SECTION 15

SUSPENSION

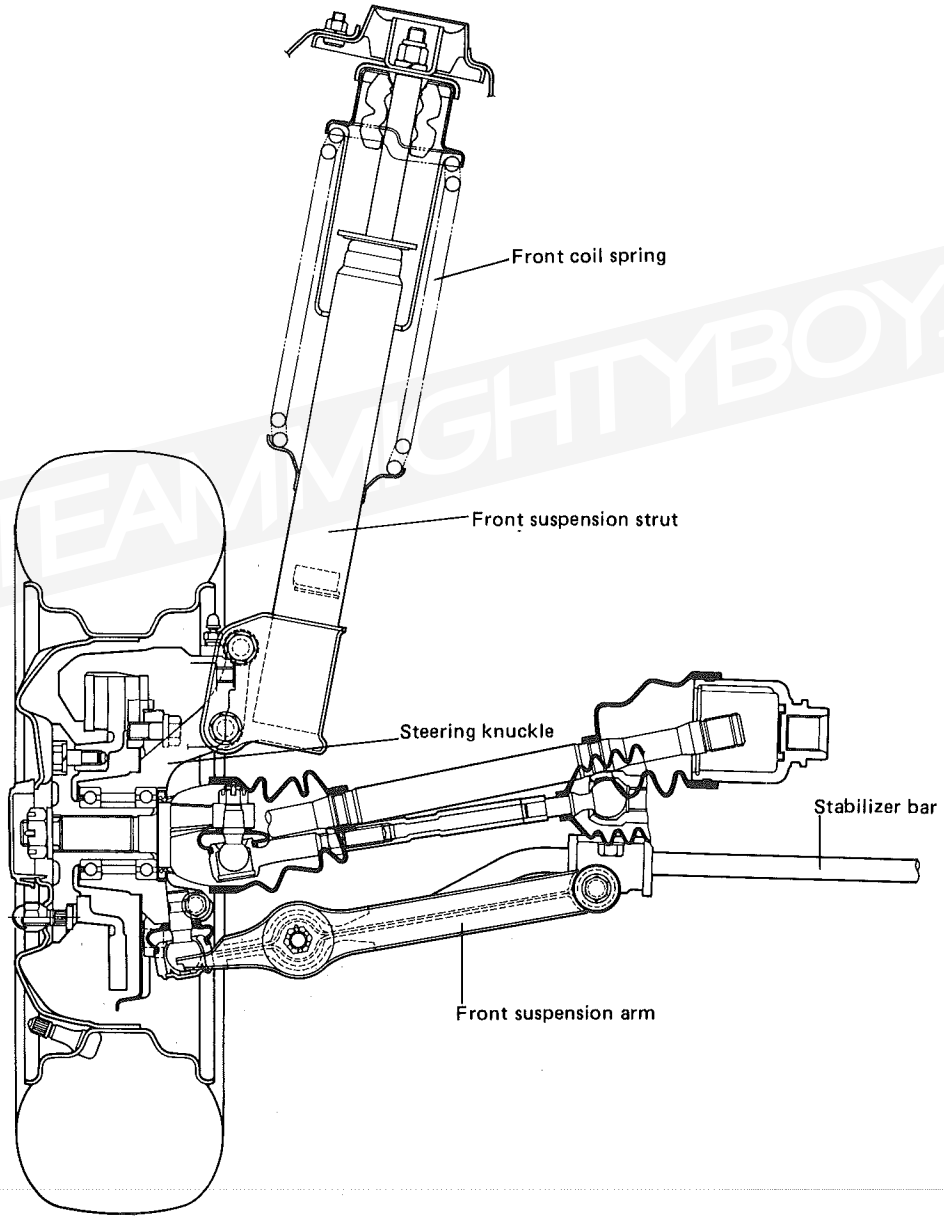
CONTENTS

NOTICE:
These fasteners are important attaching parts in that they could affect performance of vital parts and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of all parts. There is to be no welding as it may result in extensive damage and weakening of the metal.

