INTRODUCTION

HOW TO USE THIS MANUAL

To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

An **INDEX** is provided on the first page of each section to guide you to the item to be repaired.

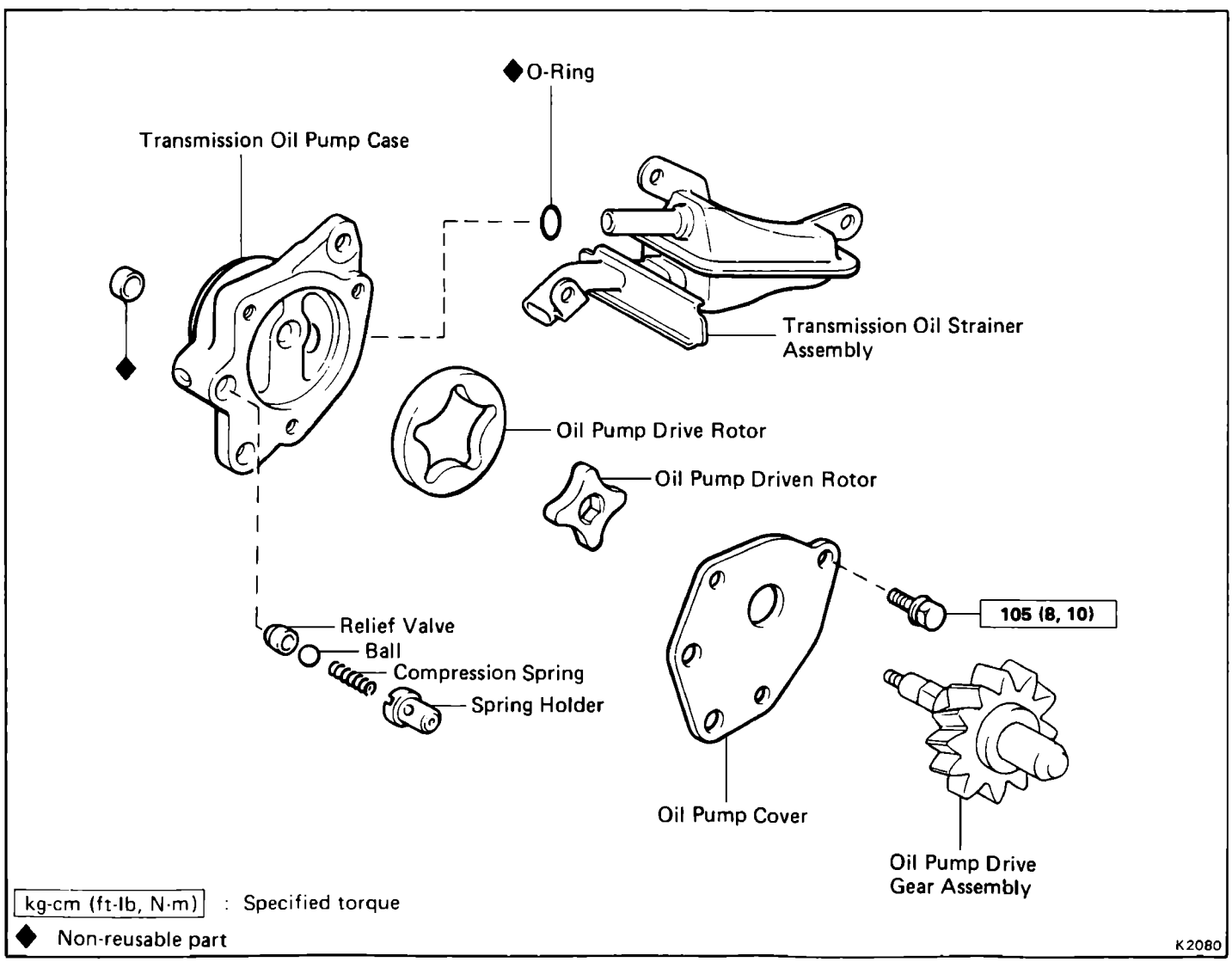
At the beginning of each section, **PRECAUTIONS** are given that pertain to *all* repair operations contained in that section. *Read these precautions before starting any repair task.*

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The repair for each possible cause is referenced in the remedy column to quickly lead you to the solution.

REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

Example:



The procedures are presented in a step-by-step format:

- The illustration shows *what* to do and *where* to do it.
- The task heading tells *what* to do.
- The detailed text tells *how* to perform the task and gives other information such as specifications and warnings.

Example:

Illustration: what to do and where

Task heading: what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston as shown in the figure.

SST 09350-30020 (09350-06120)

Set part No. *Component part No.*

Detailed text: how to do task

(b) Measure the stroke applying and releasing the compressed air (4 – 8 kg/cm^2, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.

Piston stroke: 1.40 – 1.70 mm (0.0551 – 0.0669 in.)

Specification

This format provides the experienced technician with a FAST TRACK to the information needed. The upper case task heading can be read at a glance when necessary, and the text below it provides detailed information. Important specifications and warnings always stand out in bold type.

REFERENCES

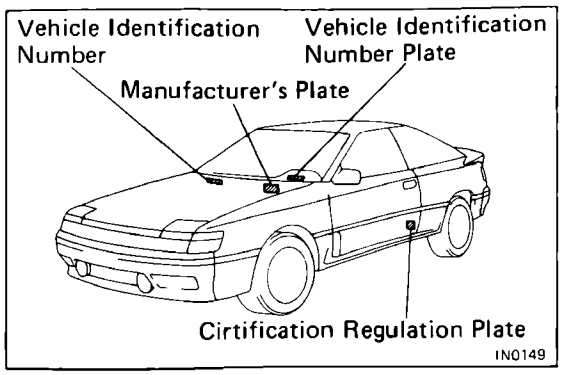
References have been kept to a minimum. However, when they are required you are given the page to refer to.

SPECIFICATIONS

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found in Appendix A, for quick reference.

WARNINGS, CAUTIONS, NOTES:

- WARNINGS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- CAUTIONS are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- NOTES are separated from the text but do not appear in bold. They provide additional information to help you efficiently perform the repair.



IDENTIFICATION INFORMATION

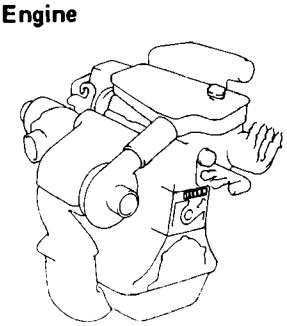
VEHICLE IDENTIFICATION NUMBER

The vehicle identification number is stamped on the cowl panel of the engine compartment. This number is also stamped on top of the instrument panel and the driver's door panel.

