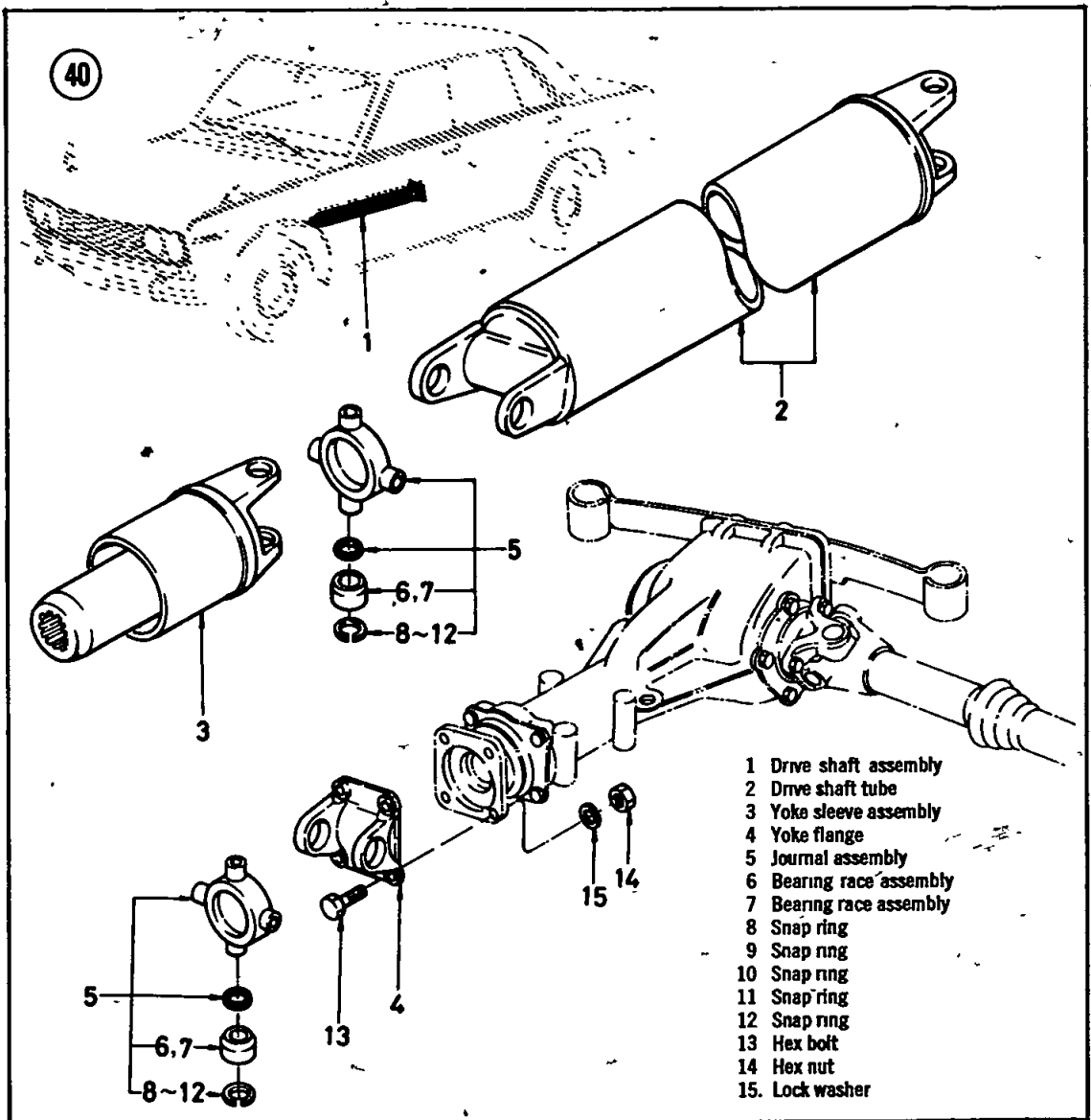
- 4 Remove handbrake rear cable adjusting nut from the adjuster. Disconnect left-hand cable from the adjuster (sedan).

- 5 Disconnect rear flange yoke from the companion flange by removing the nuts and bolts. See **Figure 42**

CAUTION

Be careful not to let end of drive shaft drop to ground. Lower it gently.

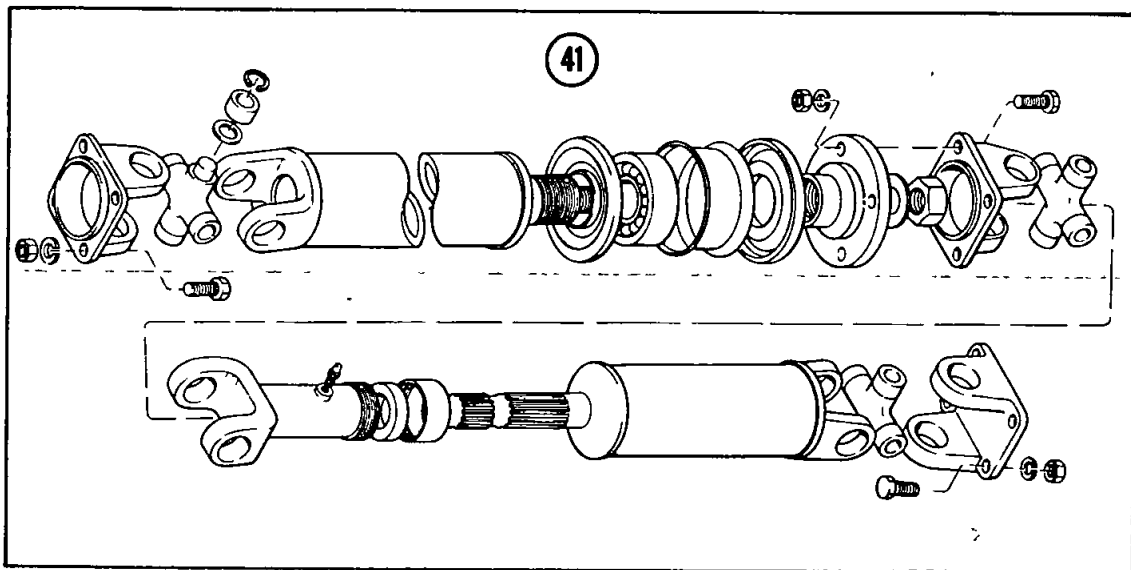
- 6 Pull the drive shaft backwards away from the transmission. Remove the drive shaft as soon as it is clear of the transmission. Make certain to support both ends of the shaft during removal (sedan and wagon)



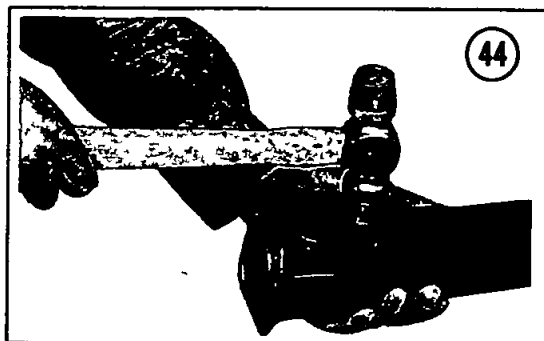
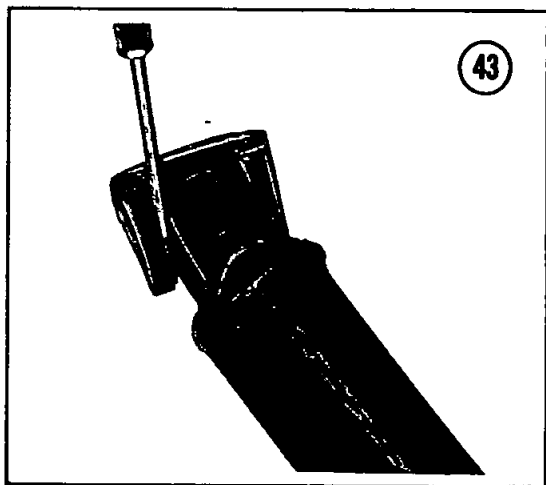
7. Remove mounting bolts from both transmission and differential gear case. Remove bearing mounting bracket. Lower drive shaft to ground (pick-up)

Disassembly

The drive shaft is a balanced unit and must be marked as to parts location before disassembly. Mark the relative positions of the drive shaft, sleeve yoke, flange yoke, and other parts so they can be reassembled in their original positions.



1. Before disassembly, clean all parts and mark locations
2. Remove four snap rings from each universal joint, as shown in Figure 43



2. If the drive shaft tubes show signs of damage, have them checked for runout and balance by a dealer or an automotive machine shop

Assembly

1. Apply wheel bearing grease liberally to the needle bearings. Insert them in the bearing race and install onto the journal. Replace snap ring. Various thickness snap rings are available to adjust axial play in the journal assembly.
2. Apply gear oil to inside of spline and outside of yoke. Slide the drive shaft splined yoke onto the transmission main shaft splines (sedan and wagon).
3. Apply wheel bearing grease liberally to the drive shaft center spline. Fill the cavity with wheel bearing grease through the grease nipple (pick-up).
4. Finish assembly by reversing procedures used during removal.

Inspection and Repair

1. Check each part for signs of wear, damage, rust, distortion, and pitting. Replace as required. If any part of the journal assembly requires replacement, replace the entire assembly.

SERVICE DATA AND SPECIFICATIONS

Table 3 gives the service data and specifications for the driveshaft.

**AUTOMATIC TRANSMISSION
CHECKS AND ADJUSTMENTS**

While removal and repair of the automatic transmission is not recommended, the following checks and adjustments should help prevent costly repairs.

Transmission Oil Check

Check the automatic transmission oil level at least every 3,000 miles. Replenish with high quality automatic transmission fluid as required. Be careful not to overfill, as damage to the seals can result. To check the oil level, proceed as follows:

- 1 Start the engine and run it until normal operating temperature is reached.
- 2 Apply brakes and move the transmission shift lever through all drive positions and place lever in park position.
- 3 With engine running, remove transmission dip stick, clean it with a lint-free cloth or paper, and return it to the transmission.
- 4 Remove dip stick again and examine level on dip stick gauge. It should be between the low and full marks. Replenish as necessary.
- 5 Visually inspect the color and condition of the oil on the dip stick. Normal color of the oil is red. If the color is abnormal, drain and replace. If the oil has deteriorated to a varnish-like quality, it may cause the control valve to stick. Blackened oil may indicate a burned clutch or brake band.

- 6 Should the above conditions exist, refer maintenance to a transmission specialist.

Transmission Oil Leakage Check

Oil leakage may occur at the junction of the transmission and rear extension, oil tube connectors, oil pan, oil pressure inspection holes, downshift solenoid, or breather pipe.

Abnormal oil usage usually indicates leaks that should be stopped before severe damage is done. To inspect for oil leaks, proceed as follows:

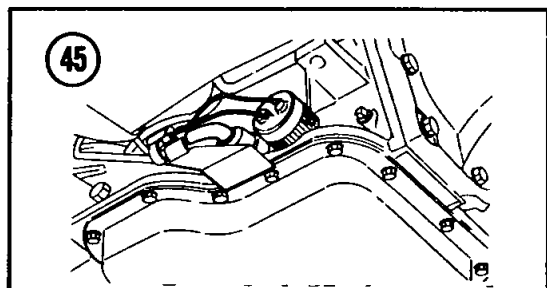
1. Lift car up on hoist or jack up and place on stands.
2. Clean outside of transmission case with cleaning solvent to remove dirt and oil accumulations.
3. Start engine and run until operating temperature is reached.
4. Shift gear lever to drive to increase oil pressure and circulation within transmission.
5. Inspect points mentioned above for signs of leakage. Leakage of transmission oil is distinctive by its reddish color.
6. If leaks are detected, refer service and repair to qualified transmission specialist.

**Kick-down Switch and Downshift Solenoid —
Checks and Adjustment**

When kick-down operation is not correct, or the speed changing point is too high, check the kick-down switch, downshift solenoid, and the wiring between them. Figure 45 shows the location of these parts. To check operation, proceed as follows:

Table 3 DRIVESHAFT SERVICE DATA AND SPECIFICATIONS

Specifications	
Axial play of spider journal	0.0315 in (0.08mm)
Sleeve yoke spline to mainshaft	0 to 0.0031 in (0 to 0.08mm)
Spline lash wear limit	0.0197 in (0.5mm)
Maximum drive shaft runout	0.0236 in (0.6mm)
Journal diameter wear limit	0.0059 in (0.15mm)
Permissible dynamic unbalance at 4,000 rpm	0.278 in oz (15 gr/cm)
Tightening Torque	
Flange yoke to companion flange nuts	28.93 to 61.5 ft-lb (4.0 to 8.5 kg/m)
Companion flange (center bearing) nut (pick-up)	74 to 111 ft-lb (10 to 15 kg/m)
Bearing mounting bracket installation bolt	18 to 20 ft-lb (2.4 to 2.7 kg/m)

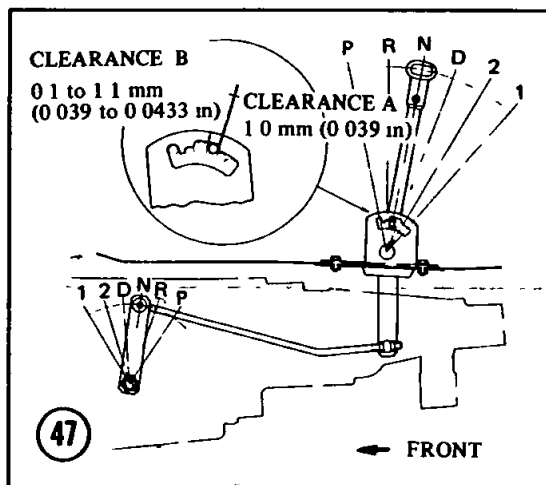
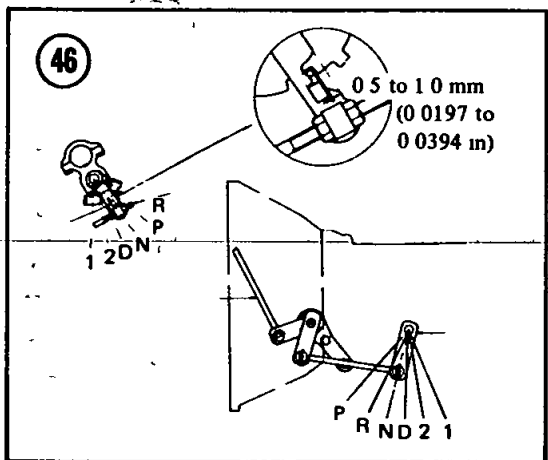


1. Insert key in ignition switch and turn to first position.
2. Depress accelerator pedal fully. Listen for the solenoid to click. If a click is heard, the solenoid is operating correctly.
3. Replace solenoid if click is not heard. Before replacing solenoid, drain approximately 2½ pints of transmission oil from transmission. Re-fill when solenoid replacement is complete.
4. If solenoid is operating correctly but trouble persists, check wires for continuity with electrical tester.

Linkage Inspection and Adjustment

To inspect and adjust the linkage on the transmission, proceed as follows. Figure 46 shows the linkage for column shift models, and Figure 47 shows the linkage for floor shift models.

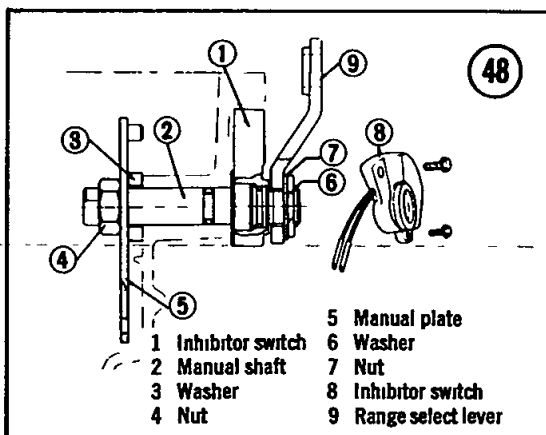
1. Move selector from P to 1 and back again several times. If the linkage is correct, a slight click should be felt and heard when the selector is set at each position.
2. If the lever position is incorrect, adjust the linkage in the engine compartment so that posi-



tion "D" of the detent manual valve aligns with position "D" of the position plate, as shown in the illustrations.

Inhibitor Switch — Checks and Adjustment

The inhibitor switch lights the reverse lamp and enables the starter motor to operate in the neutral and park positions. Figure 48 shows the construction and mounting of the inhibitor switch. To check the inhibitor switch, proceed as follows:



1. Move selector lever to reverse position and check that reverse lamp bulb lights. If not, inspect bulb and replace if defective. If bulb is all right, replace inhibitor switch.
2. Check for proper operation of starter motor in neutral and park positions. If abnormal, check to see that linkage is correct. If linkage is correct, replace inhibitor switch.

CHAPTER TWELVE

DIFFERENTIAL, REAR AXLE, AND REAR SUSPENSION

The differential, rear axle, and rear suspension differ for the various models. This chapter deals with each separately.

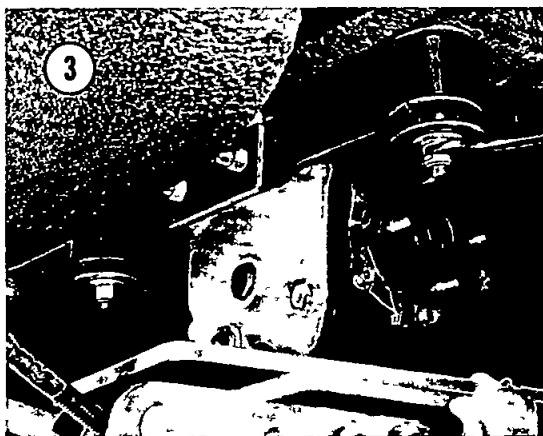
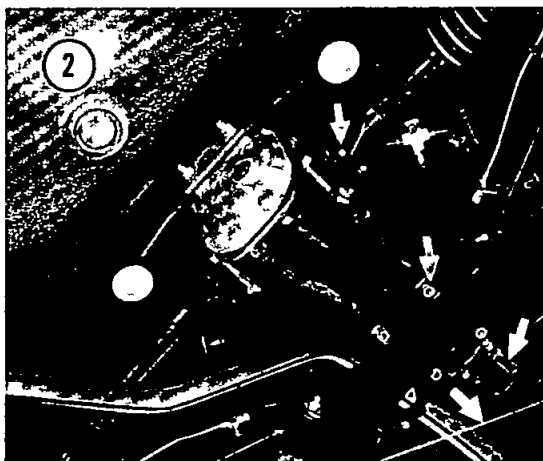
Due to the need for special tools and experience to disassemble and repair these units, the following procedures generally cover removal, inspection, and replacement only. If mechanical difficulties exist within the differential and rear axle components, refer service and repair to a Datsun dealer or competent garage.

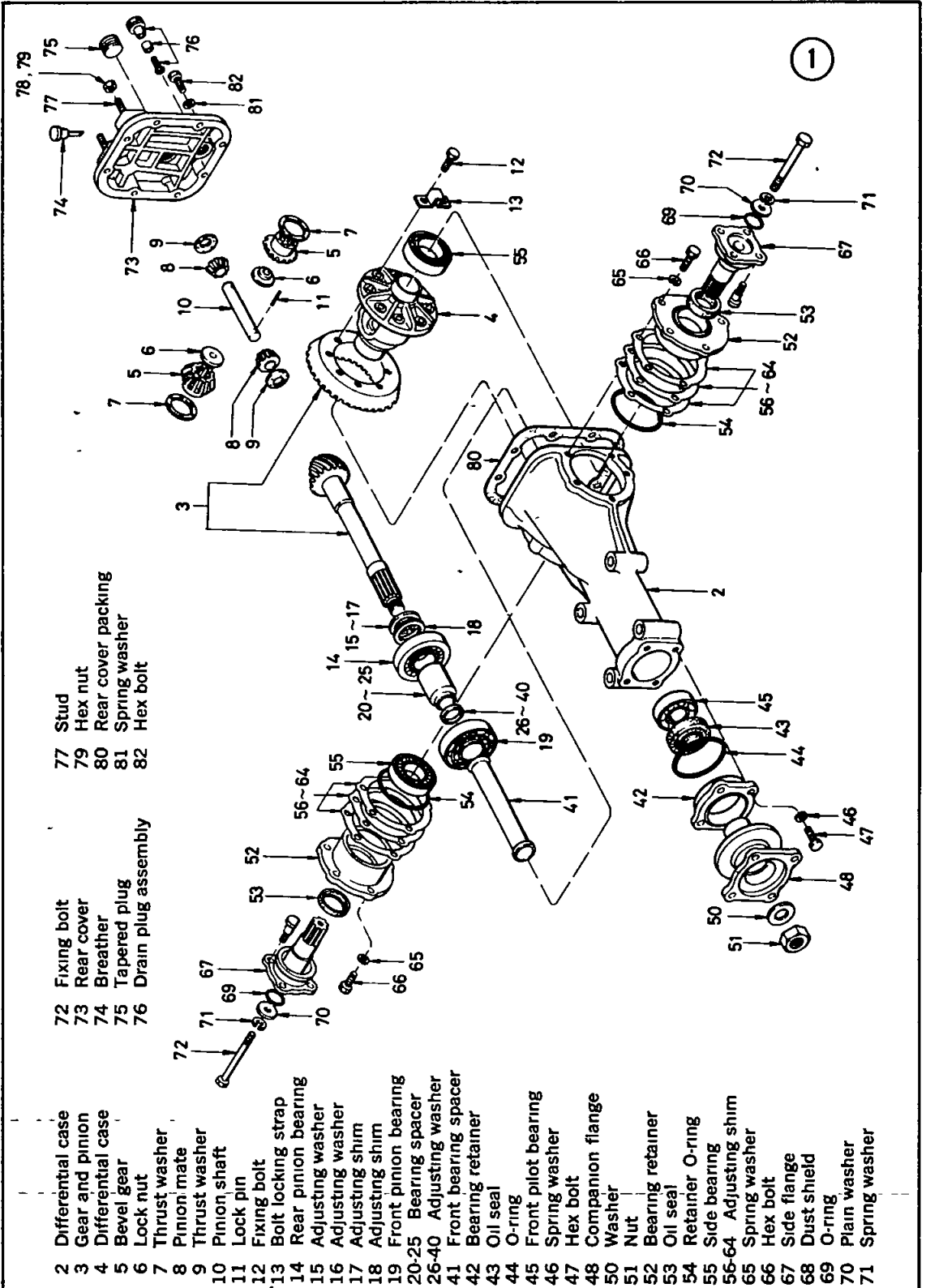
DIFFERENTIAL (SEDAN)

The cast iron differential assembly used in the sedan is shown in **Figure 1** (next page). Proper lubrication of the gear housing is essential. Check lubricant every 3,000 miles and replenish as necessary. Drain and refill lubricant at least every 30,000 miles.

Differential Removal (Sedan)

1. Disconnect handbrake rear cable, drive shaft, and axle drive shafts by removing bolts shown by arrows of **Figure 2**.
2. Place a jack under the differential and lift slightly. Remove nuts on both ends of differential mounting member. See **Figure 3**.
3. Remove four fixing bolts that hold differential to the suspension member.





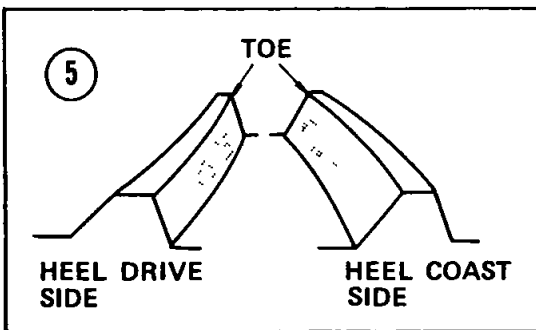
4 Lower the jack and remove differential from rear of vehicle. See **Figure 4**. After removal, support suspension member with a stand to prevent distortion and damage to the insulators.



Differential Inspection (Sedan)

The following inspection can be done without disassembly of the differential. If abnormalities or damage exists, refer further service and repair to your dealer.

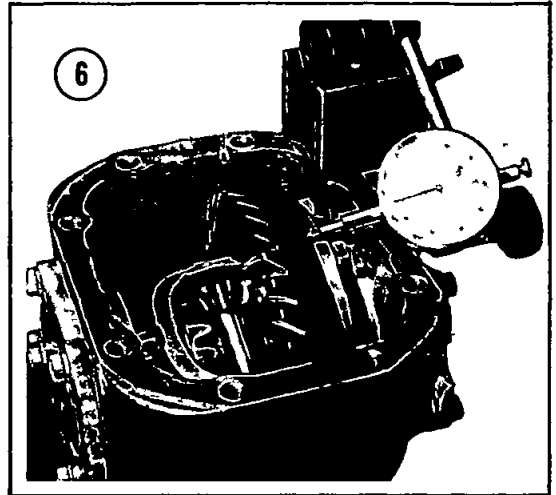
1 Check the tooth contact pattern with lead oxide at two or three points after removing rear cover. Refer to **Figure 5**, which shows the correct contact pattern. If the contact pattern is incorrect, disassembly and adjustment of differential is required.



- 2 Use a dial indicator to measure backlash between the drive gear and pinion. Backlash should be 0.0039 to 0.0079 in. (0.10 to 0.20mm). Check all gear teeth for damage and cracks.
- 3 Check runout at the rear of the drive gear if the tooth contact pattern or backlash is ab-

normal. Runout should be less than 0.0031 in. (0.08mm). See **Figure 6**.

4 Rotate the gears and listen for signs of defective bearings. If noises are evident, the differential must be disassembled and repaired.



Differential Installation (Sedan)

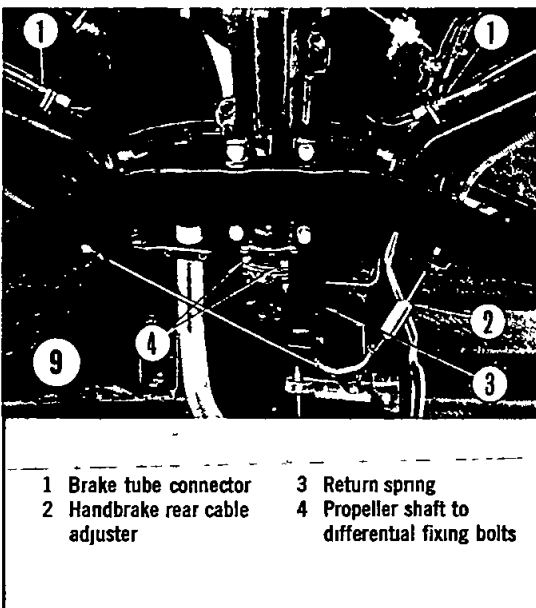
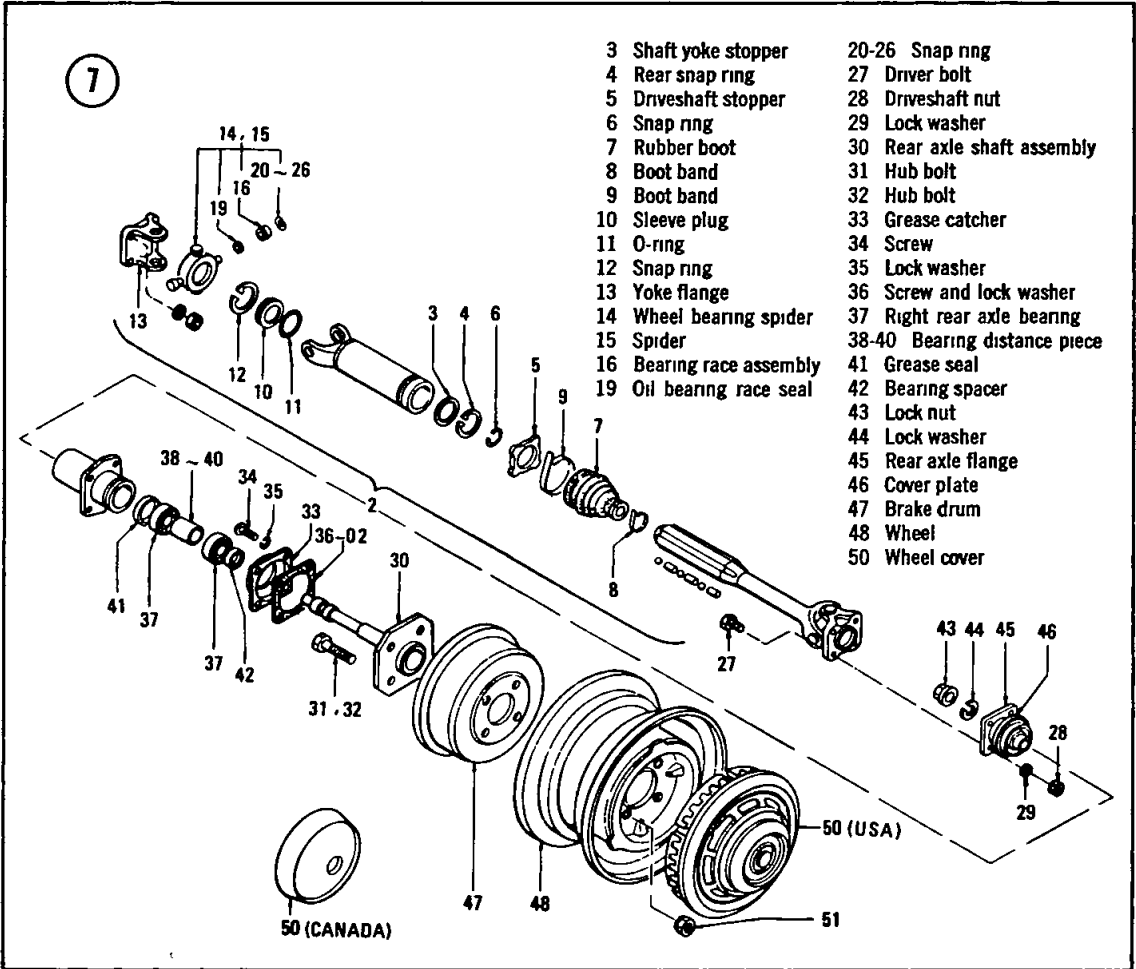
- 1 Mount the differential assembly to the rear suspension member.
- 2 Fit the differential mounting member to the fitting hole by pushing it forward with a bar. Torque the nuts to 61 ft-lb (8.5 kg/m).
- 3 Install axle drive shafts, drive shaft, and handbrake rear cable.

REAR AXLE AND SUSPENSION (SEDAN)

Figure 7 and **Figure 8** (page 153) are exploded diagrams of the sedan rear axle and suspension. The fully independent rear suspension is a semi-trailing arm design with a suspension member, suspension arms, coil springs, and hydraulic shock absorbers. The wheel bearings are lifetime lubricated.

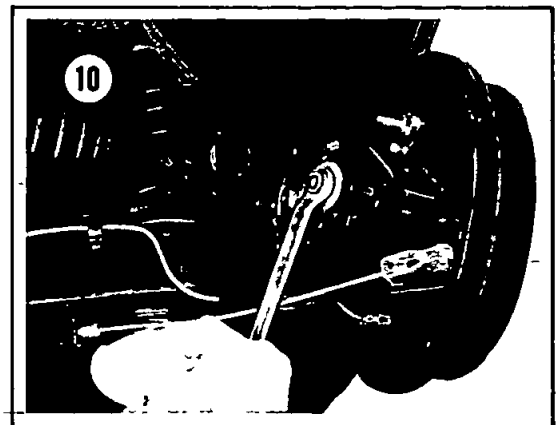
Rear Axle and Suspension Removal (Sedan)

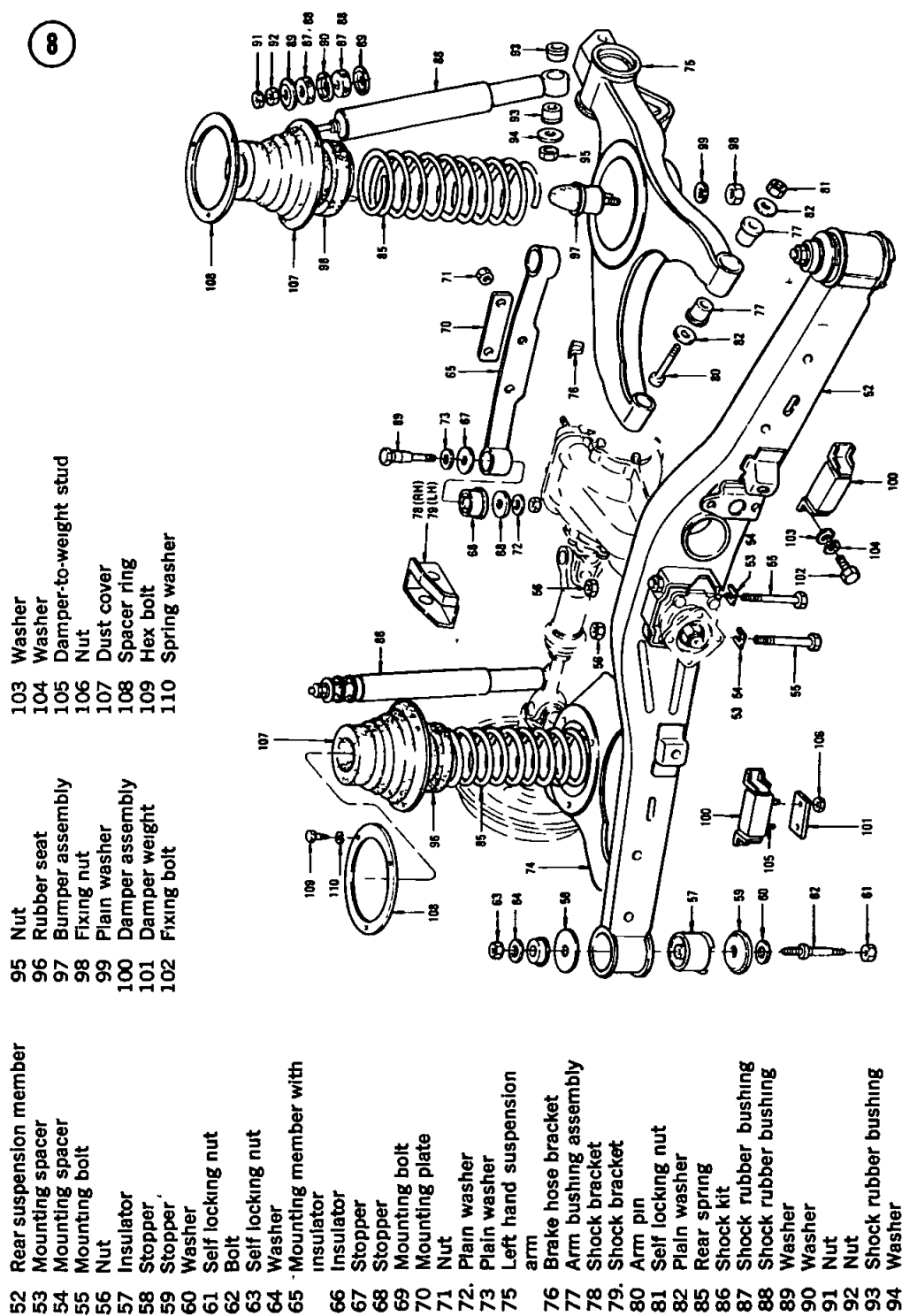
- 1 Jack up the rear of the vehicle and support it on stands.
- 2 Remove wheels.
- 3 Refer to **Figure 9** and disconnect handbrake linkage and return spring. Remove tail pipe and muffler.
- 4 Disconnect brake hose from brake tube. Remove four bolts holding drive shaft to differential. Lower drive shaft gently to ground.



5 Jack up suspension arm and remove shock absorber from lower mounting bracket See Figure 10 Take care not to lose rubber bushings.

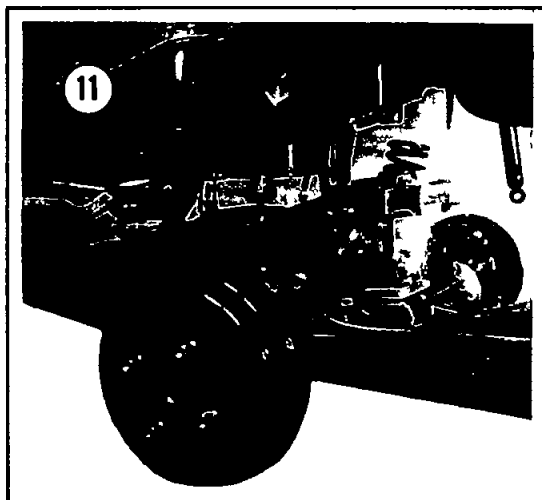
6. Support the center of the suspension member and differential with a transmission jack. Re-





move two nuts attaching differential suspension member to the body.

7. Gently lower the suspension assembly from the body by lowering the jack. Support the suspension so it does not fall off of the jack. See **Figure 11**. Withdraw jack and suspension from vehicle.



Rear Axle and Suspension Inspection And Repair (Sedan)

With the rear suspension removed from the vehicle, inspect all parts for wear and damage. Pay special attention to the bushings in the suspension arms and rubber bumpers. Check condition of the spring rubber insulators in the suspension member and drive unit mounting member. Replace as required.

Rear Axle and Suspension Installation (Sedan)

1. Installation procedures are the opposite of removal.
2. Be sure that the suspension member and drive unit mounting member are lined up correctly.
3. Tighten fixing nuts and bolts as follows:

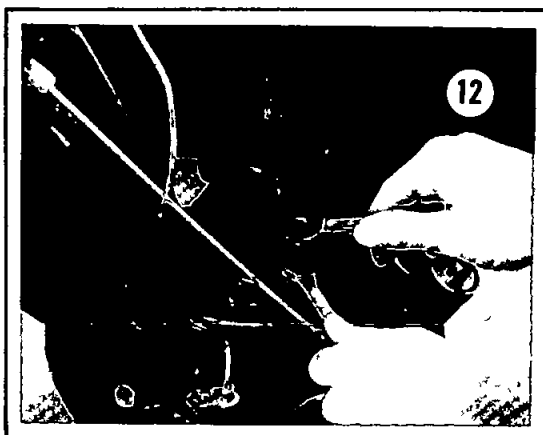
Suspension Member Mounting Nuts	72 ft.-lb (10 kg/m)
Differential Mounting Nuts	62 ft.-lb (8.5 kg/m)
Shock Absorber Lower End Nuts	17 ft.-lb (2.3 kg/m)

COIL-SPRING (SEDAN)

Coil Spring Removal (Sedan)

1. Jack up rear of vehicle and support it on stands.

2. Remove wheels.
3. Disconnect handbrake linkage and return spring.
4. Remove drive shaft flange nuts (**Figure 12**)



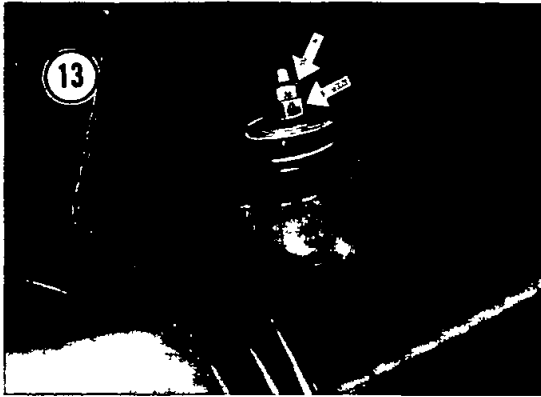
5. Remove nuts from lower part of bumper assembly
6. Place a jack under suspension arm and remove shock absorber from lower mounting. Lower jack and remove coil spring, spring seat, and bumper assembly.

Coil Spring Inspection and Repair (Sedan)

1. Check condition of coil spring for wear and damage. Replace if defective.
2. Check all rubber parts for wear, damage, and general condition.
3. Installation of the coil spring assembly is the reverse of removal. Make certain the coil spring is installed with its flat face at the top.

SHOCK ABSORBER REMOVAL, REPLACEMENT, INSTALLATION (SEDAN)

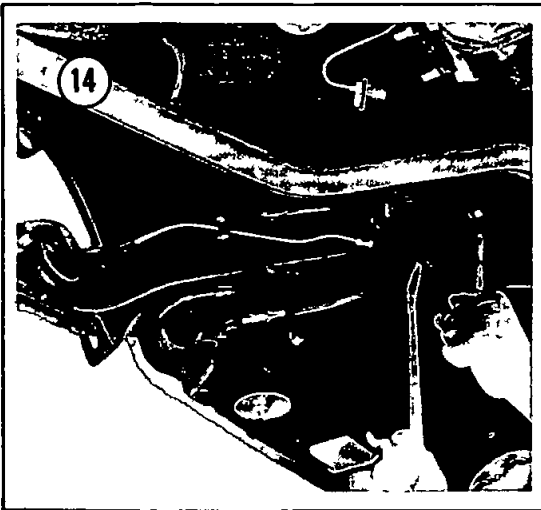
1. Open the trunk and remove the liner.
2. Remove double nuts that fasten upper end of rear shock absorber to the body (**Figure 13**).
3. Disconnect lower end of shock absorber from suspension arm.
4. Check general condition of shock absorber. Check for oil leaks, cracks, and straightness of shaft. Replace if defective.
5. Inspect rubber bushings for damage, wear, and general condition. Replace as required.
6. Installation is the reverse of removal.



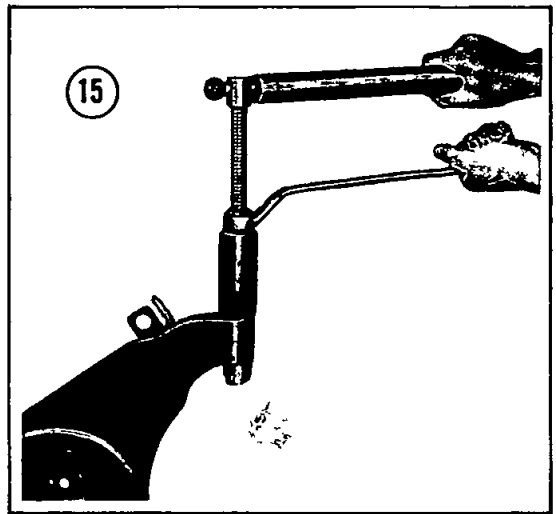
REAR SUSPENSION ARM (SEDAN)

Rear Suspension Arm Removal (Sedan)

- 1 Jack up the rear of the vehicle and support it on stands
- 2 Remove wheel and brake drum.
- 3 Disconnect drive shaft from axle shaft.
- 4 Remove handbrake cable from lever attached to wheel cylinder
- 5 Plug brake tube to prevent loss of brake fluid
- 6 Remove wheel bearing lock nut, rear axle shaft, wheel bearings, and oil seal Remove rear brake assembly from suspension arm.
- 7 Place jack under suspension arm, remove shock absorber from lower bracket, lower jack gradually, remove coil spring, spring seat, and bumper assembly.
- 8 Remove two bolts securing suspension arm to suspension member and remove suspension arm See Figure 14



- 9 Remove rubber bushing from suspension arm using a bushing remover, as shown in Figure 15.

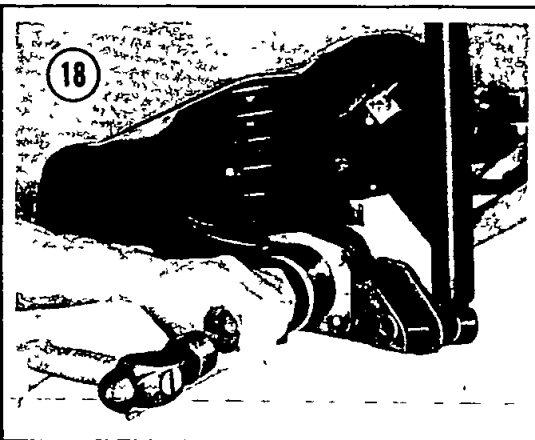
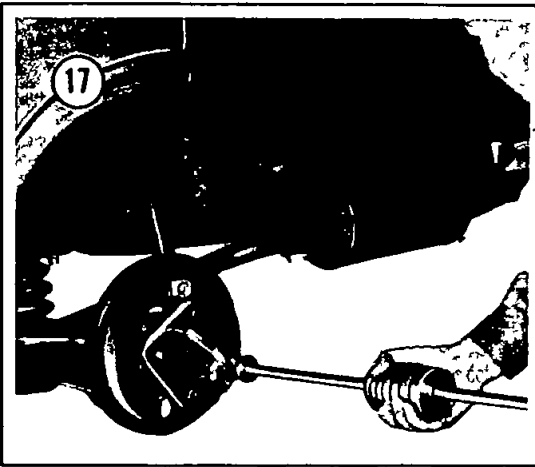
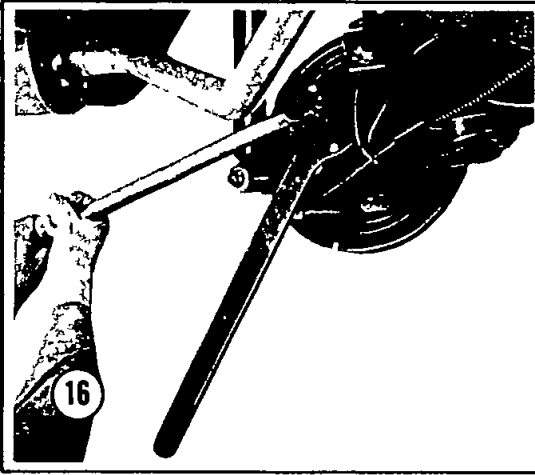


Rear Suspension Arm Inspection, Repair, and Installation (Sedan)

- 1 Examine suspension arms for damage, dents, and cracks Replace if defective.
- 2 Check rubber bushings carefully for wear, damage, and general condition
- 3 Install suspension arm in reverse of removal When installing suspension arm to suspension member, re-tighten the bolts after the vehicle is removed from stands Change self locking nuts every time they are removed during servicing

REAR AXLE SHAFT, WHEEL BEARINGS, AND SEALS REMOVAL AND DISASSEMBLY (SEDAN).