15-1. GENERAL DESCRIPTION

Front suspension is Macpherson (strut) type independent suspension system as shown below, and consists of coil springs, front suspension struts, steering knuckles, stabilizer bar, and front suspension arms.
Rear suspension is of dead axle type using leaf springs, and consists of leaf springs, bump stoppers, and shock absorbers.

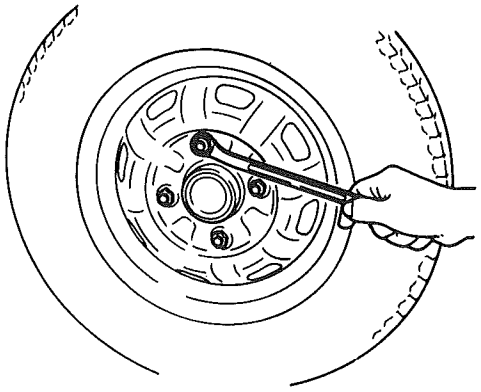
15-2. FRONT SUSPENSION



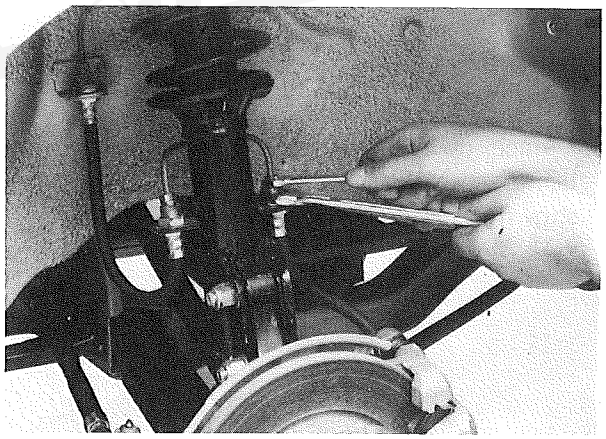
REMOVAL

Front coil spring

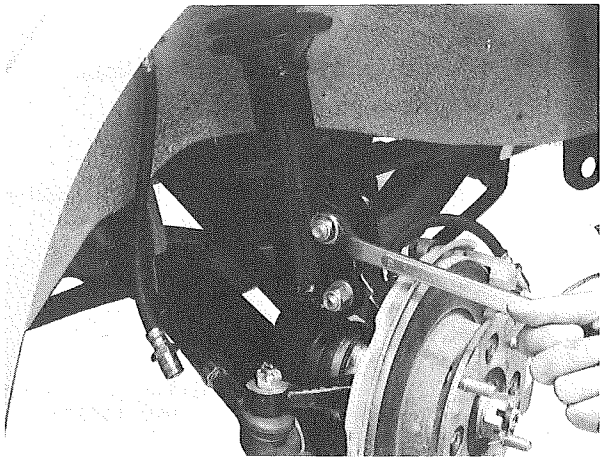
1) Lift front end of vehicle by jacking after loosening hub nuts, and support it on safety stands.
2) Take off wheel.



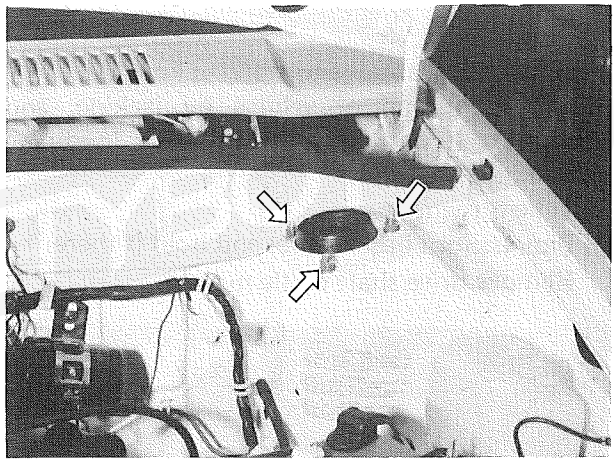
3) Clean outside of reservoir.
4) Take out brake fluid with a syringe or such.
5) Disconnect brake flexible hoses and brake pipe, and remove flexible hoses from suspension strut.