3S-FE Engine

3S-GE Engine

3S-GTE Engine

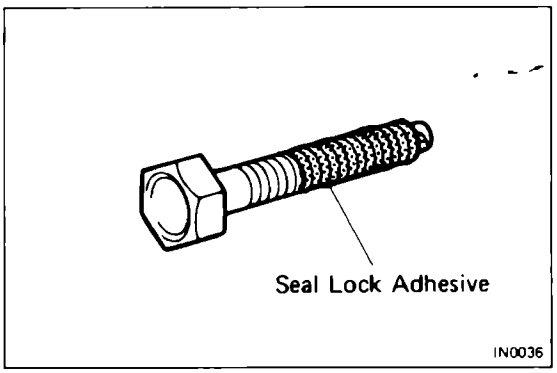


ENGINE SERIAL NUMBER

The engine serial number is stamped on the rear of the cylinder block.

GENERAL REPAIR INSTRUCTIONS

1. Use fender seat and floor covers to keep the vehicle clean and prevent damage.
2. During disassembly, keep parts in the appropriate order to facilitate reassembly.
3. Observe the following:
   (a) Before performing electrical work, disconnect the negative cable from the battery terminal.
   (b) If it is necessary to disconnect the battery for inspection or repair, always disconnect the cable from the negative (−) terminal which is grounded to the vehicle body.
   (c) To prevent damage to the battery terminal post, loosen the terminal nut and raise the cable straight up without twisting or prying it.
   (d) Clean the battery terminal posts and cable terminals with a shop rag. Do not scrape them with a file or other abrasive object.
   (e) Install the cable terminal to the battery post with the nut loose, and tighten the nut after installation.
   Do not use a hammer to tap the terminal onto the post.
   (f) Be sure the cover for the positive (+) terminal is properly in place.
4. Check hose and wiring connectors to make sure that they are secure and correct.
5. Non-reusable parts
   (a) Always replace cotter pins, gaskets, O-rings and oil seals etc. with new ones.
   (b) Non-reusable parts are indicated in the component illustrations by the " ◆ " symbol.



6. Precoated parts

   Precoated parts are bolts and nuts, etc. that are coated with a seal lock adhesive at the factory.

   (a) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.

   (b) Recoating of precoated parts

      (1) Clean off the old adhesive from the bolt, nut or threads.

      (2) Dry with compressed air.

      (3) Apply the specified seal lock adhesive to the bolt or nut threads.

   (c) Precoated parts are indicated in the component illustrations by the "★" symbol.

7. When necessary, use a sealer on gaskets to prevent leaks.

8. Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.

9. Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found at the back of this manual.

10. When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or use one with a lower rating.

11. Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations. (See page IN-17)

   (a) If the vehicle is to be jacked up only at the front or rear end, be sure to block the wheels at the opposite end in order to ensure safety.

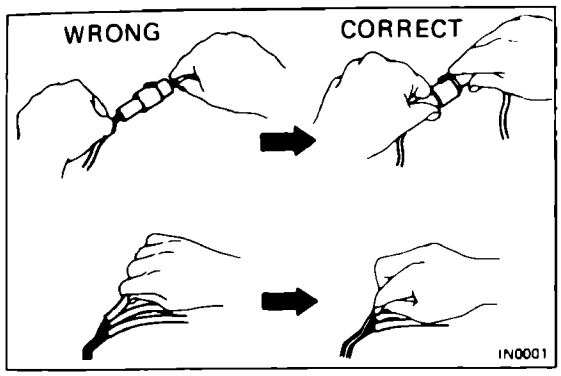
   (b) After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.

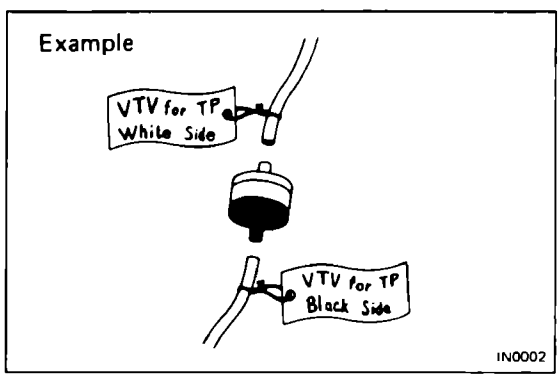
12. Observe the following precautions to avoid damage to the parts:

   (a) Do not open the cover or case of the ECU unless absolutely necessary.
   (If the IC terminals are touched, the IC may be destroyed by static electricity.)

   (b) To disconnect vacuum hoses, pull on the end, not the middle of the hose.

   (c) To pull apart electrical connectors, pull on the connector itself, not the wires.





(d) Be careful not to drop electrical components, such as sensors or relays. If they are dropped on a hard floor, they should be replaced and not reused.

(e) When steam cleaning an engine, protect the distributor, coil, air filter and VCV from water.

(f) Never use an impact wrench to remove or install temperature switches or temperature sensors.

(g) When checking continuity at the wire connector, insert the tester probe carefully to prevent terminals from bending.

(h) When using a vacuum gauge, never force the hose onto a connector that is too large. Use a step-down adapter instead. Once the hose has been stretched, it may leak.

13. Tag hoses before disconnecting them:

(a) When disconnecting vacuum hoses, use tags to identify how they should be reconnected.

(b) After completing a job, double check that the vacuum hoses are properly connected. A label under the hood shows the proper layout.

PRECAUTIONS FOR VEHICLES EQUIPPED WITH A CATALYTIC CONVERTER

WARNING: If large amounts of unburned gasoline flow into the converter, it may overheat and create a fire hazard. To prevent this, observe the following precautions and explain them to your customer.

1. **Use only unleaded gasoline.**

2. **Avoid prolonged idling.**

   Avoid running the engine at idle speed for more than 20 minutes.

3. **Avoid spark jump test.**

   (a) Spark jump test only when absolutely necessary. Perform this test as rapidly as possible.

   (b) While testing, never race the engine.

4. **Avoid prolonged engine compression measurement.**

   Engine compression tests must be made as rapidly as possible.