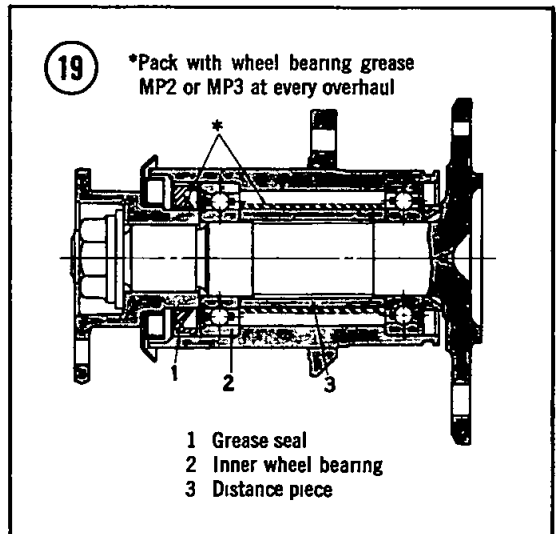
- 1 Jack up the rear of the vehicle and support it on stands
- 2 Remove wheel and brake drum
- 3 Disconnect drive shaft from axle shaft.
- 4 Remove wheel bearing lock nut using axle shaft flange wrench to hold the companion flange See Figure 16
- 5 Use a slide hammer to withdraw the axle shaft assembly Refer to Figure 17
- 6 Remove oil seal and inner bearing using rear axle shaft bearing drift, as shown in Figure 18



7 Remove grease catcher and withdraw outer bearing using a bearing puller. Since the inner race has to be pulled against during removal, always replace it with a new one during assembly.

REAR AXLE SHAFT, WHEEL BEARINGS, AND SEALS INSPECTION AND INSTALLATION (SEDAN)

1. Inspect all parts for signs of damage and wear.
2. Check the axle shaft for straightness, cracks, and distortion. Do not attempt to straighten a bent shaft by heating. This would weaken the shaft and could lead to more serious trouble.
3. Check the oil seal lip for damage. As a matter of good practice, discard and replace oil seals whenever they are removed.
4. Check bearings for signs of leakage and ease of movement. Replace if defective.
5. Before assembly, clean all parts thoroughly with solvent.
6. Install wheel bearings so that the sealed side of the outer bearing faces the wheel and the sealed side of the inner bearing faces the differential. Apply pressure to the inner race only during assembly.
7. Refer to **Figure 19**. Apply wheel bearing grease during assembly as indicated.



8 Torque wheel bearing nut to 181 to 239 ft-lb (25 to 33 kg-m). Check rear axle shaft end play and turning torque. End play should be less than 0 to 0.006 in. (0 to 0.15mm). Turning torque should be less than 65 in. oz. (4.5 kg-cm). If the end play or turning torque are not within specification, disassemble and replace the distance piece with one of the correct length.

DIFFERENTIAL (WAGON)

The differential carrier is made of aluminum alloy and uses a hypoid bevel gear. Proper lubrication is essential. Check and replenish the lubricant every 3,000 miles. Drain and refill every 30,000 miles. **Figure 20** is an exploded diagram of the differential used in the wagon.

Differential Removal (Wagon)

- 1 Jack up the rear wheels and support vehicle with stands
- 2 Disconnect drive pinion companion flange-to-yoke connection.
- 3 Remove rear wheel axles as described later in this chapter
- 4 Remove differential from vehicle.

Differential Inspection (Wagon)

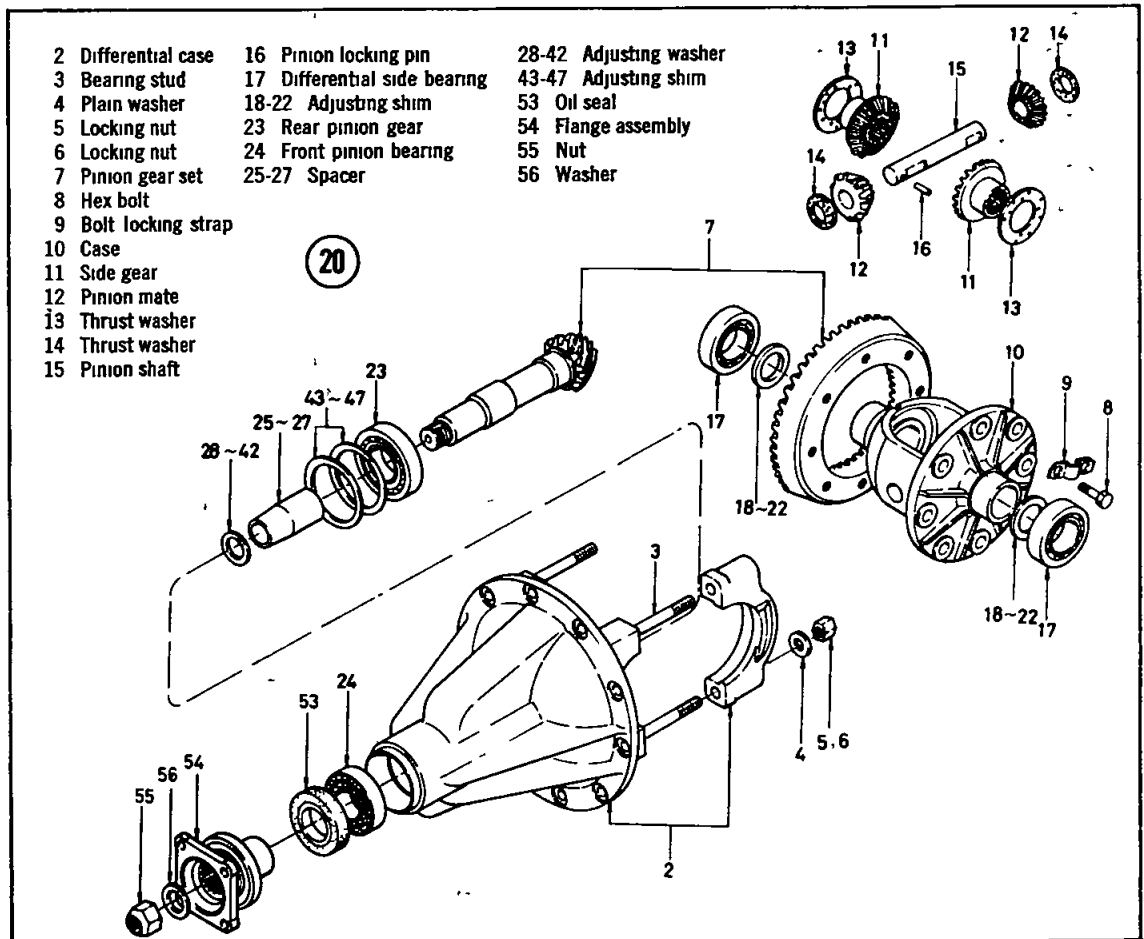
The following inspection can be done without disassembly of the differential. Perform the fol-

lowing inspection, and if abnormalities or damage exists, refer further service and repair to your dealer

- 1 Check the tooth contact pattern with lead oxide at two or three points, after removing rear cover. Refer to Figure 5 for correct contact pattern. If the pattern is not correct, disassembly and adjustment of the differential is required.
- 2 Measure backlash between drive gear and pinion with a dial indicator. Backlash should be 0.0059 to 0.0079 in. (0.15 to 0.20mm).
- 3 Rotate the gears and listen for signs of bearing noise. Defective bearings should be replaced by a dealer.
- 4 Inspect gear teeth for signs of damage or cracks.

Differential Installation (Wagon)

Install the differential by reversing the procedures used for removal.



REAR AXLE AND SUSPENSION (WAGON)

The rear axle is a semi-floating type. The rear wheel bearings are presealed and do not require periodic servicing. However, whenever new bearings are installed, they should be packed with wheel bearing grease during installation. **Figure 21** is an exploded view of the rear axle, while **Figure 22** is an exploded view of the rear suspension.

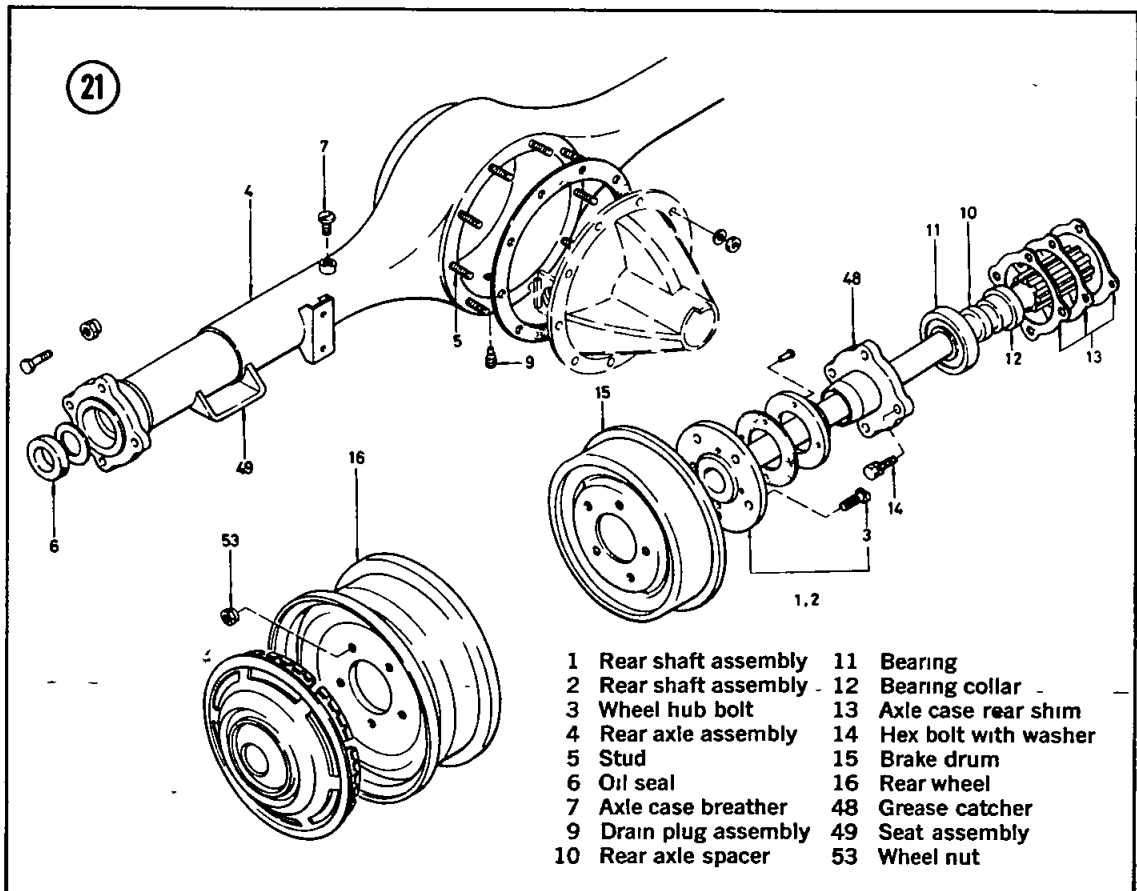
Rear Axle Removal (Wagon)

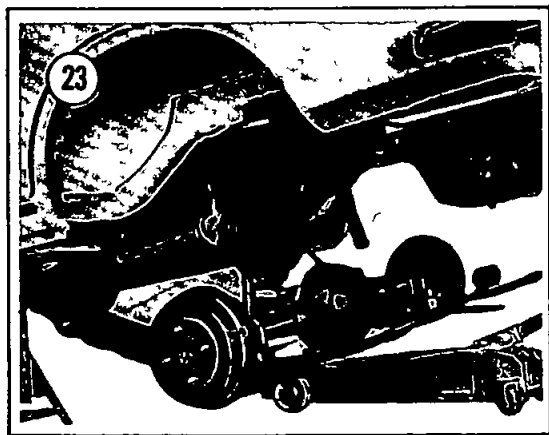
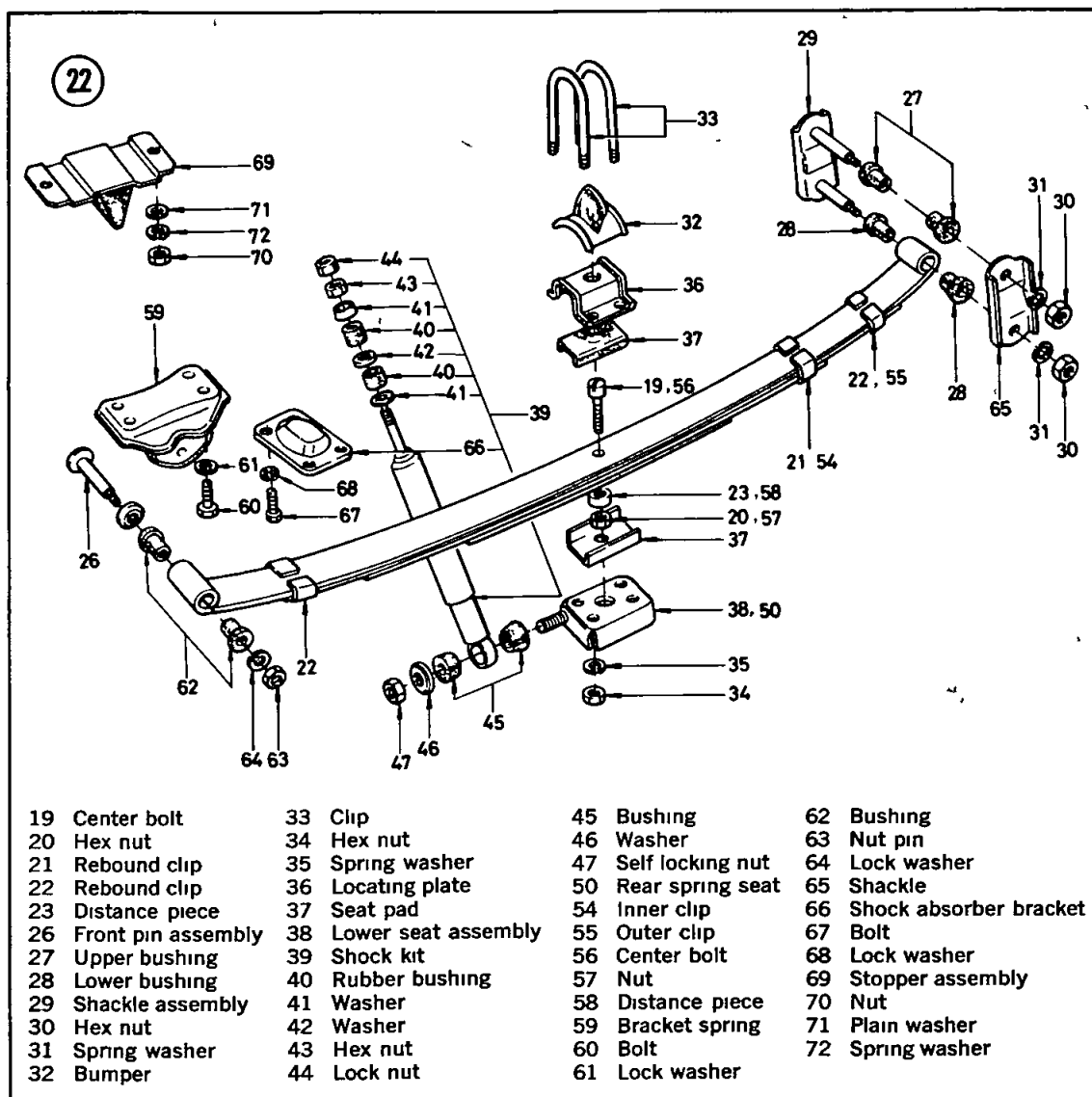
- 1 Remove hub caps and loosen wheel nuts
- 2 Jack up rear of vehicle and support it on stands
- 3 Remove wheel nuts and wheels. Remove brake drums. If drums are not free or are difficult to remove, slacken off brake shoe adjuster a few notches
4. Disconnect brake hose from brake tube. Plug up the hose to prevent fluid loss

- 5 Disconnect handbrake rear cable from balance lever assembly.
- 6 Remove four bolts holding drive shaft to the drive pinion companion flange
7. Release both lower shock absorber self-locking nuts and slide the mounting eyes off the pivot of the rear spring seat
8. Support rear axle with a transmission jack.
- 9 Loosen the U bolt lock nuts. Remove the nuts from both rear spring shackles and remove the shackles from the rear spring eyes.
10. Remove the U bolt lock nuts. Lower the jack and withdraw the rear axle assembly. See **Figure 23**.

Rear Axle Disassembly and Inspection (Wagon)

- 1 Disconnect brake line ends from wheel cylinders and remove the line complete with the three-way connector
- 2 Remove cross rod clamp and balance lever arm from the rear axle case. Remove both cross





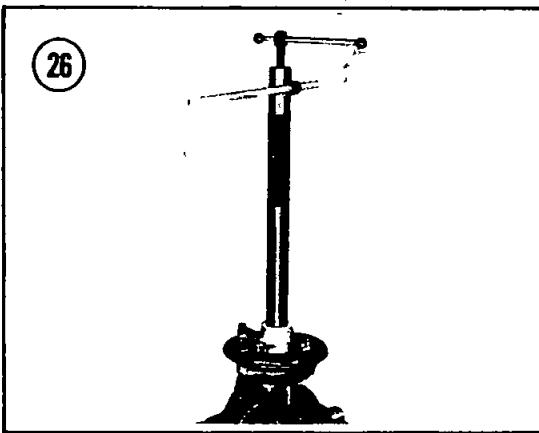
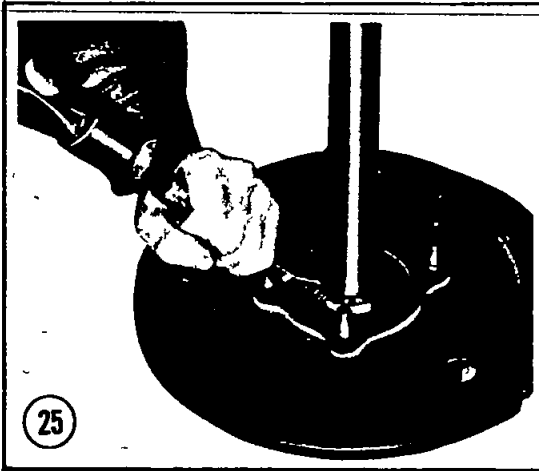
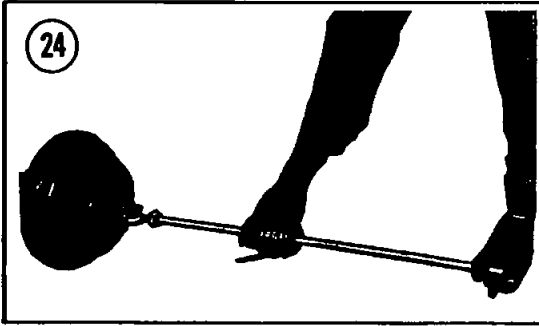
rod ends from the wheel cylinder lever assembly. Withdraw the handbrake linkage assembly.

3 Unscrew the oil drain plug and drain oil into suitable container.

4 Remove four nuts holding brake back plate to the axle case. Draw out axle shaft assembly with the brake back plate and grease catcher. Use a slide hammer as shown in **Figure 24**

5 Press off the bearing collar or cut it loose with a cold chisel, as shown in **Figure 25**. The removed collar should not be reused.

6 Use a bearing puller to remove the bearing. See **Figure 26**. Take out brake back plate



7 Remove ten nuts holding the differential assembly to the axle case and withdraw the differential assembly

Rear Axle Inspection, Assembly, and Installation (Wagon)

1 Check the axle shafts for straightness, cracks, damage, wear, and distortion. Replace if defective. Do not attempt to heat axle to straighten

it as this will weaken the axle and could lead to more serious trouble

2 Clean all parts thoroughly with solvent

3. Check oil seal lip for damage. Replace as required.

4. Check the bearings for damage and replace if defective.

5 Assemble the rear axle unit in the reverse of disassembly.

6 Use a new gasket between axle cases and differential

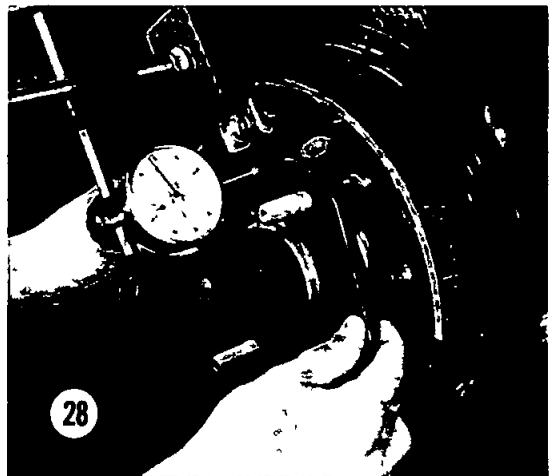
7 The gear carrier fixing nuts must be torqued in a diagonal pattern to prevent oil leaks. Tighten to 14.5 to 15.9 ft-lb (2.0 to 2.2 kg/m).

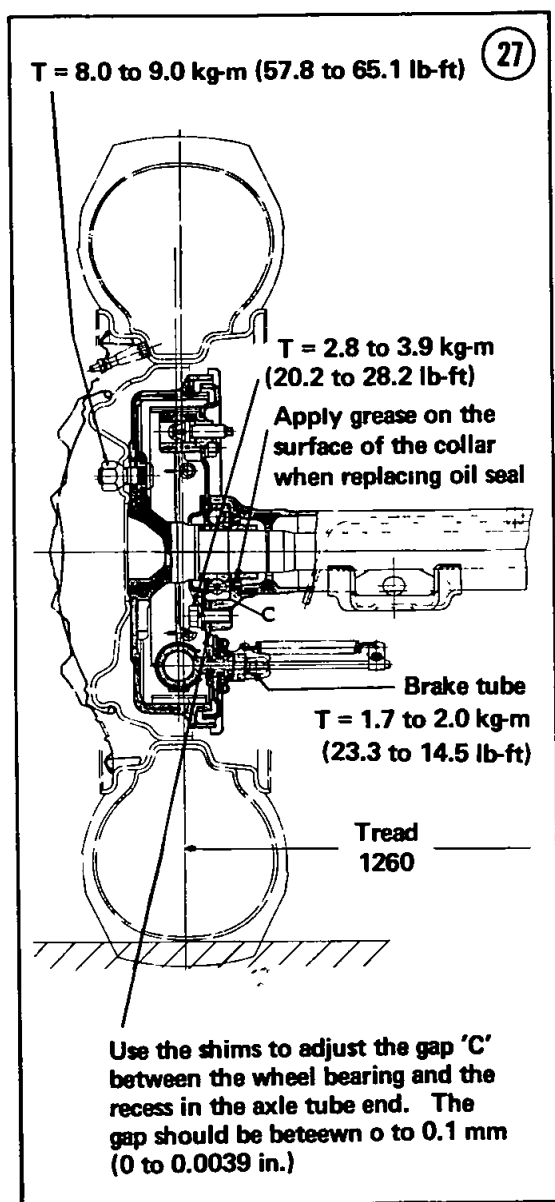
8 Install the grease catcher, bearing spacer, bearing, and new bearing collar on the axle shaft. The bearing collar must be fitted using an arbor press and 4 to 5 tons of force. Make certain to pack the wheel bearing with grease and insert the wheel bearing with the seal side toward the wheel.

9 If the oil seal has been replaced, take care not to damage it when installing the axle shaft assembly. As a matter of good practice, replace the oil seal whenever the axle is disassembled.

10 Refer to Figure 27 and grease the indicated areas. Torque all bolts as specified.

11 Adjust the axial end play between the wheel bearing and the recess in the axle tube with adjusting shims. The end play should be 0.0118 to 0.0197 in (0.3 to 0.5mm). Check end play with a dial gauge as shown in Figure 28.





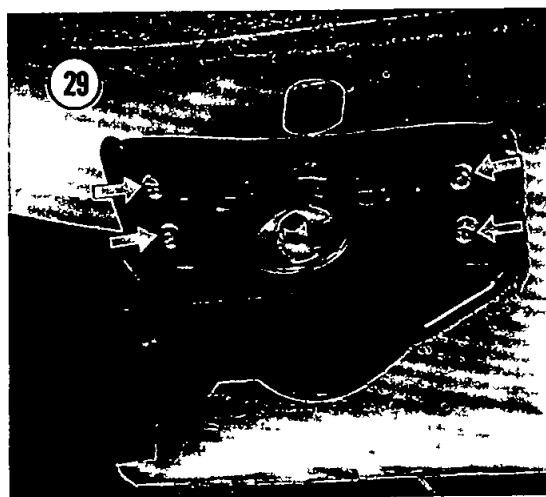
12 Fill the differential housing with specified lubricating oil

REAR SUSPENSION (WAGON)

The rear suspension consists of semi-elliptic leaf springs, hydraulic shock absorbers, and rubber bumpers. Iso-clamp devices are used for attaching the axle housing to the spring. The leaf springs, shock absorbers, and rear axle housing are mounted on rubber bushings at each end. See Figure 22

REAR SPRING REMOVAL, INSPECTION, REPAIR AND INSTALLATION (WAGON)

- 1 Jack up the center of the rear axle until the wheels are off the ground. Support the rear end with stands.
- 2 Remove spare tire
- 3 Disconnect shock absorber bottom end from spring lower seat.
4. Loosen rear spring U bolt nuts. Remove bolts, bumper assemblies, spring seat location plates, and seat pads
- 5 Remove four fixing bolts holding the front bracket See Figure 29.



- 6 Lower the rear spring and the bracket from the body.
- 7 Remove rear shackle upper and lower nut
- 8 Separate front bracket from spring by removing front pins
- 9 Examine the spring leaves for fractures, cracks, or other damage Replace as required.
- 10 Check front pin, shackle, U bolts, and spring seat for wear, cracks, and other damage Replace if defects are found.
- 11 Inspect all rubber parts for wear, damage, and general condition Replace as required.
- 12 Install the rear springs in the reverse of removal
- 13 See that bumper is properly installed The elongated flange of the rubber bumper should face the rear.

14 Coat the front bracket pin and bushing, and shackle pin and bushing with a soap solution prior to assembly.

15 The front pin securing nut and shock absorber lower end securing nut should be retightened after the vehicle is sitting on the ground

16 Make certain the shackle bushing flange is clamped evenly on both sides

SHOCK ABSORBER REMOVAL, INSPECTION, AND INSTALLATION (WAGON)

1 Jack up the center of the rear axle and support the axle housing with stands

2 Remove the lower end of the rear shock absorber from spring seat.

3 Loosen the four bolts securing the upper bracket to body. Remove shock absorber and upper bracket

4. Check shock absorber for leaks and cracks. Check the shaft for straightness. Replace if defective

5 Inspect rubber bushings for damage, cracks, and general condition. Replace if defective.

6 Install the shock absorber by reversing the procedure used during removal

DIFFERENTIAL (PICK-UP)

The differential carrier is made up of aluminum alloy and uses a hypoid bevel gear. Proper lubrication is essential. Check and replenish the lubricant every 3,000 miles. Drain and refill every 30,000 miles. **Figure 30** is a cross sectional view of the pick-up differential.

Differential Removal (Pick-up)

1 Jack up the rear wheels and support vehicle with stands

2 Disconnect drive pinion companion flange-to-yoke connection

3 Remove rear axles as described later in this chapter

4 Remove differential gear assembly.

Differential Inspection (Pick-up)

The following inspection can be done without disassembly of the differential. If abnormalities or damage exists, refer further service and repair to your dealer

1 Check the tooth contact pattern with lead oxide at two or three points after removing rear cover. Refer to **Figure 5** for correct contact pattern. If the pattern is faulty, disassembly and adjustment of the differential is required

2 Measure backlash between drive gear and pinion with a dial indicator. Backlash should be 0.0051 to 0.0071 in (0.13 to 0.18mm)

3 Rotate the gears and listen for signs of bearing noise

4 Inspect gear teeth for signs of damage or cracks.

Differential Installation (Pick-up)

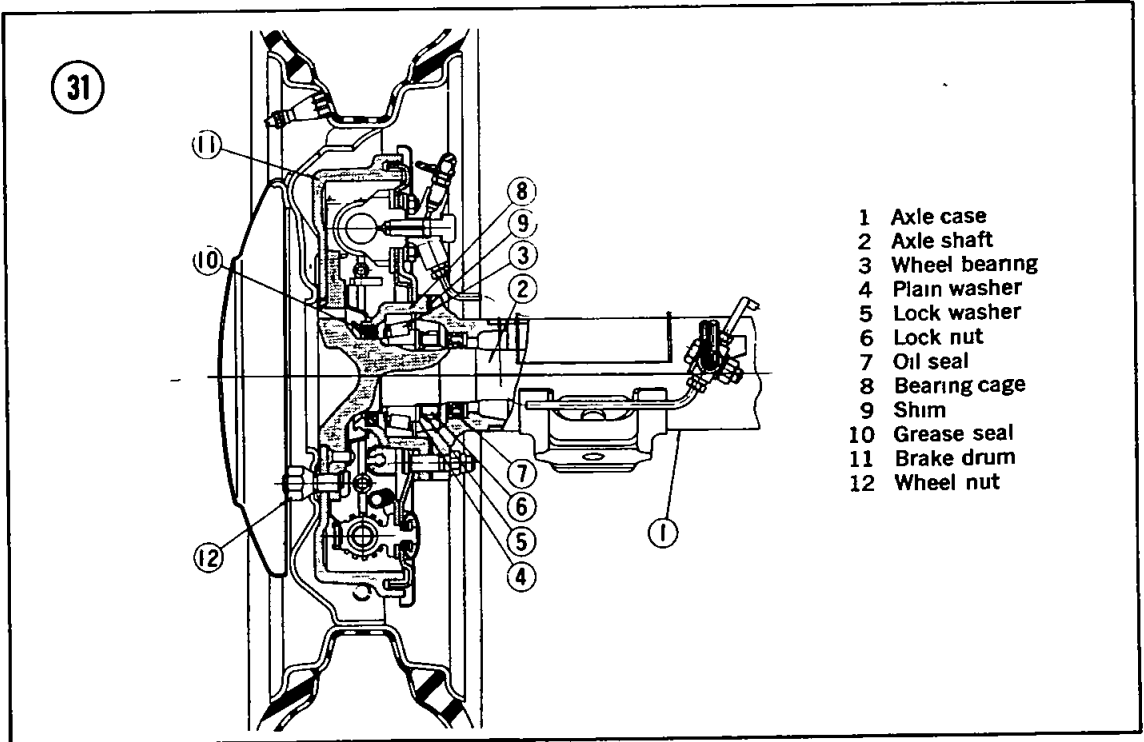
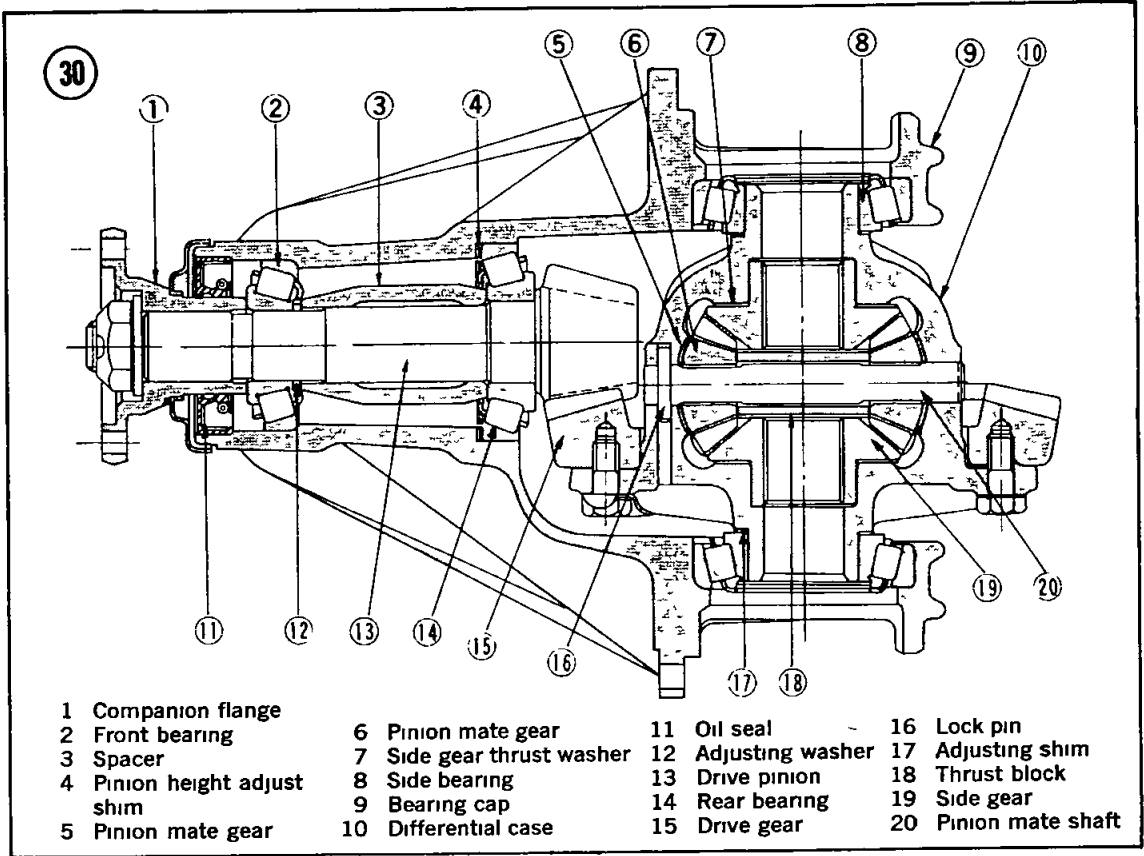
Install the differential by reversing the procedures used during removal.

REAR AXLE AND SUSPENSION (PICK-UP)

The rear axle is of the semi-floating type. The rear wheels use tapered roller bearings. **Figure 31** is a cross sectional view of the rear axle.

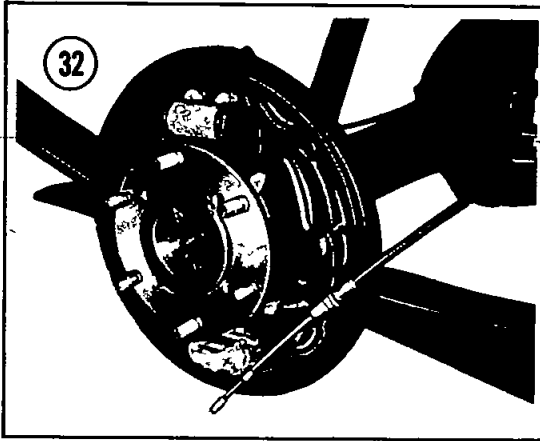
REAR SUSPENSION TORQUE TIGHTENING SPECIFICATIONS (WAGON)

Shock absorber upper bracket to body bolts	11 to 18 ft.-lb (1.5 to 2.5 kg/m)
Shock absorber to upper bracket lock nuts	12 to 16 ft.-lb (1.7 to 2.2 kg/m)
Shock absorber to lower bracket lock nuts	25 to 33 ft.-lb (3.5 to 4.5 kg/m)
Rear spring U bolt nuts	43 to 47 ft.-lb (6.0 to 6.5 kg/m)
Shackle nuts	32 to 36 ft.-lb (4.5 to 5.0 kg/m)
Front pin nuts	32 to 36 ft.-lb (4.5 to 5.0 kg/m)
Front bracket fixing nuts	13 to 17 ft.-lb (1.8 to 2.3 kg/m)
Brake disc to rear housing bolts	20 to 28 ft. lb (2.8 to 3.9 kg/m)
Differential carrier to axle housing bolt	14 to 16 ft.-lb (2.0 to 2.2 kg/m)
Drive shaft flange nuts	20 to 28 ft. lb (2.8 to 3.9 kg/m)

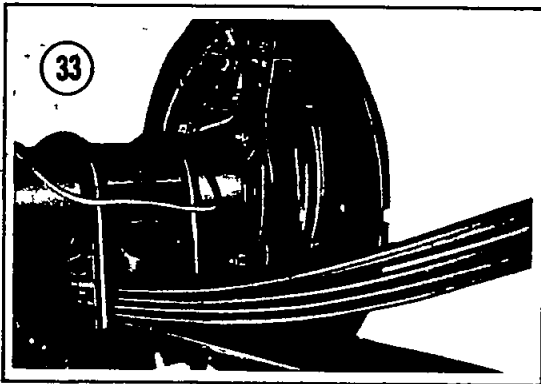


Rear Axle Removal (Pick-up)

- 1 Jack up the vehicle and support it with stands
2. Remove wheels and brake drum.
3. Remove brake shoe and disconnect hand-brake wire See **Figure 32**



- 4 Remove four nuts holding brake end to axle
Disconnect brake line Refer to **Figure 33**



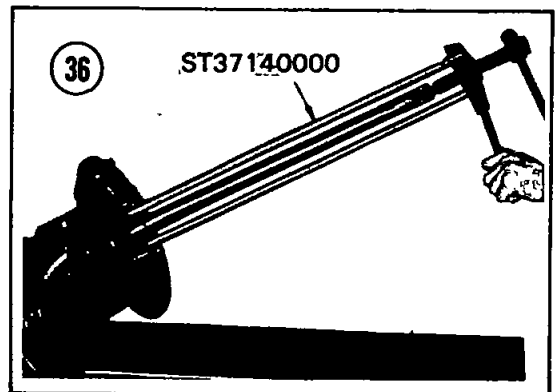
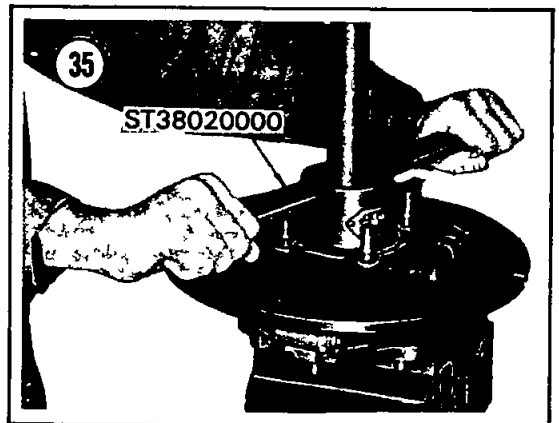
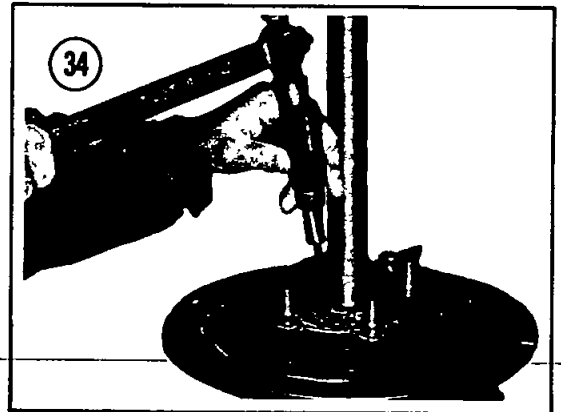
- 5 Withdraw axle shaft Be careful not to damage oil seal in axle case side.

- 6 Secure axle in holding fixture or secure with vise.

- 7 Unbend lockwasher with screwdriver as shown in **Figure 34** Do not reuse lockwasher, replace with new one

- 8 Remove lock nut with a wrench or special tool shown in **Figure 35**

- 9 Withdraw axle bearing, brake disc, and bearing cage by using a puller or special tool shown in **Figure 36**



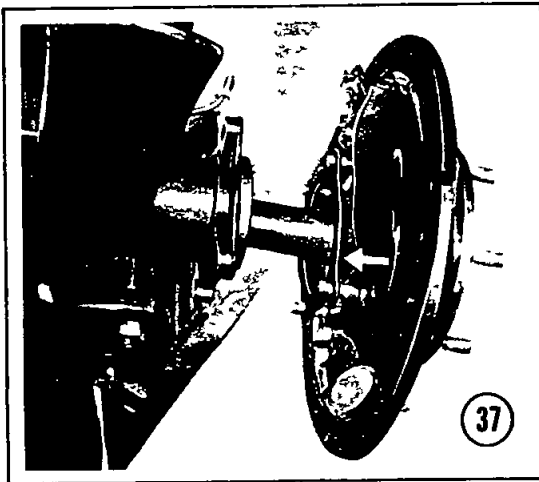
- 10 Remove oil seal as required Do not reuse oil seal again, replace it with a new one

11. To remove bearing cup from cage, remove seal, apply a brass bar, and tap it evenly with a hammer

Rear Axle Inspection and Installation (Pick-up)

- 1 Check the axle for bends and cracks Replace if damaged

- 2 Check wheel bearings for damage or noise
Replace them if defective
- 3 Be sure to use new oil seals and lockwashers
- 4 Fit bearing cup and grease seal to cage Tap with a brass hammer while fitting Fill grease seal lip with wheel bearing grease after fitting
- 5 Install brake disc and bearing cage on axle Fit bearing cone with brass bar
- 6 Tighten lock nut Place faced side of nut to washer side so that washer is not damaged Torque lock nut to 108 to 145 ft-lb (15 to 20 kg/m)
- 7 Match washer lip with groove in nut, tighten nut, and bend washer carefully to prevent lip damage
- 8 Use a brass bar to fit oil seal to tube end When fitted, apply grease to the lip Be careful not to deform seal or damage lip
- 9 Completely fill bearing with grease.
- 10 Install shaft Adjust axial clearance with shims See **Figure 37** Clearance should be 0.012 to 0.035 in. (0.3 to 0.9mm) Standard shim thickness is 0.059 in (1.5mm)



- 11 Install other shaft Adjust axial clearance with shim Clearance should be 0.0008 to 0.0059 in (0.02 to 0.15mm)
- 12 Install bolts and torque to 26 to 34 ft-lb. (3.6 to 4.7 kg/m)

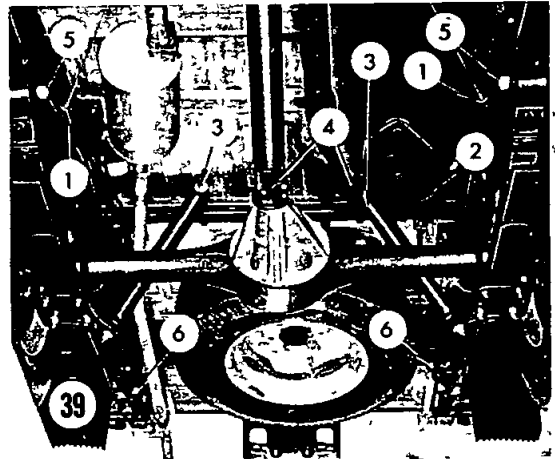
REAR SUSPENSION (PICK-UP)

The rear suspension is a banjo type rigid suspension with parallel semi-elliptic leaf

springs Front and rear ends of the springs are secured on the frame with rubber bushings. Shock absorbers are installed on the cross member from the spring lower pad. **Figure 38** (next page) is an exploded diagram of the rear suspension.