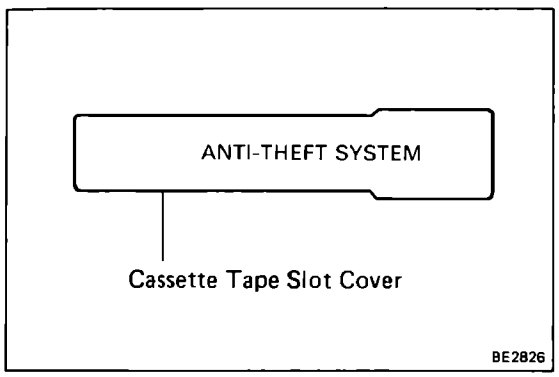
5. **Do not run engine when fuel tank is nearly empty.**

   This may cause the engine to misfire and create an extra load on the converter.

6. **Avoid coasting with ignition turned off and prolonged braking.**

7. **Do not dispose of used catalyst along with parts contaminated with gasoline or oil.**

PRECAUTIONS FOR VEHICLES WITH AN AUDIO SYSTEM WITH BUILT-IN ANTI-THEFT SYSTEM

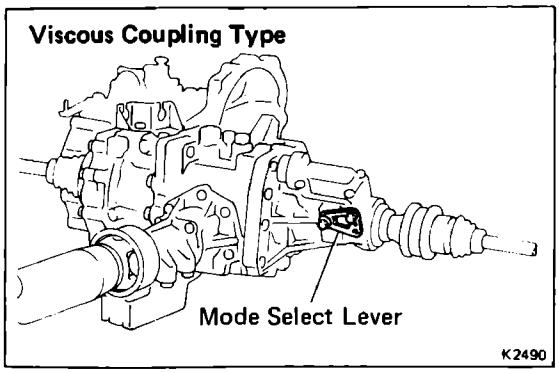


The Audio System with acoustic flavor only for USA specification vehicles shown on the left has a built-in anti-theft system which makes the audio system soundless if stolen.

If the power source for the audio system is cut even once, the anti-theft system operates so that even if the power source is reconnected, the audio system will not produce any sound unless the ID number selected by the customer is input again.

Accordingly, when performing repairs on vehicles equipped with this system, before disconnecting the battery terminals or removing the audio system the customer should be asked for the ID number so that the technician can input the ID number afterwards, or else a request made to the customer to input the ID number.

For the method to input the ID number or cancel the anti-theft system, refer to the Owner's Manual.



PRECAUTIONS WHEN SERVICING FULL-TIME 4WD VEHICLES

The full-time 4WD Celica is equipped with the viscous coupling type of center differential lock. When carrying out any kind of servicing or testing on a full-time 4WD in which the front or rear wheels are made to rotate (braking test, speedometer test, on-the-car wheel balancing, etc.), or when towing the vehicle, be sure to observe the precautions given belows. If incorrect preparations or test procedures are used, the test will not be able to be successfully carried out, and may be dangerous as well. Therefore, before beginning any such servicing or test, be sure to check the following items:

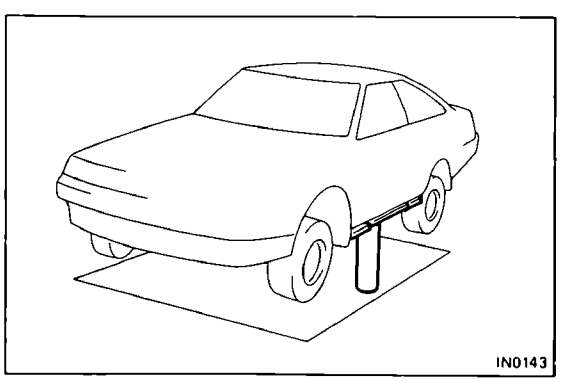
(1) Center differential lock type
(2) Center differential mode position
(3) Whether wheels should be touching ground or jacked up
(4) Transmission gear position
(5) Maximum testing vehicle speed
(6) Maximum testing time

Also be sure to observe the following cautions:

(1) Never accelerate or decelerate the vehicle suddenly
(2) Observe the other cautions given for each individual test

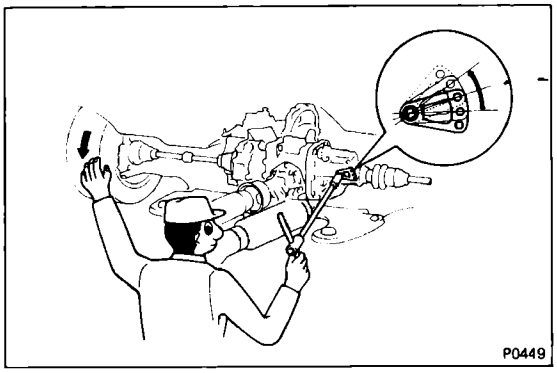
BEFORE BEGINNING TEST

During tests with a brake tester or chassis dynamometer, such as braking force tests or speedometer tests, if only the front or the rear wheels are to be rotated, it is necessary to set the Mode Select Lever on the transaxle to the Viscous Free Mode or to the FF Mode depending on the type of test being perform. In addition, after moving the lever to the position of the desired mode, be sure to check that the center differential's state has changed accordingly.



MOVING MODE SELECT LEVER

1. JACK UP VEHICLE

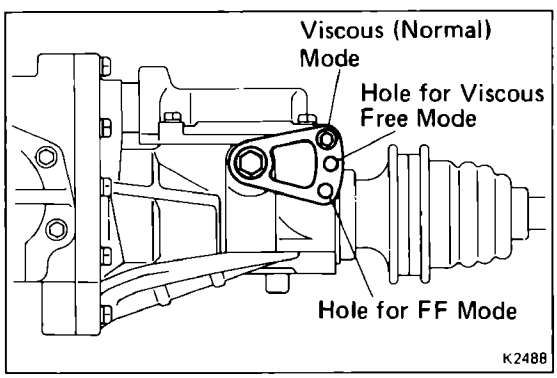


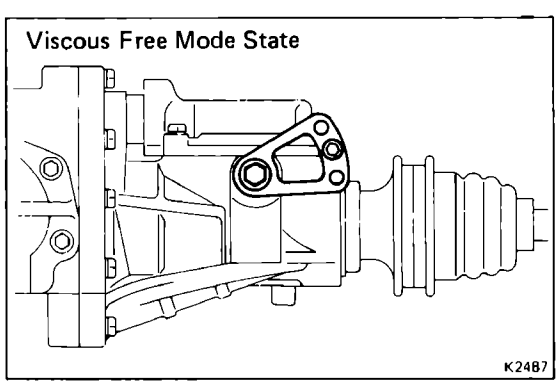
2. REMOVE MODE SELECT LEVER SET BOLT

3. MOVE MODE SELECT LEVER TO DESIRED MODE POSITION

NOTE:
1. If the mode select lever cannot be moved smoothly, shift the transmission to 1st gear, then move the lever while rotating one front wheel by hand.
2. Do not use excessive force when moving the mode select lever.

4. LOCK MODE SELECT LEVER WITH SET BOLT

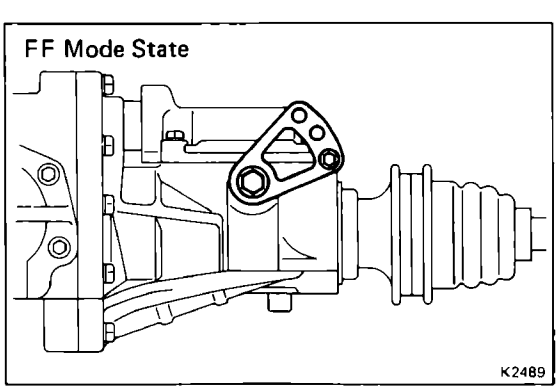




5. CONFIRM MODE

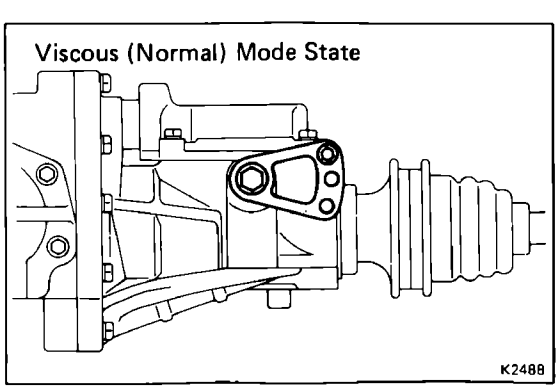
Viscous Free Mode:

Jack up one of the front wheels and check that the wheel can be rotated by hand with the transmission in neutral.



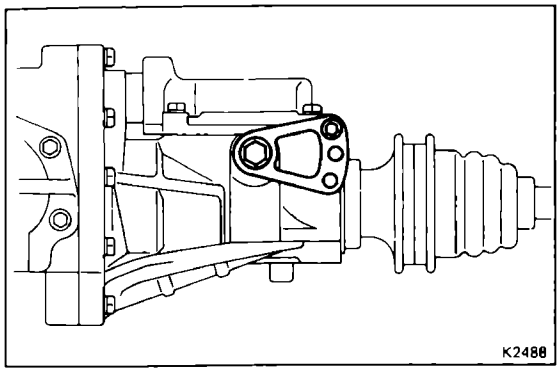
FF Mode:

Jack up one of the rear wheels and check that the wheel can be rotated by hand with the transmission in 1st gear.



Viscous (Normal) Mode:

Jack up one of the front wheels and check that the wheel resists being rotated by hand with the transmission in neutral.



6. AFTER FINISHING TEST, RETURN MODE SELECT LEVER TO "VISCOUS (NORMAL) MODE" POSITION AND INSTALL SET BOLT

CAUTION:

1. After moving the mode select lever, jack up one of the front or rear wheels and check that the wheel rotates to confirm that the mode selection has been made correctly.

2. Be sure to tighten the set bolt securely each time after moving the mode select lever.

3. Do not engage the clutch or pump the accelerator or brakes suddenly in the viscous free mode or the FF mode.

4. If either the front or the rear wheels are placed on the tester rollers in the viscous free mode, be careful not to exceed the following limits:

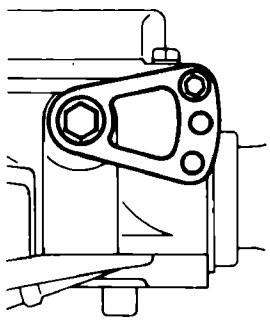
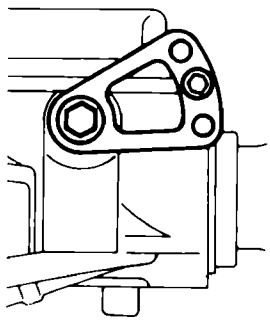
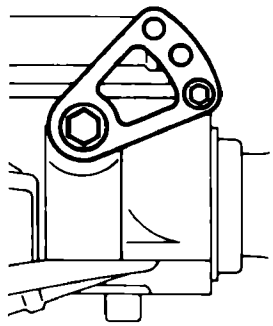
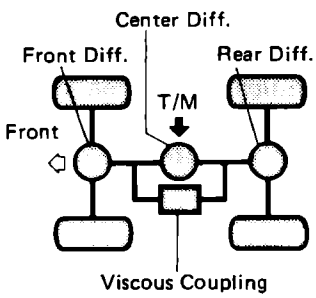
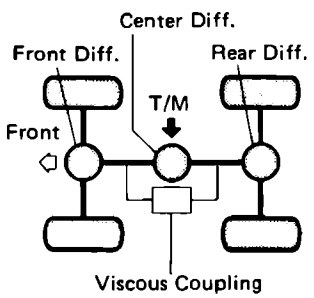
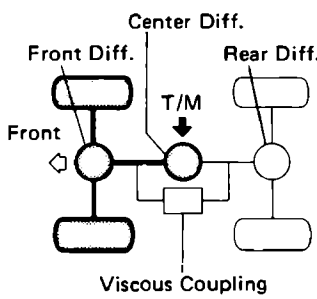
   Maximum speed:
   Speed indicated on speedometer
   Wheel speed (tester speed) 19 mph (30 km/h) or 38 mph (60 km/h)
   Maximum test time: 60 sec.

   Note that the actual wheel speed (tester speed) is twice the speed indicated by the speedometer due to center differential operation.

5. Do not drive the vehicle in 1st gear, 2nd gear or in reverse while in FF mode. If it is necessary to move the vehicle, drive it in 3rd, 4th or 5th gear. When desiring to back the vehicle, push it backwards manually.

6. After finishing the test, be sure to move the mode select lever back to the viscous (normal) mode and lock it securely with the set bolt.