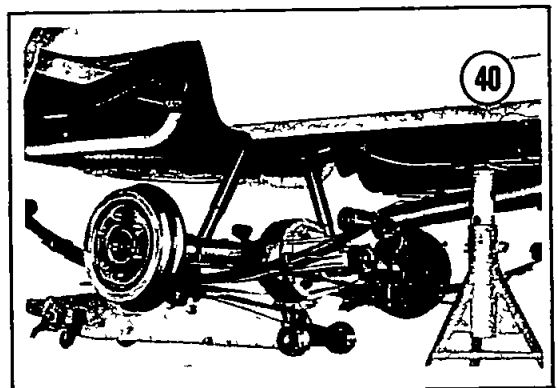
Rear Suspension Assembly Removal (Pick-up)

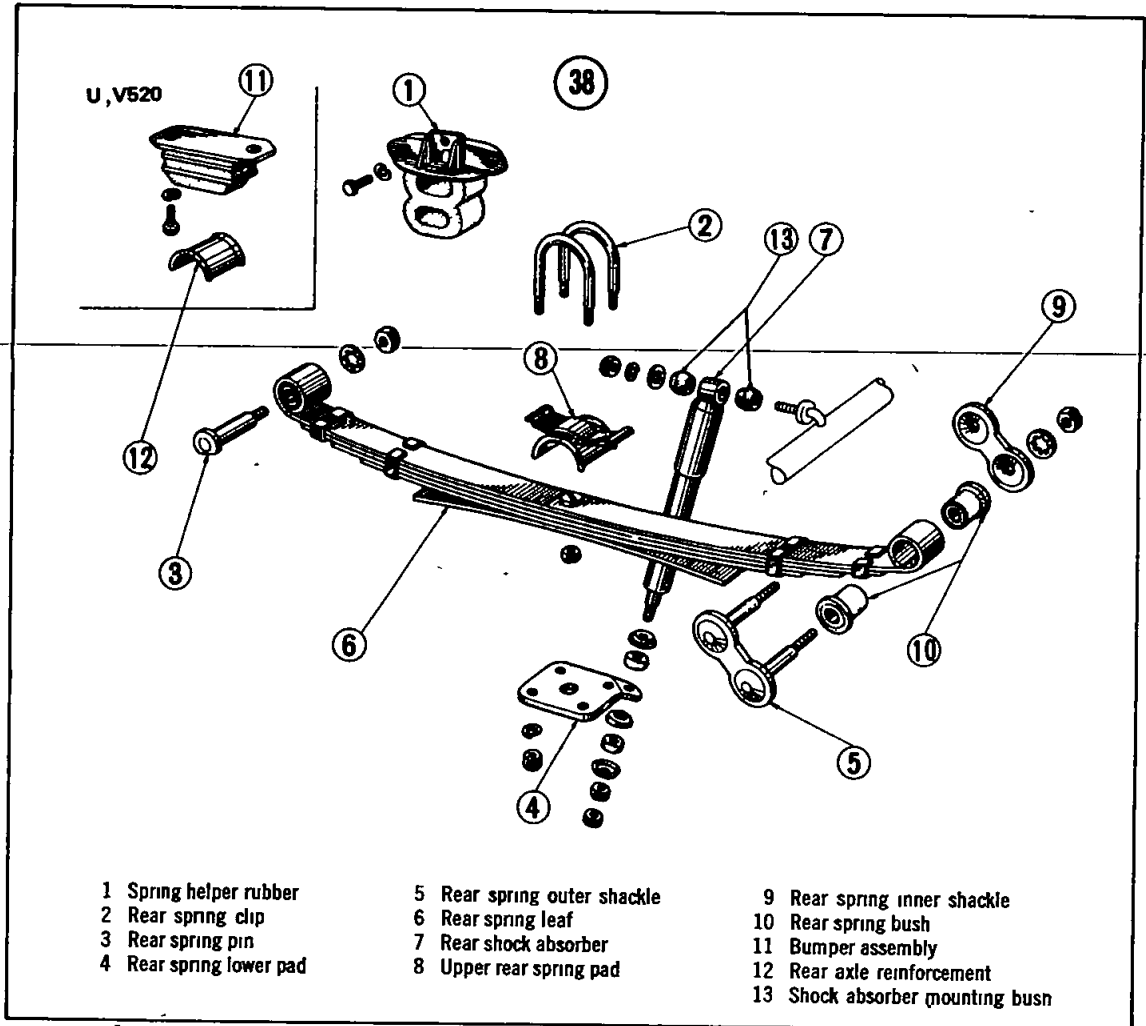
- 1 Jack up rear of vehicle and support it with stands Remove wheels
- 2 Refer to **Figure 39** Disconnect handbrake wire and equalizer unit Separate bracket (1).
- 3 Remove brake tube (2), shock absorber (3), and drive shaft (4)



- | | |
|------------------|--------------------|
| 1 Bracket | 4 Propeller shaft |
| 2 Brake tube | 5 Spring pin |
| 3 Shock absorber | 6 Shackle assembly |

- 4 Support axle case with a jack at the center. Remove spring pin (5) and shackle assembly (6) The spring seat need not be removed from shock absorber
- 5 Lower jack slowly and remove suspension assembly, as shown in **Figure 40**





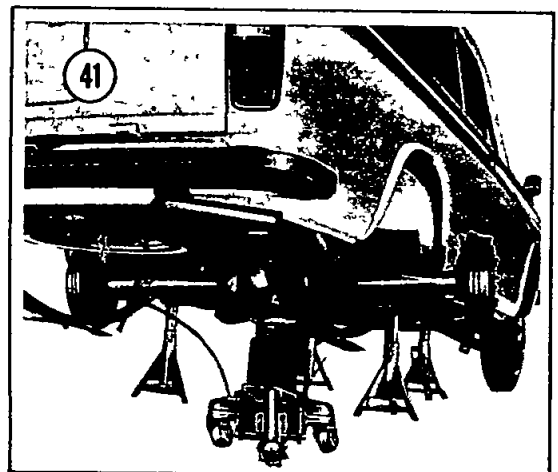
REAR SPRING REMOVAL (PICK-UP)

- 1 Jack up vehicle, support it with stands, and remove wheels.
2. Support axle case with jack or stand.
- 3 Remove U bolts and separate spring from axle case
- 4 Remove spring pin and shackle assembly
Remove leaf spring

4 Pass axle case through space above spring, and remove it from the side See Figure 41.

AXLE CASE REMOVAL (PICK-UP)

- 1 Jack up vehicle, support it with stands, and remove road wheel.
- 2 Remove handbrake wire, brake tube, shock absorber, and drive shaft
- 3 Remove U bolts and separate axle case from spring



REAR SUSPENSION (PICK-UP)**Rear Suspension Inspection and Repair (Pick-up)**

1. Check springs for cracks, breaks, and general condition. Replace as required. If a spring on one side is replaced, also replace the other one.
2. Check U bolts for bends, stripped threads, and general condition. Replace as required
3. Check rubber bumpers and bushings for cracks, wear, and general condition. Replace if defective
4. Check shock absorbers for leaks or other damage. Replace as required.

Rear Suspension Installation (Pick-up)

1. Replace the rear suspension components in the reverse order of removal.

2. When installing rubber bushings, coat them lightly with a soap solution
3. Torque parts as follows:

Shackle Pin	83 to 94 ft.-lb (11.5 to 13 kg/m)
Spring Pin	83 to 94 ft.-lb (11.5 to 13 kg/m)
U Bolt Securing Nut	61 to 72 ft.-lb (8.5 to 10 kg/m)
Shock Absorber	
Upper Nut	26 to 31 ft.-lb (3.6 to 4.3 kg/m)
Shock Absorber	
Lower Nut	10 to 12 ft.-lb (1.4 to 1.6 kg/m)
Drive Shaft Securing	
Bolt	18 to 22 ft.-lb (2.5 to 3.0 kg/m)

NOTE *Retighten bolts and nuts that hold bushings after vehicle has been removed from jack and stands*

CHAPTER THIRTEEN

FRONT AXLE, FRONT SUSPENSION, AND STEERING

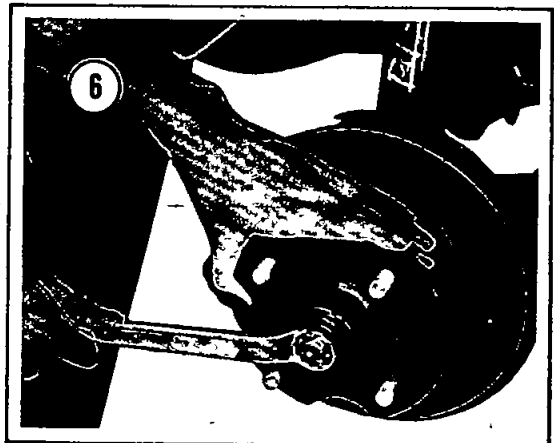
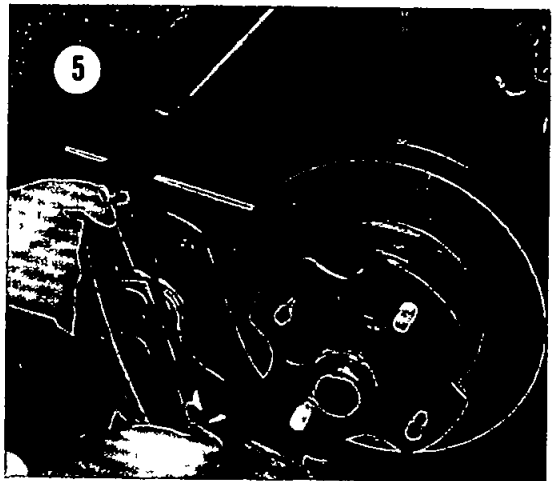
A strut-type front suspension is used on sedans and wagons. The shock absorber and the spindle are a single unit, which is supported by a coil spring on the upper end and by the transverse link on the lower end. Figures 1, 2, and 3 are exploded diagrams of the axle and suspension system used. Figure 1 illustrates the axle, Figure 2 shows the sedan suspension, and Figure 3 covers the wagon.

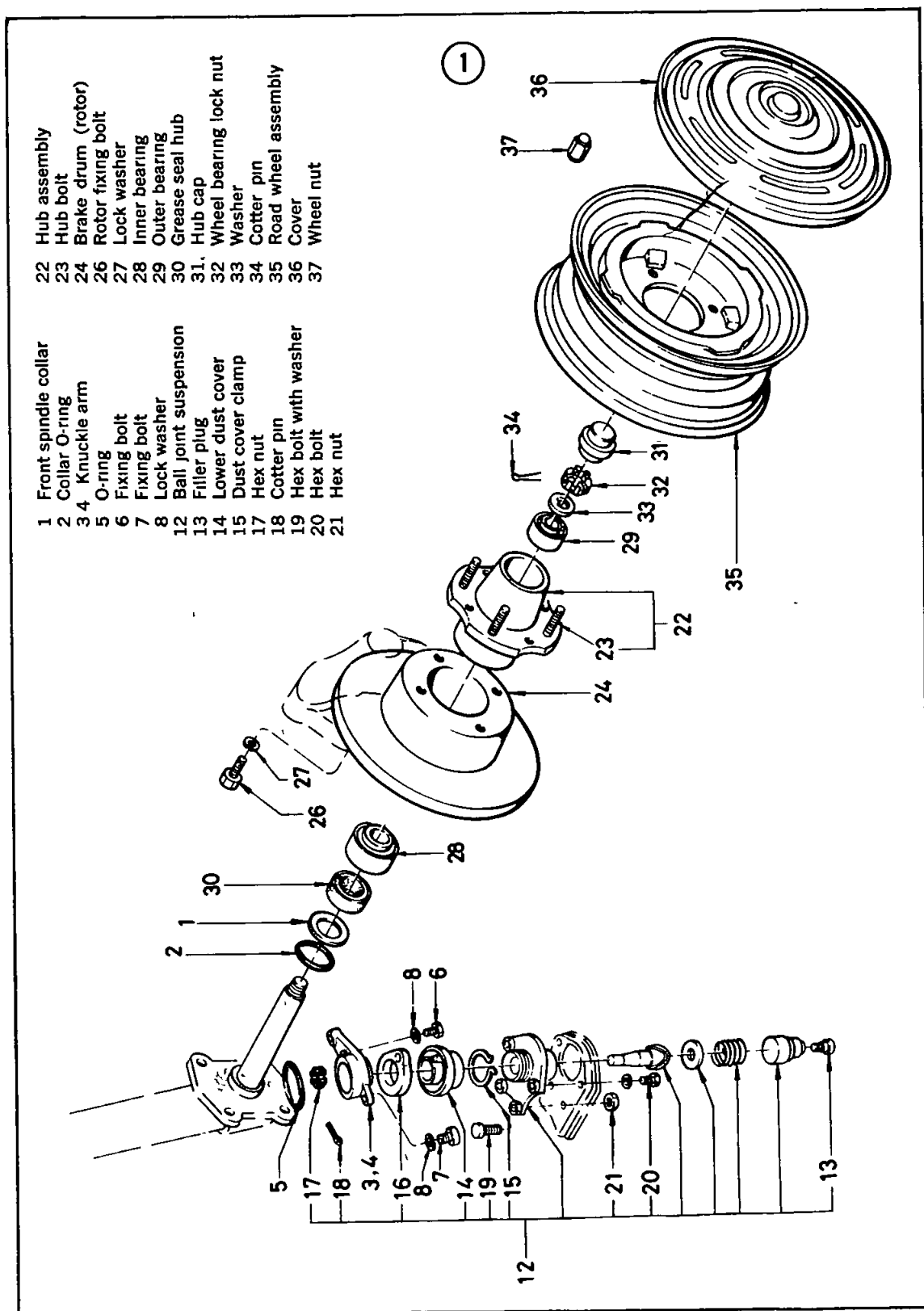
Front suspension on the pick-up is a double-wishbone independent design which uses torsion bars. Figure 4 is a cross sectional view.

WHEEL HUB AND WHEEL BEARING (SEDAN AND WAGON)

Wheel Hub and Wheel Bearing Removal (Sedan and Wagon)

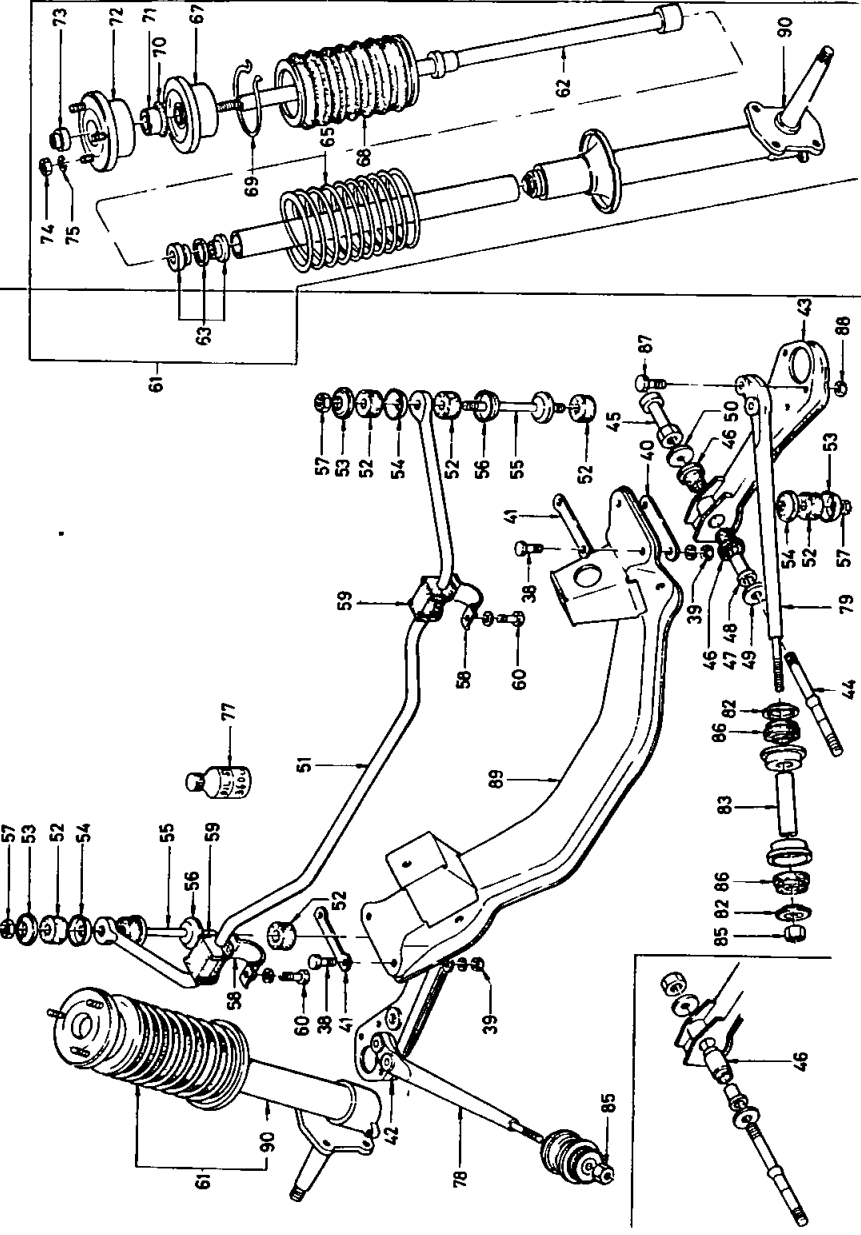
- 1 Jack up the front of the vehicle and support it on stands.
- 2 Remove the wheels.
- 3 Detach brake hose connector at frame
- 4 Remove caliper fixing bolts and then caliper. See Figure 5.
- 5 Remove hub cap, cotter pin, and front spindle nut. See Figure 6.
- 6 Remove front wheel bearing washer. Detach front wheel hub and rotor.



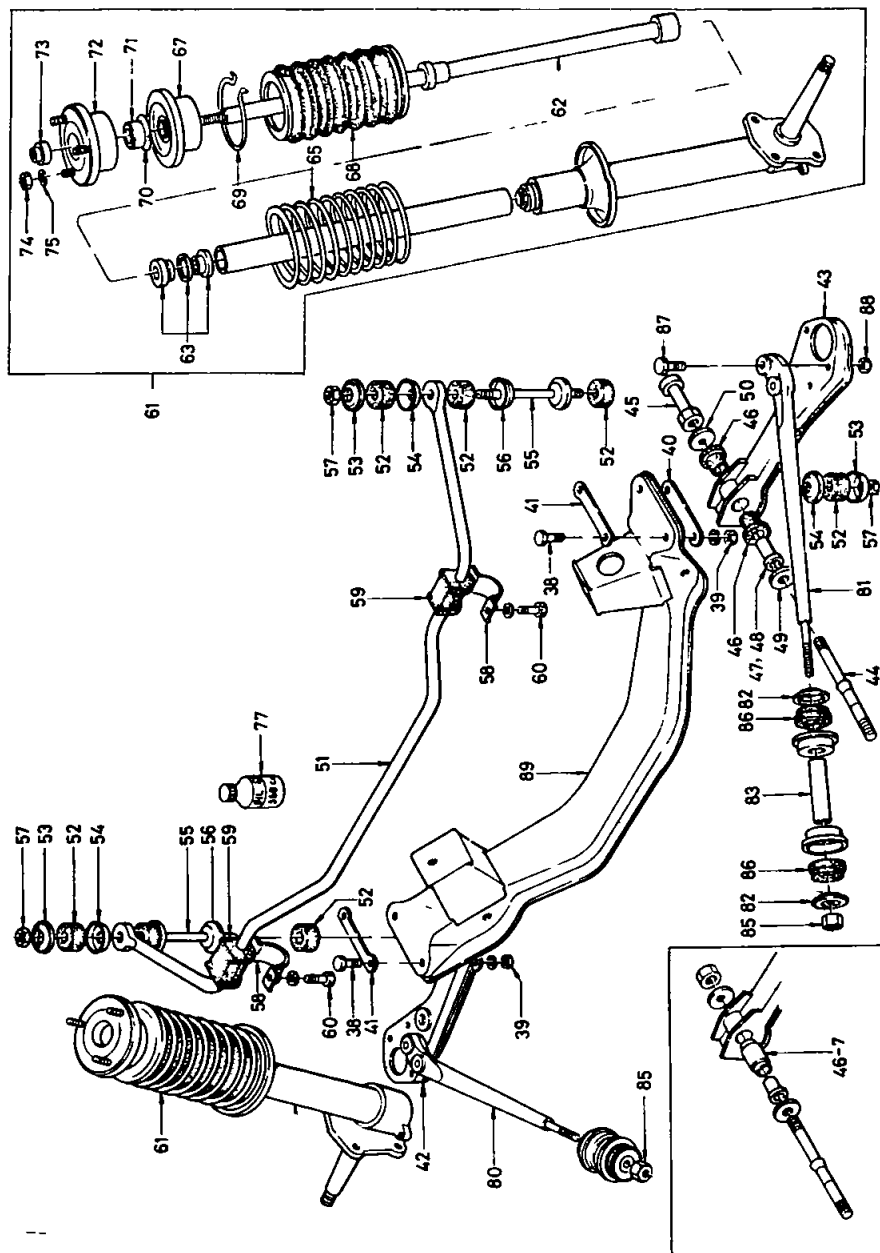


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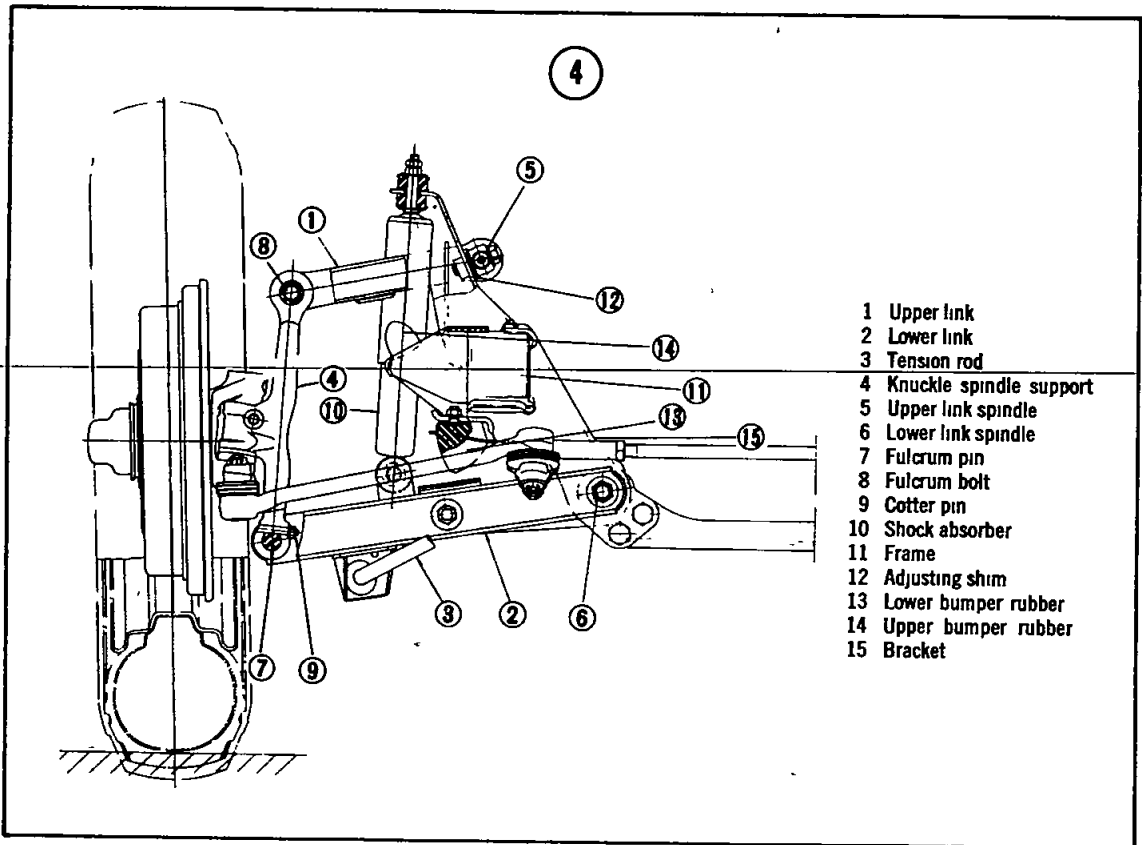
- 38 Hex bolt
- 39 Hex nut
- 40 Plain washer
- 41 Plain washer
- 42-43 Transverse link
- 44 Bolt
- 46 Bushing assembly
- 47 Collar
- 48 Collar
- 49 Washer
- 50 Washer
- 51 Torsion bar
- 52 Rubber bushing
- 53 Washer
- 54 Washer
- 55 Connecting rod
- 56 Washer
- 57 Nut
- 58 Stabilizer bracket
- 59 Stabilizer bushing
- 60 Hex bolt
- 61 Strut kit
- 62 Shock absorber kit
- 63 Strut seal kit
- 65 Front spring
- 67 Spring seat
- 68 Dust cover
- 69 Snap ring
- 70 Dust seal
- 71 Bearing
- 72 Insulator
- 73 Nut
- 74 Nut
- 75 Washer
- 77 Strut oil
- 78 Tension rod
- 79 Tension rod
- 82 Washer
- 83 Bushing collar
- 85 Nut
- 86 Bushing
- 87 Fixing bolt
- 88 Nut
- 89 Suspension member
- 90 Strut assembly with axle swivel



3



- 38 Hex bolt
- 39 Hex nut
- 40 Plain washer
- 41 Plain washer
- 42-43 Transverse link
- 44 Bolt
- 45 Nut
- 46 Bushing assembly
- 47 Collar
- 48 Washer
- 49 Washer
- 50 Washer
- 51 Torsion bar
- 52 Rubber bushing
- 53 Washer
- 54 Washer
- 55 Connecting rod
- 56 Washer
- 57 Nut
- 58 Stabilizer bracket
- 59 Stabilizer bushing
- 60 Hex bolt
- 61 Strut kit
- 62 Shock absorber kit
- 63 Strut seal kit
- 65 Front spring
- 67 Spring seat
- 68 Dust cover
- 69 Snap ring
- 70 Dust seal
- 71 Bearing
- 72 Insulator
- 73 Nut
- 74 Nut
- 75 Washer
- 80 Tension rod
- 81 Tension rod
- 82 Washer
- 83 Bushing collar
- 85 Nut
- 86 Bushing

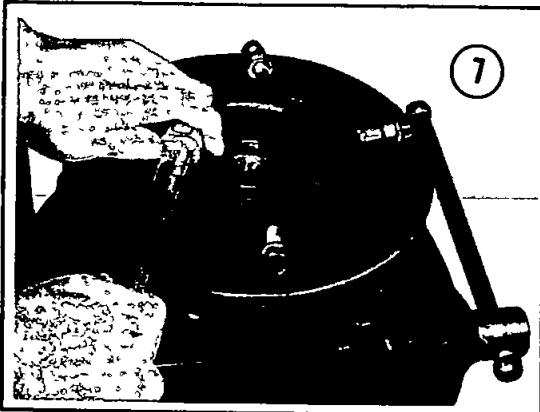


7. Remove bearing collar and extract the outer bearing cage.

8. Use a screwdriver to remove front hub grease seal and inner bearing cage.

9. Use a drift to punch out the outer and inner race of the outer bearings. Punch out inner bearing.

10. Detach rotor from wheel hub, as shown in Figure 7.



Wheel Hub and Wheel Bearing Inspection and Repair

1. Inspect all parts for wear and damage and clean with solvent.
2. Rotate bearings by hand to make certain they move freely. If dragging is evident, replace bearings.
3. Check the axle for scoring, excessive wear, rust, or other damage. Repair or replace as required.
4. Inspect the rotor for scoring, pitting, or rust. If damaged, recondition the rotor by having it turned or refaced. Refer to Chapter Fourteen.

Wheel Hub and Wheel Bearing Installation

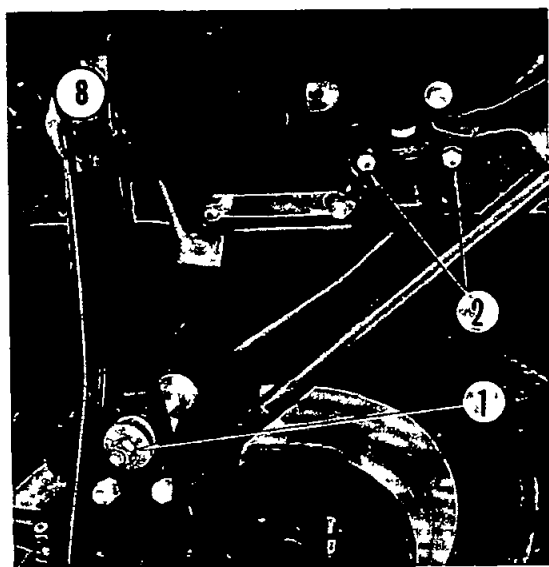
1. Assembly is the reverse of removal.
2. Apply wheel bearing grease to the inside of hub cap.
3. Replace grease seals with new ones whenever they are removed.
4. Torque bolts to specifications on next page.

Spindle Nut	21.7 to 25.3 ft.-lb (3.0 to 3.5 kg/m)
Caliper Fixing Bolts	52.8 to 71.6 ft.-lb (7.3 to 9.9 kg/m)
Rotor Fixing Bolts	28.2 to 38.3 ft.-lb (3.9 to 5.3 kg/m)
Back Plate Fixing Bolt	19.5 to 26.8 ft.-lb (2.7 to 3.7 kg/m)

STABILIZER (SEDAN AND WAGON)

Stabilizer Removal (Sedan and Wagon)

1. Refer to Figure 8 Remove stabilizer mount bolts (1) from both sides of the transverse link.
2. Remove the bracket bolts (2) and stabilizer.



Stabilizer Inspection and Repair

1. Inspect the stabilizer for wear and damage. If the stabilizer has been bent, replace it.
2. Check bushings for wear and damage. Replace as required.

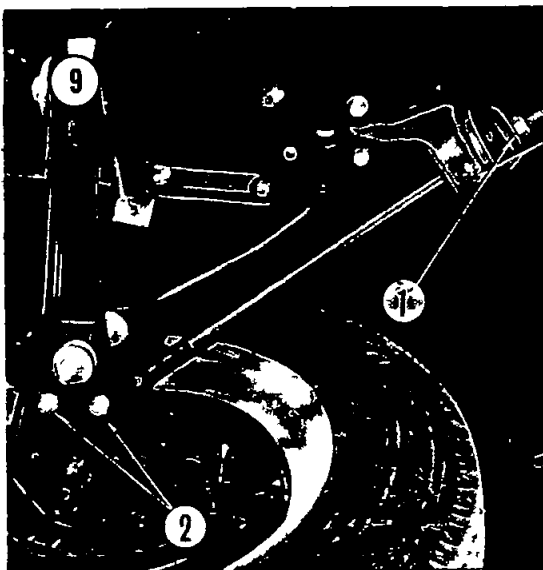
Stabilizer Installation

1. Reverse the procedure used in removal.
2. Torque parts as follows

Transverse Link Bracket	8.7 to 12.3 ft.-lb (1.2 to 1.7 kg/m)
Frame Bracket	13.7 to 18.1 ft. lb (1.9 to 2.5 kg/m)

TENSION ROD REMOVAL/INSPECTION/REPAIR (SEDAN AND WAGON)

1. Refer to Figure 9 Remove bolts (2) on the transverse link side. Remove nuts (1) on the body/frame side.



2. Remove tension rod
3. Inspect tension rod for bends or cracks. Replace if defective
4. Inspect rubber bushings for damage and wear. Replace as required.

Tension Rod Installation

1. Install tension rod in the reverse order used in removal
2. Torque mounting bolts as follows:

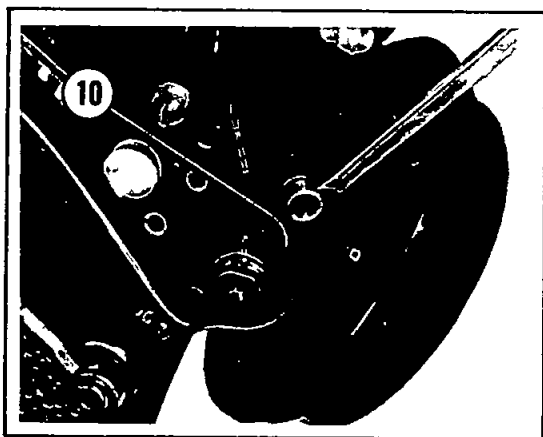
Frame Bracket Side	52.1 to 69.4 ft.-lb (7.2 to 9.6 kg/m)
Transverse Link Side	35.4 to 45.6 ft.-lb (4.9 to 6.3 kg/m)

SPRING AND STRUT ASSEMBLY (SEDAN AND WAGON)

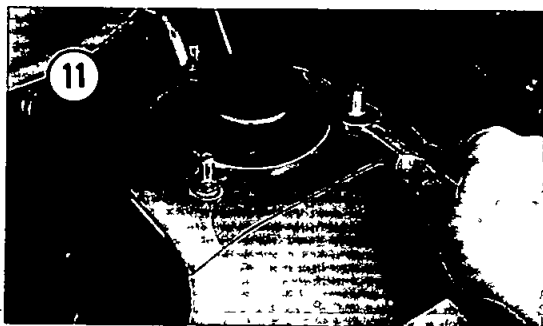
Repair and servicing requires special tools not usually available to the home mechanic. The following procedures are limited to removal and replacement. Disassembly and repair should be referred to a Datsun dealer.

Spring and Strut Assembly Removal and Installation

- 1 Jack up the front of the car and support it on stands.
2. Remove front wheel.
- 3 Detach brake hose connector at frame Remove lock spring and disconnect brake hose from brake tube Plug up end of tube so that brake fluid will not leak out.
4. Detach tension rod fixing bolts and stabilizer fixing nut Remove from transverse link.
- 5 Detach two bolts connecting strut assembly and knuckle arm, as shown in **Figure 10**.



- 6 Place a jack at the bottom end of the strut assembly.
- 7 Open the hood and remove the strut fixing nuts Refer to **Figure 11**



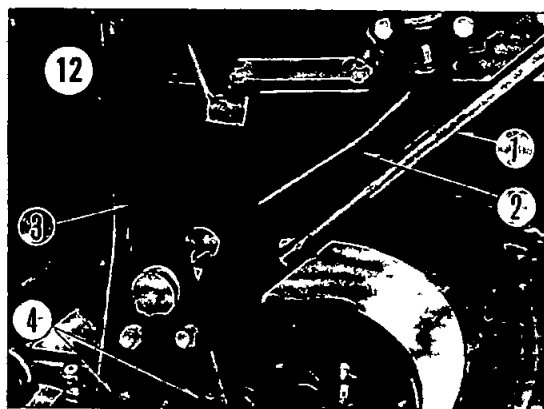
8. Lower the jack slowly. The strut assembly, with springs attached, can now be removed from the body frame.
9. Install strut assembly in the reverse of removal.

10 Torque fixing bolts as follows

Strut Assembly to Body Nuts	28 2 to 37 6 ft.-lb (3 9 to 5 2 kg/m)
Knuckle Arm to Strut Bolts	43 4 to 57 8 ft.-lb (6 0 to 8 0 kg/m)
Tension Rod to Transverse Link Nut	35 4 to 45 6 ft.-lb (4 9 to 6 3 kg/m)
Transverse Link Bracket Bolts	8 7 to 12 3 ft.-lb (1 2 to 1 7 kg/m)
Frame Bracket Bolts	13 7 to 18 1 ft.-lb (1 9 to 2 5 kg/m)

TRANSVERSE LINK REMOVAL AND INSTALLATION (SEDAN AND WAGON)

- 1 Jack up the vehicle and support it with stands.
- 2 Refer to **Figure 12** Separate the tension rod (1) and the stabilizer (2) from the transverse link (3) Remove lower ball joint fixing bolts (4)



- 3 Remove nut and take out transverse link.
- 4 Inspect transverse link and rubber parts for wear and damage Replace as required
5. Install transverse link in the reverse of removal
- 6 Torque bolts as follows:

Transverse Link to Cross Member	88 2 to 97 6 ft.-lb (12 2 to 13 5 kg/m)
Lower Ball Joint	13 7 to 18 1 ft.-lb (1 9 to 2 5 kg/m)
Tension Rod to Transverse Link	35 4 to 45 6 ft.-lb (4 9 to 6 3 kg/m)
Stabilizer to Transverse Link	8 7 to 12 3 ft.-lb (1 2 to 1 7 kg/m)

LOWER BALL JOINT REMOVAL/REPAIR/INSTALLATION (SEDAN AND WAGON)

1. Separate tension rod and stabilizer from the transverse link.

- 2 Remove bolt connecting strut and knuckle arm.
- 3 Remove cotter pin and lower ball joint.
4. Separate lower ball joint from knuckle arm
- 5 Remove bolts for lower ball joint Separate transverse link from lower ball joint
- 6 Inspect ball joint and dust cover for wear or damage Replace as required If end play in the axial direction of the ball joint exceeds 0 0012 to 0 0136 in (0.03 to 0.6mm), replace it.
- 7 Install ball joint in the reverse of removal. Grease it through the grease nipple Take care to fill the cavity slowly so that grease does not come out from the clamp portion.
- 8 Torque bolts as follows

Lower Ball Joint to Transverse Link	13 7 to 18 1 ft.-lb (1 9 to 2 5 kg/m)
Ball Stud Nut	39 8 to 55 0 ft.-lb (5 5 to 7 6 kg/m)
Knuckle Arm to Strut	43 4 to 57 8 ft.-lb (6 0 to 8 0 kg/m)
Tension Rod to Transverse Link	35 4 to 45 6 ft.-lb (4 9 to 6 3 kg/m)
Stabilizer to Transverse Link	8 7 to 12 3 ft.-lb (1 2 to 1 7 kg/m)

FRONT SUSPENSION ADJUSTMENT AND WHEEL ALIGNMENT (SEDAN AND WAGON)

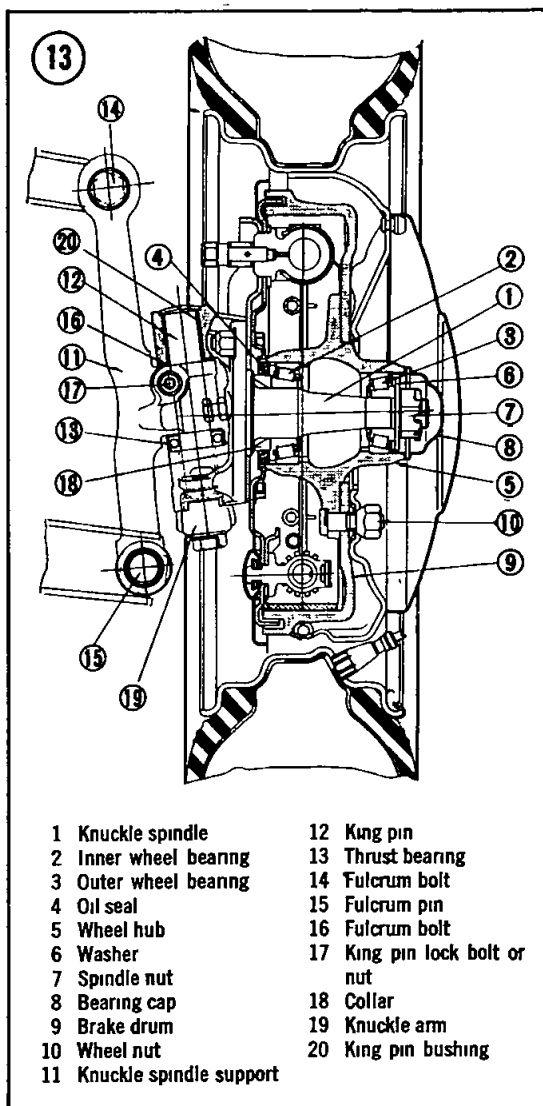
Due to the specialized equipment required, front suspension adjustment and wheel alignment should be referred to a Datsun dealer or front-end specialist The following specifications apply to the sedan and wagon

	Sedan	Wagon
Caster	1° 40'	2° 00'
Camber	1° 00'	2° 10'
King Pin Inclination	8° 00'	7° 50'
Toe In	0 236 to 0 354 in (6 to 9mm)	0 118 to 0 236 in (3 to 6mm)
Steering Angle In	38 to 39°	38 to 39°
Steering Angle Out	22° 30' to 33° 30'	22° 30' to 33° 30'

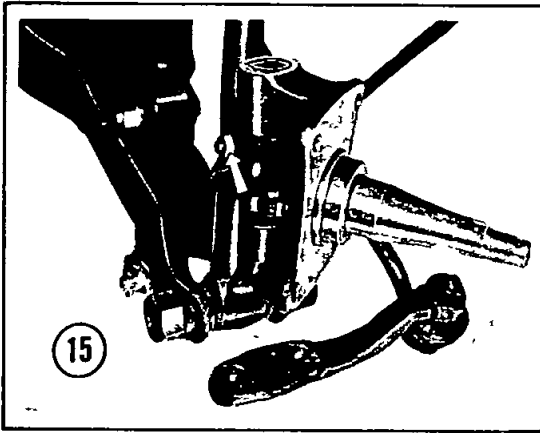
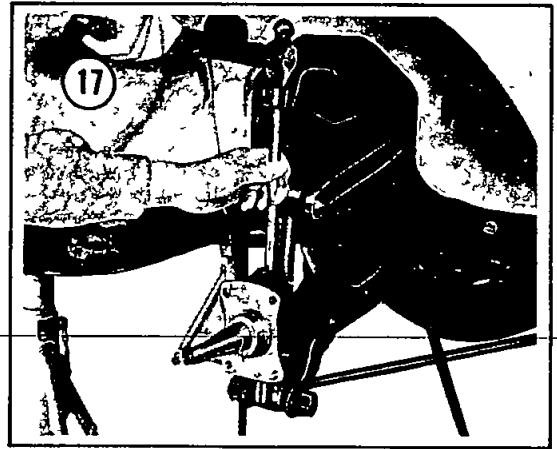
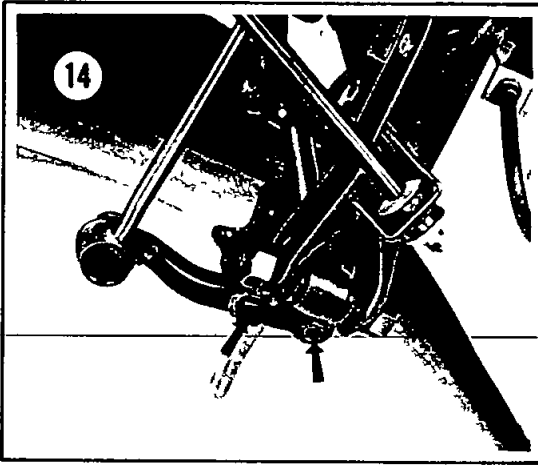
Front Axle Removal (Pick-up)

Refer to **Figure 13** and proceed as follows.

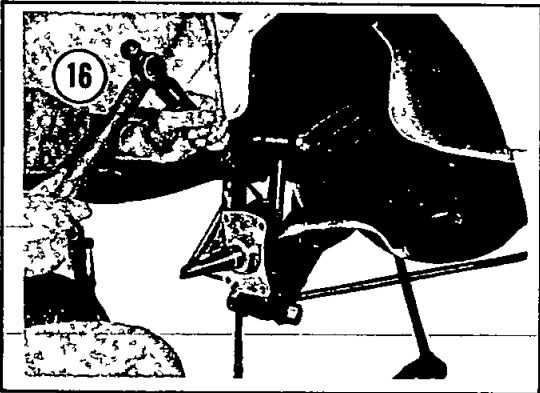
1. Jack up vehicle and support it with stands.
- 2 Remove wheel nuts and wheels
- 3 Remove brake hose from wheel cylinder.



- 4 Remove the brake drum Refer to Chapter Fourteen
5. Remove bearing cap, cotter pin, and spindle nut from spindle knuckle
- 6 Remove wheel hub, wheel bearings, oil seal, and collar from spindle knuckle
- 7 Remove brake assembly from knuckle spindle flange
- 8 Remove knuckle arm from spindle knuckle. See **Figure 14**.
9. Remove king pin lock bolt See **Figure 15**.
10. Remove plug from the top of king using a rod or other suitable tool. The plug can be



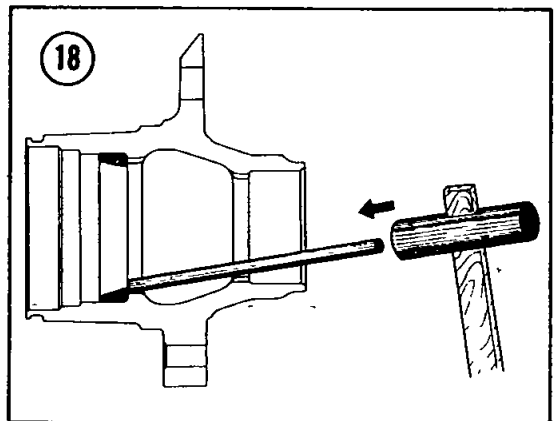
drilled, tapped, and a bolt inserted to use as a plug puller. Refer to Figure 16.



11. Drive out king pin and lower plug with a drift, as shown in Figure 17.

12. Tap spindle lightly with a hammer and detach it from the spindle knuckle support. Be careful not to lose the thrust bearing.

13. Remove wheel bearing by lightly tapping the outer race with a hammer and brass bar. Refer to Figure 18. Tap the outer race evenly.



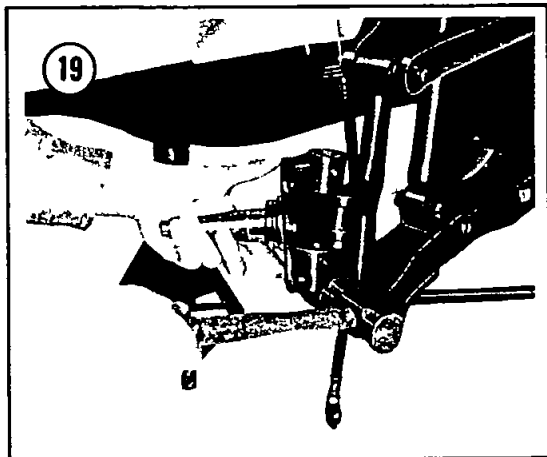
Front Suspension Inspection and Repair

1. Inspect king pin and bushing for signs of damage, seizing, rusting, and wearing. If clearance between the king pin and bushing exceeds 0.00059 in. (0.15mm), replace the king pin or bushing or both.

2. Check the oil seal for signs of damage or leakage. Replace as required.

3. Clean wheel bearings with solvent and check for general condition. Rotate bearings by hand and check for signs of dragging. If any of the conditions shown in Figure 19 are apparent, replace the bearings.

4. Check the spindle for wear and cracks. Replace as required. When bearing inner race slips against spindle, replace spindle. When thread is damaged, replace or repair the spindle.



- 5 Check front hub for cracks and damage. Replace if defective.
6. Check thrust bearing for wear, damage, rust, and ease of rotation. Replace if defective.

Front Suspension Installation

1. Reinstallation is the reverse of removal.
- 2 Apply light coating of multi-purpose grease to all sliding parts.
3. Install bushing carefully so that grease groove is on the upper side and the bushing joint is faced rearward. Remove grease nipple and drill grease hole through bushing through hole with an 0.1181 in. (3mm) drill. Remove metal shavings and burrs. Ream the inner diameter of the bushing to 0.7878 to 0.7888 in. (20.010 to 20.035mm)
4. Install thrust bearing so that the covered face side is upward.
5. Push up the bottom of the spindle lightly. Measure clearance and select a spindle shim to provide the following clearance.

Standard Clearance	0.0016 in (0.04mm)
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Shims are available in various thicknesses.

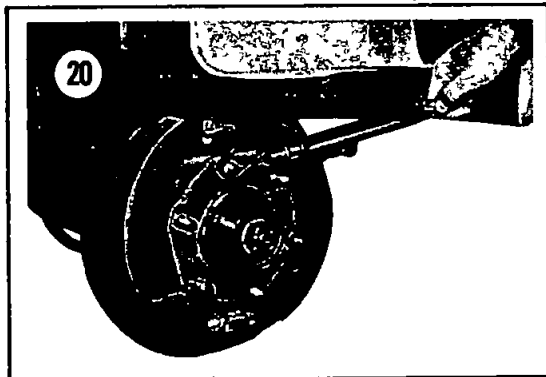
- 6 Fit king pin and make certain it operates smoothly.
- 7 Apply sealer to new plug and install.
- 8 Install bearing outer race. Fill wheel hub and hub cap with multi-purpose grease. Fill space between wheel bearing rollers and grease seal lip pocket with multi-purpose grease. Make certain wheel bearings are coated completely.
- 9 Apply multi-purpose grease to spindle shaft,

wheel bearing washer, and to the wheel bearing lock nut.