STATE IN EACH MODE

Mode	Viscous (Normal) Mode	Viscous Free Mode	FF Mode
Mode Select Lever Position	 K2488	 K2487	 K2489
State in Each Mode	 CP0052	 CP0053	 CP0054
Viscous Coupling	Operating	Not Operating	Not Operating
Center Differential	Free	Free	Locked and Separated from Rear Drive
Driving Wheels	4WD	4WD	FWD
Conditions of Use	Normal Driving	• When using a brake tester	• When using a chassis dynamometer • When using a combination tester
		Never use this mode during normal driving	

BRAKING FORCE TEST

NOTES:

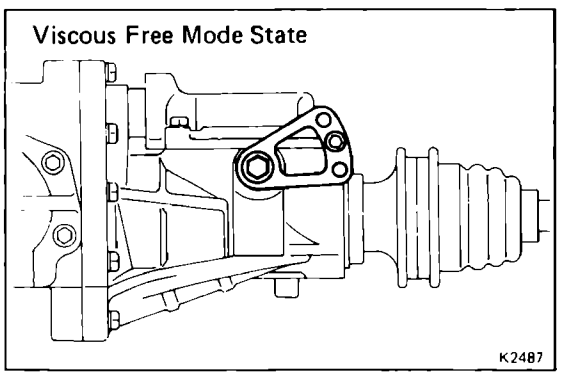
1. According to the vehicle speed during the test, select one of the two test methods described below, either A or B.
2. The mode select lever position of mode select lever differs in the two test methods, A and B, so take adequate precautions.

   Method A (Low Speed Test) : Viscous Free Mode

   Method B (High Speed Test) : FF Mode

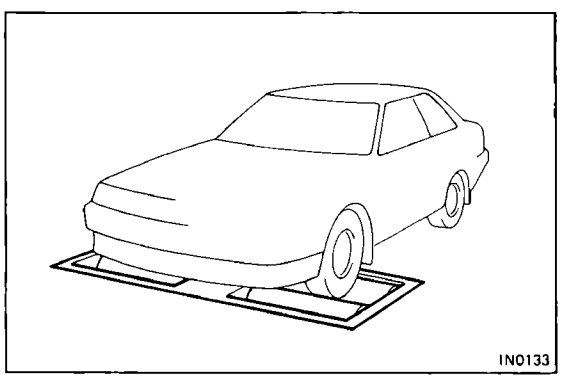
TEST METHOD A (Low Speed Test)

Speed indicated on speedometer: Below 19 mph (30 km/h),
Wheel speed (tester speed): Below 38 mph (60 km/h) and
Test time: Within 60 sec.



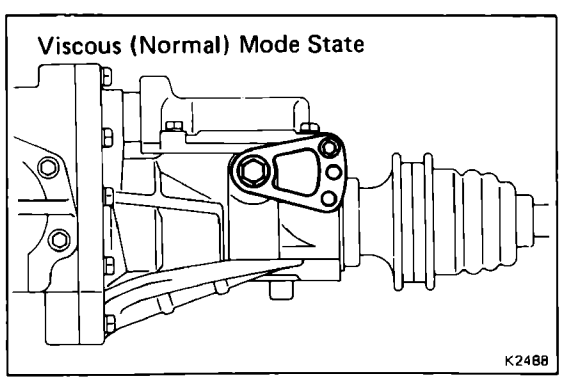
1. **MOVE MODE SELECT LEVER ON TRANSAXLE TO "VISCOUS FREE MODE" AND INSTALL SET BOLT (See page IN-8)**
2. **CONFIRM MODE SELECTION (See page IN-9)**
3. **PLACE WHEELS (EITHER FRONT OR REAR) ON TESTER ROLLERS**

   NOTE: The actual wheel speed (tester speed) is twice the speed indicated by the speedometer due to center differential operation, so take adequate precautions.

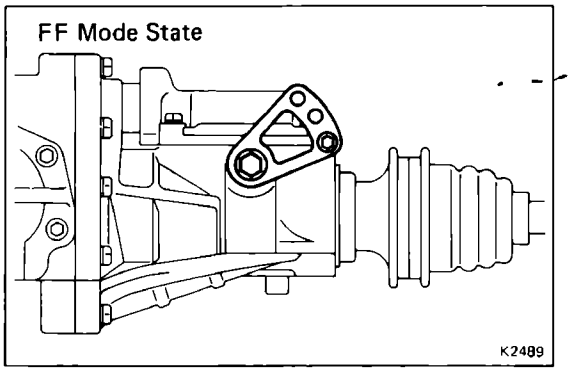


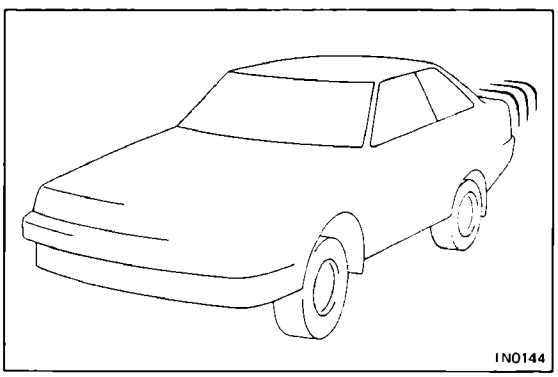
4. **DISCONNECT INERTIA WEIGHT FROM TESTER ROLLER (If equipped with it)**
5. **PUT TRANSMISSION IN NEUTRAL**
6. **OPERATE TESTER ROLLERS AND MEASURE BRAKING FORCE**

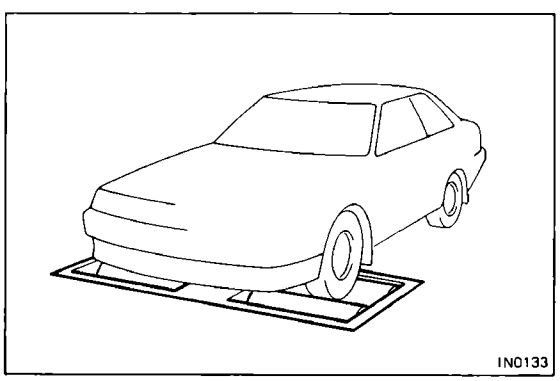
   NOTE: Since different types of tester are used, such as specialized brake testers and combination testers with built-in chassis dynamometer, speedometer tester, brake tester, etc., conduct the test in accordance with the instructions furnished for the tester model used.

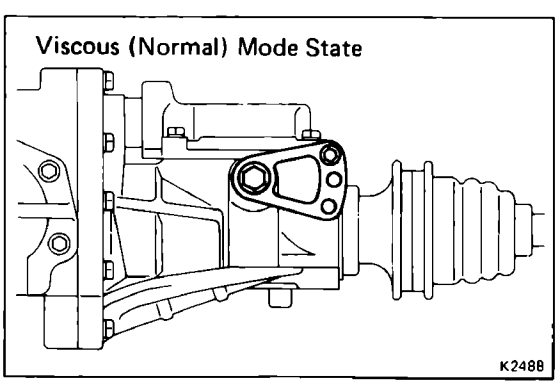


7. **AFTER FINISHING TEST, BE SURE TO MOVE MODE SELECT LEVER BACK TO "VISCOUS (NORMAL) MODE" AND LOCK IT SECURELY WITH SET BOLT**









TEST METHOD B (High Speed Test)

[Vehicle Speed: Over 38 mph (60 km/h)]

1. MOVE MODE SELECT LEVER TO "FF MODE" AND INSTALL SET BOLT
(See page IN-8)

2. CONFIRM MODE SELECTION
(See page IN-9)

3. PLACE WHEELS (EITHER FRONT OR REAR) TO BE TESTED ON TESTER ROLLERS

CAUTION:
1. Do not drive the vehicle in 1st gear, 2nd gear or reverse while in the FF mode.
2. If it is necessary to move the vehicle, drive it in 3rd, 4th or 5th gear.
3. When desiring to back the vehicle, push it backwards manually.
4. Do not engage the clutch or pump the accelerator or brake pedal suddenly.

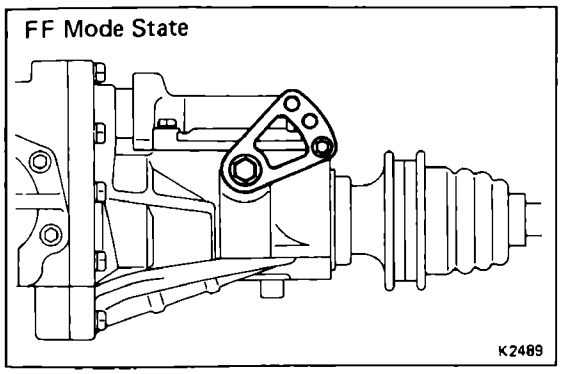
4. DISCONNECT INERTIA WEIGHT FROM TESTER ROLLER (If equipped with it)

5. PUT TRANSMISSION IN NEUTRAL

6. OPERATE TESTER ROLLERS AND MEASURE BRAKING FORCE

Tester operation differs depending on the type of tester used. Be sure to follow the procedure specified in the instructions supplied by the tester manufacturer.

7. AFTER FINISHING TEST, BE SURE TO MOVE MODE SELECT LEVER BACK TO "VISCOUS (NORMAL) MODE" AND LOCK IT SECURELY WITH SET BOLT



SPEEDOMETER TEST OR OTHER TESTS

(Using Speedometer Tester or Chassis Dynamometer)

1. MOVE MODE SELECT LEVER TO "FF MODE" AND INSTALL SET BOLT
(See page IN-8)

2. CONFIRM MODE SELECTION
(See page IN-9)

CAUTION:

1. **Do not drive the vehicle in 1st gear, 2nd gear or reverse while in the FF mode.**
2. **If it is necessary to move the vehicle, drive it in 3rd, 4th or 5th gear.**
3. **When desiring to back the vehicle, push it backwards manually.**
4. **Do not engage the clutch or pump the accelerator or brake pedal suddenly.**

3. PLACE FRONT WHEELS ON TESTER ROLLERS

4. CHOCK REAR WHEELS

5. APPLY PARKING BRAKE

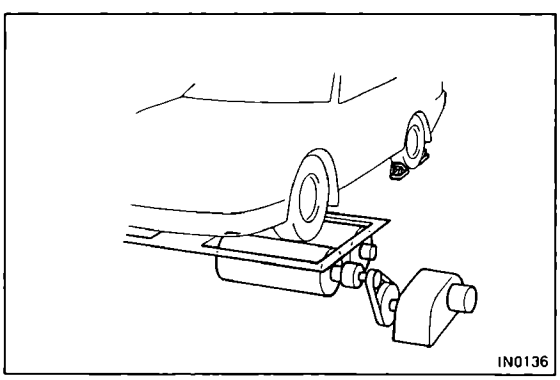
6. DISCONNECT INERTIA WEIGHT FROM TESTER ROLLER (If equipped with it)

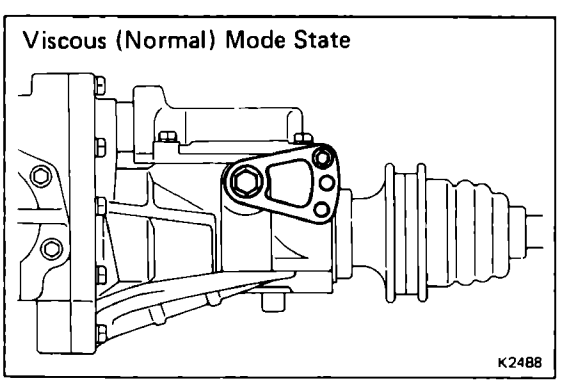
7. TEST VEHICLE
   (1) Start the engine.
   (2) Put the transmission in 3rd gear.
   (3) Engage the clutch slowly, then gradually increase the speed as the test is conducted.

   NOTE: The test should be conducted in 3rd, 4th and 5th gears.

   (4) After the test is finished, reduce the speed gradually, then stop the engine.

8. AFTER FINISHING TEST, BE SURE TO MOVE MODE SELECT LEVER BACK TO "VISCOUS (NORMAL) MODE" AND LOCK IT SECURELY WITH SET BOLT

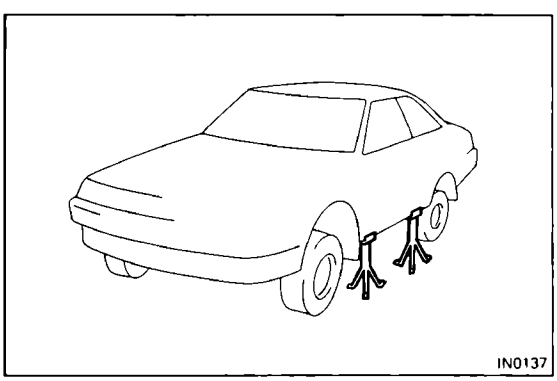




ON-THE-CAR WHEEL BALANCING

CAUTION:

1. When doing on-the-car wheel balancing on a full-time 4WD vehicle, to prevent the wheels from rotating at different speeds on indifferent directions from each other (which could lead to damage to the center differential or transaxle gears), always be sure to observe the following precautions:
   (a) All four wheels should be jacked up, clearing the ground completely.
   (b) The wheels be driven with both the engine and the wheel balancer.
   (c) The mode select lever on the transaxle of the viscous coupling type center differential should be in the viscous (normal) mode position.
   (d) The parking brake lever should be fully released.
   (e) None of the brakes should be allowed to drag.
2. Avoid sudden acceleration, deceleration and braking.
3. Carry out the wheel balancing with the transmission in 3rd or 4th gear.