10. Make certain that no dirt or foreign material is permitted in contact with parts or grease during assembly.

Wheel Bearing Adjustment

- 1 Install spindle nut and torque to 23.1 to 24.6 ft.-lb (3.2 to 3.4 kg/m)
- 2 Turn wheel hub a few times in both the clockwise and counterclockwise direction. Recheck the spindle nut tightness.
- 3 Back off spindle nut from 40 to 70 degrees until hole in spindle and nut coincide. Insert cotter pin and bend over around nut.
4. Turn wheel hub a few turns in both directions to seat bearing. Check the starting torque of the hub with a spring gauge, as shown in Figure 20.



Starting torque should be as follows:

New Bearing and Seal	13.0 in lb (or less) (15 kg/cm or less)
Used Bearing and Seal	6.1 in -lb (or less) (7 kg/cm or less)

- 5 Readjust spindle nut as necessary to achieve proper starting torque. When correct, install the hub cap.

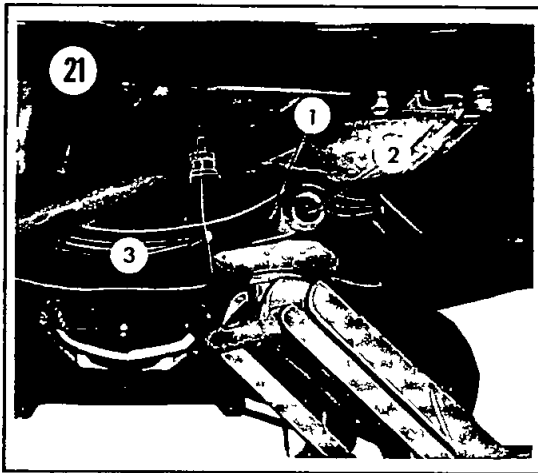
Front Suspension (Pick-up)

During the following procedures, refer to Figure 4 at the beginning of this chapter.

Front Suspension Removal

- 1 Jack up the vehicle and support it with stands
2. Remove wheels. Remove front axle as previously described
3. Remove brake hose from wheel cylinder.

4. Refer to **Figure 21** Loosen lock and adjusting nuts Place a jack under the spring anchor Remove anchor bolt



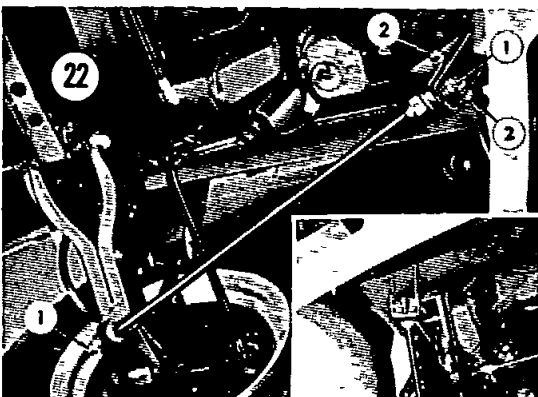
1 Spring anchor
2 Torsion bar spring
3 Anchor bolt

5 Lower the jack slowly Remove spring anchor and torsion bar spring toward rear of vehicle

6 When stabilizer is used, remove bolt holding stabilizer bracket to frame Remove stabilizer from lower link.

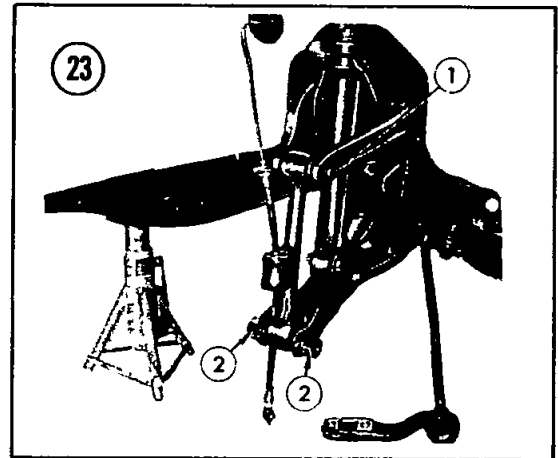
7. Remove shock absorber by removing upper and lower fixing nuts

8 Refer to **Figure 22** Remove nuts (1) from the front and rear ends of tension rod Detach tension rod with bracket.



9. Loosen the nut on the fulcrum bolt, as shown in **Figure 23** Remove fulcrum bolt and detach knuckle spindle support from upper link

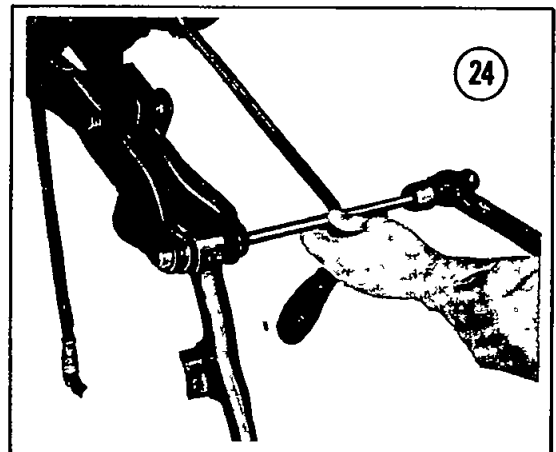
10 Remove screw bushings from both sides of fulcrum pin.



1 Fulcrum bolt
2 Screw bushing

11. Remove tightening nut from lower rear side of knuckle spindle support and remove cotter pin.

12 Use a drift to drive out fulcrum pin See **Figure 24** Detach knuckle spindle support from lower link Remove dust cover

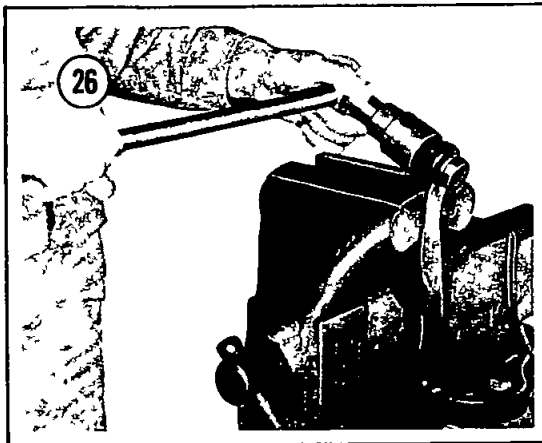


13 Remove upper link bushing from knuckle spindle support.

14. Remove upper link spindle installation bolt. Detach upper link spindle from mounting bracket with camber adjusting shim (**Figure 25**)

15 Twist and separate upper link from upper link spindle. Remove dust cover and dust seal. Place upper link in a vise and remove screw bushings

16. Loosen lower link spindle nut and remove lower link spindle. Remove lower link from lower link mounting bracket See **Figure 26**.



- 17 Remove lower link torque arm, and torque arm bolt. Separate torque arm from lower link.
- 18 Drive out lower link bushing from bracket.

Front Suspension Inspection and Repair

- 1 Check the shock absorber for oil leakage and general condition. Replace if defects are found.
- 2 Check upper and lower bushings. Replace if defective or worn.
- 3 Install screw bushing to upper link spindle and fulcrum pin. Measure end play in axial direction. If end play exceeds 0.00138 in (0.033mm), replace upper link spindle, fulcrum pin, and/or screw bushing.
- 4 Check dust cover for damage and deterioration. Replace as required.
- 5 Check threads of upper link spindle, fulcrum pin, and screw bushing. Repair or replace if defective.
- 6 Check lower link and upper link bushings for general condition and wear. Replace if defective.

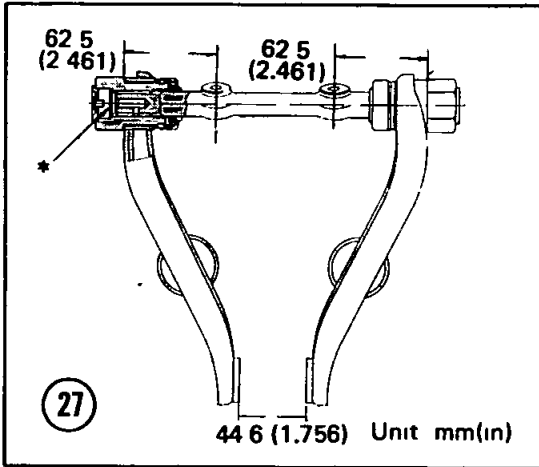
- 7 Check torsion bar for distortion, weakness, bends, and general condition. Replace if defective.
- 8 Check tension rod for distortion. If the threaded part is damaged, replace.
- 9 Check tension bar cushion rubber. Replace if defective.
- 10 Check dust seal for wear and damage. Replace as required.
- 11 Check threaded part of upper link spindle, fulcrum pin, and screw bushings for wear and damage. Replace as required.
- 12 Check lower link bushing and upper link bushing for signs of wear or damage. Replace as required.
- 13 Check torsion bar for distortion and general condition. Replace as required.
- 14 Replace rubber bumper if weakened or damaged.
- 15 Check upper and lower links for cracks, thread damage, and general condition. Repair or replace if defective.

Front Suspension Installation

- 1 Fit lower link bushing to lower link mounting bracket using a suitable drift and hammer.
- 2 Install torque arm on lower link. Torque bolts as follows:

Arm Head	18.1 to 22.4 ft-lb (2.5 to 3.1 kg/m)
Serration Boss	5.8 to 8.7 ft-lb (0.8 to 1.2 kg/m)

- 4 Tighten screw bushing on upper link. Install grease seal and dust cover. Torque to 173.5 to 180.8 ft-lb (24 to 25 kg/m).
- 5 Refer to **Figure 27**. Fill upper link screw bushing with multi-purpose grease as indicated by the * in the illustration. Apply grease to bushing interior. Thread on upper link spindle to the dimension indicated.
- 6 Screw front and rear links against upper link spindle to the opening width indicated. Remove the filler plug while fitting the front and rear links. Check to make certain that the upper link spindle operates smoothly.
- 7 Remove filler plug, install grease nipple, and inject grease until it comes out from dust cover. Reinstall filler plug.

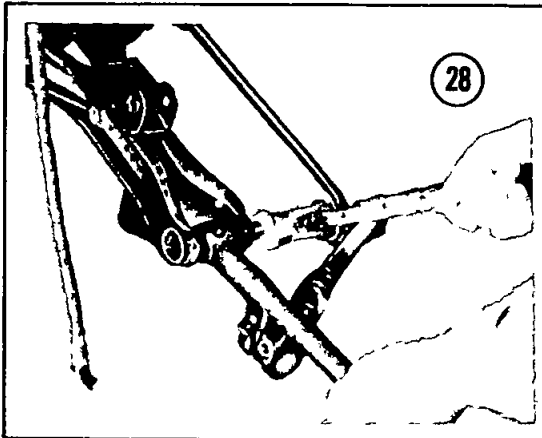


8 Install upper link spindle on upper link mounting bracket. Be sure to use the same camber shims that were used before disassembly.

9 Apply multi-purpose grease to thread on knuckle spindle support fulcrum pin. Apply grease and thread on screw bushing.

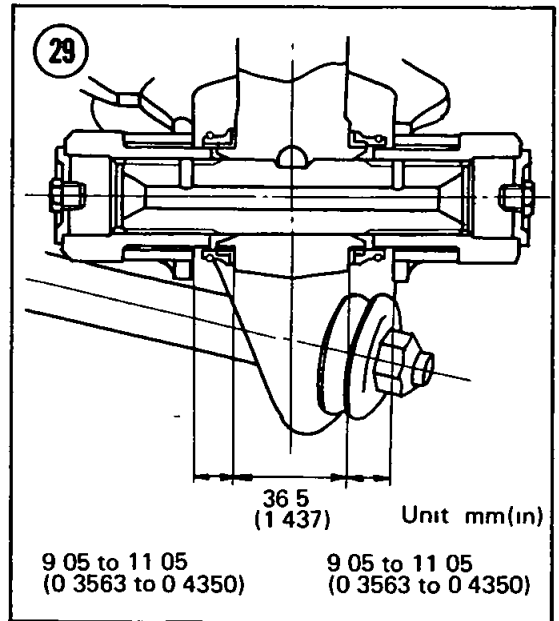
10 Install dust seal on knuckle spindle support.

11 Line up notch for cotter pin on the fulcrum pin with the hole in the knuckle spindle support. Drive fulcrum pin into knuckle spindle support with a hammer. Insert cotter pin into hole. Torque the lock nut to 2.9 to 4.3 ft-lb (0.4 to 0.6 kg/m). Refer to Figure 28.



12 Install bushings on both sides so that knuckle spindle support is in the center of the lower link. Remove filler plug. Ensure that the knuckle spindle and lower link angle is 76.5°. Torque tighten to 173.5 to 180.5 ft-lb. (24 to 25 kg/m).

13 See Figure 29. Recheck to make certain that knuckle spindle support is in center of lower link.

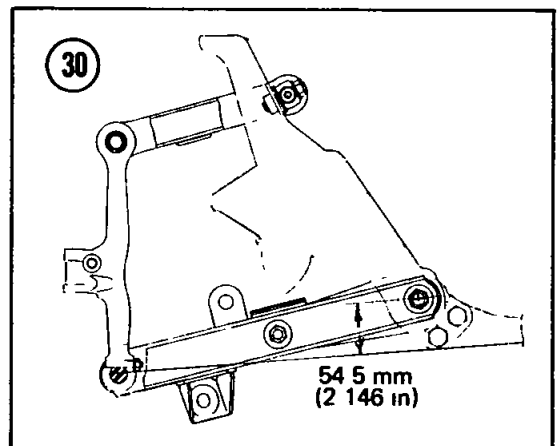


14 Install grease nipple, inject grease until grease comes from dust cover, remove grease nipple, and reinstall filler plug.

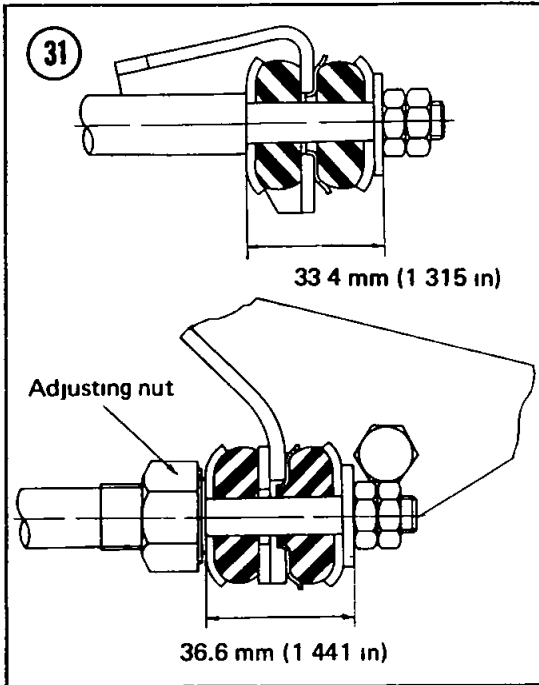
15. Make certain that fulcrum pin operates smoothly.

16 Install upper link bushing on the upper end of knuckle spindle support.

17 Refer to Figure 30. Install upper end of knuckle spindle support on upper link. Adjust to dimension shown. Install fulcrum bolt from rear of vehicle and tighten to 34.0 to 37.6 ft-lb (4.7 to 5.2 kg/m).



18 Tighten nut on rear end of tension rod to compress rubber bushings to 1 315 in. (33 4 mm) See **Figure 31** Torque lock nut to 10 8 to 15 2 ft.-lb (1 5 to 2.1 kg/m)



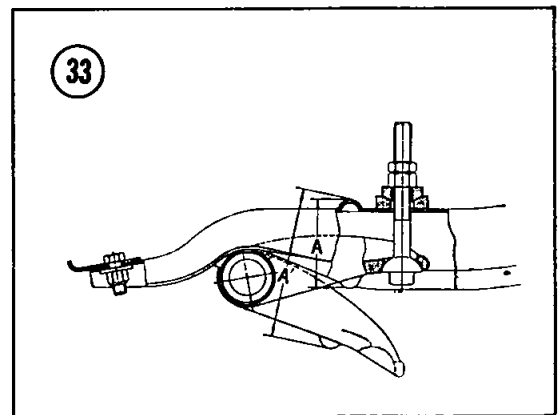
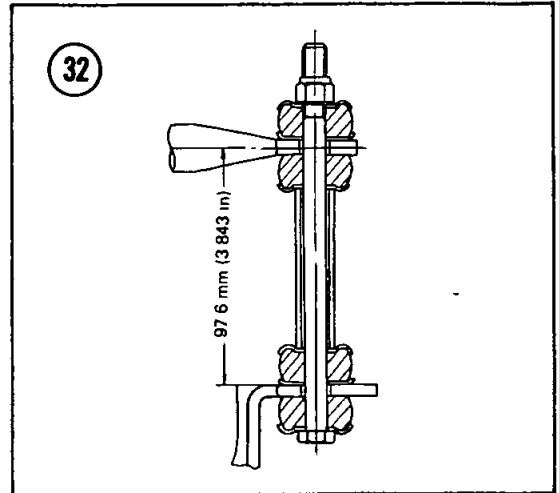
19. Install tension rod bracket on frame bracket Tighten nut on front end of tension rod until the rubber bushings measure 1 441 in (36 6mm) If rubber bushings are compressed unequally, adjust the adjusting nut until they are equal. Torque the bracket bolt to 10 8 to 15 2 ft.-lb. (1 5 to 2 1 kg/m).

20 Install shock absorber Torque upper lock nut to 10 8 to 15 2 ft.-lb. (1 5 to 2 1 kg/m) and lower bolt to 26 0 to 31 1 ft.-lb (3 6 to 4 3 kg/m).

21 On the stabilizer, tighten the nut until the dimension shown on **Figure 32** is correct Torque bracket bolt to 10 8 to 15 2 ft.-lb (1 5 to 2.1 kg/m)

22 Grease serration on both ends of torsion bar and install it on torque arm Be careful to use the correct springs They are marked on the end with an R or L for right and left

23 Position lower link to eliminate clearance between lower link and rubber bumper Install spring anchor on torsion bar The A dimension shown in **Figure 33** should be 3 86 in (98mm)



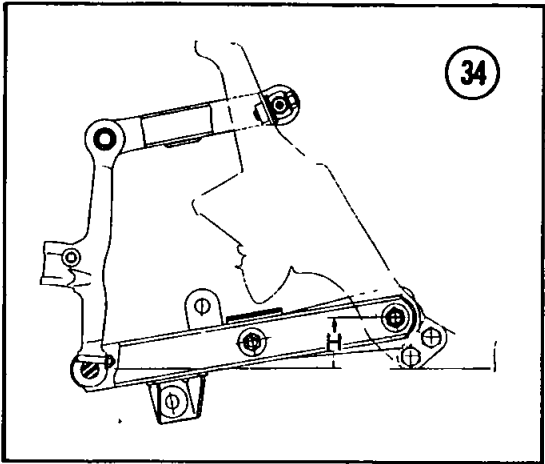
24 Jack up spring anchor and insert anchor bolt See **Figure 33** Tighten nut so that the A' dimension shown is 2 697 in (68 5mm) Torque the lock nut to 28 9 to 36 2 ft.-lb (4 to 5 kg/m).

25 Check the vehicle posture and adjust as necessary Adjustment is discussed below

POSTURE ADJUSTMENT

Vehicle posture may be incorrect due to weakened springs or other defective conditions. If adjustment is necessary, proceed as follows.

- 1 Jack up vehicle and support it on stands
- 2 Place a jack near the spring anchor bolt and jack up until the nuts are free of spring force
- 3 Refer to **Figure 34** The standard H dimension shown should be 3.11 to 3 31 in (79 to 84mm) without load, and 2 15 in. (54.5mm) with standard load. Standard load would be 3 passengers and 2,204 6 lb (1,000 kg) of cargo



Adjust the anchor bolt adjusting nut until the vehicle posture is correct. One complete turn of the nut will change the vertical measurement by approximately 0.133 in (3.5mm).

WHEEL ALIGNMENT

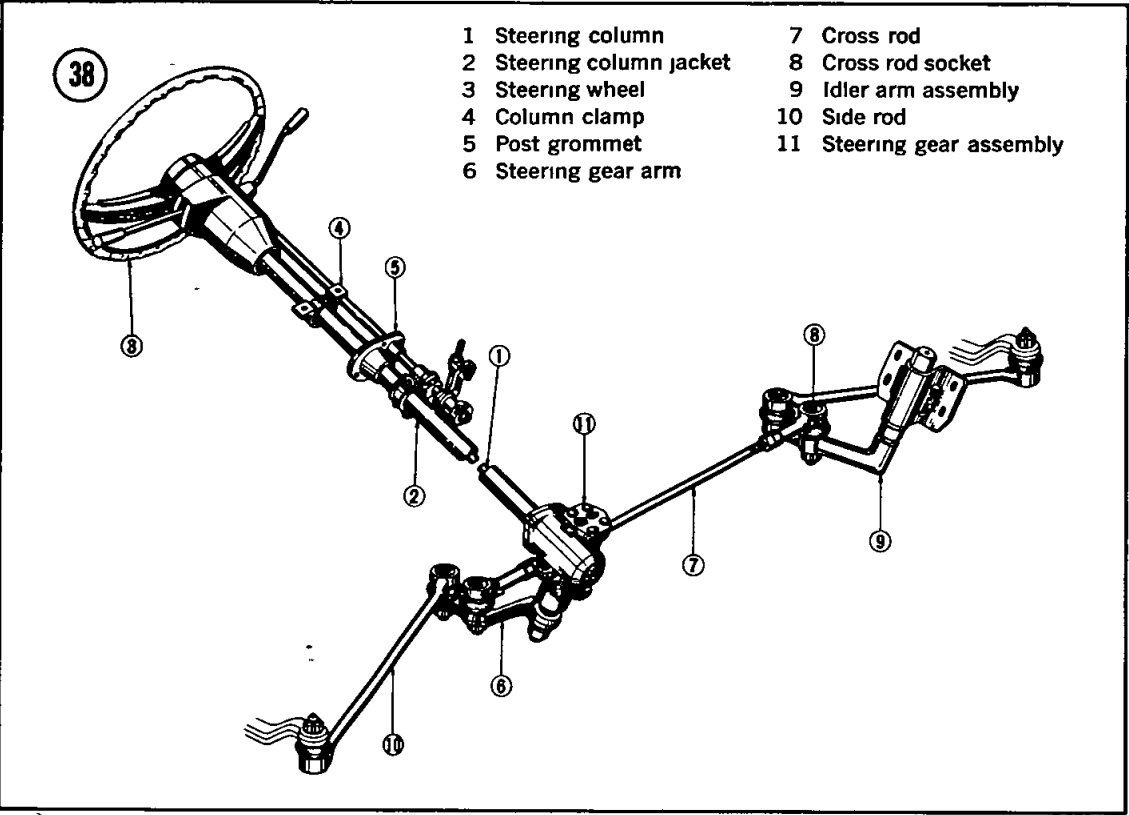
Due to the specialized equipment required, wheel alignment should be referred to a Datsun

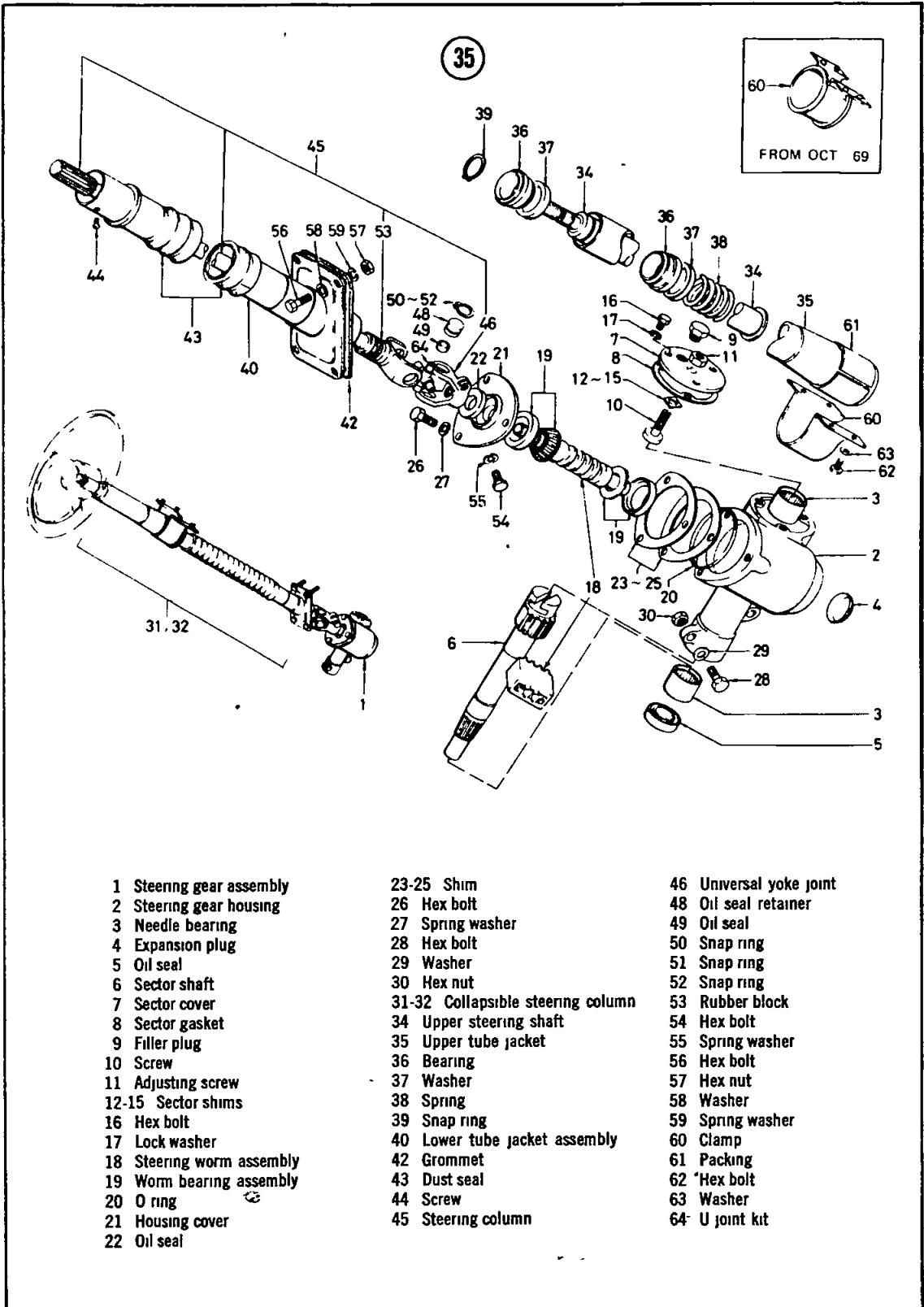
dealer or a wheel alignment specialist. The following specifications apply to the pick-up.

Caster	1° 50'
Camber	1° 15'
King Pin Inclination	6° 15'
Toe In	0.0787 to 0.1181 in (2 to 3mm)
Steering Angle Inner	36°
Steering Angle Outer	31°

STEERING SYSTEM

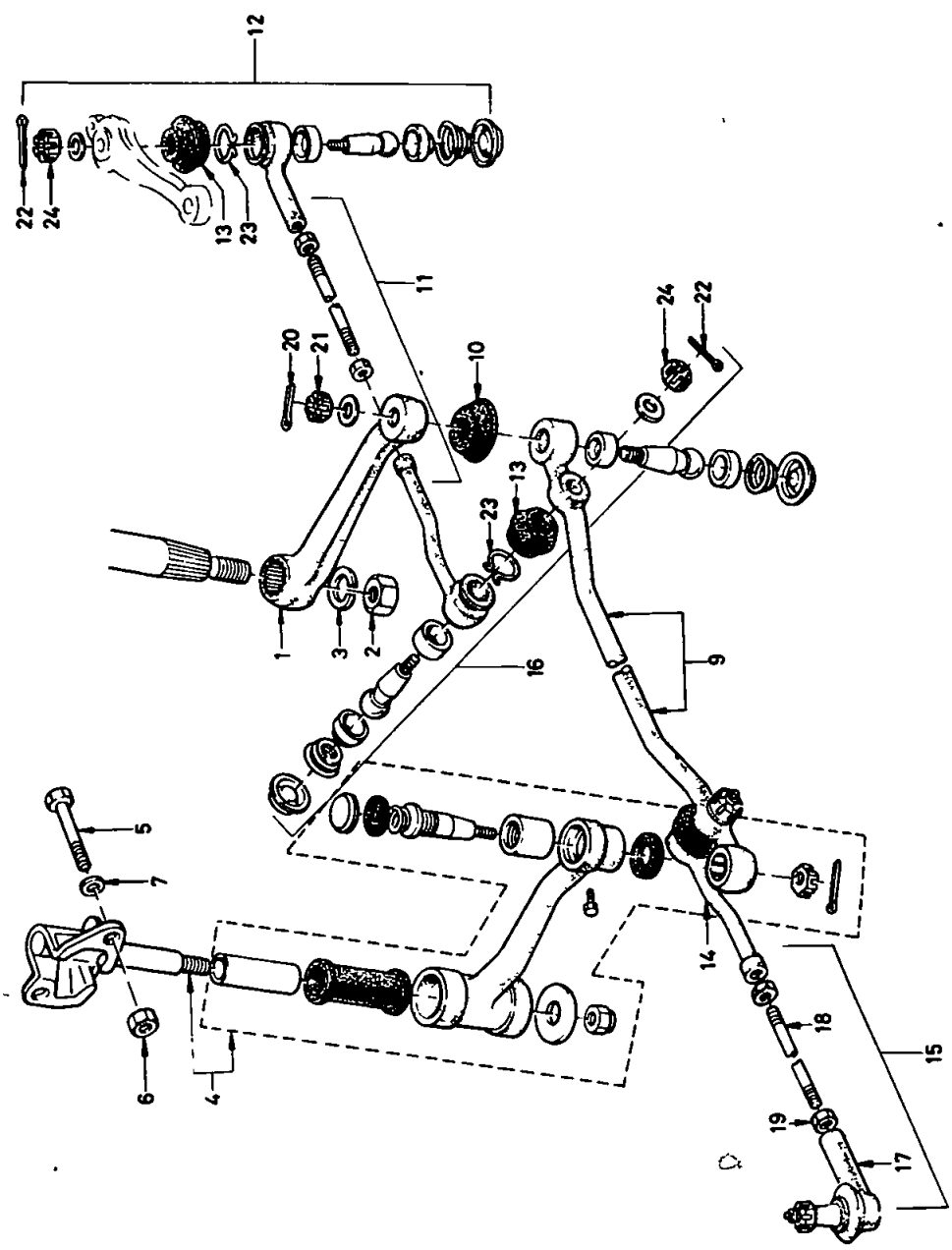
Figures 35, 36, and 37 are exploded diagrams of the steering system used in the sedan and wagon. The illustrations show the steering system used since 1969. Earlier models are similar in construction and operation. Figure 38 illustrates the steering system used on the pick-up. Required maintenance and repair of the steering system should be referred to a Datsun dealer or a steering system specialist since specialized equipment and knowledge is required. Reference to the above illustrations and following specifications should enable the extraordinarily well-equipped mechanic to service the steering system.





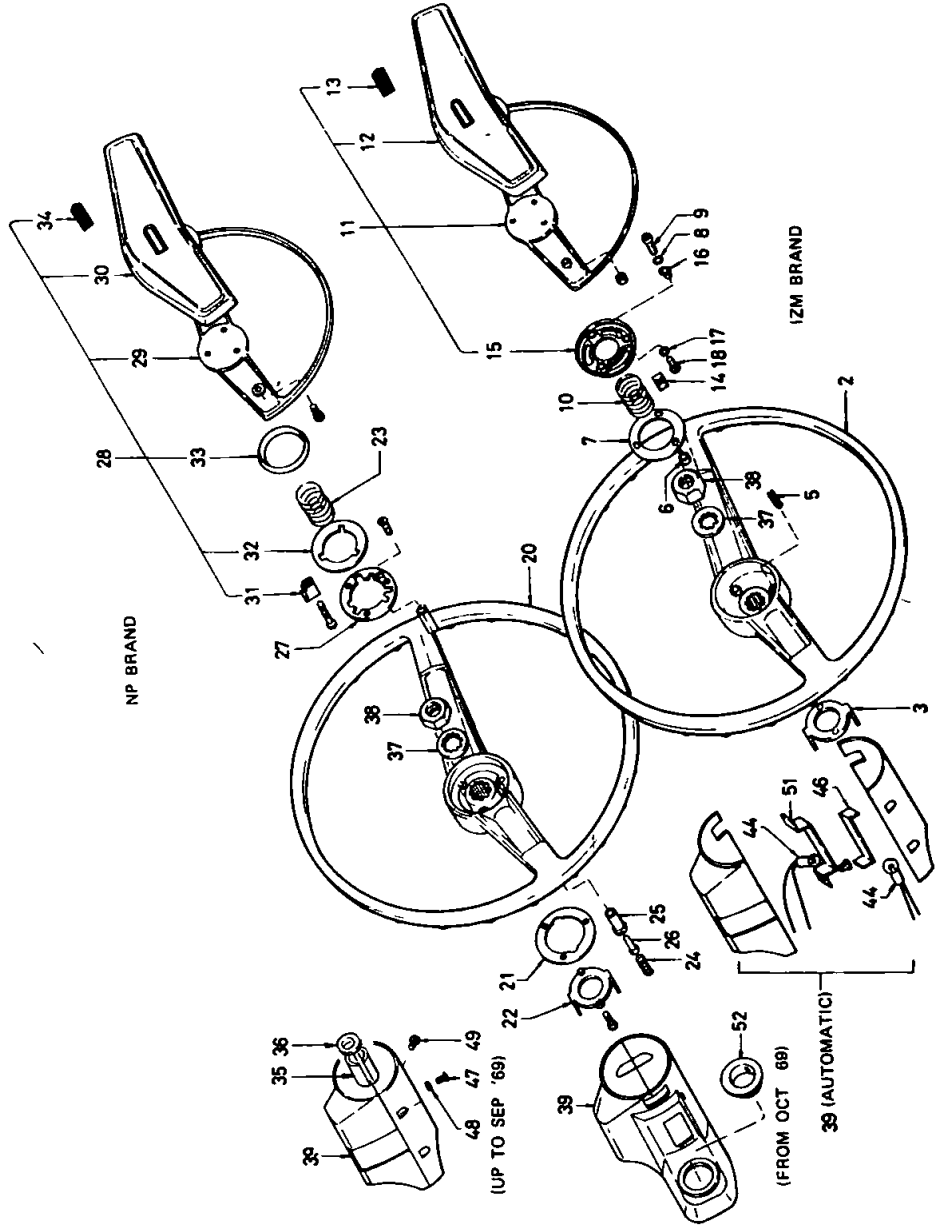
36

- 1 Steering gear arm
- 2 Hex nut
- 3 Lock washer
- 4 Idler assembly
- 5 Hex bolt
- 6 Hex nut
- 7 Plain washer
- 8 Lock nut
- 9 Cross rod assembly
- 10 Dust seal
- 11 Side rod
- 12 Socket
- 13 Dust cover
- 14 Socket
- 15 Side rod
- 16 Socket
- 17 Socket
- 18 Bracket
- 19 Hex nut
- 20 Cotter pin
- 21 Nut
- 22 Cotter pin
- 23 Clamp
- 24 Hex nut
- 25 Lock nut



37

- 2 Steering wheel
- 3 Blinker pin
- 5 Spring
- 7 Contact plate
- 8 Spring washer
- 9 Screw
- 10 Spring
- 11 Horn ring assembly
- 12 Pad
- 13 Emblem
- 14 Retainer
- 15 Contact cup
- 16 Insulator
- 17 Spring washer
- 18 Machine screw
- 20 Steering wheel
- 21 Slip ring
- 22 Insert
- 23 Horn spring
- 24 Contact spring
- 25 Cover
- 26 Contact piece
- 27 Contact seat
- 28 Horn ring assembly
- 29 Horn ring
- 30 Pad
- 31 Clamp
- 32 Contact plate
- 33 Bushing
- 34 Emblem
- 35 Collar
- 36 Collar fixing washer
- 37 Lock washer
- 38 Hex nut
- 39 Shell assembly
- 44 Indicator bulb
- 46 Hand indicator assembly
- 47 Screw
- 48 Spring washer
- 49 Screw
- 51 Shell band
- 52 Escutcheon



STEERING SERVICE DATA AND SPECIFICATIONS

Specifications	Sedan/Wagon	Pick-up
Type	Recirculating Ball	Recirculating Ball
Gear Ratio	15 0 1	19 8 1
Steering Wheel Diameter	15 9 in (405mm)	15 7 in (400mm)
Worm Bearing Shim Thickness	0 059 in (1 5mm)	0 059 in (1 5mm)
Oil Capacity	0 7 pts (0 33 liter)	0 7 pts (0 33 liter)
Initial Steering Wheel Turning Torque	3 5 5 2 in lb (4 6 kg cm)	3 5 5 2 in lb (4 6 kg cm)
End Clearance of Sector Shaft Adjusting Screw	0 0004-0 0012 in (0 01-0 03mm)	0 0004-0 0012 in (0 01-0 03mm)
Tightening Torque		
Flange Bolts	13 18 ft. lb (1 8 2 5 kg-m)	13-18 ft. lb (1 8-2 5 kg-m)
Gear Arm	100 ft -lb (14 kg m)	100 ft.-lb (14 kg-m)
Gear Housing	72 ft lb (10 kg-m)	27 ft -lb (3 7 kg-m)
Adjusting Screw Nut	13-18 ft -lb (1 8 2 5 kg m)	13-18 ft -lb (1 8-2 5 kg-m)
Idler Arm Bolts	32-44 ft -lb (4 6 kg-m)	43-50 ft.-lb (6 7 kg-m)
Idler Arm Nut	39-55 ft -lb (5 8 kg-m)	43-50 ft.-lb (6 7 kg-m)

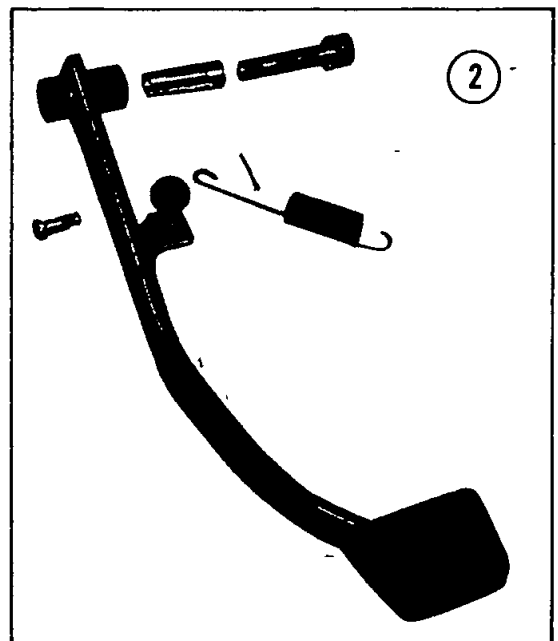
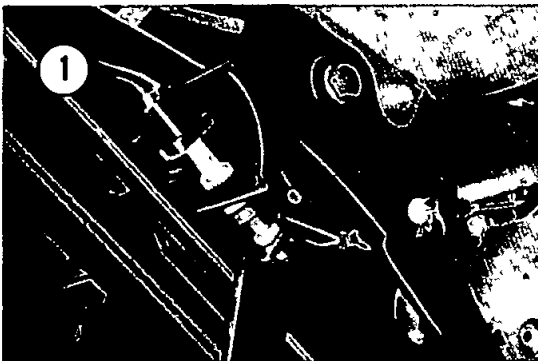
CHAPTER FOURTEEN

BRAKES

The sedan and station wagon are equipped with disc brakes on the front wheels, drum brakes on the rear wheels, and a tandem master cylinder. The pick-up has drum brakes on all four wheels and a single master cylinder. All vehicles have a mechanical handbrake that works on the rear wheels only.

BRAKE PEDAL

Figures 1 and 2 show the mounting location and the components of the brake pedal for sedans and wagons. The pick-up is similar.



3 Disconnect brake pedal from the master cylinder

4 Remove the fulcrum pin. Remove the brake pedal

Brake Pedal Removal

1. Remove pedal return spring
2. Remove clevis pin on the push rod.

Brake Pedal Inspection and Repair

Check all parts for wear, damage, and deformation. Replace defective parts as required.

Brake Pedal Installation

1. Apply pedal grease to the pedal shaft sleeves and push rod clevis pin.
2. Installation is the reverse of removal.
3. Torque the fulcrum pin to 25.3 to 28.9 ft.-lb. (3.5 to 4.0 kg/m).

MASTER CYLINDER

Figure 3 is an exploded view of the tandem master cylinder used on the sedan and wagon starting in 1969. Earlier models are similar. Figure 4 is an exploded view of the master cylinder used on the pick-up.

Master Cylinder Removal

1. Remove reservoir cap and drain brake fluid.
2. Disconnect brake pedal return spring.
3. Disconnect brake tube from master cylinder.
4. Remove two bolts holding master cylinder to front dash assembly.
5. Remove master cylinder.

Master Cylinder Disassembly

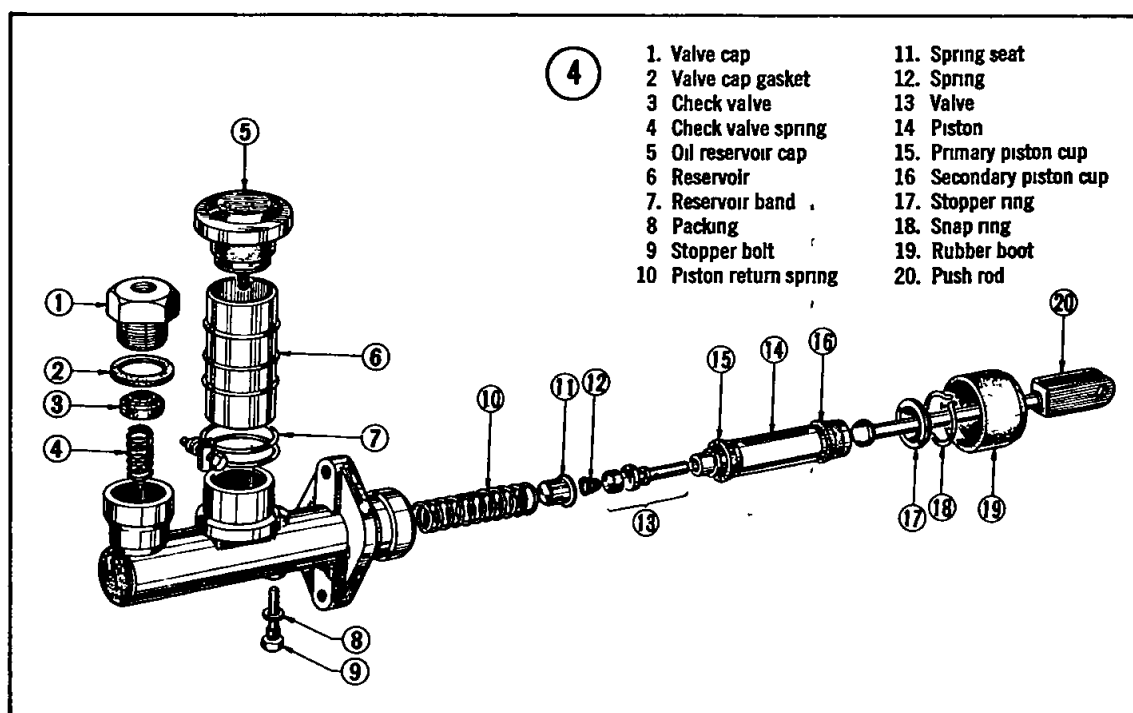
1. Remove dust cover and piston stopper screw.
2. Remove snap ring and stopper ring, then pushrod.

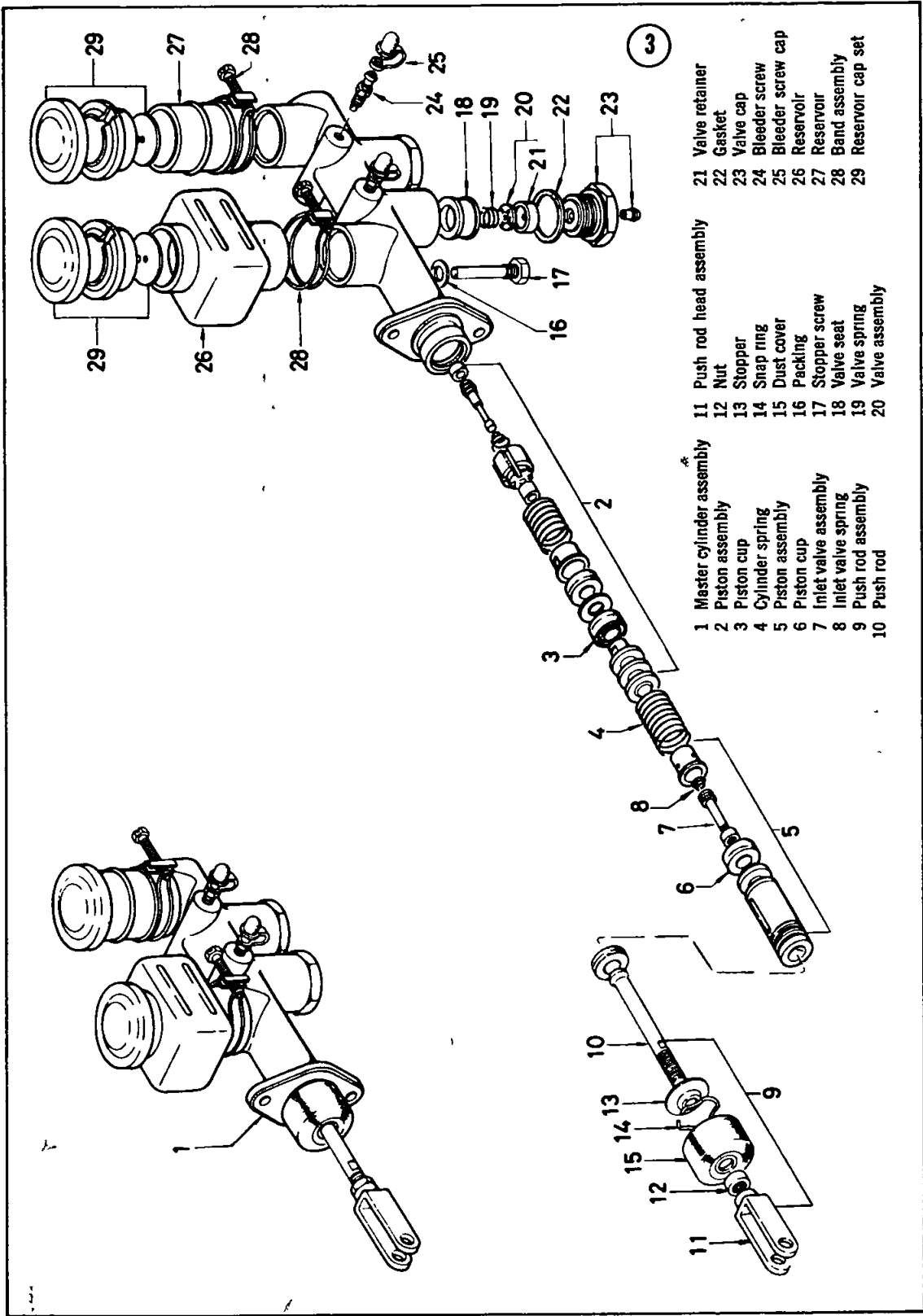
3. Remove the piston and related parts from cylinder body.
4. Remove valve cap, gasket, check valve, and check valve spring.