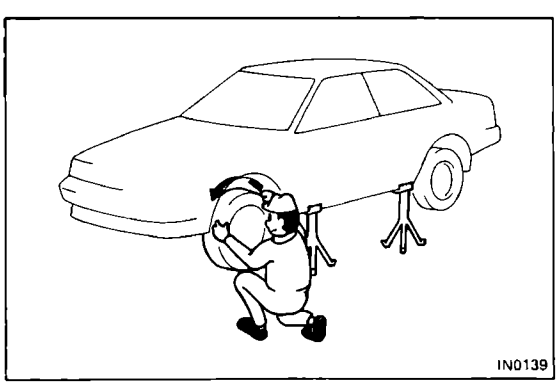

IN0137

1. JACK UP VEHICLE SO THAT ALL FOUR WHEELS CLEAR GROUND AND CAN BE ROTATED

   The wheels will be rotating fast, so make sure the vehicle is firmly supported on stands.

2. RELEASE PARKING BRAKE FULLY

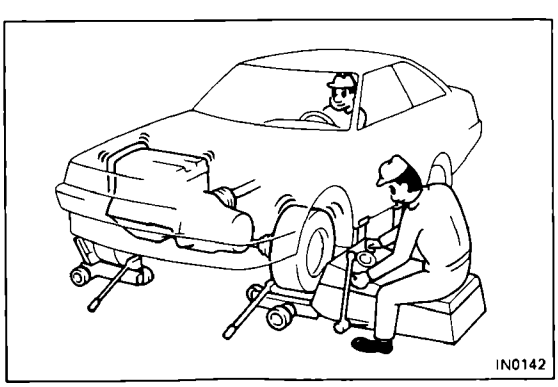
3. MAKE SURE THAT BRAKES ARE NOT DRAGGING ON ANY OF FOUR WHEELS


IN0139

4. PLACE WHEEL TO BE BALANCED ON WHEEL BALANCER

   Follow the precedure specified by the wheel balancer manufacturer.

5. START ENGINE


IN0142

6. PUT TRANSMISSION IN 3RD OR 4TH GEAR

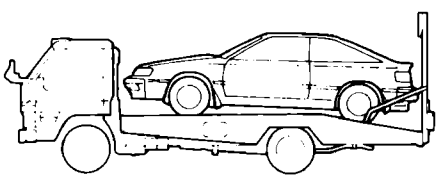
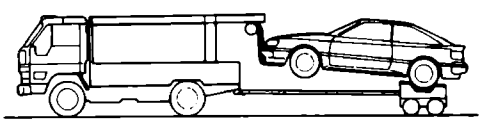
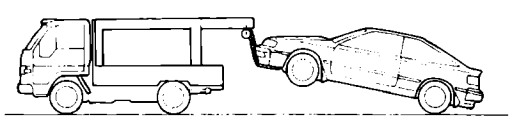
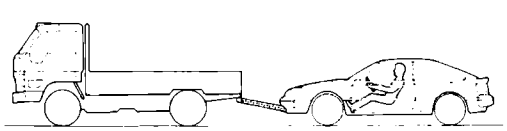
7. ENGAGE CLUTCH SLOWLY, THEN GRADUALLY INCREASE SPEED TO TEST SPEED

8. ROTATE WHEELS USING BOTH ENGINE'S DRIVING FORCE AND DRIVING FORCE OF WHEEL BALANCER AND CHECK WHEEL BALANCE

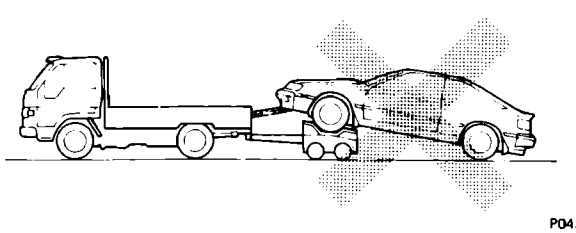
   NOTE: When doing this be careful of the other wheels, which will rotate at the same time.

PRECAUTIONS WHEN TOWING FULL-TIME 4WD VEHICLES

1. Use one of the methods shown below to tow the vehicle.
2. When there is trouble with the chassis and drive train, use method ① (flat bed truck) or method ② (sling type two truck with dollies)
3. Recommended Methods: No. ①, ② or ③
   Emergency Method : No. ④

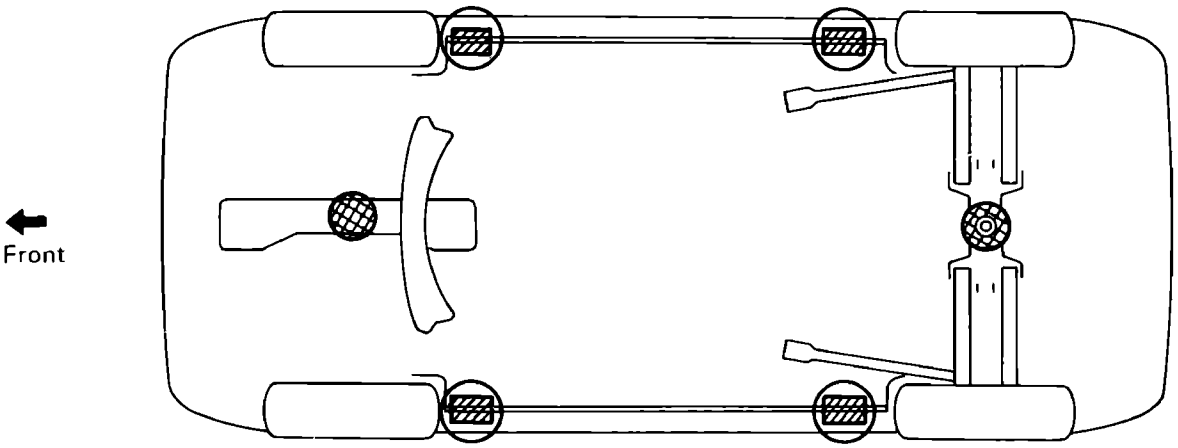
Towing Method \ Type of Center Differential	Viscous Coupling Type		
	Parking Brake	T/M Shift Lever Position	Viscous Coupling
① Flat Bed Truck  P0442	Applied	1st Gear	Normal Driving (Viscous Mode)
② Sling-Type Tow Truck with Dollies  IN0150			(No Special Operation Necessary)
③ Sling-Type Tow Truck (Front wheels must be able to rotate freely)  P0438	Released	Neutral	
④ Towing with a Rope  P0437	Released	Neutral	

NOTE: Do not use any towing method other than those shown above.
For example, the towing method shown below is dangerous, so do not use it.