NOTE: *Disassemble master cylinder carefully. Don't damage the sliding surfaces of piston and piston cup. Do not remove fluid reservoir unless absolutely necessary. Remove piston cup only if piston must be replaced.*

Master Cylinder Inspection and Repair

1. Clean all parts thoroughly with clean brake fluid.
2. Check cylinder and piston for abnormal side wear and damage. Replace as required.
3. Check all springs for weakness and damage. Repair as required.
4. As a matter of sound practice, replace all cups and valves whenever the master cylinder is disassembled. Definitely replace them if they are deformed due to swelling, wear, and age.
5. Inspect all other parts. Replace any that are defective.





Master Cylinder Assembly and Installation

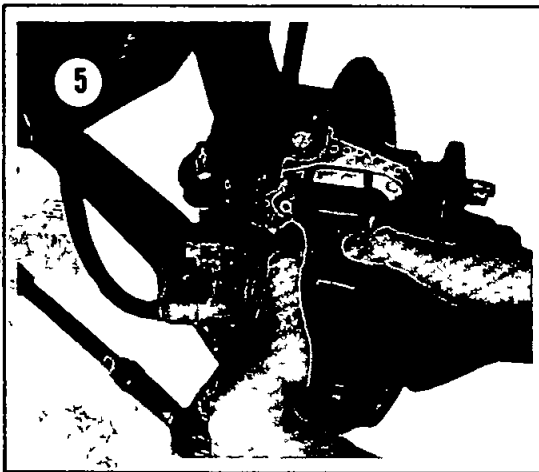
- 1 Assemble the master cylinder in the reverse order of disassembly
- 2 Prior to assembly, soak piston cap in brake fluid. Install piston so that it seats firmly on the piston cup
- 3 Coat the cylinder bore and piston assemblies with clean brake fluid before assembly
- 4 When assembly is complete, mount master cylinder on dash wall and hook connecting rod to brake pedal. Replace return spring. Fill the reservoir with clean brake fluid
- 5 If air has seeped into the brake lines, bleed the brakes as described later in this chapter.

FRONT DISC BRAKES (SEDAN AND WAGON)

Brake Pad Replacement

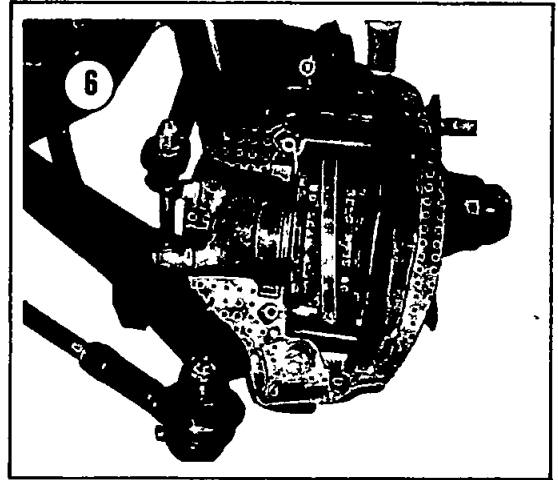
Pad wear should be checked every 4,000 miles. Clearance between the pad and the rotor is adjusted automatically, and therefore is not a wear indicator. Pad thickness is checked by removing the anti-rattle clip. When the pad lining becomes worn to 0.04 in (1mm), replace all pads on the front wheels.

- 1 Remove the hub cap, loosen the hub nuts, jack up the vehicle, support with stands, and remove the front wheels.
- 2 Remove the anti-rattle clip from the caliper plate, as shown in Figure 5.

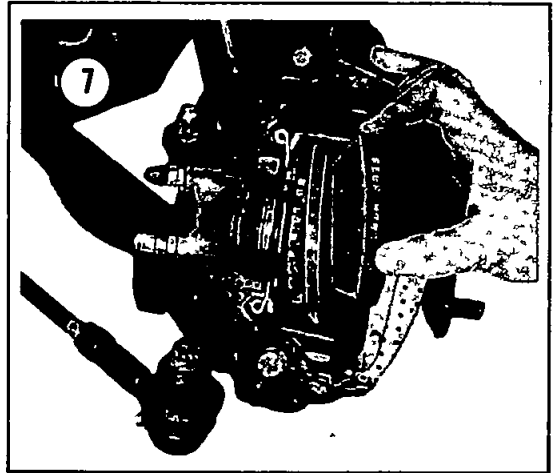


3. Loosen the bleed screw. Pull the caliper plate outward.

4. Push the piston in approximately 0.157 in (4mm), as shown in Figure 6.



- 5 The outer plate should be loose enough to be removed. See Figure 7.

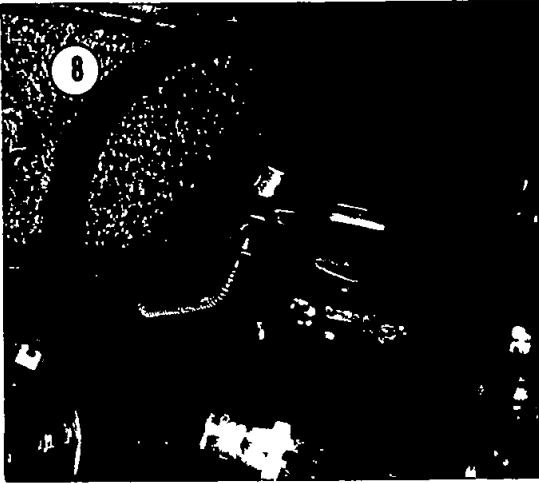


- 6 Draw the caliper plate inward and remove the inner pad.
- 7 Wipe exposed surface of piston thoroughly.
- 8 Push the piston into the cylinder bore until the new pads can be installed onto the caliper plate.
- 9 After installation, test the brakes at slow speed to make certain they are fitted properly and that no air entered the hydraulic lines. Bleed the brake system if required.

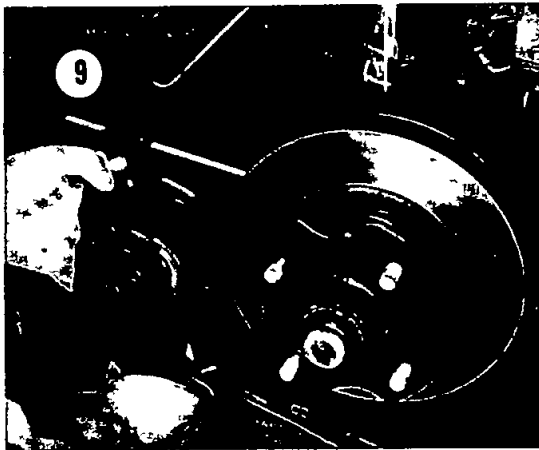
Front Disc Brake Removal

- 1 Jack up the vehicle, place it on stands, and remove the wheels.

2 Disconnect the front brake hose from the brake tube. See **Figure 8**, and plug the brake line to avoid fluid loss.



3. Screw out the bolts fixing the caliper to the knuckle flange and remove the caliper assembly, as shown in **Figure 9**

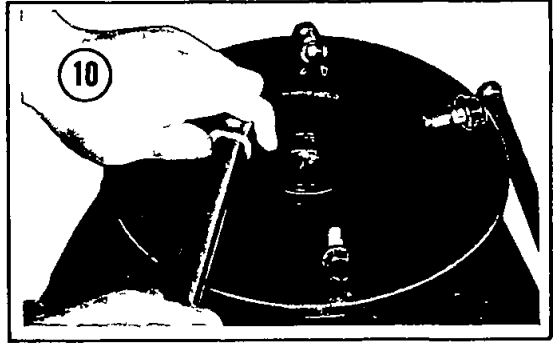


4 Remove the spindle nut and the disc hub. Separate the rotor from the hub assembly. See **Figure 10**

Front Disc Brake Disassembly

Figure 11 (next page) is an exploded diagram of the front disc brake assembly. Refer to figure and follow the following procedures

- 1 Remove the anti-rattle clip from the caliper plate and remove the brake pads
- 2 Remove the tension springs and pull the cylinder out of the caliper plate.



3 Remove the piston by applying air or hydraulic pressure to the fluid inlet hole. Remove the rubber seal from the groove on the cylinder. Remove the retainer and wiper seal. The piston can now be removed.

Front Disc Brake Inspection and Repair

1 Check the cylinder assembly for leakage and damage. Replace if defects or damage are apparent.

2 Check the disc brake pads for wear and cracks. Replace all pads if it is necessary to replace any.

3 Check the caliper for damage. Replace as required.

4 Check the rotor for scratches, scoring, and general condition. The rotor can be resurfaced if defects are found. Standard rotor thickness is 0.0394 in (10mm). The limit of reconditioning thickness is 0.0331 in (8.4mm). Replace rotors if reconditioning limits have been reached.

5 Check the rotor for runout using a dial gauge, as shown in **Figure 12**. Runout of the rotor should be less than 0.0024 in (0.06mm).



9-10 Cylinder and piston assembly

- 11 Piston seal set
- 12 Bleeder screw
- 13 Bleeder screw cap
- 14 Torsion spring set
- 15-16 Anti-rattle clip
- 17 Anti-squeak shim
- 18 19 Brake pad
- 20 Caliper fixing bolt
- 21 Lock washer
- 22-23 Baffle plate
- 24 Machine screw
- 25 Lock washer

- 1 Right hand caliper
- 2 Left hand caliper
- 3-4 Mounting bracket
- 5 6 Caliper plate assembly
- 7 Hold down pin set
- 8 Pivot pin

- 3(RH)
- 4(LH)

- 20 21

- 22(RH)
- 23(LH)

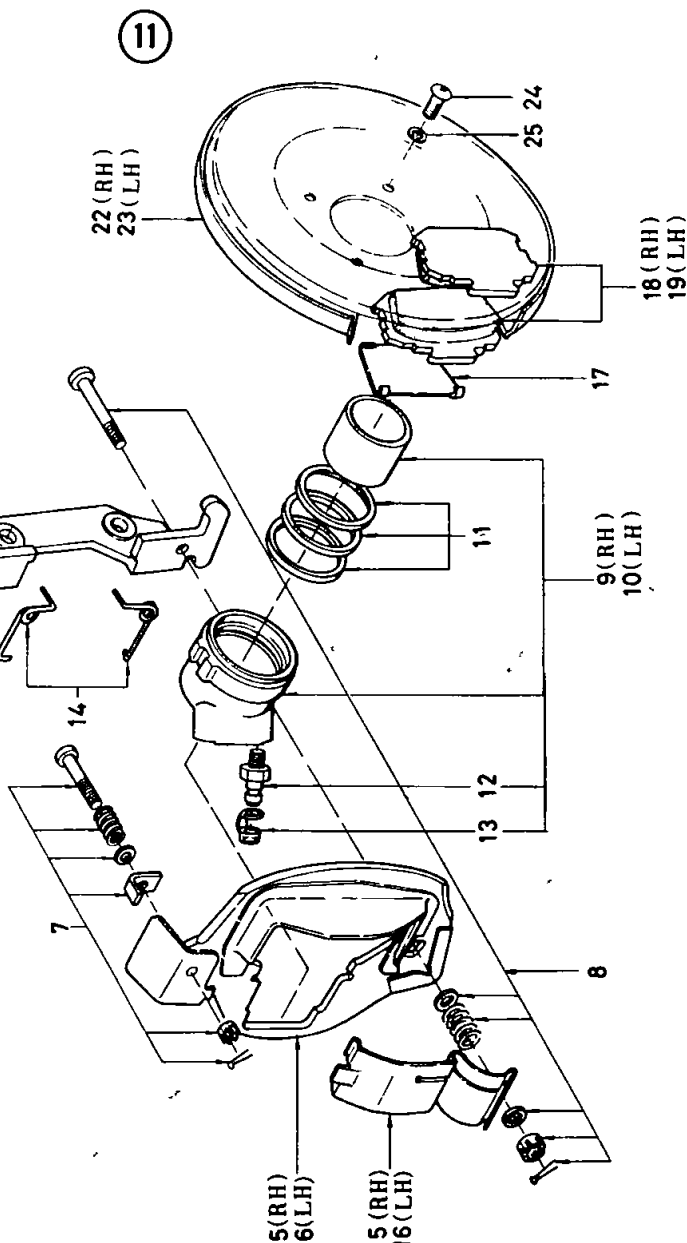
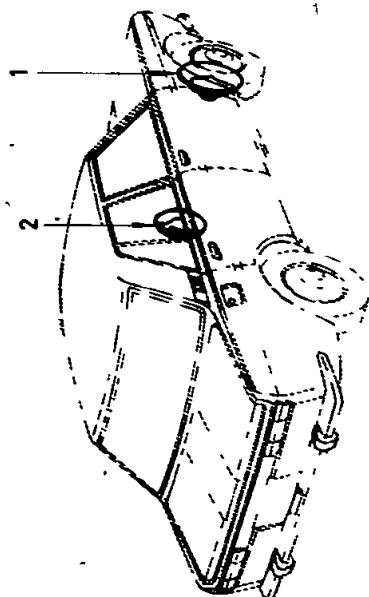
- 18(RH)
- 19(LH)

- 9(RH)
- 10(LH)

- 13 12

- 5(RH)
- 6(LH)

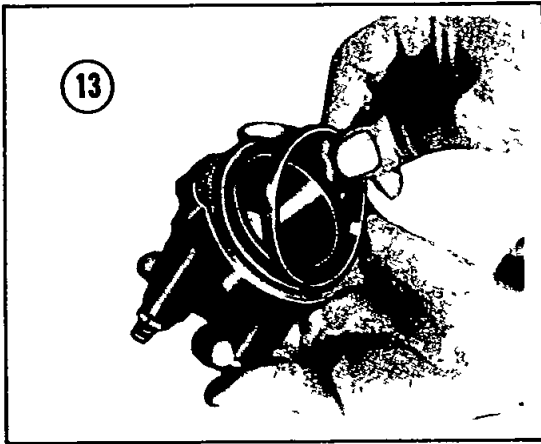
- 15(RH)
- 16(LH)



Front Disc Brake Piston Seal Replacement

If oil leakage is detected around the piston seal, it should be replaced as follows:

1. Rinse the cylinder bore with brake fluid. Insert new seal into the groove taking care not to damage it. Attach the wiper seal. Lubricate cylinder bore lightly with brake fluid.
2. Clean the piston. Inspect the piston for scoring or other damage before inserting it. Make sure that the relieved portion of the piston faces the pivot pin. Prevent tilting of the piston when it is inserted into the cylinder. Refer to Figure 13.



Front Disc Brake Assembly and Installation

1. Clean the mounting surface and disc surface. Attach the disc to the hub.
2. Install the hub to the knuckle spindle.
3. Insert the piston into the cylinder until its face is almost flush with the face of the wiper seal retainer.
4. Install the cylinder into the caliper plate and secure with the torsion springs.
5. Assemble the hold down pin, spring washer, and nut to the support bracket.
6. Insert cotter pin into the nut.
7. Assemble mounting bracket and caliper plate with pivot pin, washer spring, and nut. Tighten nut completely and insert cotter pin.
8. Pry up the hold down bracket with a screwdriver. Hook it to the upper end of the mounting bracket. Turn the caliper plate to make sure it slides smoothly.
9. Install the caliper assembly to the knuckle flange.

10. Attach shim to inner pad.
11. Insert the inner disc pad. Pull the caliper plate outward and insert the outer disc pad.
12. Attach the anti-rattle plate.
13. Replace wheel and remove stands.

REAR BRAKE (SEDAN AND WAGON)

Figure 14 is an exploded view of the rear brake assembly used in the sedan and wagon.

Rear Brake Removal and Disassembly

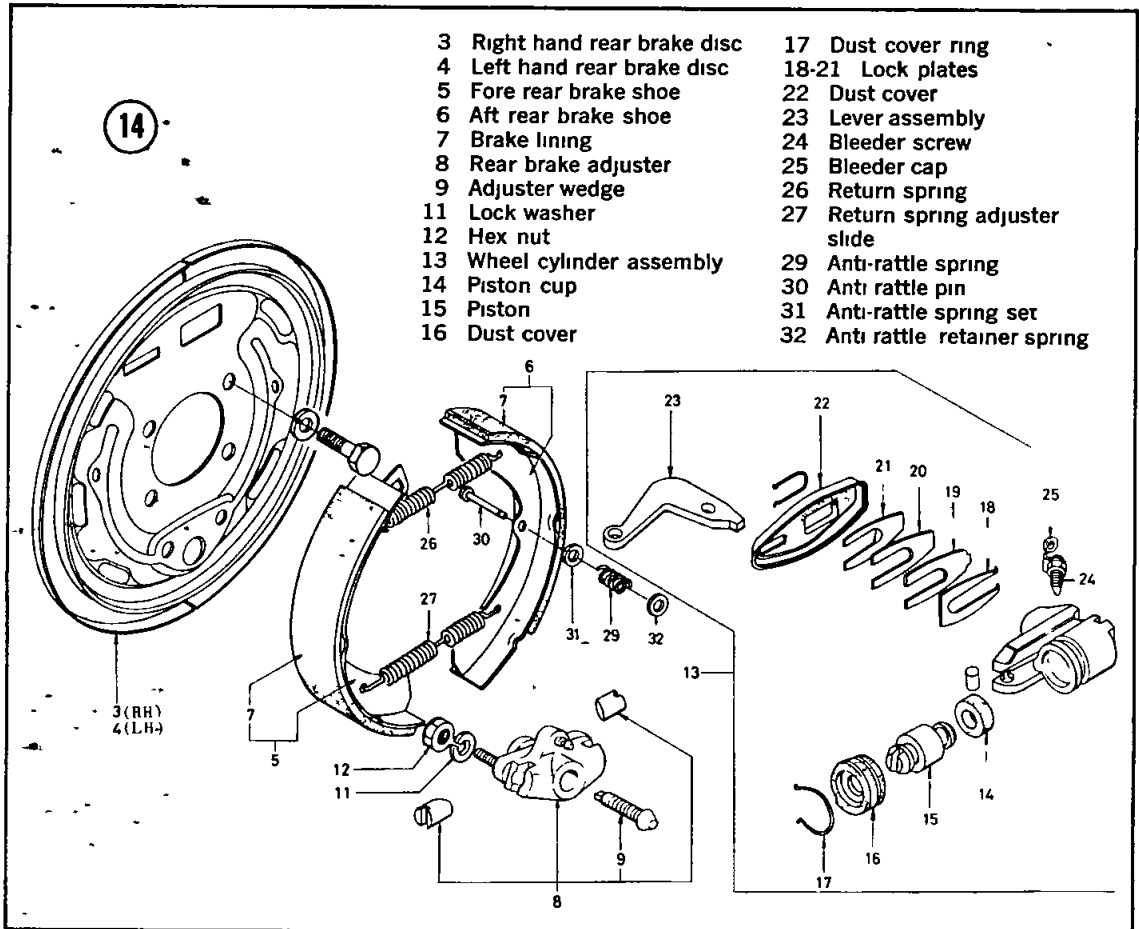
1. Jack up the rear of the vehicle and support it on stands. Remove the wheels.
2. Release the parking brake. Disconnect the cross rod from the lever of the rear wheel cylinder.
3. Remove the brake drum.
4. Remove the return springs and take out the brake shoe assemblies.
5. Disconnect the brake tube from the wheel cylinder.
6. Remove the wheel cylinder by removing dust cover, plates, and adjusting shims.
7. Disassemble the wheel cylinder by removing the dust cover and snap ring.
8. Remove the adjuster assembly.

Rear Brake Inspection and Repair (Sedan and Wagon)

1. Inspect the brake drums for scoring, signs of excessive heat, and out-of-round. Repair or replace the drums as required. The following specifications apply:

Drum Out-of-Round	Less than 0.0020 in (0.05mm)
Inner Diameter	8.999 in (228.6mm)
Maximum Diameter (after grinding)	9.040 in (229.6mm)

2. Inspect brake linings for wear, signs of oil or grease, and cracks. If any of these conditions are found, replace the linings. Have a brake specialist arc the linings to match the diameter of the drums after replacement. If the thickness of the lining is under 0.0591 in. (1.5mm), replace it.
3. Check the adjusting cams for smooth operation. Replace as required.
4. Check the springs. If they appear weak or uneven in tension, replace them.



5 Check the wheel cylinder for wear, rust, and damage. If defective, replace.

6 Check the clearance between the cylinder and the piston. If the clearance is greater than 0.0059 in (0.15mm), replace the cylinder. The cylinders can be honed with a wheel cylinder hone if the maximum dimension has not been reached.

7 Replace the piston cups whenever the cylinders are disassembled, even though the cups appear to be in good condition.

Rear Brake Assembly

- 1 Assembly is the reverse of disassembly.
- 2 Be careful not to get dirt or brake fluid on the brake linings.
- 3 Adjust shoe clearance, then bleed the hydraulic system.

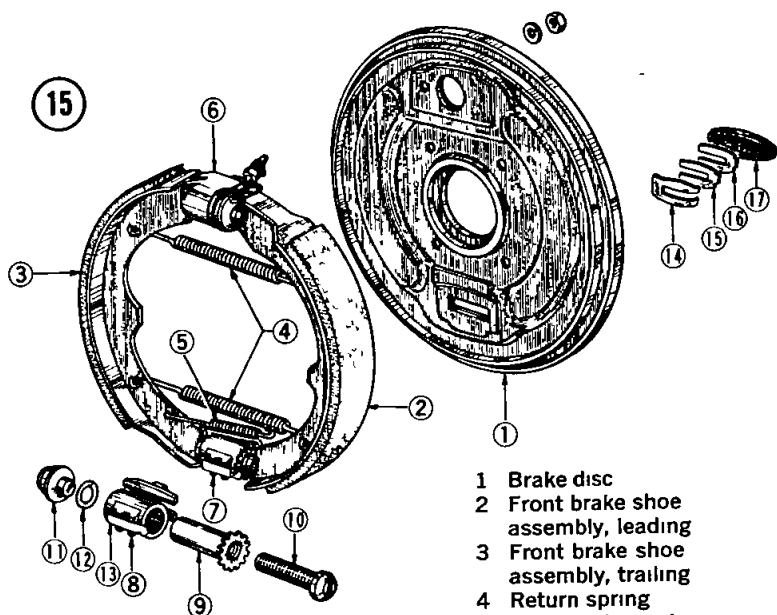
FRONT BRAKE (PICK-UP)

Figure 15 shows the front brake system for the pick-up. Generally speaking, follow the same procedures given for removal, disassembly, repair, and assembly of the sedan/wagon rear brake. The following specifications apply to the pick-up front brakes.

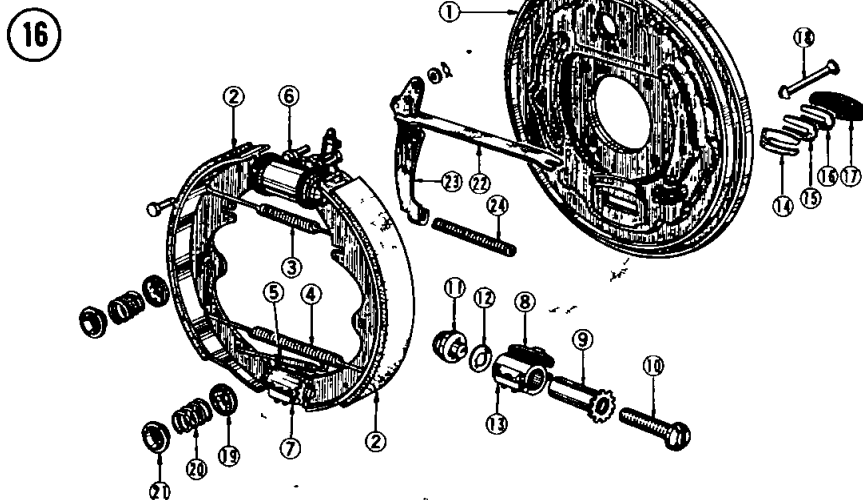
Inner Drum Diameter	10.00 in (254mm)
Drum Out-of-Round	Less than 0.0008 in (0.02mm)
Maximum Diameter (after grinding)	10.04 in (255mm)

REAR BRAKE (PICK-UP)

Figure 16 shows the rear brake system for the pick-up. Generally, follow the same procedures given for removal, disassembly, repair, and assembly as given for the sedan/wagon rear brake. Pertinent specifications are the same as for the front brakes.



- | | |
|---------------------------------------|-------------------|
| 1 Brake disc | 9 Adjuster wheel |
| 2 Front brake shoe assembly, leading | 10 Adjuster screw |
| 3 Front brake shoe assembly, trailing | 11 Adjuster head |
| 4 Return spring | 12 Shim |
| 5 Trailing shoe return spring | 13 Lock spring |
| 6 Wheel cylinder assembly | 14 Spring plate |
| 7 Adjuster assembly | 15 Lock plate |
| 8 Adjuster housing | 16 Shim |
| | 17 Rubber boot |



- | | | | |
|------------------------------|---------------------|--------------------|-----------------------|
| 1 Brake disc | 7 Adjuster assembly | 13 Lock spring | 19 Spring seat |
| 2 Rear brake shoe assemblies | 8 Adjuster housing | 14 Spring plate | 20 Anti-rattle spring |
| 3 Upper return spring | 9 Adjuster wheel | 15 Lock plate | 21 Retainer |
| 4 Lower return spring | 10 Adjuster screw | 16 Shim | 22 Extension link |
| 5 After shoe return spring | 11 Adjuster head | 17 Rubber boot | 23 Toggle lever |
| 6 Wheel cylinder assembly | 12 Shim | 18 Anti-rattle pin | 24 Return spring |

WHEEL CYLINDERS (PICK-UP)

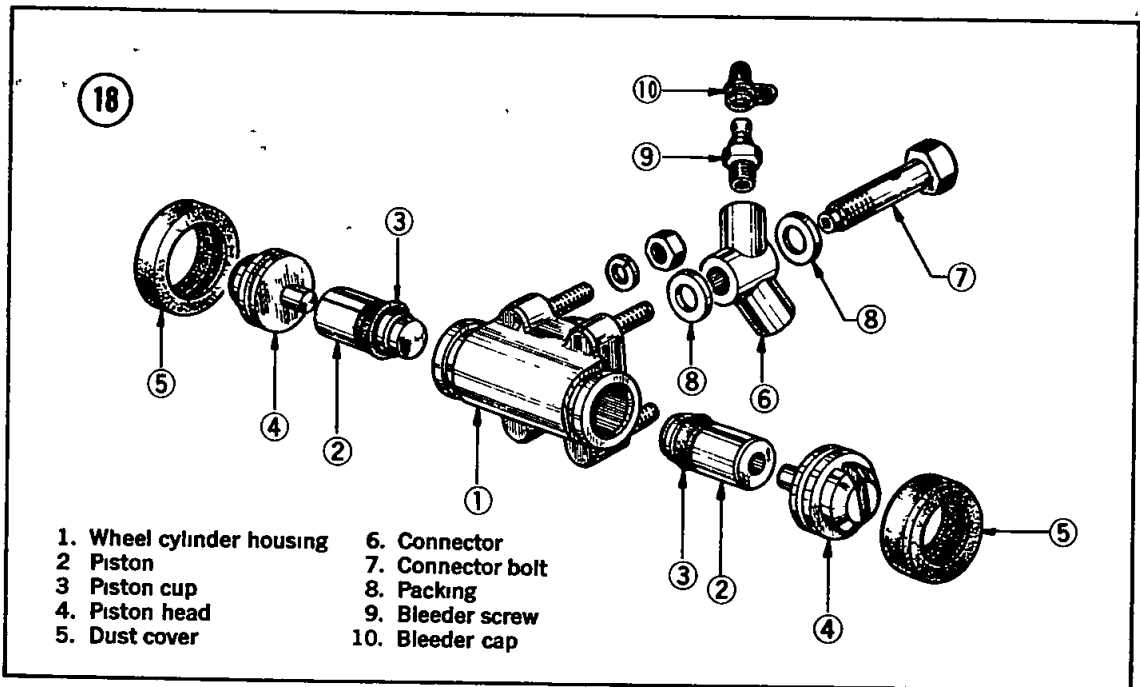
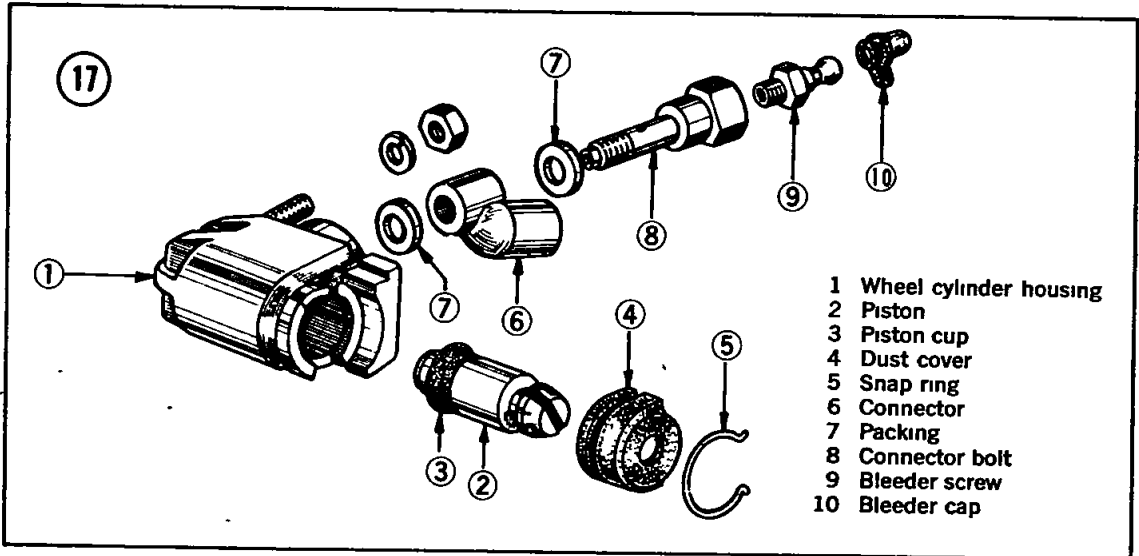
Figures 17 and 18 illustrate the front and rear wheel cylinders used on the pick-up. Maintenance procedures are essentially the same as specified for the sedan/wagon.

BRAKE SYSTEM BLEEDING

Brakes require bleeding whenever air enters the system, lowering the effective braking hydraulic pressure. This can happen when the

master cylinder or wheel cylinders are serviced, or if the fluid in the reservoir runs dry. Air can also enter through a leaky brake line or hose. Find the leaky line or hose and replace it before bleeding.

When handling brake fluid, be careful not to get any on the brake shoes or body paint. Brake shoes will be permanently damaged, requiring replacement. Body paint can be damaged unless you wipe the area with a clean cloth immediately, then wash it with a soapy solution.



1 Ensure that the brake fluid reservoir at the master cylinder is full, and that the vent in the cap is open.

2 Connect a plastic or rubber tube to the bleeder valve on the right rear wheel. Suspend the other end of the tube in a jar or bottle filled with a few inches of clean brake fluid. During the remaining steps, keep this end submerged at all times and never let the level in the brake fluid reservoir drop below $\frac{1}{2}$ full.

3 Open the bleeder valve on the right rear wheel about one turn. Have an assistant depress the brake pedal slowly. As soon as the pedal is all the way down, close the bleeder valve and let the pedal up. Repeat this step as many times as necessary until pure fluid without air bubbles comes from the tube.

4 Bleed the remaining wheels in the following order: left rear, right front, and left front. Keep checking the brake fluid reservoir to make certain it doesn't run out of fluid.

5 When all wheels are bled, fill the reservoir to the full level. Never reuse the brake fluid bled from the system, or any that has been lying around. Start with a fresh container.

HANDBRAKE

Figures 19 (next page) and 20 (page 199) are exploded views of the handbrake system used on the sedan and station wagon, respectively. Figure 21 (page 200) shows the pick-up handbrake system.

Front Cable Removal (Sedan and Wagon)

1 Release handbrake completely. Disconnect the front cable by removing the clevis pin that connects to the handbrake control stem.

2 Screw out the adjusting nut from the rear end of the front cable. Disconnect the cable from the center lever.

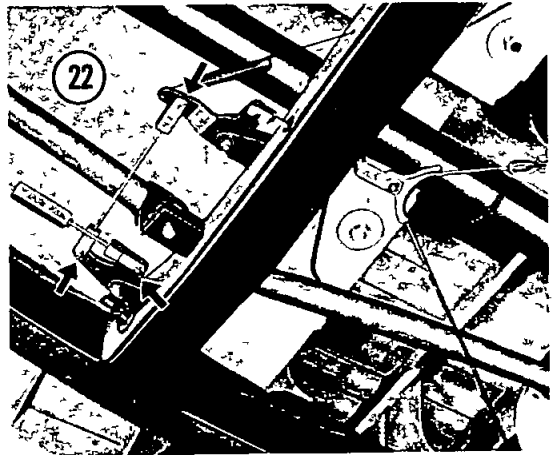
4. Remove the handbrake cable clamp from under the vehicle. Pull out the lock plate fixing the front cable to the front cable retainer. Extract the front cable.

5 Unfasten the front cable outer casing from the bracket. Remove the cable.

Front Cable Removal (Pick-up)

1 Loosen handbrake.

2 Remove clevis pin and separate cable from outer lever. See Figure 22.



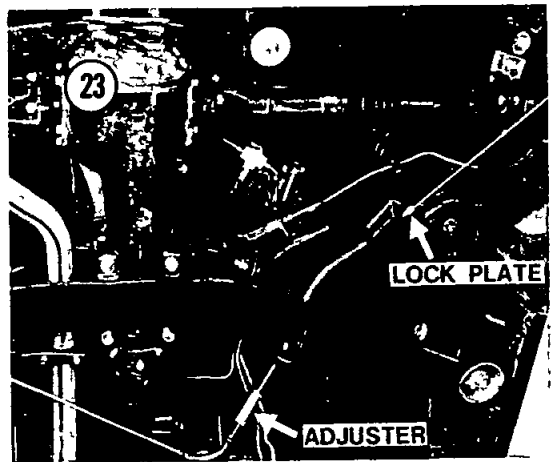
3 Remove clevis pin and separate cable from front lever. Remove cable.

4 Remove center cable from control levers by removing clevis pins.

Rear Cable Removal (Sedan)

1 Remove adjusting nut from adjuster. Disconnect left-hand rear cable from handbrake adjuster.

2 Pull out lock plates, see Figure 23, and remove clevis pins that connect rear cable with rear wheel cylinder levers. Remove cable.

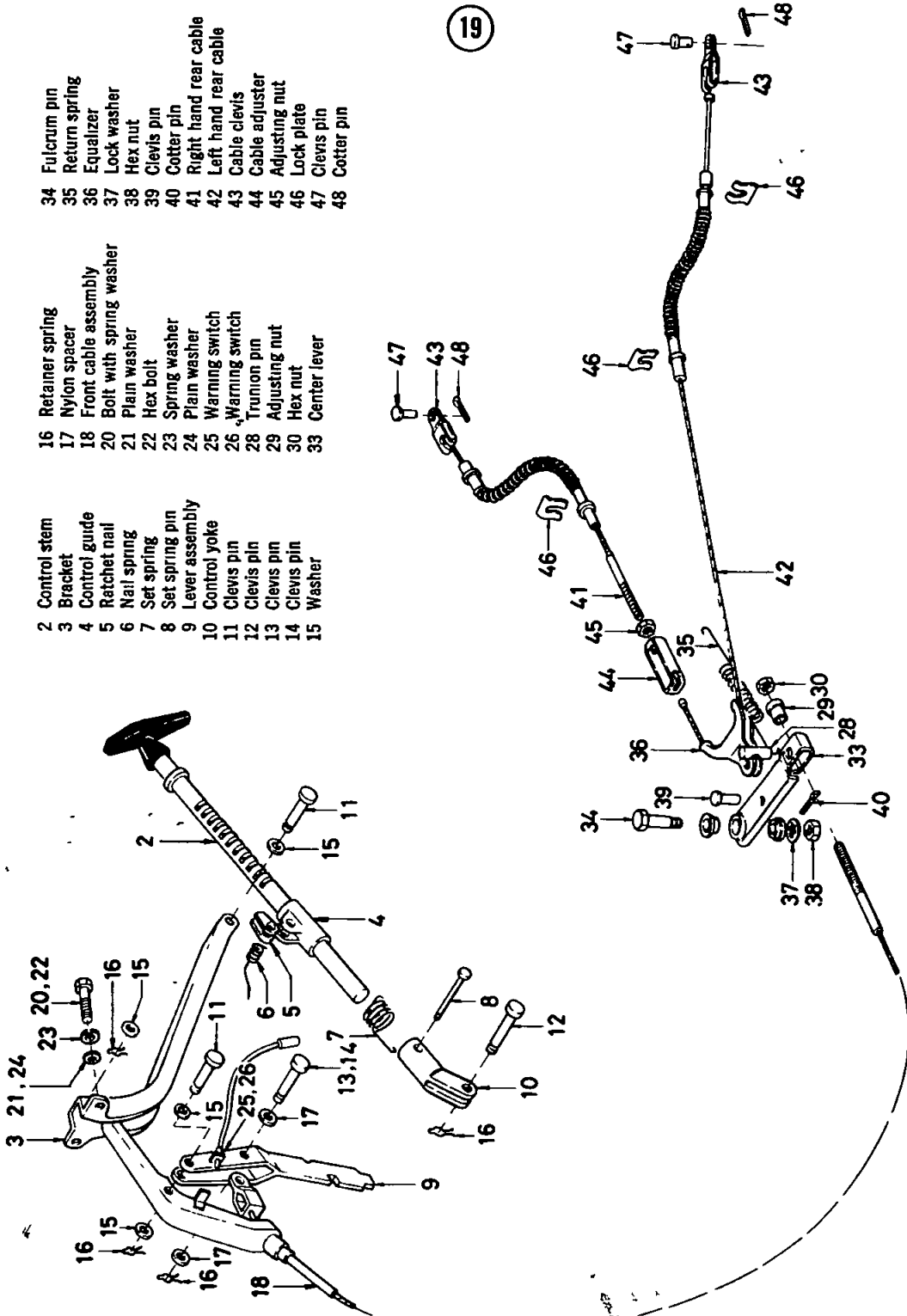


Rear Cable Removal (Wagon)

1. Remove both clevis pins at the ends of the rear cable.

2. Remove cable.

- 2 Control stem
 3 Bracket
 4 Control guide
 5 Ratchet nail
 6 Nail spring
 7 Set spring
 8 Set spring pin
 9 Lever assembly
 10 Control yoke
 11 Clevis pin
 12 Clevis pin
 13 Clevis pin
 14 Clevis pin
 15 Washer
 16 Retainer spring
 17 Nylon spacer
 18 Front cable assembly
 20 Bolt with spring washer
 21 Plain washer
 22 Hex bolt
 23 Spring washer
 24 Plain washer
 25 Warning switch
 26 Warning switch
 28 Trunion pin
 29 Adjusting nut
 30 Hex nut
 33 Center lever
 34 Fulcrum pin
 35 Return spring
 36 Equalizer
 37 Lock washer
 38 Hex nut
 39 Clevis pin
 40 Cotter pin
 41 Right hand rear cable
 42 Left hand rear cable
 43 Cable clevis
 44 Cable adjuster
 45 Adjusting nut
 46 Lock plate
 47 Clevis pin
 48 Cotter pin



- 2

Control stem
- 3

Bracket
- 4

Control guide
- 5

Ratchet nail
- 6

Nail spring
- 9

Lever assembly
- 10

Control yoke
- 11

Clevis pin
- 12

Clevis pin
- 13

Clevis pin
- 14

Clevis pin
- 15

Washer
- 16

Retainer spring
- 17

Nylon spacer
- 18

Front cable assembly
- 20

Bolt with spring washer
- 21

Plain washer
- 22

Hex bolt
- 23

Spring washer
- 24

Plain washer
- 25

Warning switch
- 26

Warning switch
- 29

Adjusting nut
- 30

Hex nut
- 51

Bushing
- 52

O-ring
- 53

Plain washer
- 54

Plain washer
- 55

Hex nut
- 56

Cotter pin
- 57

Lock washer
- 58

Hex nut
- 59

Balance lever
- 60

Gross rod
- 61

Gross rod
- 62

Clip
- 63

Screw
- 64

Nut
- 65

Spring
- 66

Grommet
- 67

Clevis pin
- 68

Cotter pin
- 69

Center lever
- 70

Pin
- 71

Pin
- 72

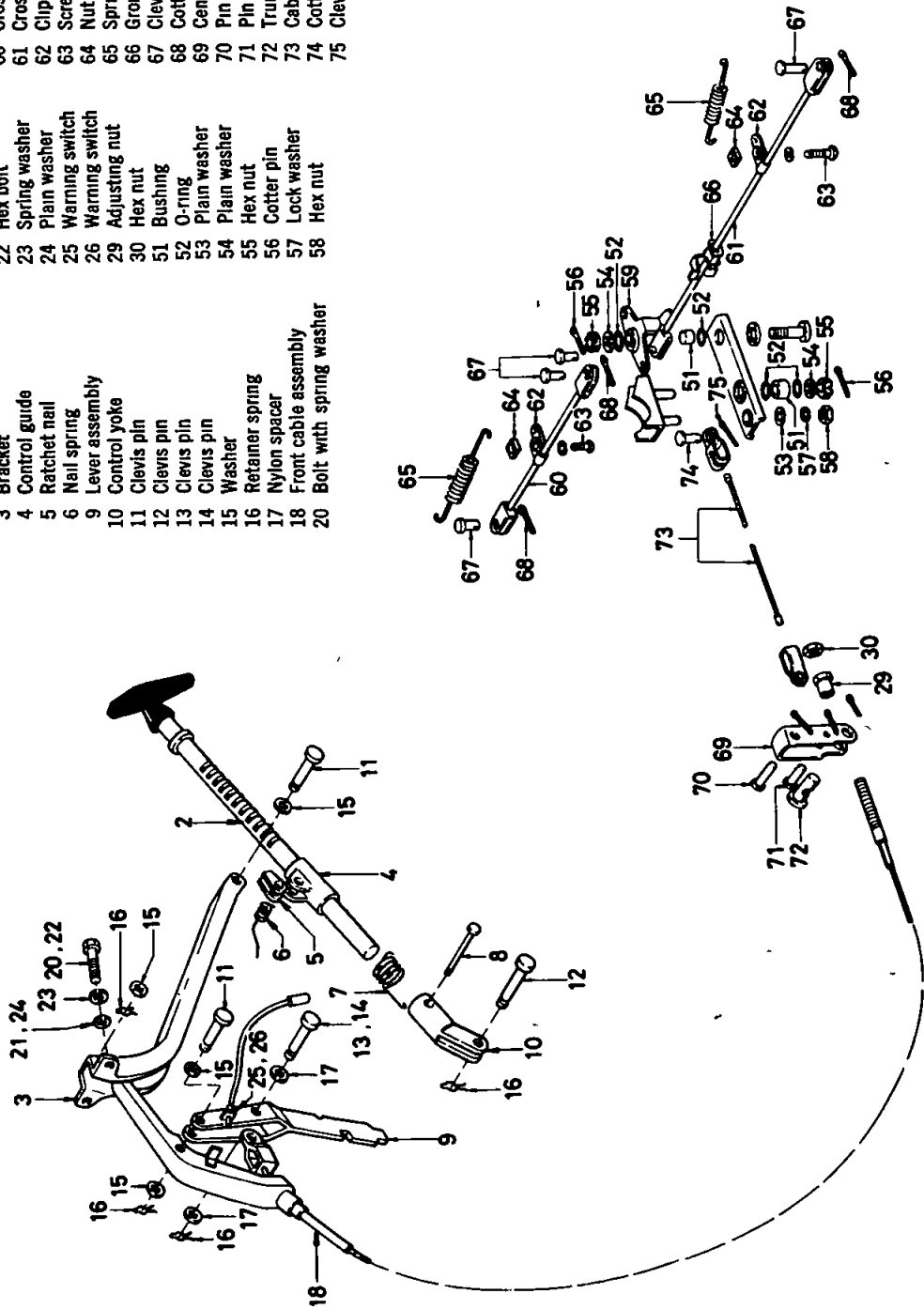
Trunion
- 73

Cable assembly
- 74

Cotter pin
- 75

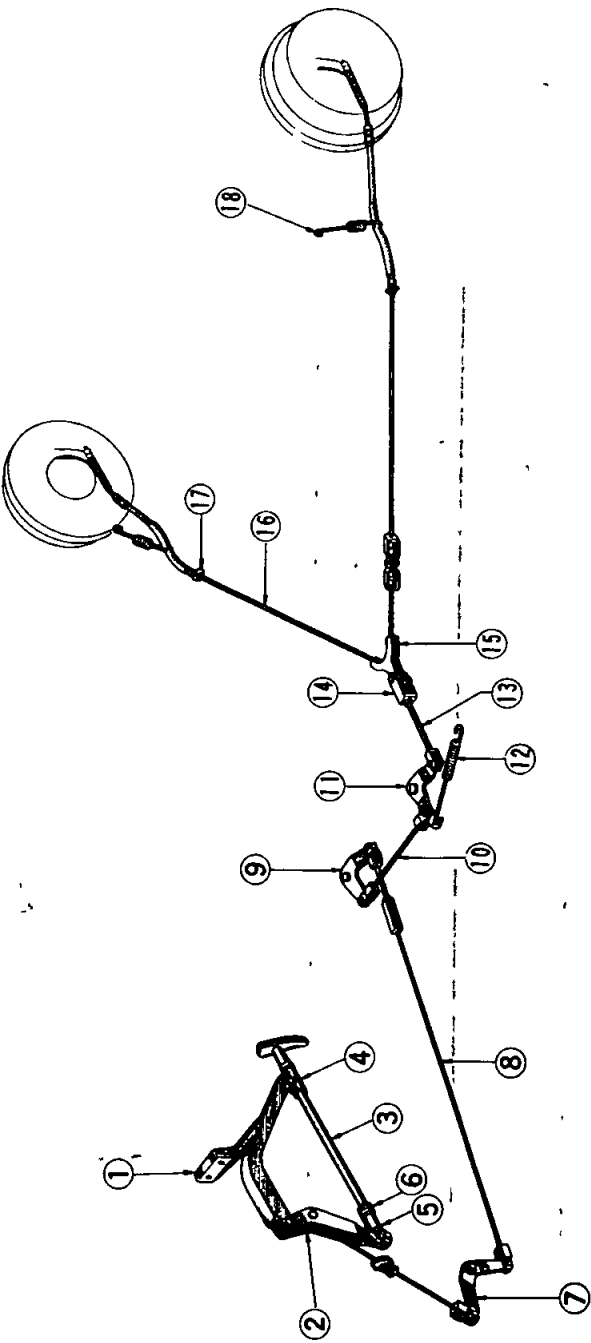
Clevis pin

20



21

- 1 Control bracket
- 2 Control lever
- 3 Control stem
- 4 Control guide
- 5 Control yoke
- 6 Set spring
- 7 Front lever
- 8 Front cable
- 9 Outer lever
- 10 Center cable
- 11 Inner lever
- 12 Arm spring
- 13 Center link rod
- 14 Equalizer link
- 15 Equalizer
- 16 Rear cable
- 17 Lock plate
- 18 Cable spring

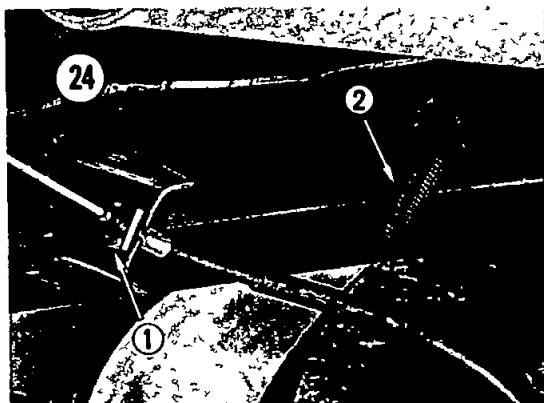


Cross Rod Removal (Wagon)

1. Remove the pull off springs at each end of the cross rods.
2. Remove clevis pins and cross rods.

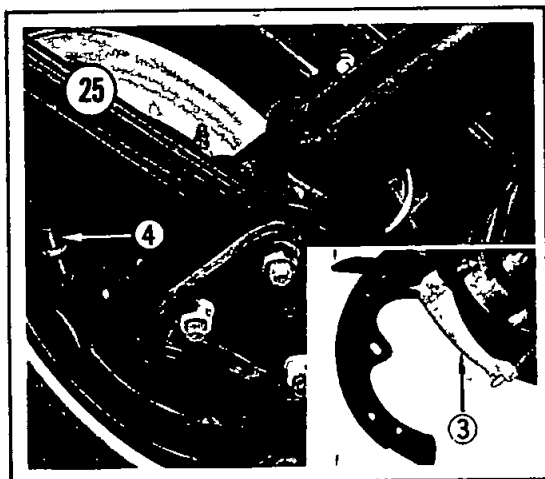
Rear Cable Removal (Pick-up)

1. Remove clevis pin and disconnect equalizer from equalizer link.
2. Remove lock plate (1) and cable spring (2), as shown in Figure 24



3. Remove both rear brake drums. Disconnect rear cable from toggle lever (3) Separate cable connecting flange (4) from brake disc. See Figure 25.