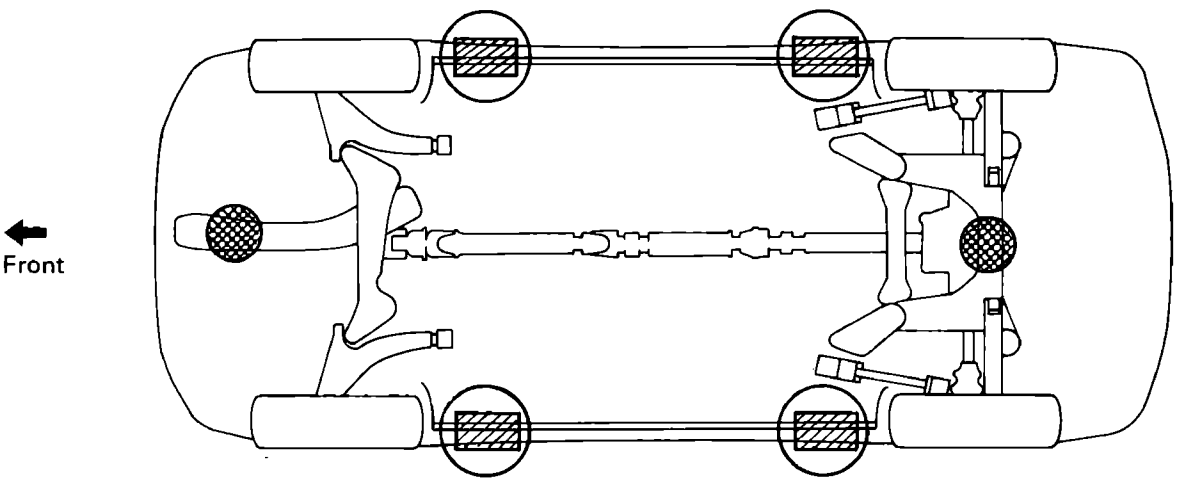
 P0439	During towing with this towing method, there is a danger of the drivetrain heating up and causing a burnout malfunction, or of the front wheels flying off the dolly.

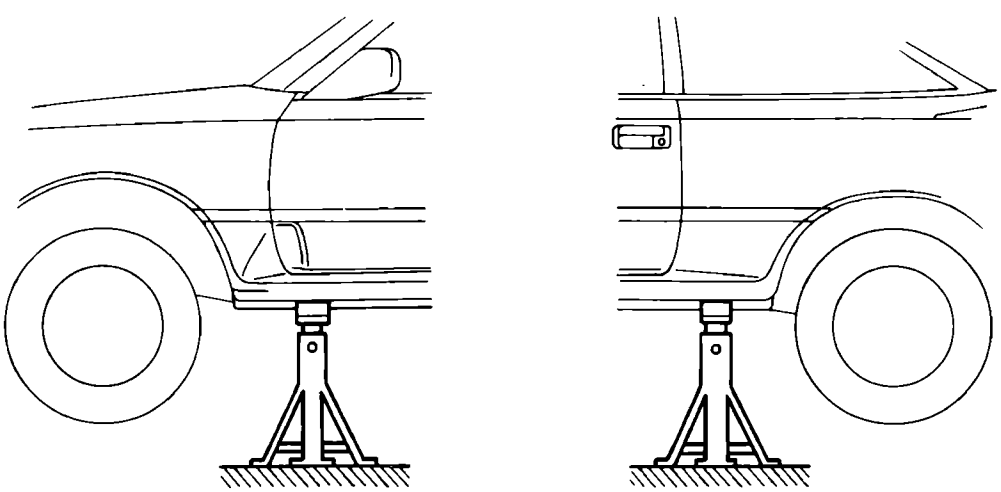
VEHICLE LIFT AND SUPPORT LOCATIONS

FWD



4WD





JACK POSITION

Front ..... Center of engine mounting center member

Rear ..... Jack up support of rear subframe

PANTOGRAPH JACK POSITION

SUPPORT POSITION

Safety stand .....

IN0053
IN0124
IN0123

ABBREVIATIONS USED IN THIS MANUAL

ALR	Automatic Locking Retractor
A.B.S.	Anti-lock Brake System
A/C	Air Conditioner
Approx.	Approximately
A/T, ATM	Automatic Transaxle
ATF	Automatic Transmission Fluid
B_0	Overdrive Brake
B_1	Second Coast Brake
B_2	Second Brake
B_3	First and Reverse Brake
BTDC	Before Top Dead Center
BVSV	Bimetal Vacuum Switching Valve
C_0	Overdrive Direct Clutch
C_1	Forward Clutch
C_2	Direct Clutch
CALIF.	Vehicles Sold in California
CB, C/B	Circuit Breaker
CCS	Cruise Control System
ECT	Electronic Controlled Transaxle
ECU	Electronic Controlled Unit
EFI	Electronic Fuel Injection
EGR	Exhaust Gas Recirculation
ELR	Emergency Locking Retractor
EVAP	Evaporative (Emission Control)
EX	Exhaust (manifold, valve)
Ex.	Except
F_0	No. 0 One-way Clutch
F_1	No. 1 One-way Clutch
F_2	No. 2 One-way Clutch
FIPG	Formed in Place Gasket
FL	Fusible Link
FR, Fr	Front
FWD	Front Wheel Drive
IN	Intake (manifold, valve)
IG	Ignition
ISC	Idle Speed Control
LH	Left-hand
Min.	Minimum
MP	Multipurpose
M/T, MTM	Manual Transaxle
OD, O/D	Overdrive
O/S	Oversize
PCV	Positive Crankcase Ventilation
PKB	Parking Brake
PS	Power Steering
RH	Right-hand
Rr	Rear
SOL.	Solenoid
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
SW	Switch
TCCS	TOYOTA Computer Controlled System
TDC	Top Dead Center
T-VIS	TOYOTA-Variable Induction System
TWC	Three-Way Catalyst
U/S	Undersize
VSV	Vacuum Switching Valve
VTV	Vacuum Transmitting Valve
w/	With
w/o	Without
2WD	Two Wheel Drive Vehicles (4 x 2)
4WD	Four Wheel Drive Vehicles (4 x 4)