4. Remove rear cable



Handbrake Inspection and Repair

1. Inspect all cables and parts for damage, excessive elongation, and general wear. Replace as required

2. Inspect ratchet pawl and teeth on control stem for excessive wear. Replace as required
3. Check springs for weakness. Replace as required.

Handbrake Installation

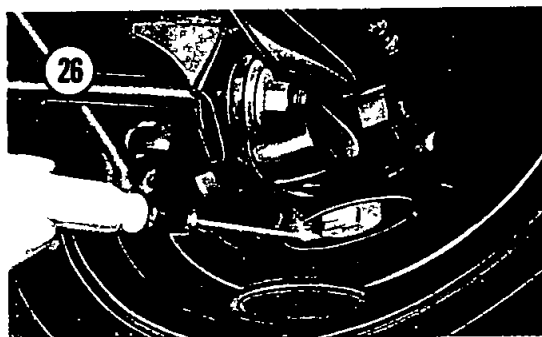
1. Install parts of the handbrake system in the reverse of removal. Make certain all connections are tight.
2. Lubricate all sliding parts with multi-purpose grease

Front Brake Adjustment (Sedan and Wagon)

Adjustment of the front disc brake units is not required, as it is made automatically. Replace the front disc brake pads and rebuild the piston assemblies if the brakes are defective.

Front Brake Adjustment (Pick-up)

1. Refer to Figure 26. Jack up vehicle to lift wheel requiring adjustment.



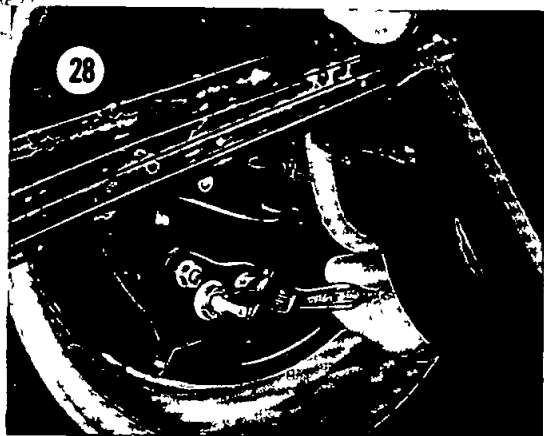
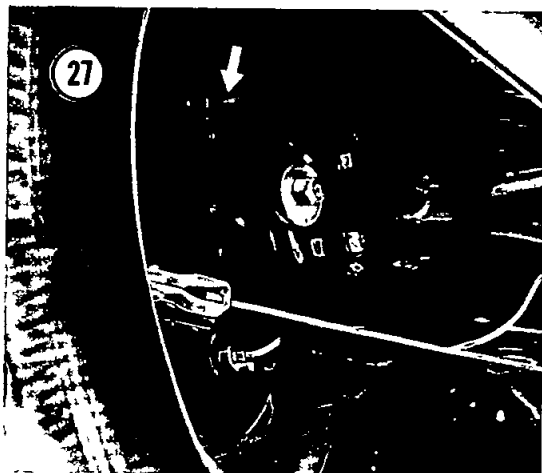
2. Remove rubber boot from brake disc.
3. Lightly tap adjuster housing and move it forward. Turn adjuster wheel with a screwdriver, and spread brake shoes. Stop turning adjuster wheel when a considerable drag is felt on brake drum.

NOTE: For both left and right brakes, brake shoes spread when adjuster wheel is turned downward.

4. Return adjuster wheel 12 ratchet teeth to obtain correct clearance between brake drum and shoes
5. Turn brake drum to make sure that drum turns without dragging. If dragging exists, readjust.

Rear Brake Adjustment (Sedan and Wagon)

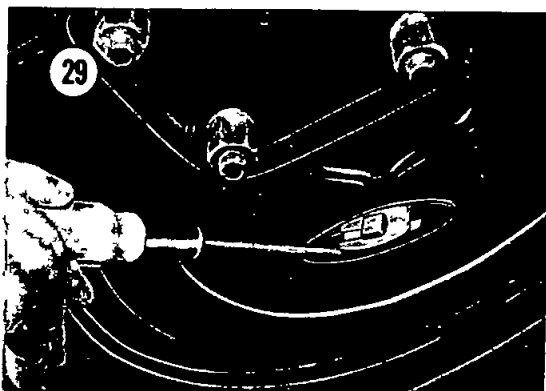
- 1 Jack up the rear wheel.
- 2 Release the handbrake completely
3. **Figure 27** shows the adjusting screw for the sedan, **Figure 28** for the wagon. Depress the brake pedal several times and turn the adjusting screw clockwise until the drum cannot be moved by hand



4. Return adjusting screw counterclockwise until the shoes are just clear of the drum. This should be about three notches.
- 5 Rotate the drum to see if the shoes are dragging. If so, readjust until the drag is gone

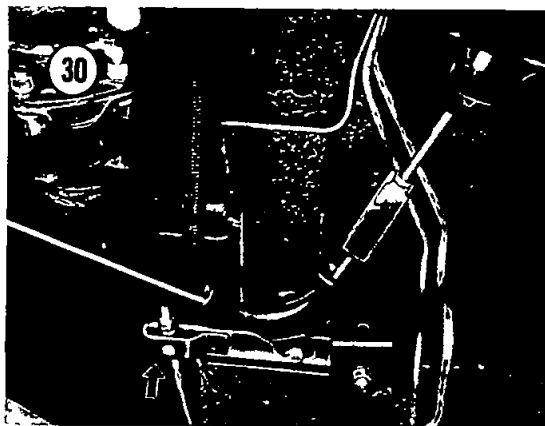
Rear Brake Adjustment (Pick-up)

- 1 Jack up rear wheel.
- 2 Release handbrake. Adjust the wheel using the same procedure given for the front wheel. See **Figure 29**

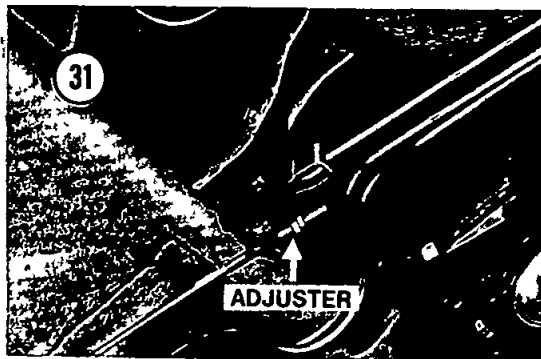


Handbrake Adjustment

- 1 Release handbrake and adjust rear brakes as previously described
- 2 Adjust the front and rear handbrake cable by adjusting nuts shown in **Figure 30**. The stroke of the handbrake control stem should be 3 346 to 3 740 in (85 to 95mm) (sedan only).



- 3 Refer to **Figure 31**. Adjust the front cable by turning the adjusting nut so that the control stem stroke is 4 330 to 4 724 in (110 to 120mm) (wagon only)



4 **Figure 32** shows the adjusting points for the pick-up. With rear cable stretched, adjust equalizer link with adjust screw (A), so that (L) dimension is 1 161 in (29 5mm). Lock adjust screw with lock nut.

5 Adjust front cable adjust screw (B) so that control stem stroke is 3 15 to 3 94 in (80 to 100mm). Lock adjust screw with lock nut.



SERVICE DATA AND SPECIFICATIONS

Table 1 provides the service data and specifications for the sedan, wagon, and pick-up.

Table 1 BRAKE SERVICE DATA AND SPECIFICATIONS

	Sedan/Wagon	Pick-up
Brake Pedal		
Pedal free height	8 150 in (207mm)	5 33 in (135 5mm)
Full stroke of pedal head	5 709 in (145mm)	
Master Cylinder		
Inner diameter	0 75 in (19 05mm)	0 75 in (19 05mm)
Maximum clearance between cylinder and piston	0 0051 in (0 13mm)	0 006 in (0 15mm)
Wheel Cylinder		
Inner diameter (front)	2 0 in (50 8mm)	0 8125 in (20 64mm)
Inner diameter (rear)	0 8125 in (20 64mm)	0 8125 in (20 64mm)
Maximum clearance between cylinder and piston	0 007 in (0 18mm)	0 006 in (0 15mm)
Brake Drum and Rotor		
Drum brake inner diameter, front		10 00 in (254mm)
Disc brake outer diameter, front	9 130 in (232mm)	
Drum brake outer diameter, rear	9 00 in (228 6mm)	10 00 in (254mm)
Maximum allowable out of round	0 002 in (0 05mm)	0 008 in (0 20mm)
Limit of drum reconditioning (inner diameter)	9 039 in (229 6mm)	10 04 in (255mm)
Maximum rotor runout	0 0024 in (0 06mm)	
Minimum rotor thickness	0 331 in (8 4mm)	
Lining Dimension		
Front (width x thickness x length)		1 8 x 0 2 x 9 6 in (45 x 4 5 x 244mm)
Front disc pad (width x thickness x length)	1 563 x 0 354 x 3 386 in (39 7 x 9 x 86mm)	
Rear (width x thickness x length)	1 575 x 0 18 x 8 642 in (40 x 4 5 x 219 5mm)	1 8 x 0 2 x 9 6 in (45 x 4 5 x 244mm)
Total friction area (drum type)	54 4 sq in (351 sq cm)	68 2 sq in (440 sq cm)
Total friction area (front disc)	17 77 sq in (114 2 sq cm)	

(continued)

Table 1 BRAKE SERVICE DATA AND SPECIFICATIONS (continued)

	Sedan/Wagon	Pick-up
Tightening Torque (ft.-lb /kg/m)		
Fulcrum pin	25.3 to 28.9 (3.5 to 4.0)	25.3 to 28.9 (3.5 to 4.0)
Master cylinder mounting bolts	15.2 to 18.1 (2.1 to 2.5)	15.2 to 18.1 (2.1 to 2.5)
Front brake wheel cylinder	10.8 to 15.2 (1.5 to 2.1)	30.4 to 37.6 (4.2 to 5.2)
Rear brake wheel cylinder	10.8 to 15.2 (1.5 to 2.1)	10.8 to 13.0 (1.5 to 1.8)
Rotor fixing bolts	28.2 to 38.3 (3.9 to 5.3)	
Brake hose to wheel cylinder	12.3 to 14.5 (1.7 to 2.0)	12.3 to 14.5 (1.7 to 2.0)

CHAPTER FIFTEEN

BODY ELECTRICAL SYSTEM

Exploded diagrams of the various systems are given below. Inspection of the construction details, as given in the exploded diagrams, should enable the mechanic to identify, remove, repair/replace, and install defective parts. General procedures are given at the end of the chapter.

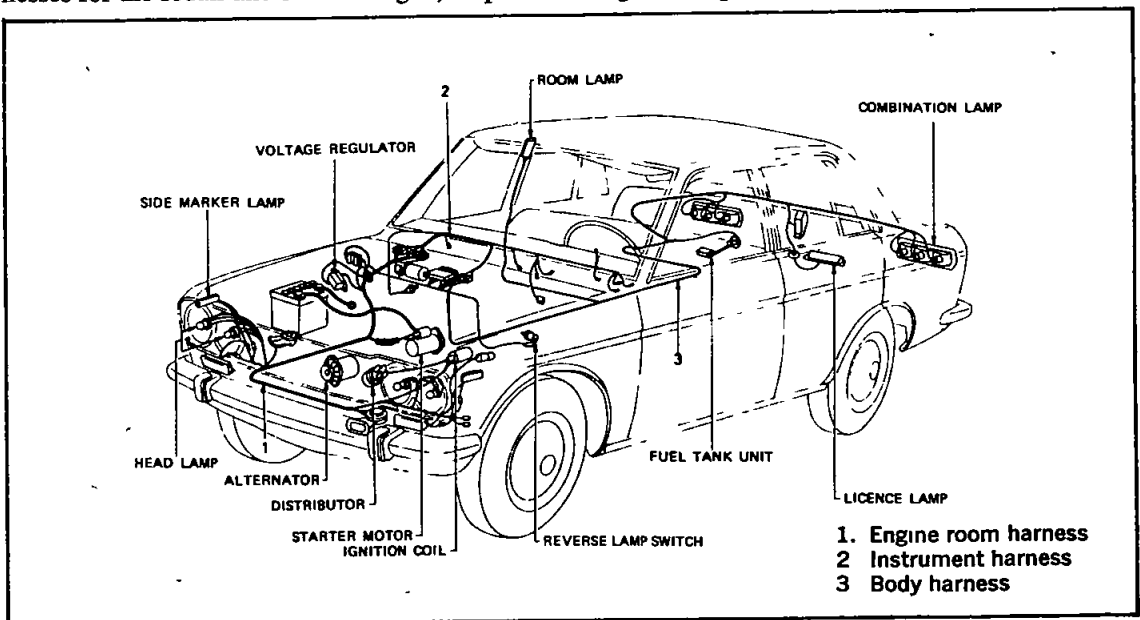
WIRING

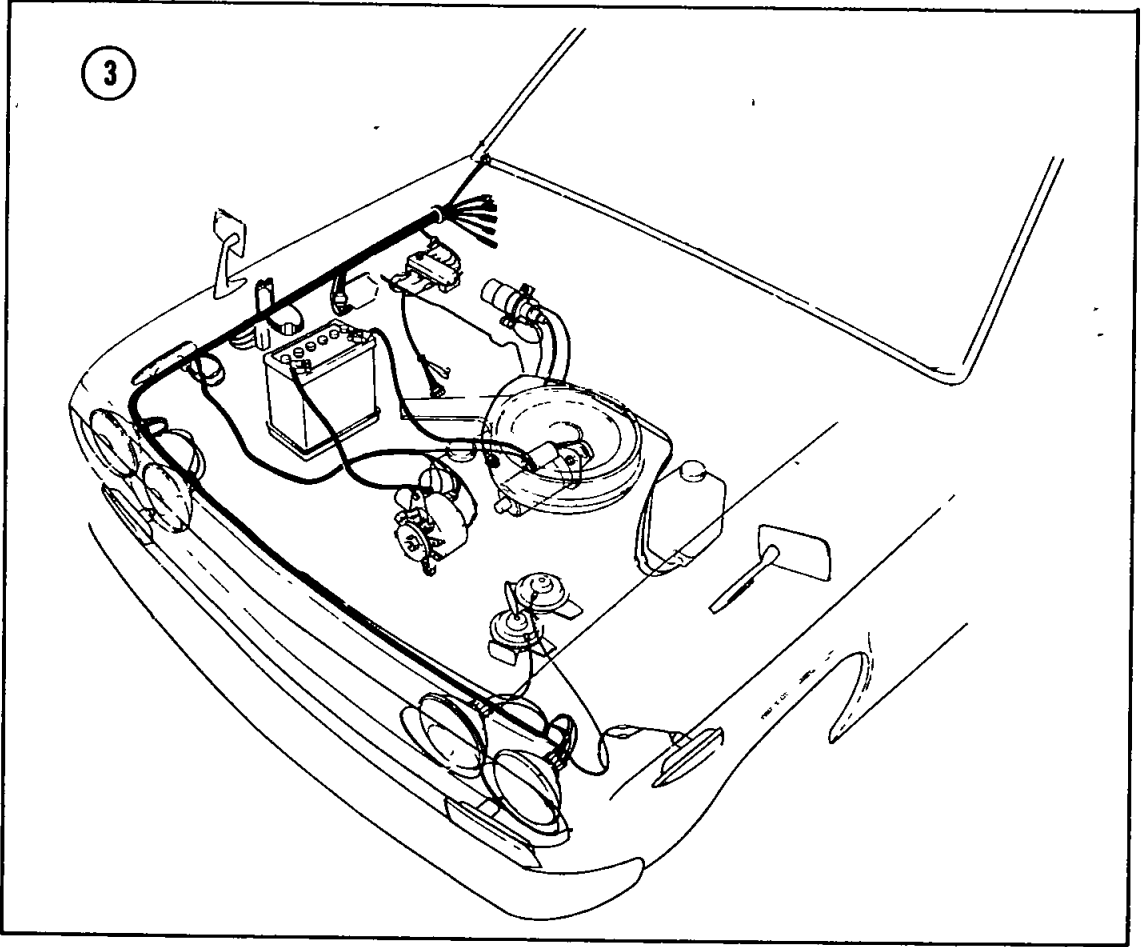
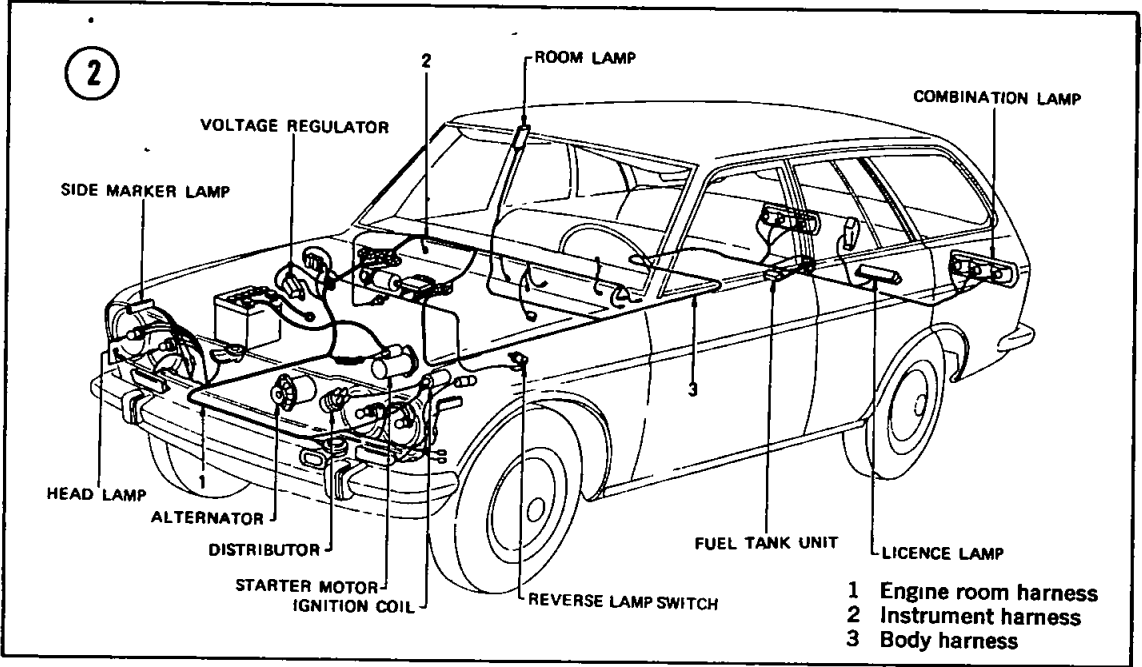
Figures 1 and 2 illustrate the wiring and harnesses for the sedan and station wagon, respectively.

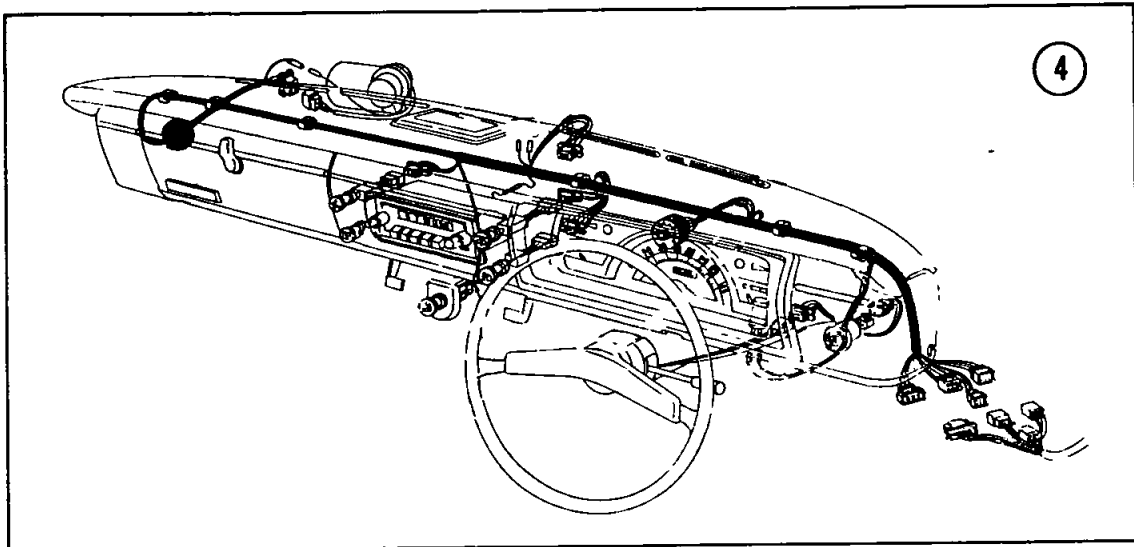
Figures 3 and 4 show pick-up wiring.

SWITCHES/FUSES

Figure 5 (page 208) provides details of switches used through 1969. Figure 6 (page 207) covers switches used since 1970. Figures 7 (page 209) and 8 (page 210) provide further switch location and function information. Fuse blocks are located on the firewall within the engine compartment.

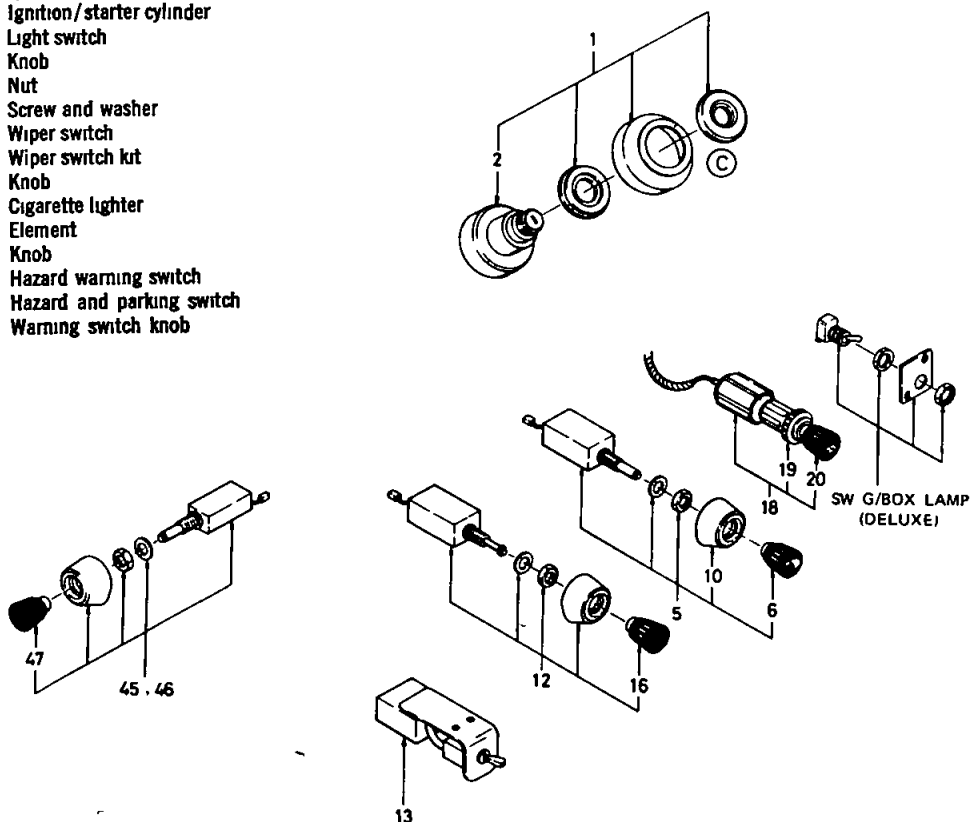


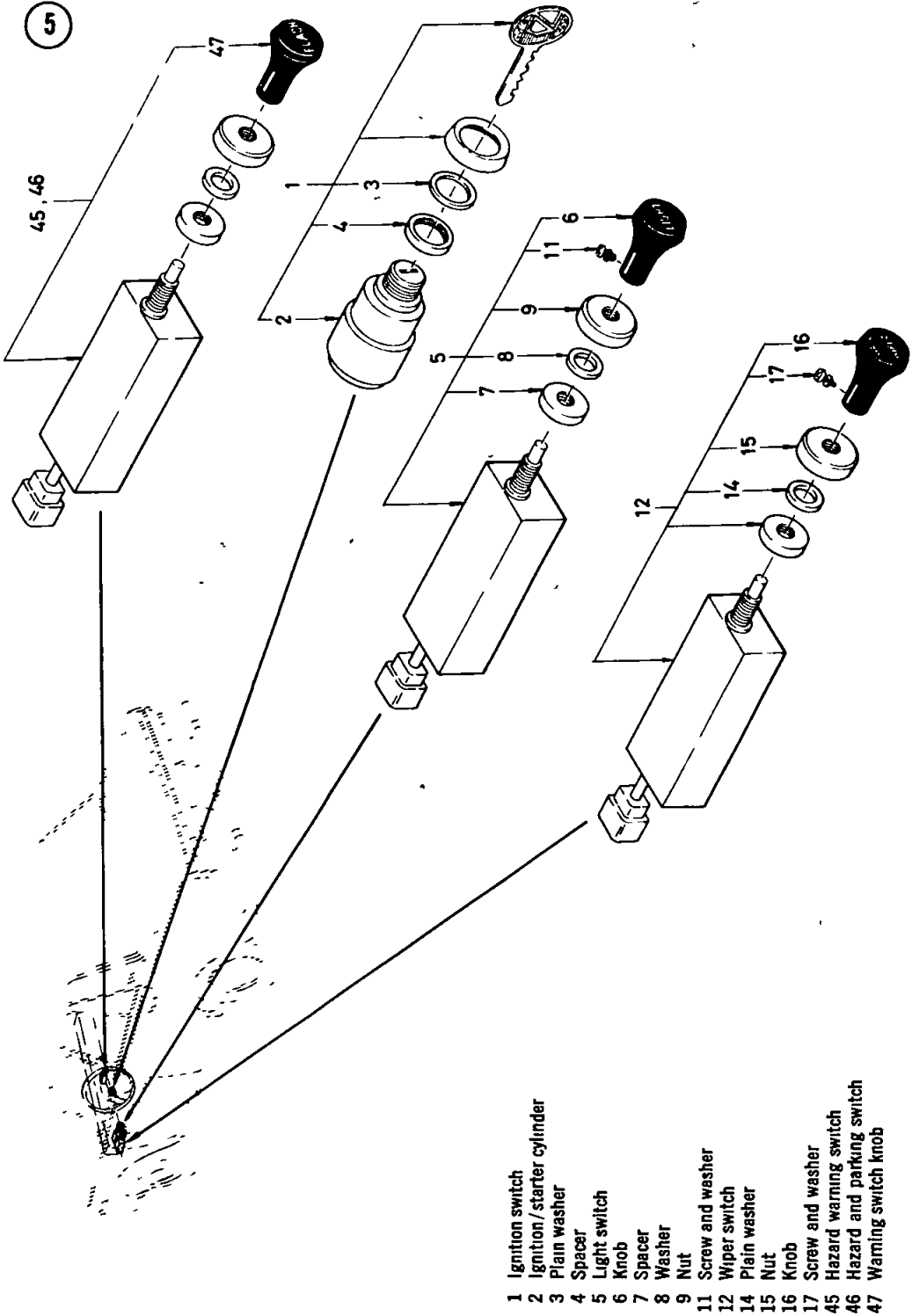




6

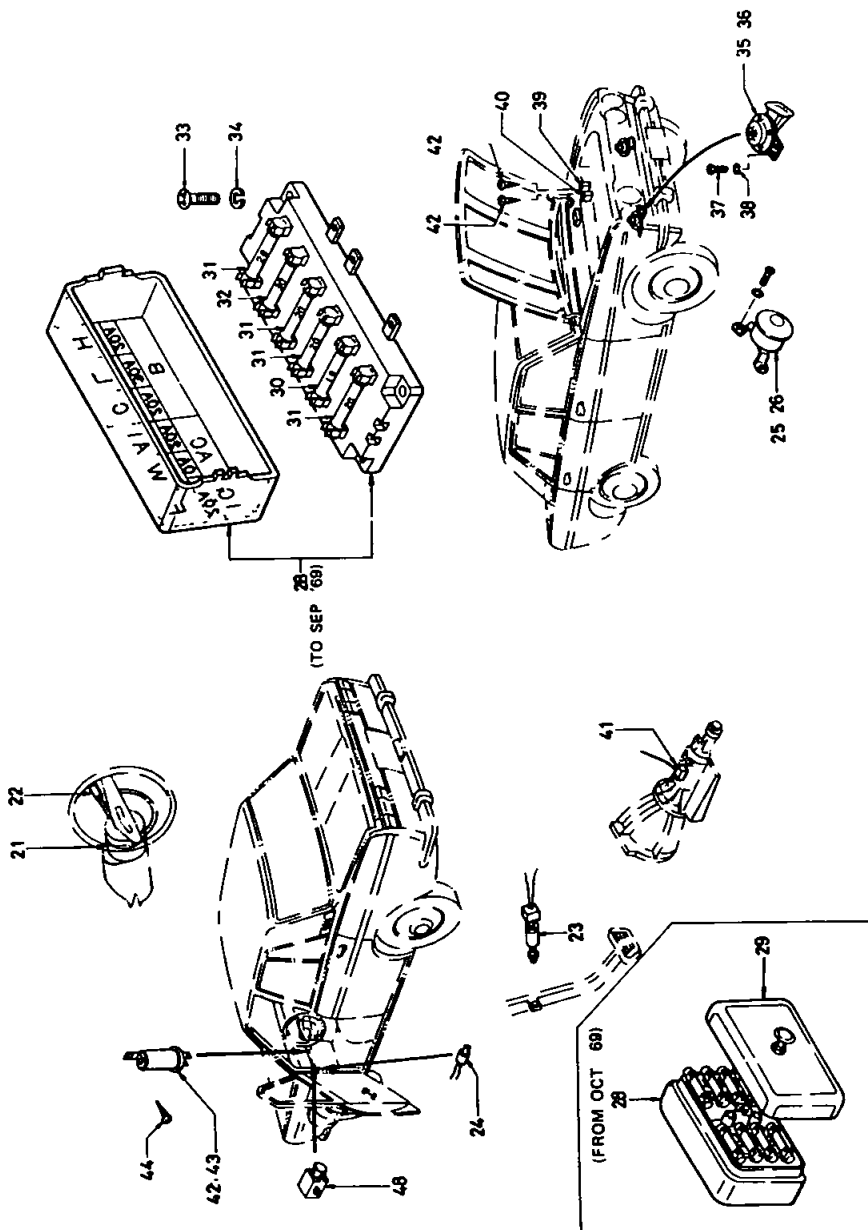
- 1 Ignition switch
- 2 Ignition/starter cylinder
- 5 Light switch
- 6 Knob
- 10 Nut
- 11 Screw and washer
- 12 Wiper switch
- 13 Wiper switch kit
- 16 Knob
- 18 Cigarette lighter
- 19 Element
- 20 Knob
- 45 Hazard warning switch
- 46 Hazard and parking switch
- 47 Warning switch knob

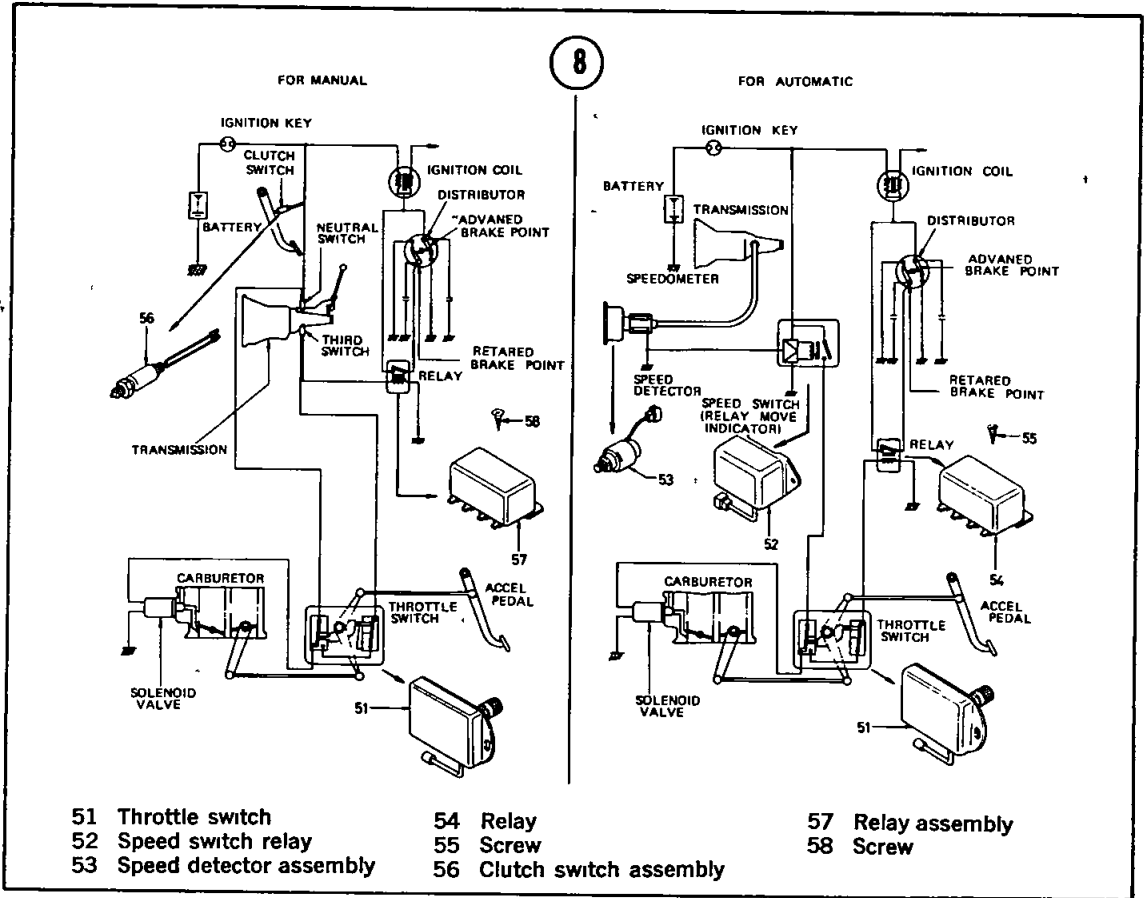




7

- 21 Turn signal and dimmer switch
- 22 Turn signal switch knob
- 23 Stop light switch
- 24 Door switch
- 25 Warning buzzer
- 26 Warning buzzer
- 28 Fuse block
- 29 Fuse block cover
- 30 Fuse, 10 ampere
- 31 Fuse, 20 ampere
- 32 Fuse, 30 ampere
- 33 Machine screw
- 34 Lock washer
- 35 Horn, high pitch
- 36 Horn, low pitch
- 37 Machine screw
- 38 Lock washer
- 39 Horn relay
- 40 Lower beam relay
- 41 Inhibitor switch
- 42 Screw
- 43 Flasher unit
- 44 Screw
- 48 Bracket





INSTRUMENT METERS AND PANELS

Figure 9 illustrates the instrument panel and gauges used on the sedan and wagon models until 1970. Figure 10 (page 212) shows the instrument panel and gauges since 1970. Figure 11 (page 213) shows the instrument panel and gauges used on the pick-up.

HEATER

Figures 12 (page 214) and 13 (page 215) are exploded views of the heaters used on the sedan and wagon. Figure 14 (page 213) shows the heater used on the pick-up.

WINDSHIELD WIPER

Figure 15 (page 216) illustrates the windshield wiper system used on the sedan and wagon since 1969. Earlier models were similar. Figure 16 (page 217) shows the wiper motor, while Figure 17 (page 217) shows the wiper motor linkage on the pick-up.

WINDSHIELD WASHER

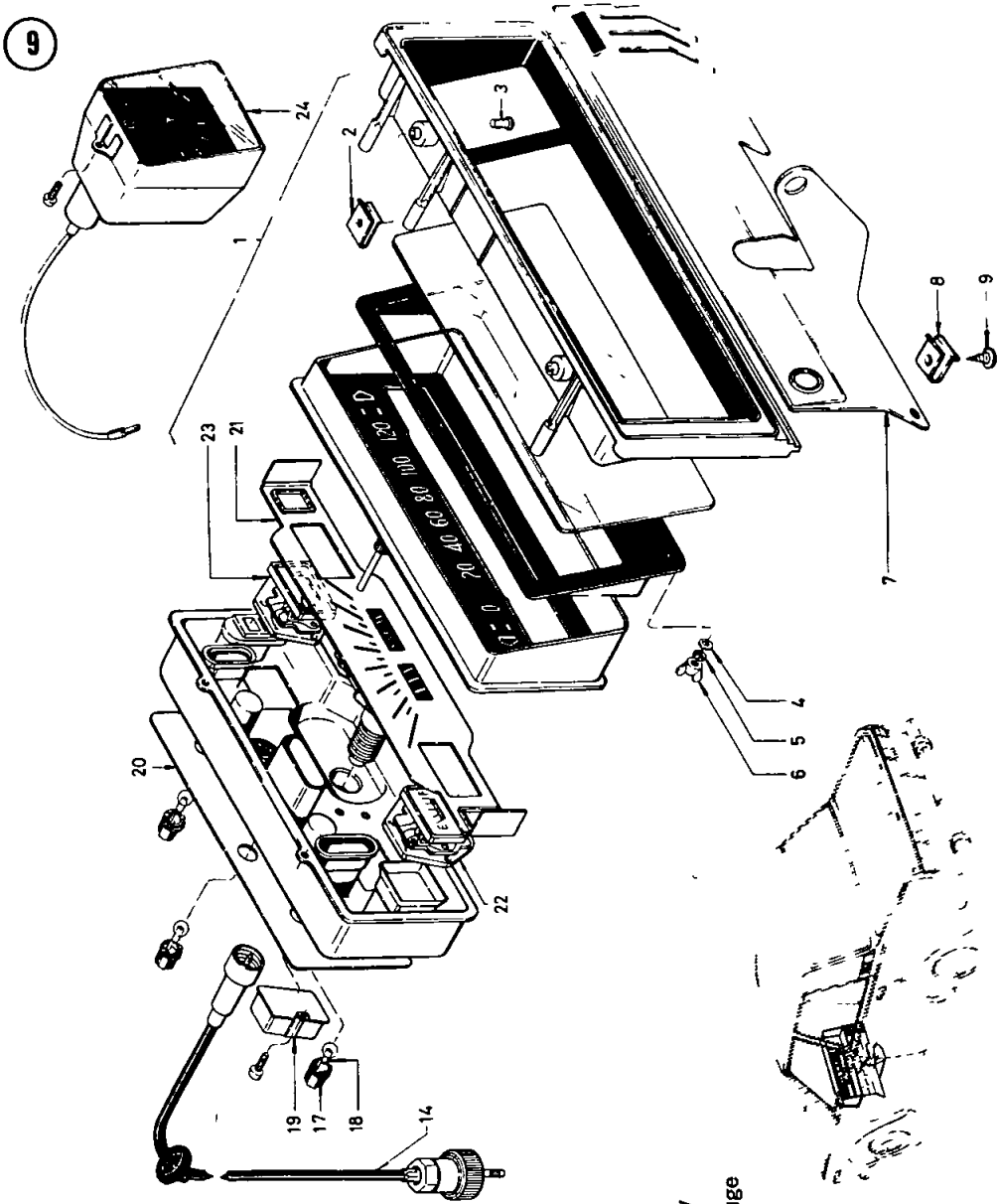
Figure 18 (page 218) is an exploded view of the windshield washer system used on the sedan and wagon since 1969. The washer used on the pick-up is similar.

HEADLAMP

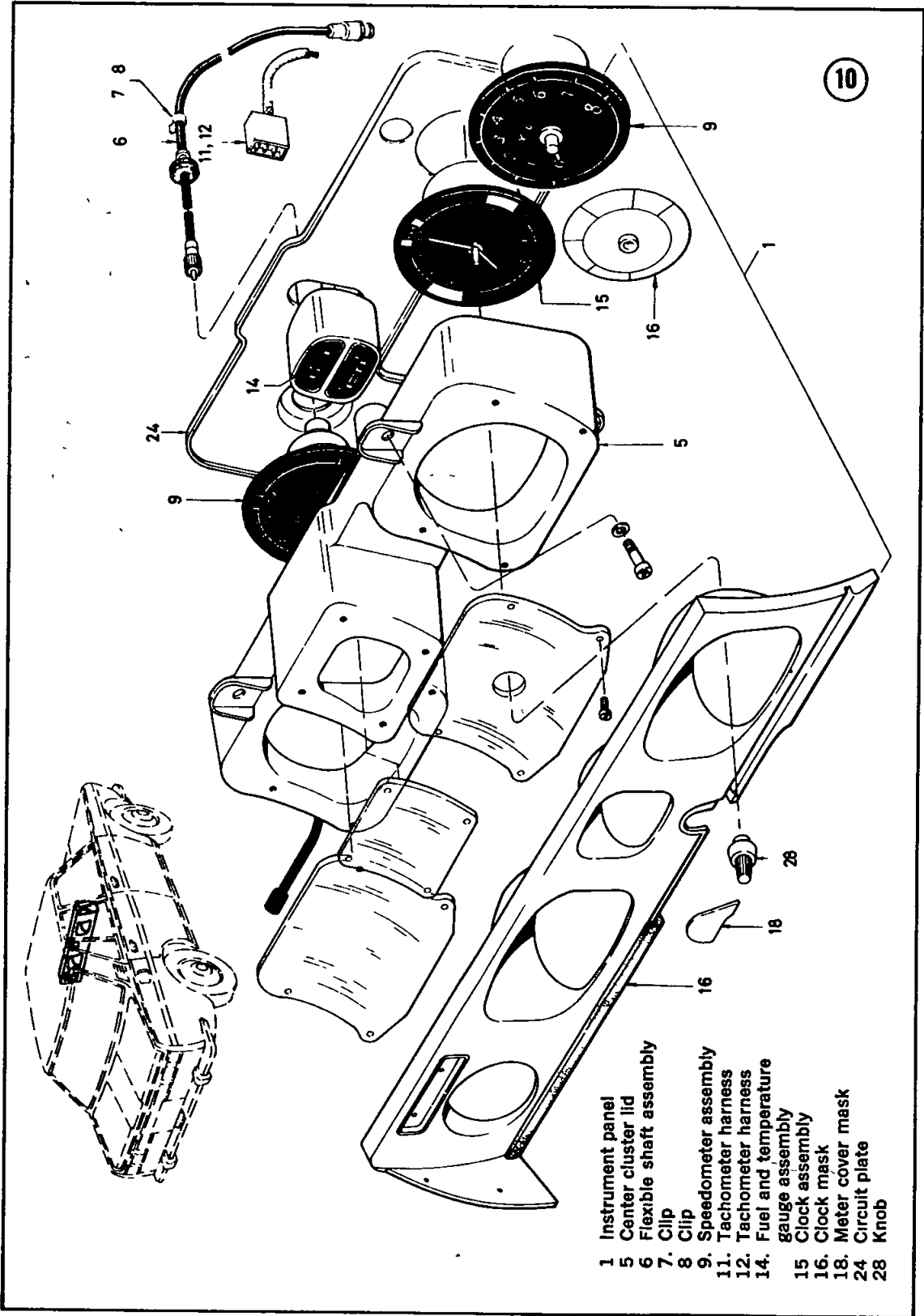
The headlamp units used on the sedan, wagon, and pick-up are all similar to that shown in Figure 19 (page 219). Replacement of the sealed beam units requires that the headlamp trim be removed so that the sealed beam unit can be withdrawn. Adjustment of the headlamps should be referred to a qualified electrical shop.

Lamp Bulb Replacement

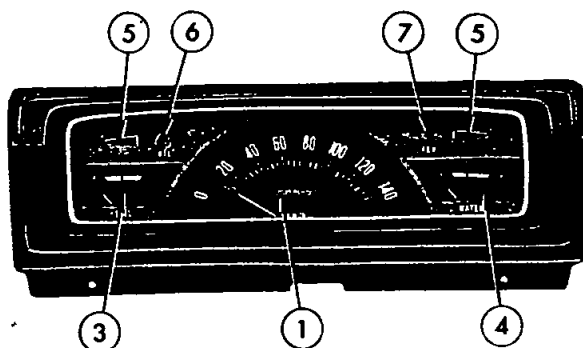
Bulb replacement consists of removing the retainer ring and lens from the unit, removing the bulb, and replacing it. In some cases, the



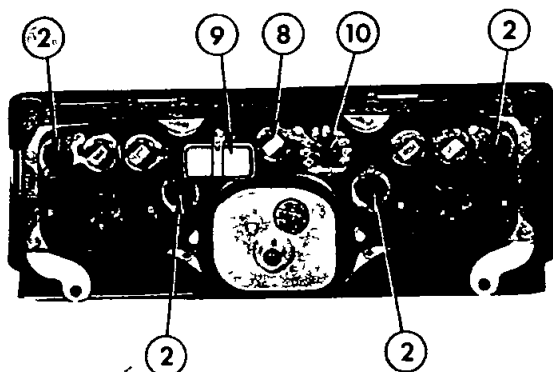
- 1 Instrument panel
- 2 Nut spring
- 3 Screw
- 4 Washer
- 5 Spring washer
- 6 Wing nut
- 7 Cluster lid
- 8 Expansion nut
- 9 Screw
- 14 Flexible shaft
- 17 Socket assembly
- 18 Bulb 12 volt 3 watt
- 19 Voltage regulator
- 20 Circuit plate
- 21 Speedometer assembly
- 22 Fuel gauge assembly
- 23 Water temperature gauge
- 24 Clock assembly



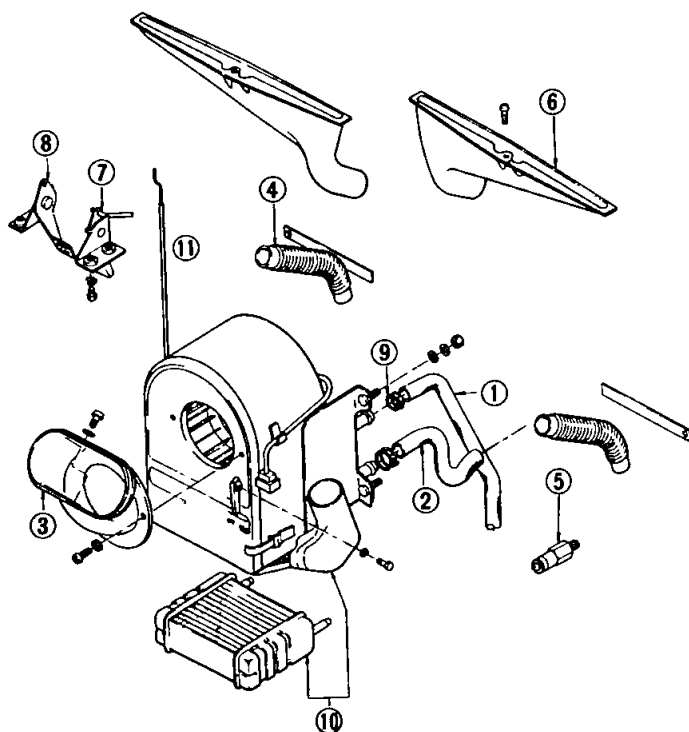
11



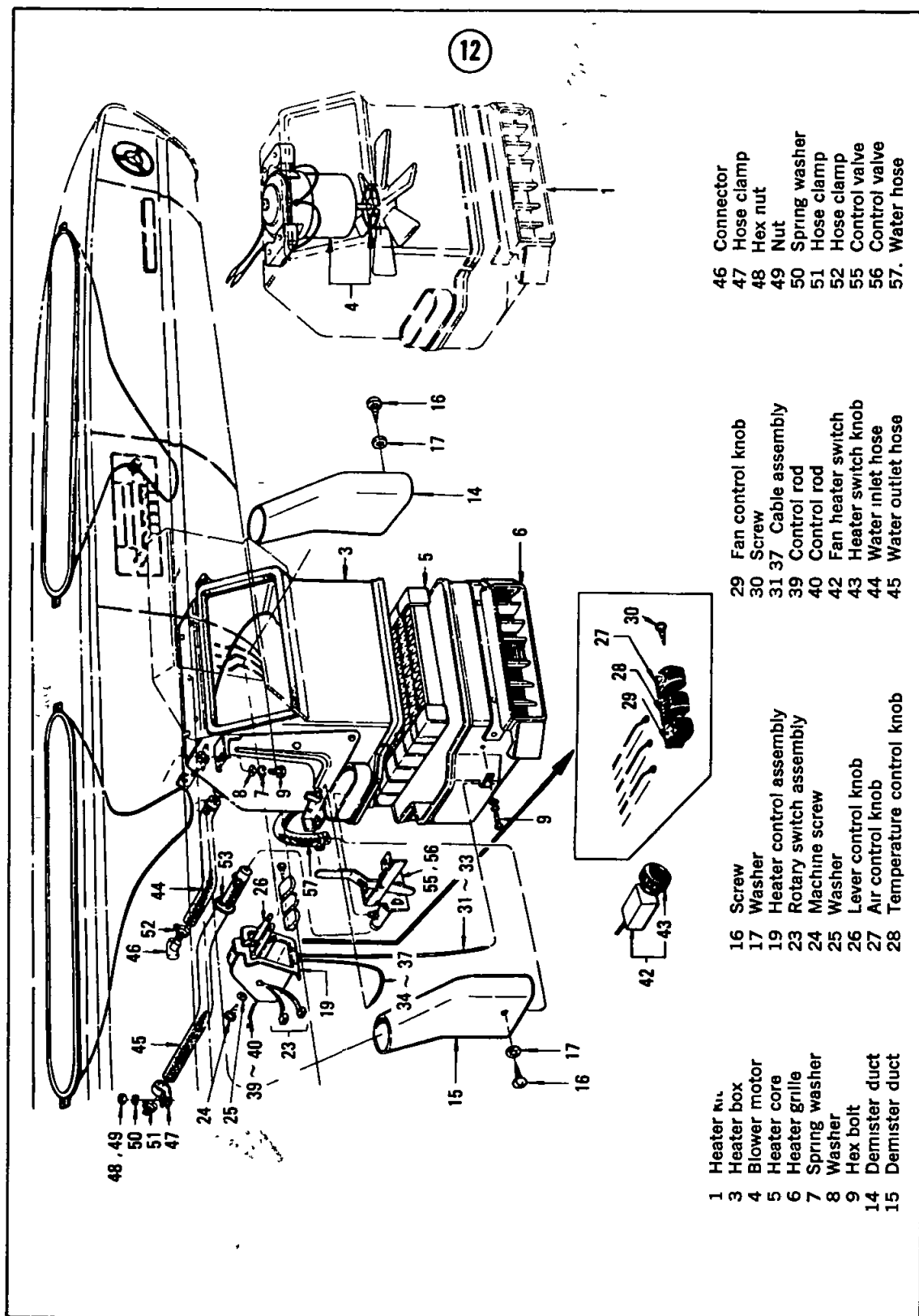
- 1 Speedometer
- 2 Meter illumination lamp
- 3 Fuel gauge
- 4 Temperature gauge
- 5 Turn signal indicator
- 6 Oil pressure warning lamp
- 7 Ignition warning lamp
- 8 Headlamp high beam indicator
- 9 Regulator
- 10 12-pole connector



14

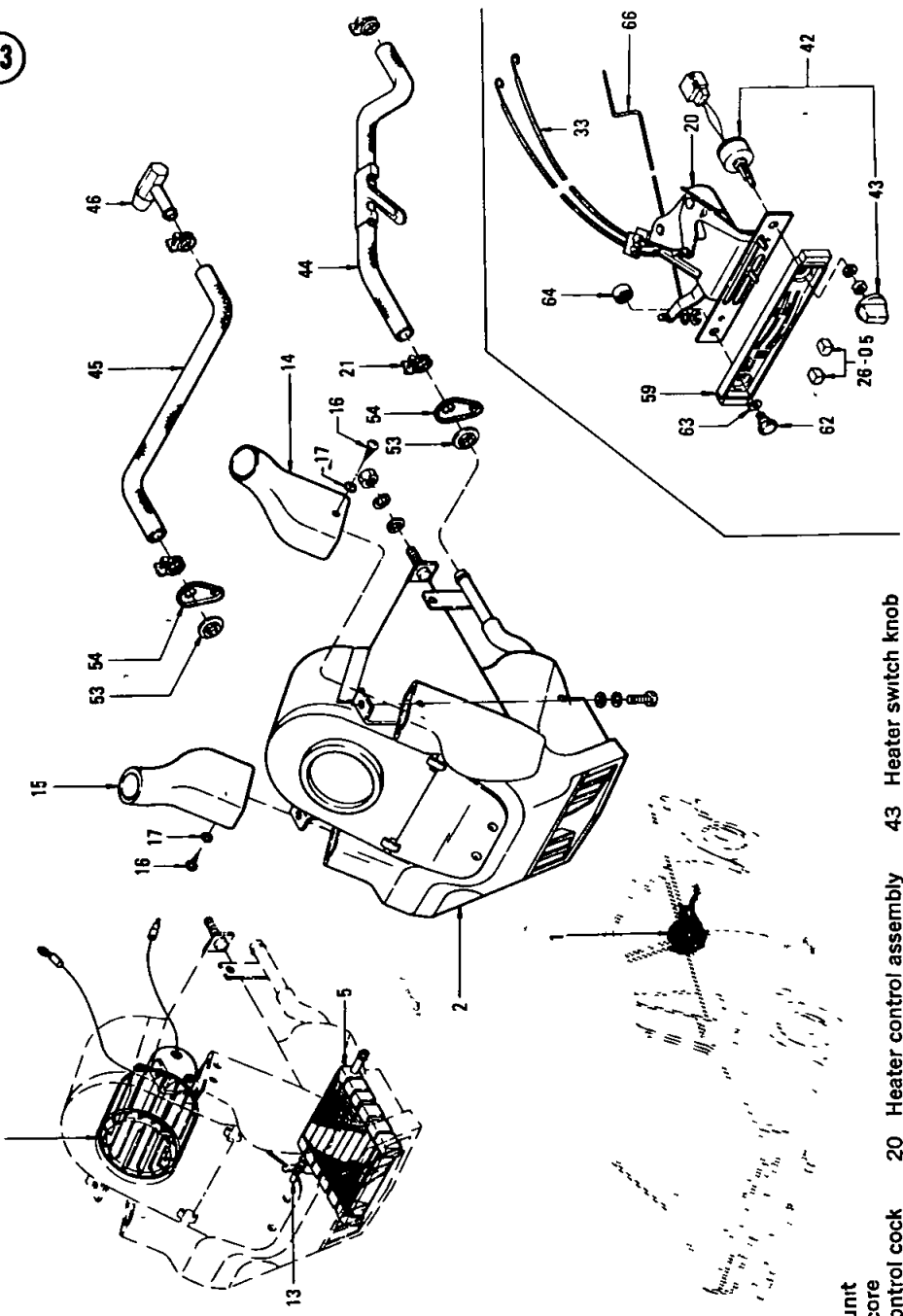


- 1 Inlet hose
- 2 Outlet hose
- 3 Air duct
- 4 Defroster hose
- 5 Hose connector
- 6 Defroster nozzle
- 7 Heater control lever
- 8 Air control lever
- 9 Clamp
- 10 Interior heater unit
- 11 Heater control cable

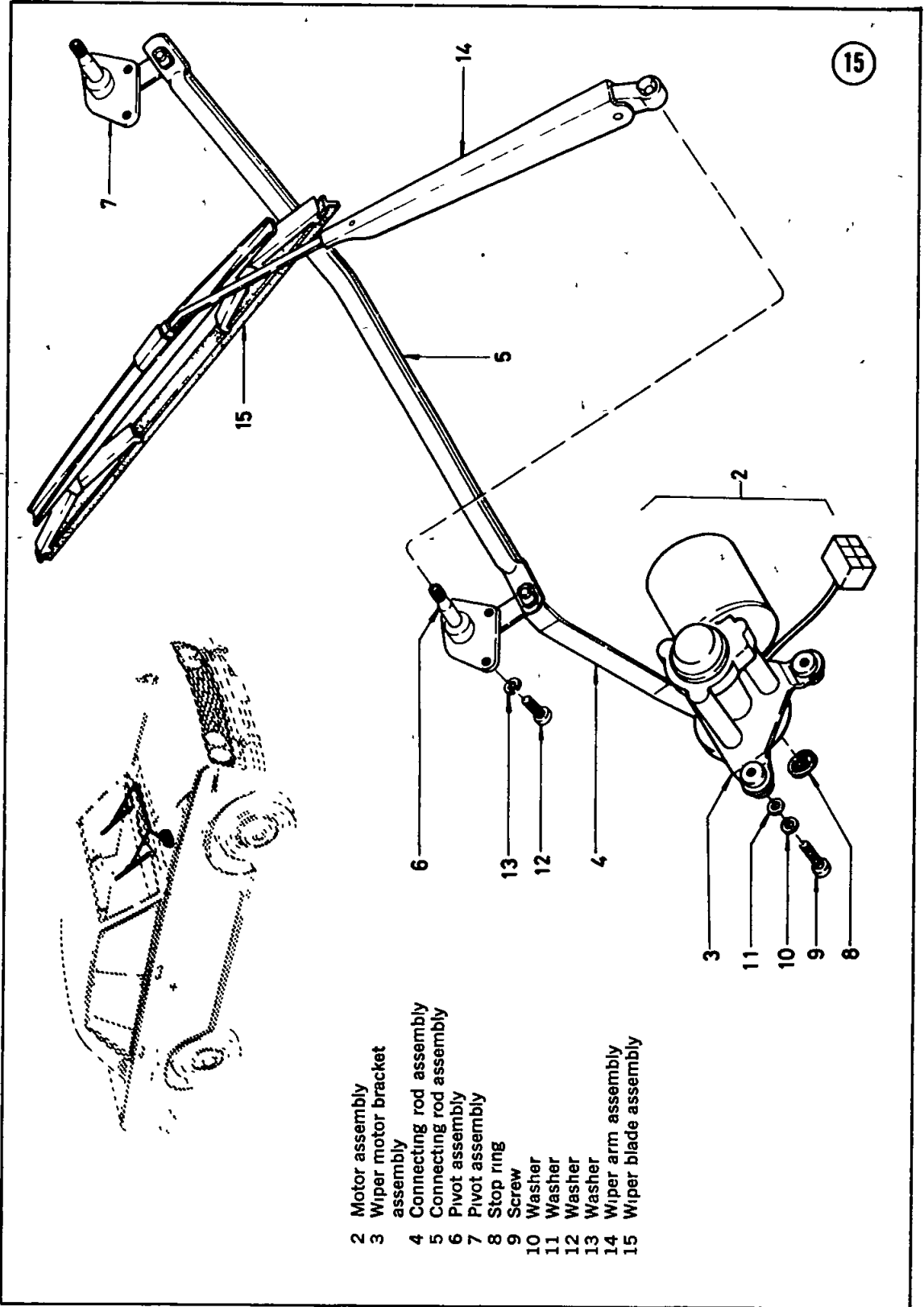


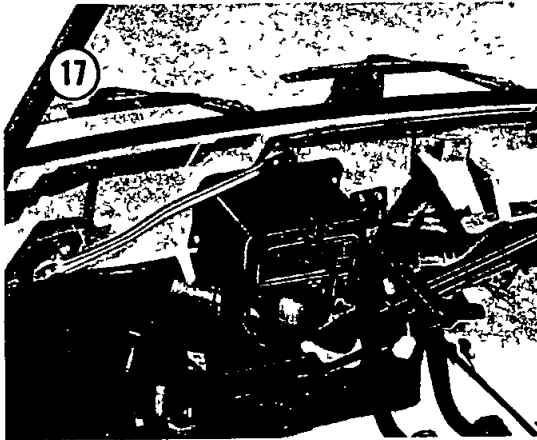
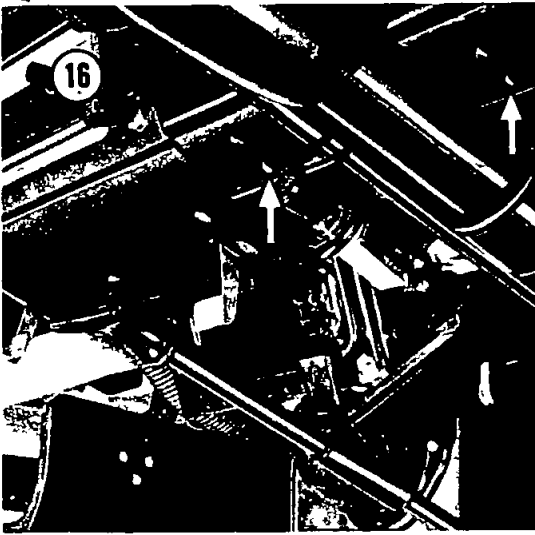
13

ASSY-BLOWER
27013-A4605



- | | | | |
|----|-------------------------|----|--------------------|
| 2 | Heater unit | 43 | Heater switch knob |
| 5 | Heater core | 44 | Water inlet hose |
| 13 | Demister duct | 45 | Water outlet hose |
| 14 | Water control cock | 46 | Connector |
| 15 | Demister duct | 53 | Heater grommet |
| 16 | Screw | | |
| 17 | Washer | | |
| 20 | Heater control assembly | | |
| 21 | Heater control knob | | |
| 26 | Lever control knob | | |
| 33 | Cable assembly | | |
| 42 | Fan heater switch | | |
| 54 | Cover grommet | 64 | Nut |
| 62 | Bolt | 66 | Control rod |
| 63 | Washer | | |





bulb socket must be pulled out from the back of the unit and then the bulb can be replaced. Carefully inspect the unit that requires bulb replace-

ment and follow the appropriate procedure. Make certain you replace the bulb with one rated at the same voltage, amperage, and wattage. Examples of units that might require bulb replacement are the front park and directional lamps, rear combination lamp, side marker lamps, interior room lamps, license plate lamps, and engine compartment lamps.

Fuse Replacement

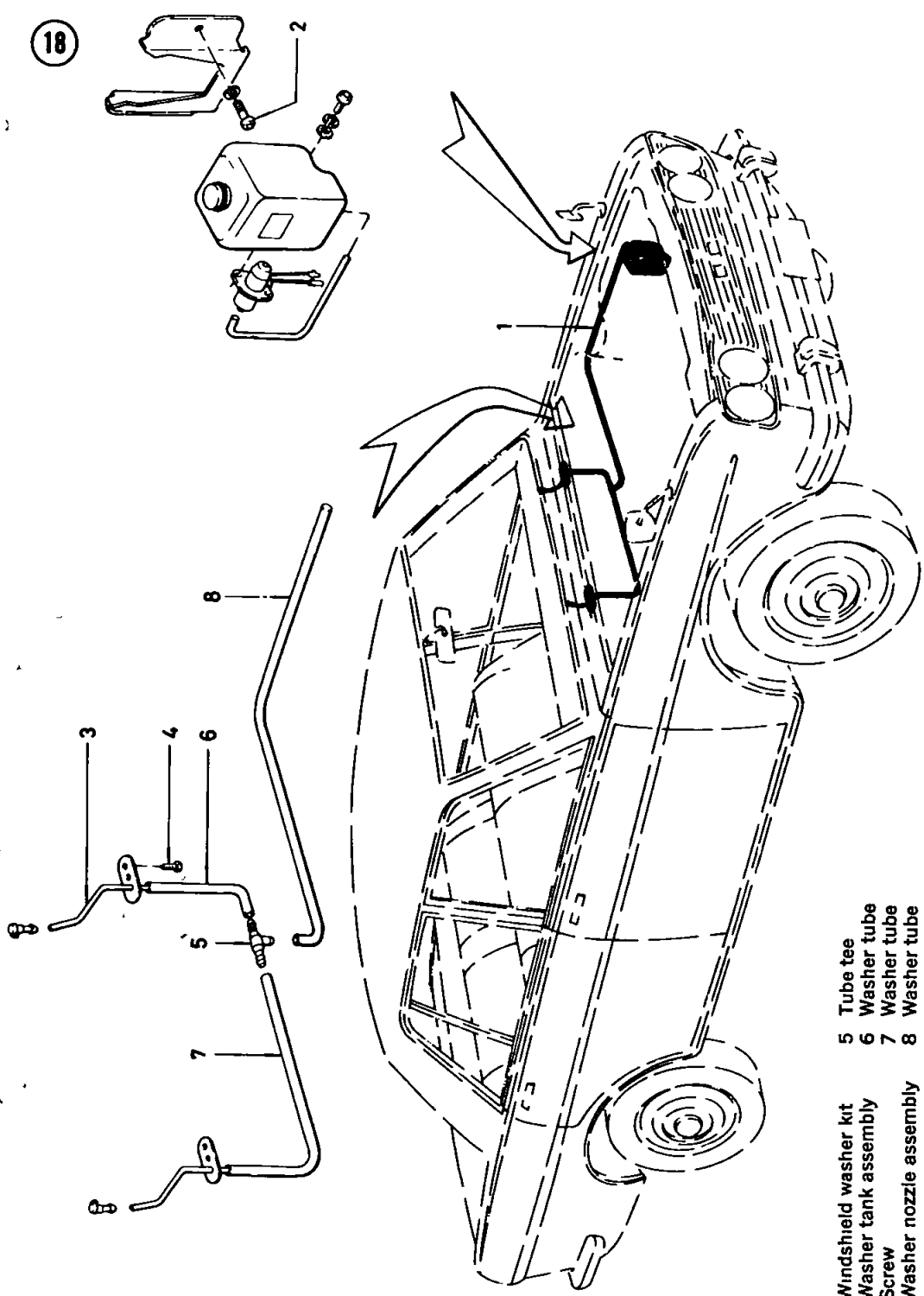
Whenever a failure occurs in any part of the electrical system, always check the fuse box to see if a fuse has blown. The fuse box is located on the firewall within the engine compartment. If a fuse has blown, it will be evident by blackening of the fuse or by a break of the metal element within the fuse.

The wiring diagrams below indicate the circuits that are connected to each fuse. Before replacing a fuse, always determine what caused it to blow and correct the trouble. Never replace a fuse with one of a higher amperage rating than originally used. Never use tin foil or other material to jump across fuse terminals. Failure to follow these basic rules could result in fire or damage to major components.

WIRING DIAGRAMS

The following figures provide wiring diagrams for the sedan, wagon, and pick-up. **Figure 20** (page 220) applies to the sedan and station wagon with manual transmission. **Figure 21** (page 221) covers the sedan and station wagon with automatic transmission. **Figure 22** (page 222) is for the pick-up.

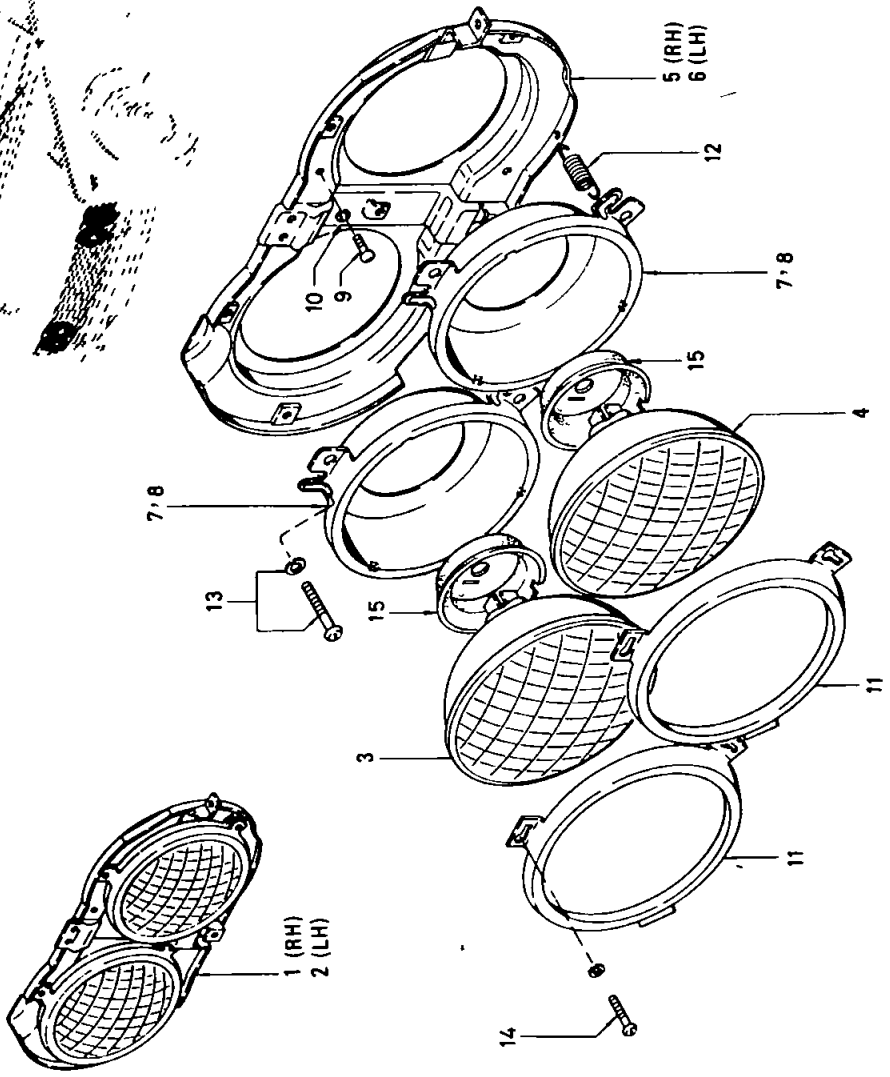
18

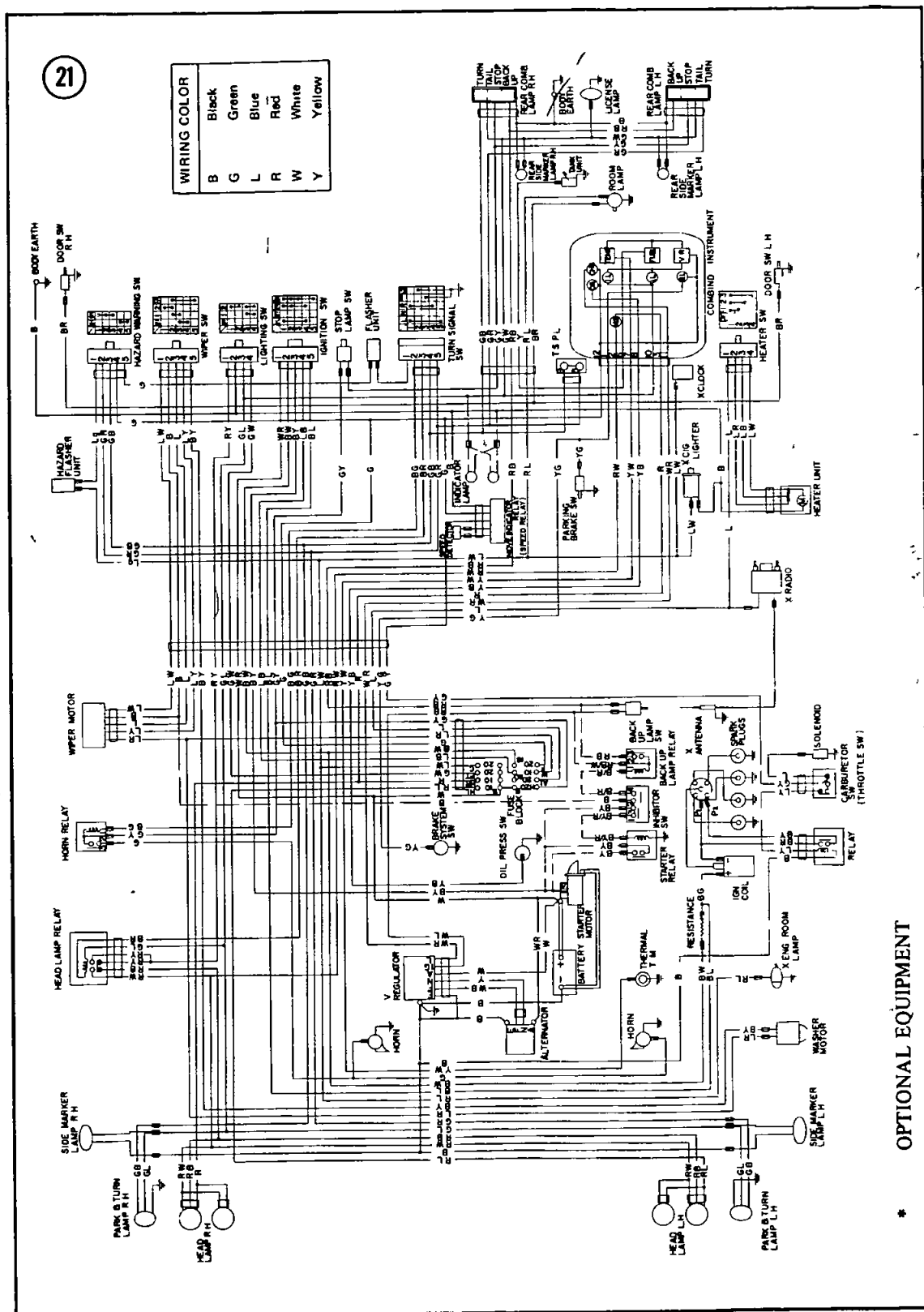


- 1 Windshield washer kit
- 2 Washer tank assembly
- 3 Screw
- 4 Washer nozzle assembly
- 5 Tube tee
- 6 Washer tube
- 7 Washer tube
- 8 Washer tube

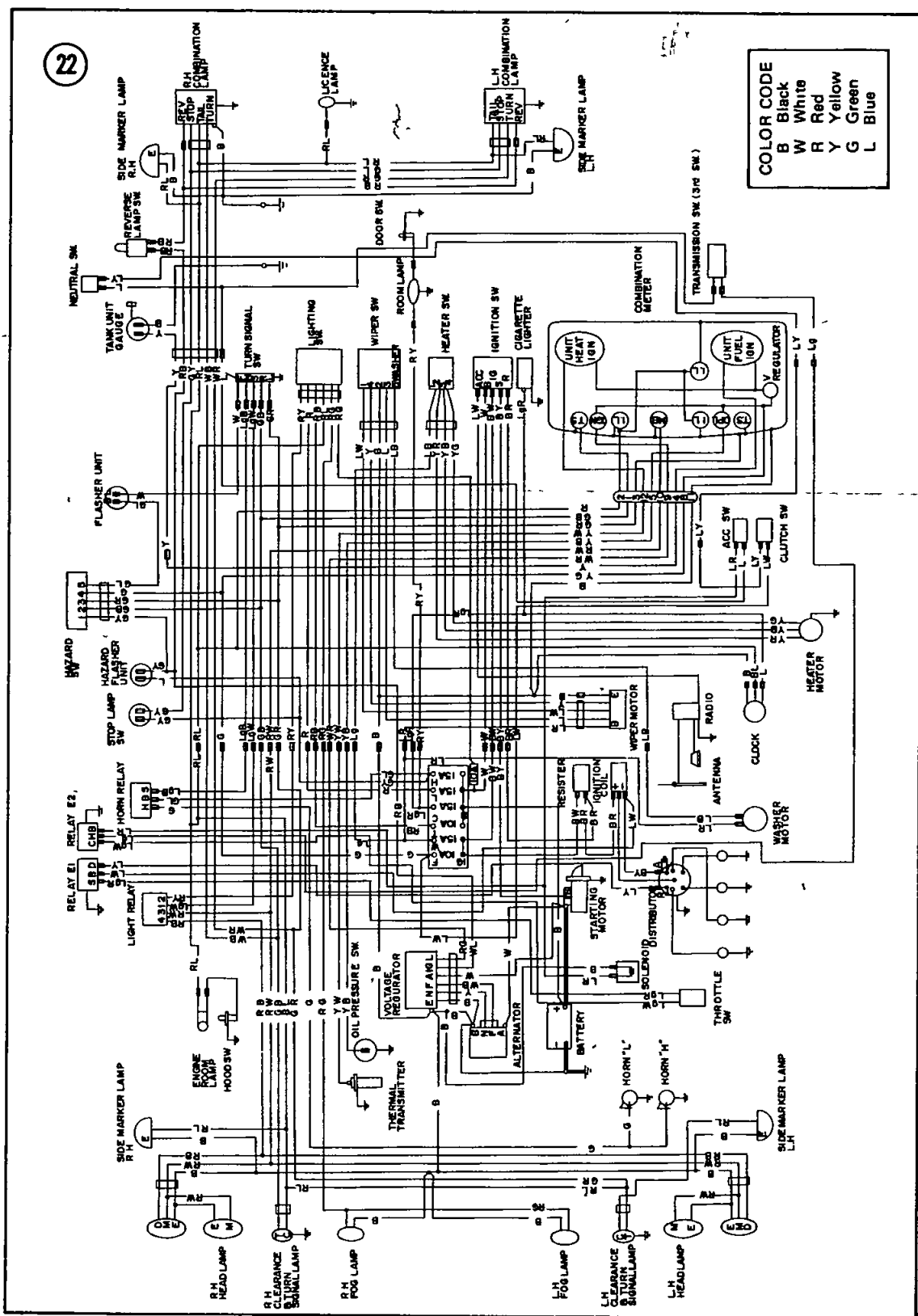
19

- 1-2 Headlamp assembly
- 3 4 Sealed beam unit
- 5-6 Headlamp body
- 7-8 Mounting ring
- 9 Screw
- 10 Lock washer
- 11 Retaining ring
- 12 Tension spring
- 13 Adjusting screw
- 14 Screw
- 15 Headlamp cover





Риски Р



CUT WIRE = RED & NARROW YELLOW

BLUE/WHITE → RADIO

WHITE → FUSE BLOCK, LIGHTING
#L SWITCH

BLACK/WHITE → FUSE BLOCK #W,
BLUE/GREEN WIRE,
HEATER SWITCH
WASHER MOTOR

BLACK/YELLOW → STARTER SOLENOID

BLACK/RED → COIL



CHAPTER SIXTEEN

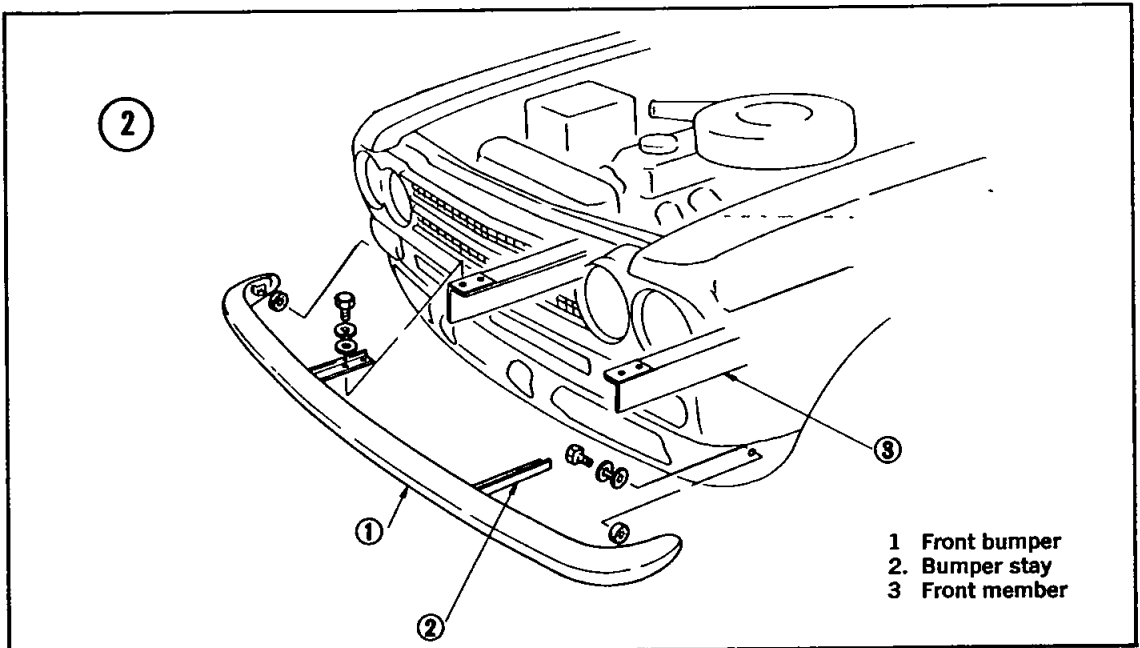
BODY

This chapter provides information and procedures for removal, adjustment, and/or replacement of various body components. Included are the hood, front trim, doors, seats, locks, bumpers, tail gates, and door and window controls. The illustrations given are typical of the sedan; the station wagon is similar. Details on the pick-up are given in separate illustrations. Other body repairs require special knowledge

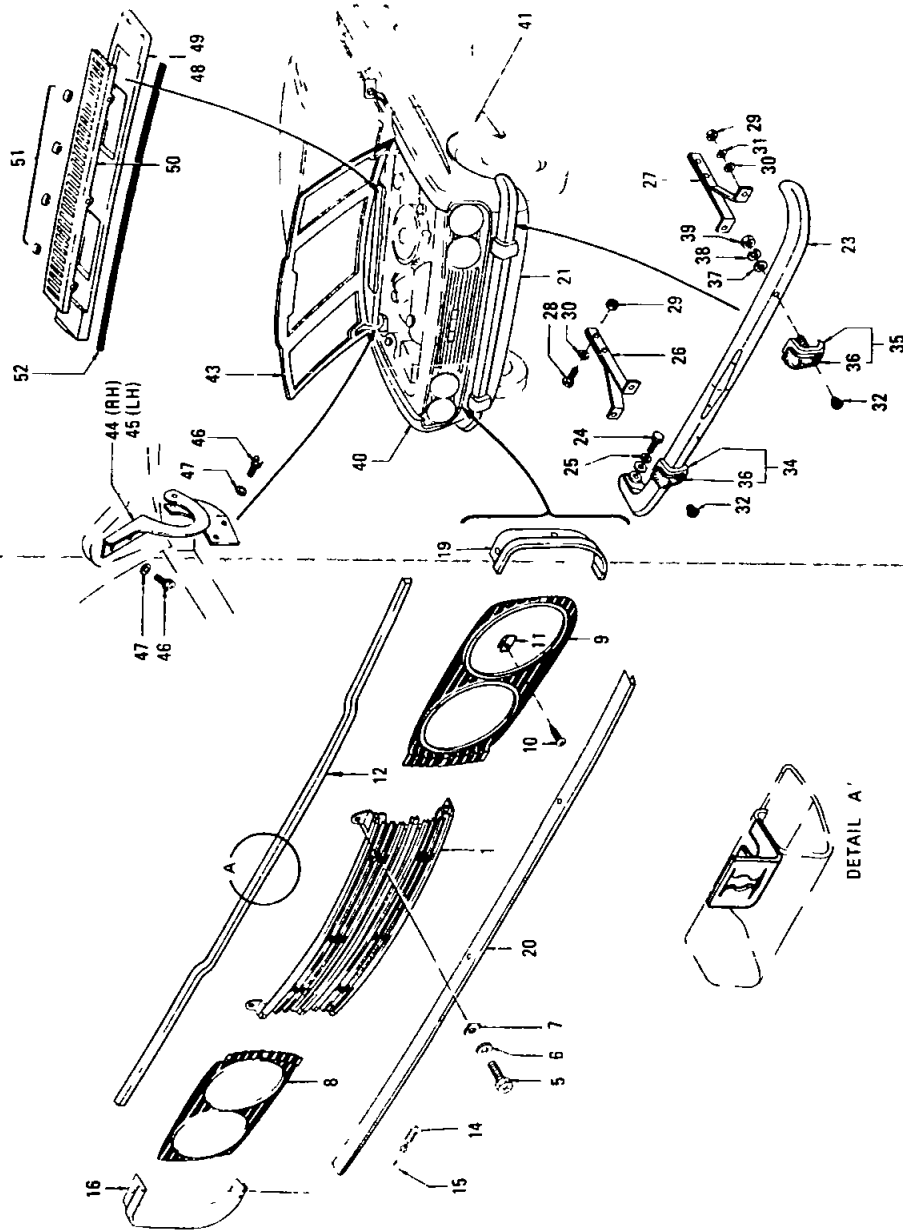
and tools and should be referred to your Datsun dealer or local body shop.

FRONT BODY TRIM AND BUMPERS

Figure 1 (next page) is an exploded diagram of the body trim and bumper for the sedan. **Figure 2** shows the front bumper on the pick-up. Refer to the illustrations and remove and replace



1



- 1 Radiator grille
- 5 Screw
- 6 Washer
- 7 Washer
- 8 9 Head lamp finisher
- 10 Screw
- 11 Nut
- 12 Hood top moulding
- 14 Screw
- 15 Washer
- 16 Moulding
- 19 Moulding
- 21 Front apron
- 23 Front bumper
- 24 Hex bolt with washer
- 25 Washer
- 26-27 Bumper stay
- 28 Bolt
- 29 Nut
- 30 Washer
- 31 Washer
- 32 Plug
- 34-35 Overrider
- 36 Rubber
- 37 Washer
- 38 Lock washer
- 39 Nut
- 40-41 Front Fender
- 43 Hood assembly
- 44-45 Hood hinge
- 46 Bolt
- 47 Washer
- 48-49 Cowl panel
- 50 Cowl grille
- 51 Cowl grille cap
- 52 Sealing rubber

parts as required **Figure 3** illustrates the front body trim on the pick-up

HOOD LOCK CONTROL

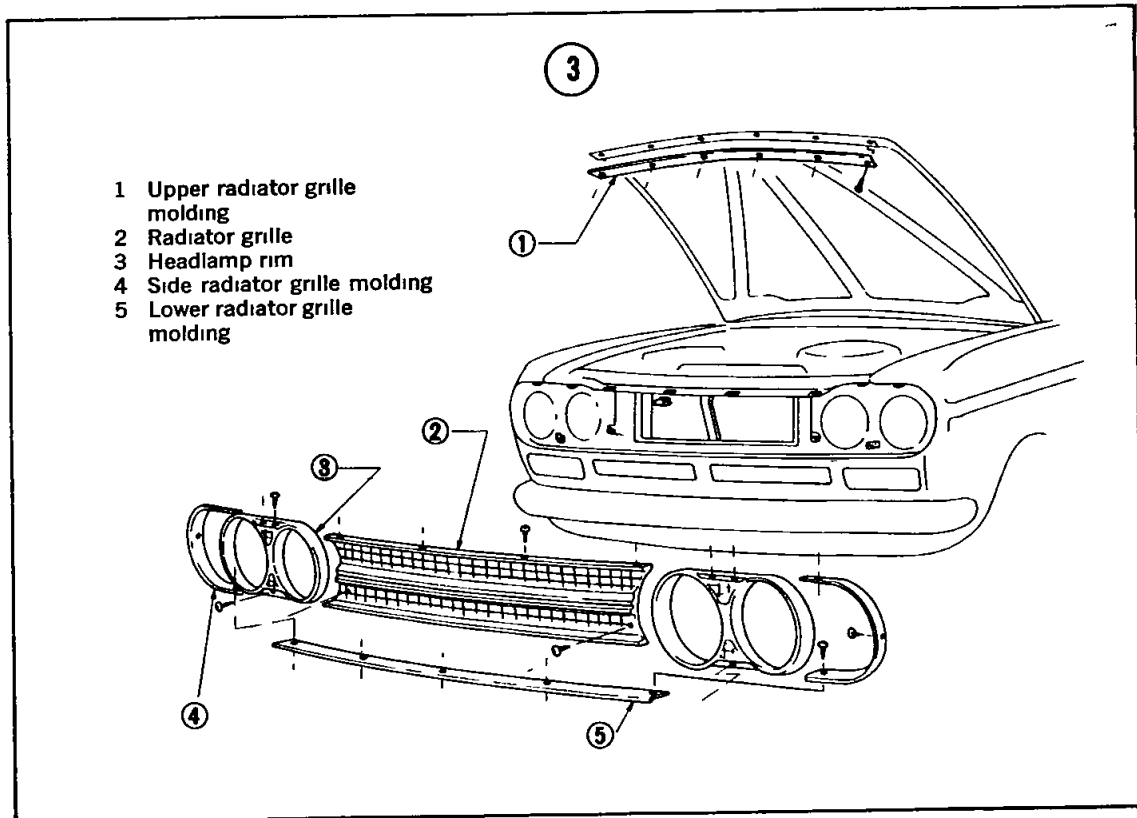
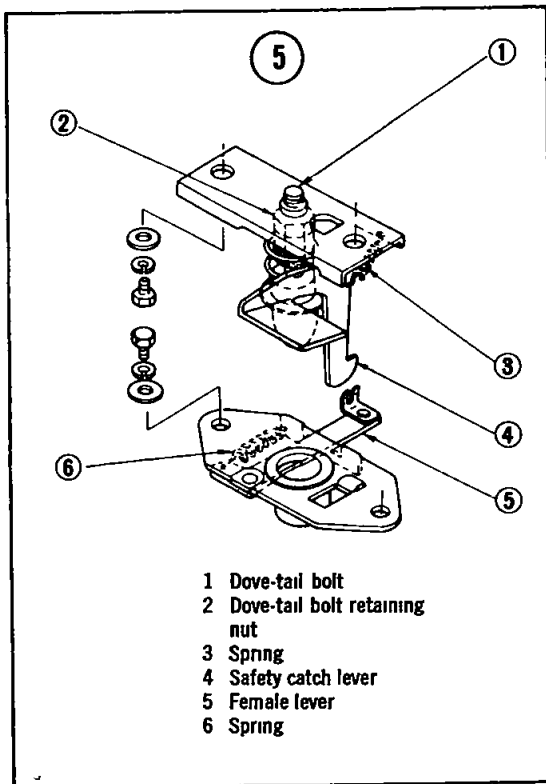
Figure 4 (next page) shows the hood lock control on the sedan and wagon **Figure 5** illustrates the hood lock for the pick-up Adjustment of the male and female assemblies is done after loosening the mounting screws

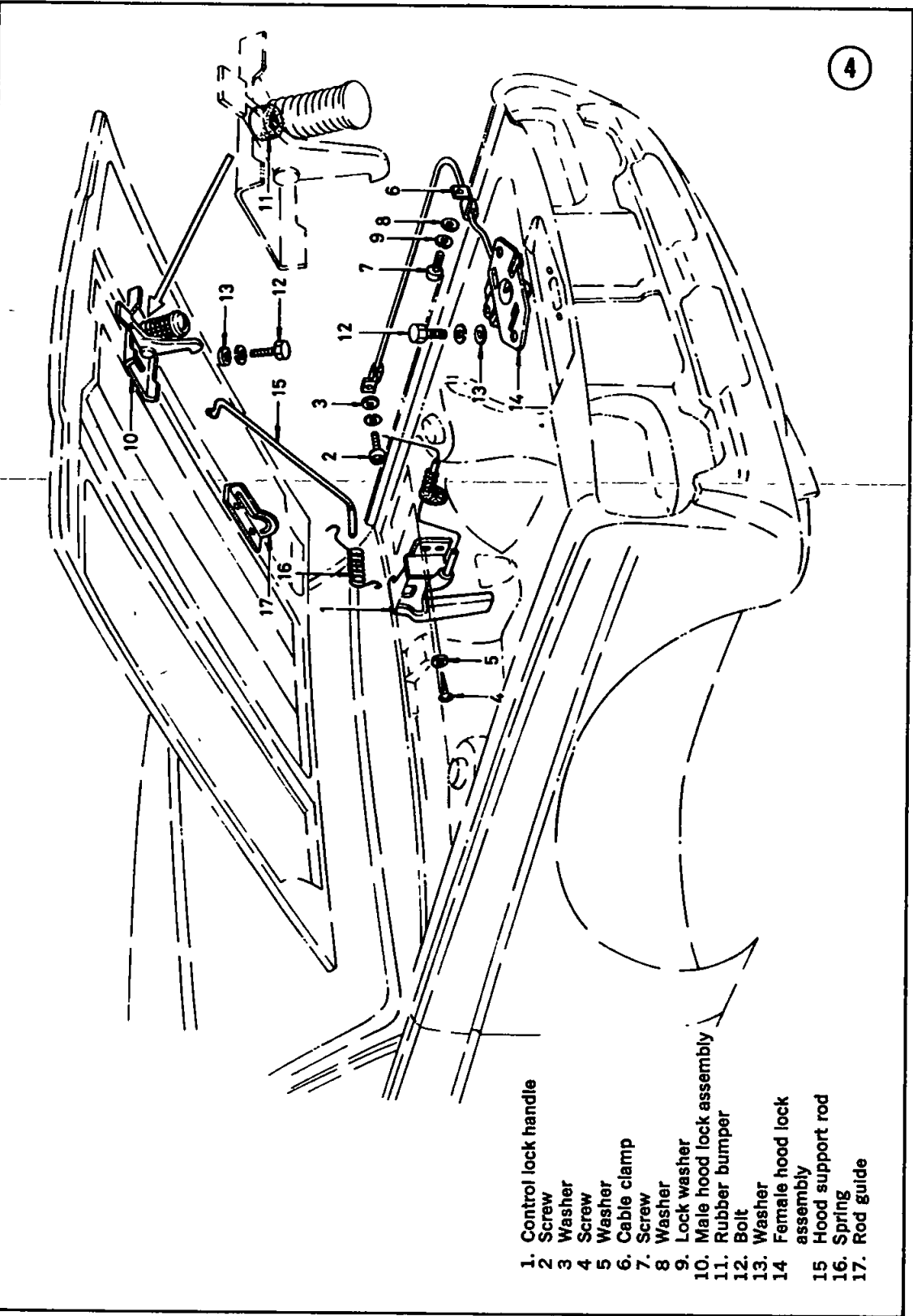
DOORS

Figure 6 (page 227) shows the construction of the front door on the four door sedan The two door sedan and the wagon are similar **Figure 7** (page 228) applies to the pick-up.

DOOR LOCK AND REGULATOR

Refer to **Figure 8** (page 229) for the sedan and wagon and **Figure 9** (page 228) for the pick-up The striker plate on the door frame is adjustable by loosening the mounting screws Adjustment can be made to the top, bottom, left, or right Rear door control units are similar

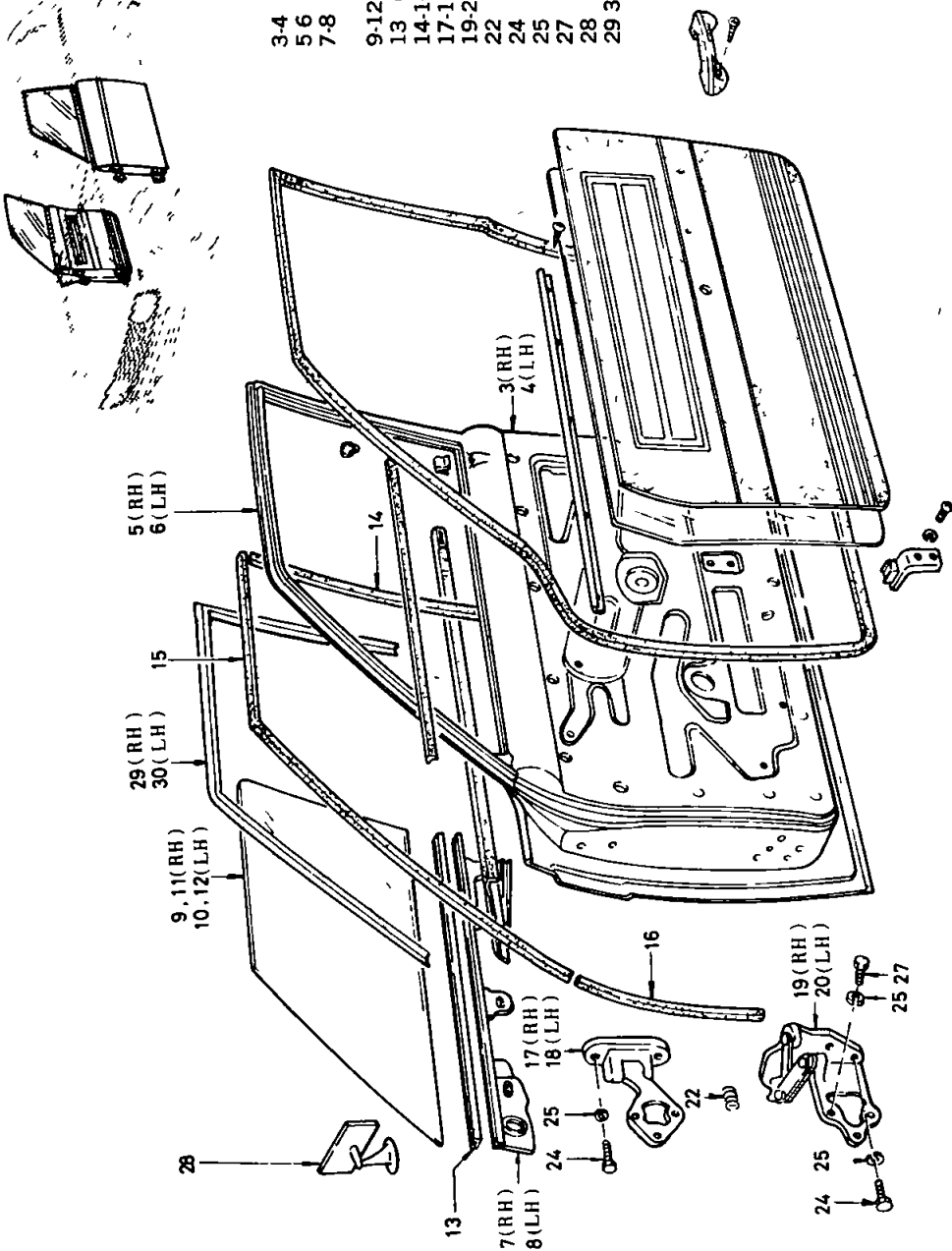


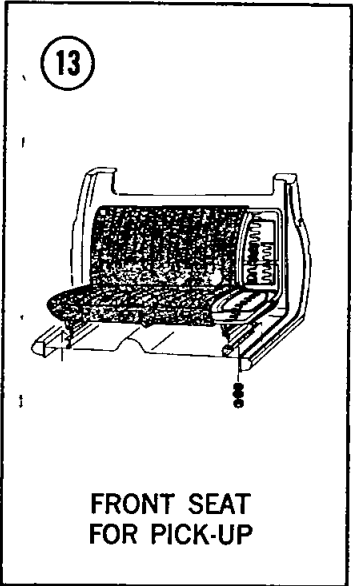
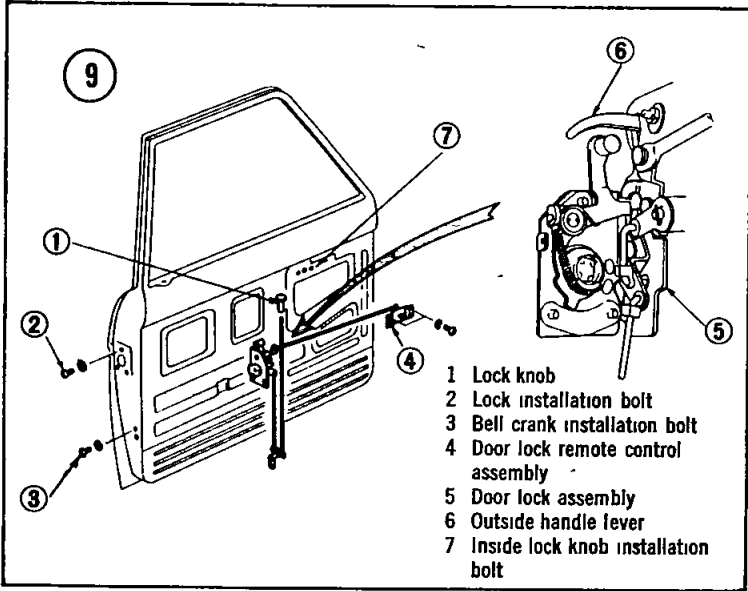
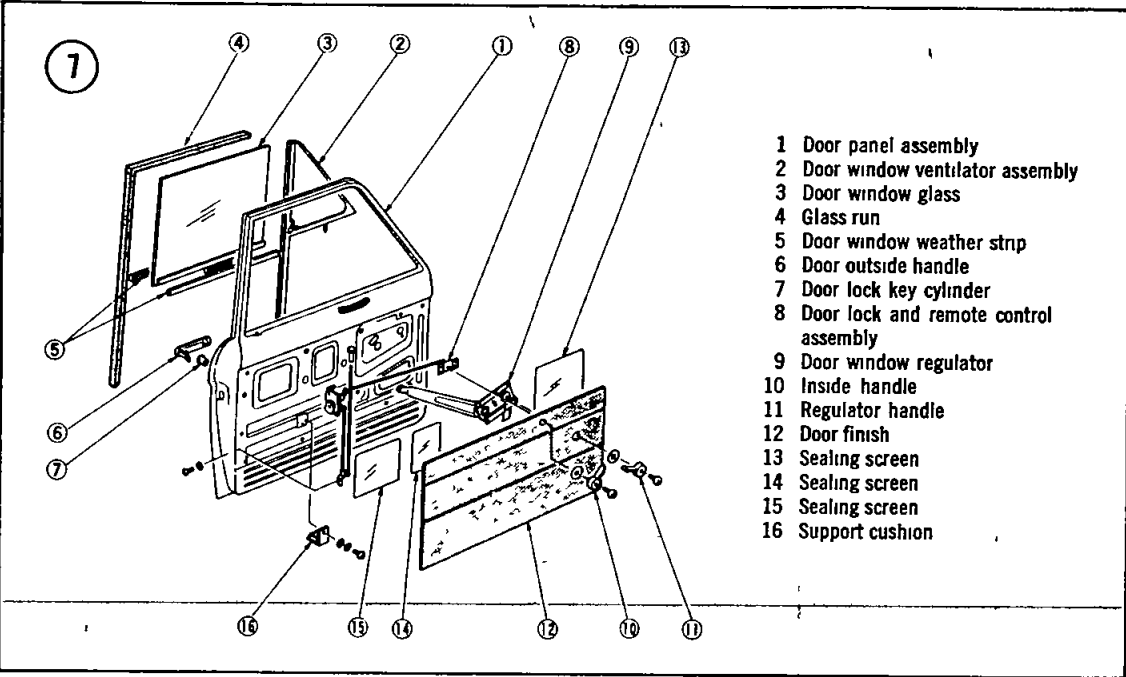


- 1. Control lock handle
- 2. Screw
- 3. Washer
- 4. Screw
- 5. Washer
- 6. Cable clamp
- 7. Screw
- 8. Washer
- 9. Lock washer
- 10. Male hood lock assembly
- 11. Rubber bumper
- 12. Bolt
- 13. Washer
- 14. Female hood lock assembly
- 15. Hood support rod
- 16. Spring
- 17. Rod guide

6

- 3-4 Front door panel
- 5 6 Front door sash
- 7-8 Glass channel assembly
- 9-12 Door window glass
- 13 Glazing rubber
- 14-16 Rubber runner
- 17-18 Hinge assembly
- 19-20 Hinge assembly
- 22 Spring
- 24 Bolt
- 25 Bolt
- 27 Bolt
- 28 Mirror assembly
- 29 30 Door cover set





TRUNK LID AND BUMPER

Figure 10 (page 230) shows the construction details of the sedan trunk lid and bumper. Figure 11 (page 231) illustrates the wagon bumper assembly.

SEATS

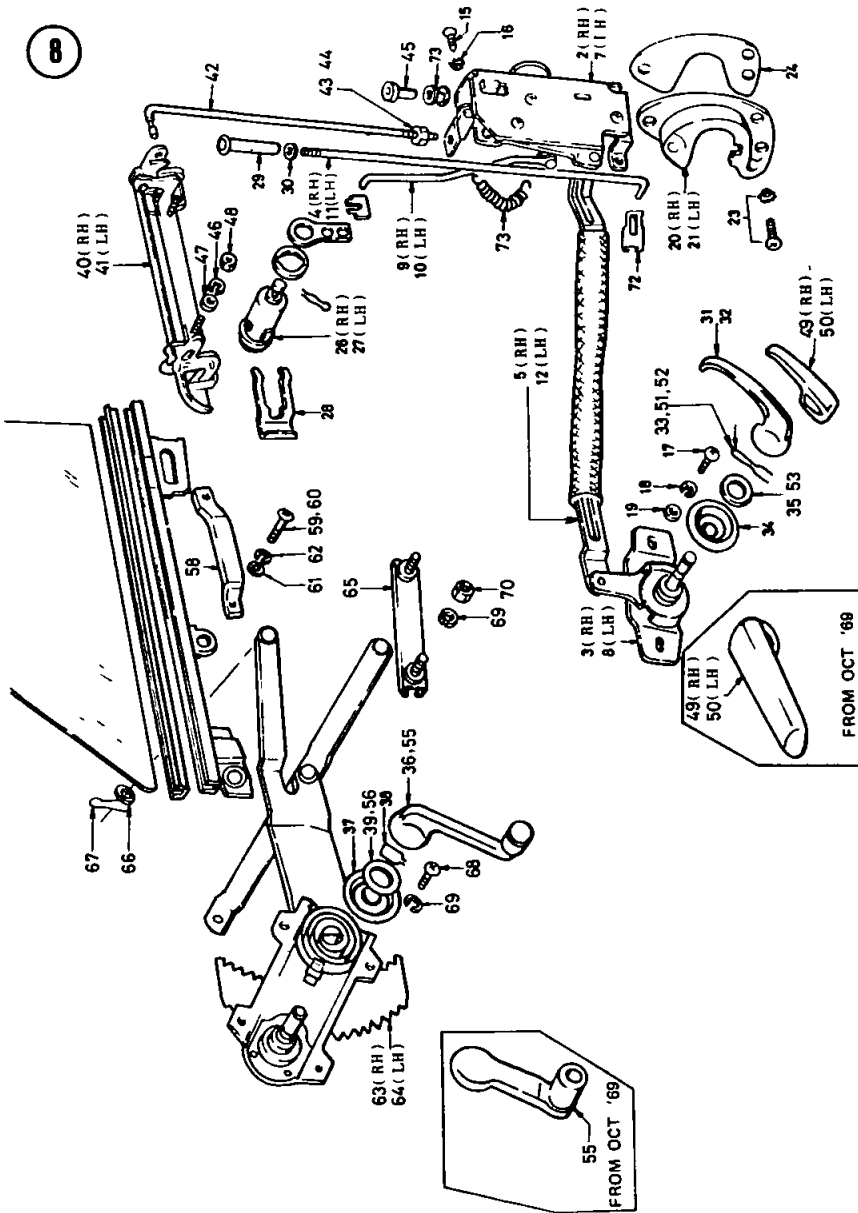
Figure 12 (page 232) is an exploded view of the front seat and mounting brackets used in the

four door sedan. The front seats and mounting brackets for the two door sedan and station wagon are the same. Figure 13 shows the seat for the pick-up.

TAIL GATE

Refer to Figure 14 (page 233) for details of the station wagon tail gate.

8



- | | | |
|---------------------------------------|------------------------------|-----------------------------|
| 2 Regulator control and lock assembly | 53 Washer | 65 Regulator guide assembly |
| 3 Regulator control and lock assembly | 55 Regulator handle assembly | 66 Washer |
| 4 Knob rod | 56 Washer | 67 Spring |
| 5 Link assembly | 58 Handle | 68 Screw |
| 7 Lock assembly | 59 Screw | 69 Lock washer |
| 8 Regulator control assembly | 60 Screw | 70 Nut |
| 9 Rod key | 61 Washer | 72 Rod holder |
| 10 Rod rod | 62 Lock washer | 73 Spring |
| 11 Knob rod | 63-64 Regulator assembly | |
| 12 Link assembly | | |
| 15 Screw | | |
| 16 Washer | | |
| 17 Screw | | |
| 18 Washer | | |
| 19 Washer | | |
| 21 Striker | | |
| 22 Rubber helper | | |
| 23 Bolt | | |
| 24 Shim | | |
| 26-27 Cylinder lock assembly | | |
| 28 Retainer clip | | |
| 29 Lock knob | | |
| 30 Grommet | | |
| 31 Door handle assembly | | |
| 32 Door handle | | |
| 33 Spring | | |
| 34 Escutcheon | | |
| 35 Washer | | |
| 37 Escutcheon | | |
| 38 Spring | | |
| 39 Washer | | |
| 40 41 Door handle assembly | | |
| 42 Rod assembly | | |
| 43-44 Rod nut | | |
| 45 Rod holder | | |
| 46 Lock washer | | |
| 47 Washer | | |
| 48 Nut | | |
| 49-50 Door handle assembly | | |
| 51-52 Spring | | |

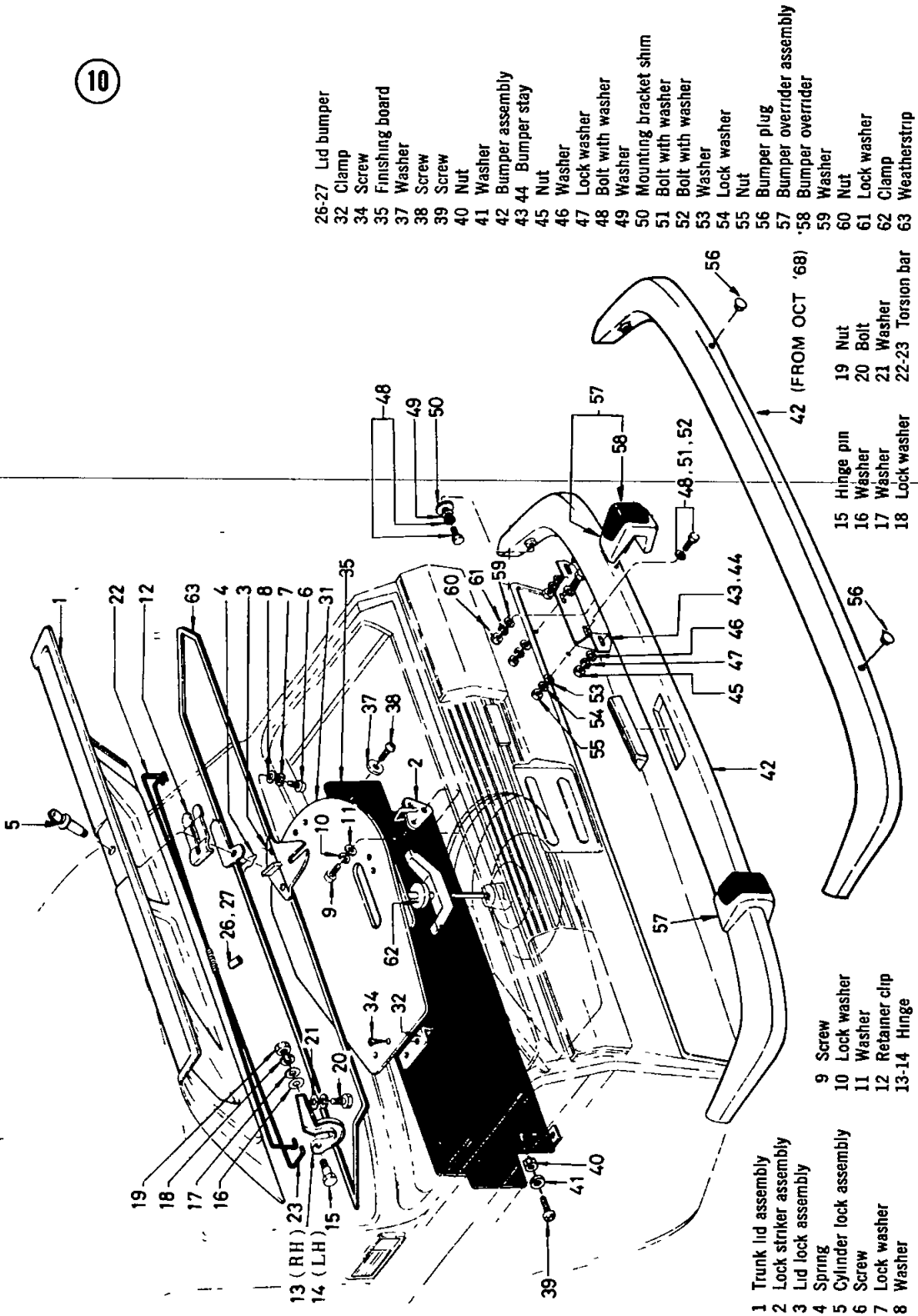
- 65 Regulator guide assembly
66 Washer
67 Spring
68 Screw
69 Lock washer
70 Nut
72 Rod holder
73 Spring

- 53 Washer
55 Regulator handle assembly
56 Washer
58 Handle
59 Screw
60 Screw
61 Washer
62 Lock washer
63-64 Regulator assembly

FROM OCT '69

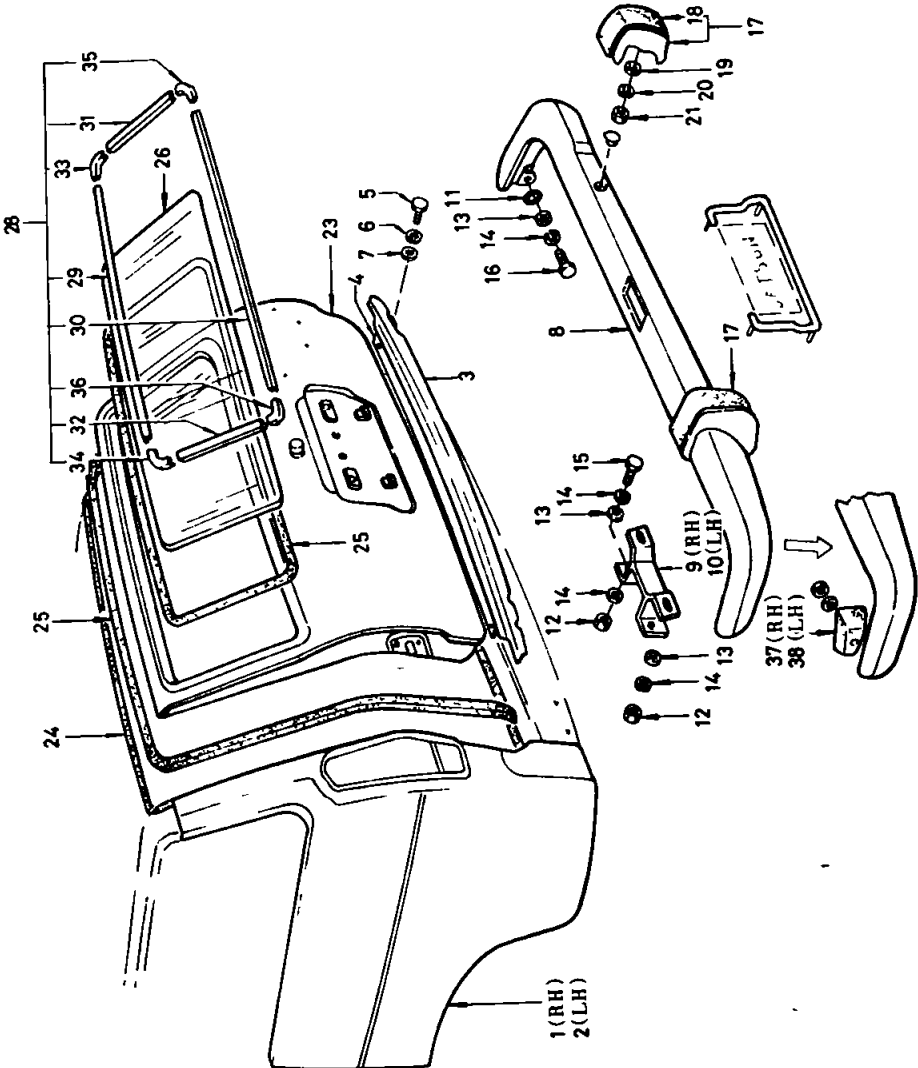
FROM OCT '69

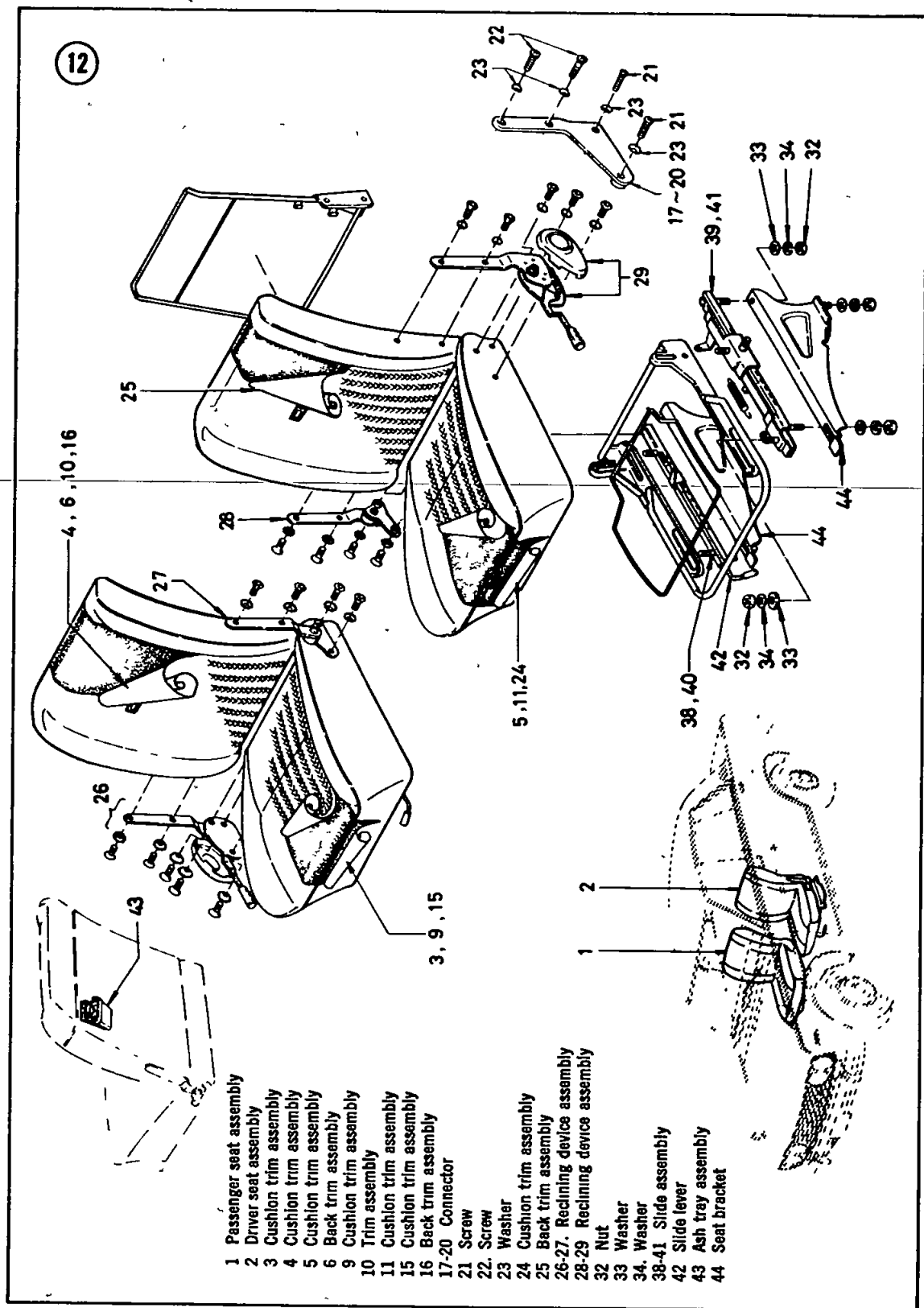
10



11

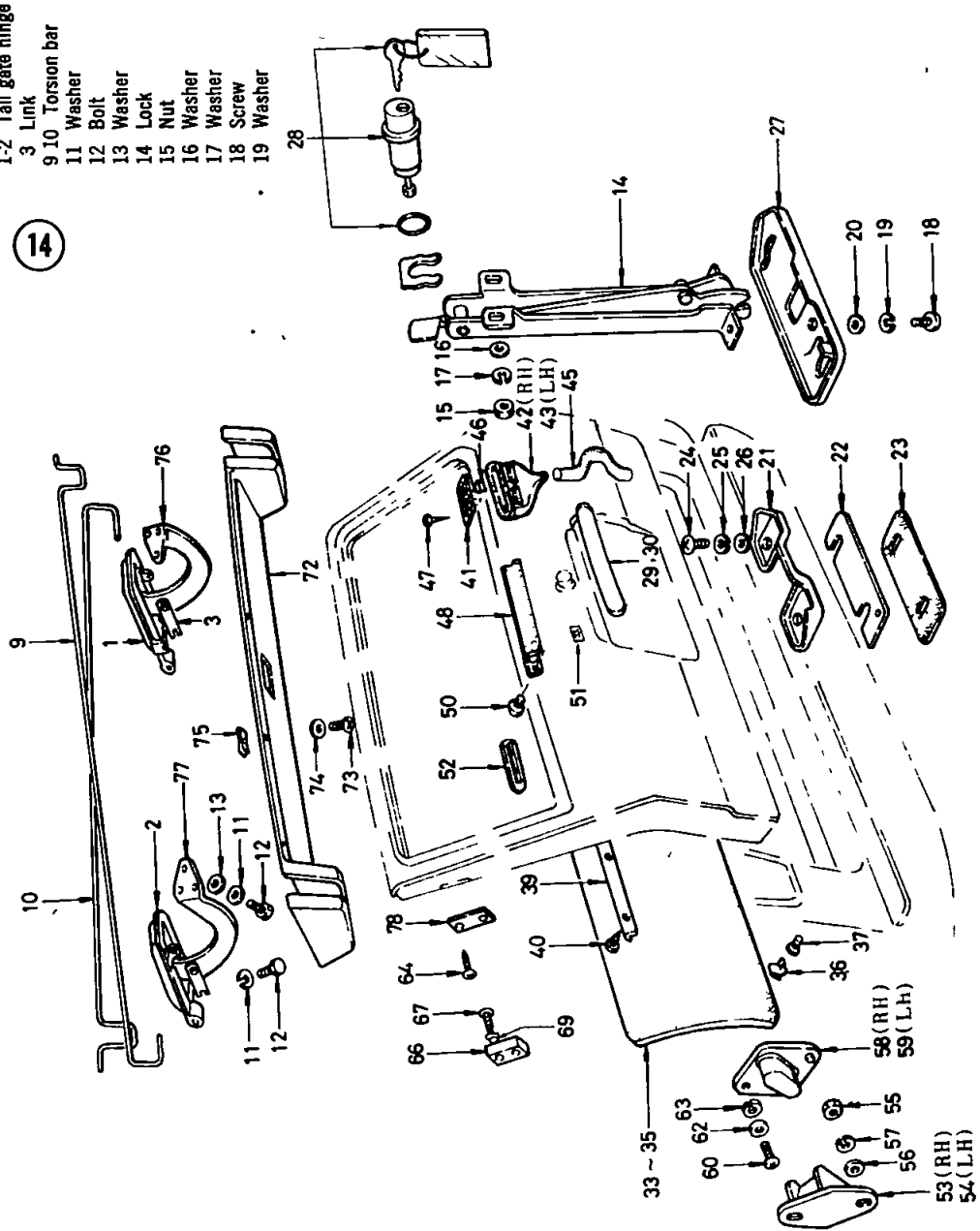
- 1-2 Fender
- 3 Rear apron
- 4 Shim
- 5 Bolt
- 6 Washer
- 7 Washer
- 9 10 Stay assembly
- 11 Washer
- 12 Nut
- 13 Washer
- 14 Lock washer
- 15 Hex bolt
- 16 Hex bolt
- 17 Bumper override assembly
- 18 Bumper override
- 19 Washer
- 20 Lock washer
- 21 Nut
- 23 Panel assembly
- 24-25 Weatherstrip
- 26 Tailgate glass
- 28 Moulding set
- 29 32 Moulding
- 33-36 Moulding connectors
- 37-38 Bumper rubber





- 1-2 Tail gate hinge
3 Link
9 10 Torsion bar
11 Washer
12 Bolt
13 Washer
14 Lock
15 Nut
16 Washer
17 Washer
18 Screw
19 Washer
20 Washer
21 Lock striker
22 Friction plate
23 Adjusting shim
24 Screw
25 Washer
26 Washer
27 Striker catcher
28 Cylinder lock
29 Handle
30 Packing
33 35 Tail gate trim
36 Finish clip
37 Finish cap
40 Screw
41 Rear ventilator grille
42-43 Rear duct
45 Drain hose
46 Nut
47 Screw
48 Ventilator
50 Screw
51 Nut
52 Ventilator grille
53-54 Down stopper
55 Nut
56 Washer
57 Washer
58-59 Dove tail
60 Screw
62 Washer
63 Lock washer
64 Screw
66 Rubber bumper
67 Screw
69 Lock washer
72 Torsion bar cover
73 Screw
74 Washer
75 Nut
76-77 Tail gate hinge
78 Bumper plate

14



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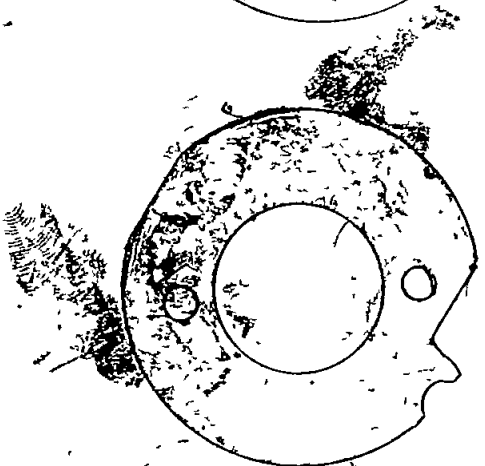
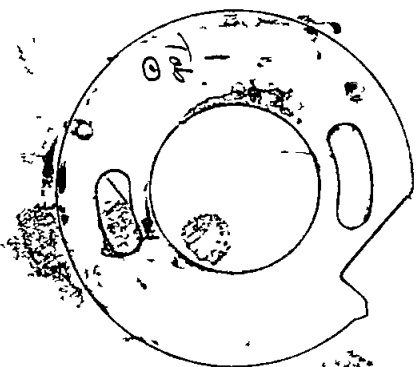
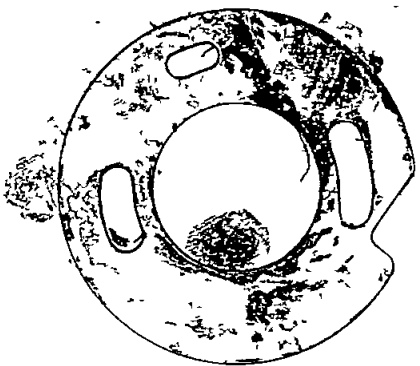
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Bottom up!!

Black

then silver

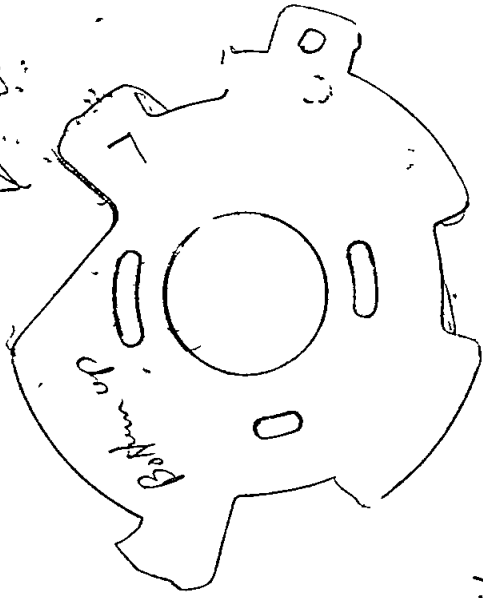
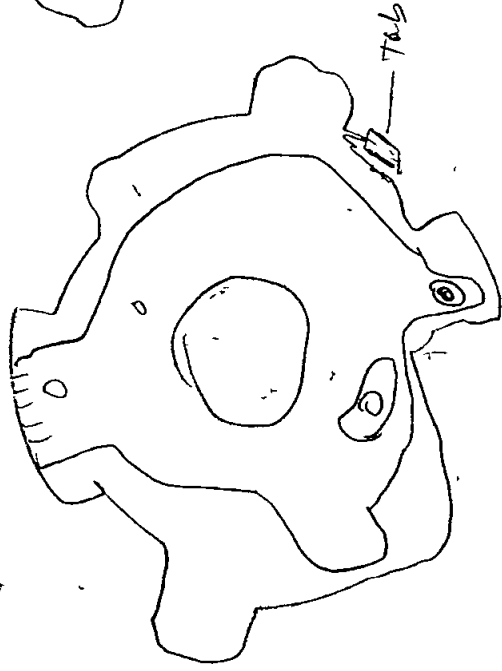
then blue



the tile sliced - put down

Excerpt from VA = 3-wire setup

X-Threaded screw = top of VA



D412-64

16/51-A351D

010

(COST)

MAINTENANCE LOG

[illegible]

NOTES

Oil Filter AC PF-20, FRAM PH-16 or PH-43, Lee LF-16

Front Wheel Bearings: Inner L-44649a or L-44649-10

Outer LM 11749 or LM 11749-10

Seals KCY 43 55 8 NOK 3 or

40232 21000

Size of Front wheel axle nut 22 mm

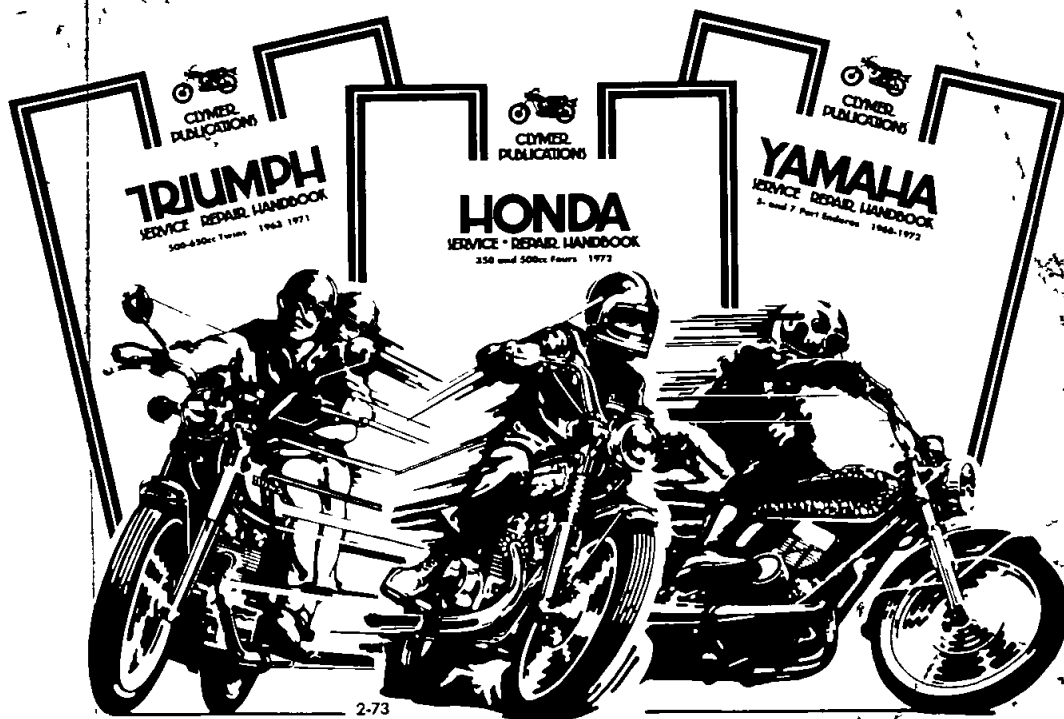
Bulbs: Pickup Brake (outside): 1073

Tail/brake (2 filaments) (m. LdL): M2/TS 1157

Backup (inside): 1073 $\equiv$ 1156

Side marker: 67/97

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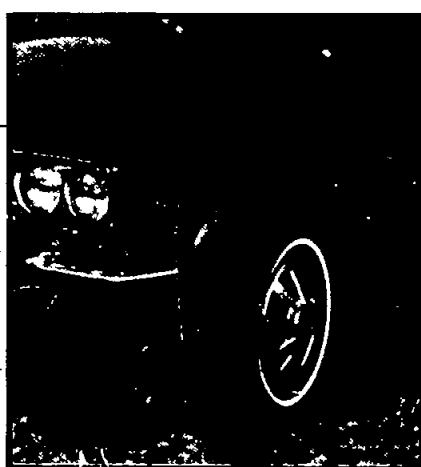
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