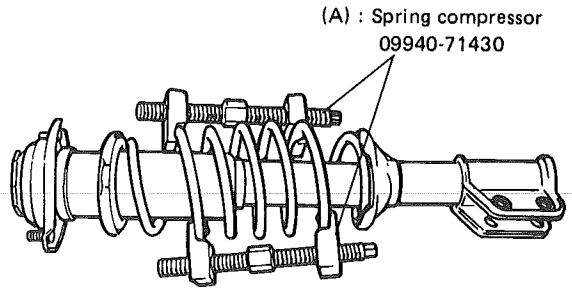
6) Remove 2 bolts securing strut to steering knuckle.



7) Remove strut by loosening strut support nuts.

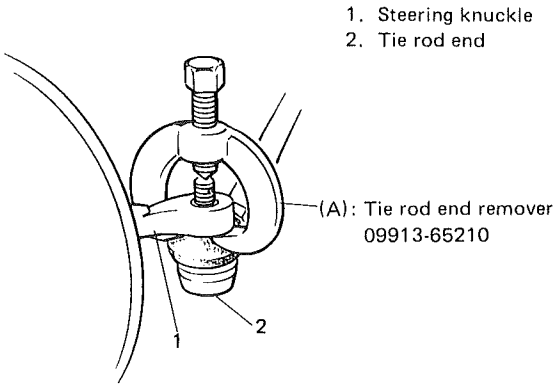


8) Compress coil spring by using special tool, front spring compressor (A) (09940-71430) until play between coil spring and spring seat is obtained. Remove lock nut of front suspension strut, and then remove strut support, bearing, dust seal, rubber seat, bump stopper and coil spring.



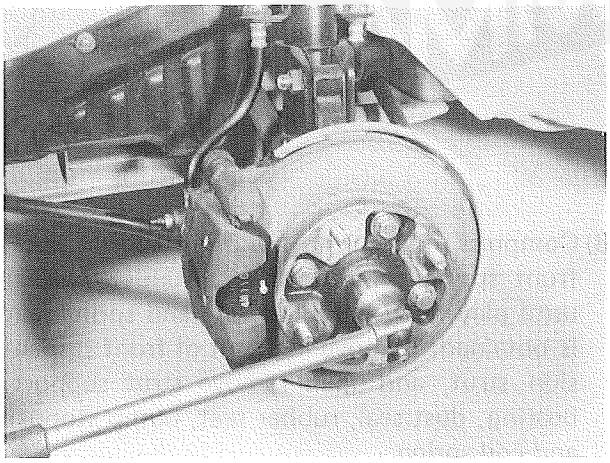
Tie rod end

Detach tie rod end from steering knuckle by using special tool (A) (09913-65210).



Front wheel bearings and steering knuckle

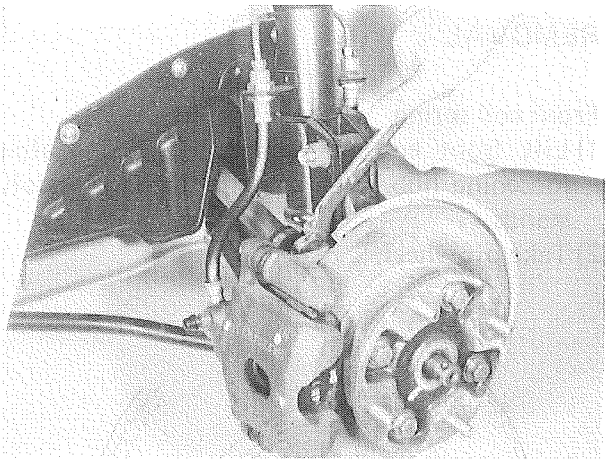
1) Lift front end of vehicle by jacking, and support it on safety stands, after loosening hub nuts.
2) Take off wheel.
3) Depress foot brake pedal and hold it there. Remove drive shaft castle nut.



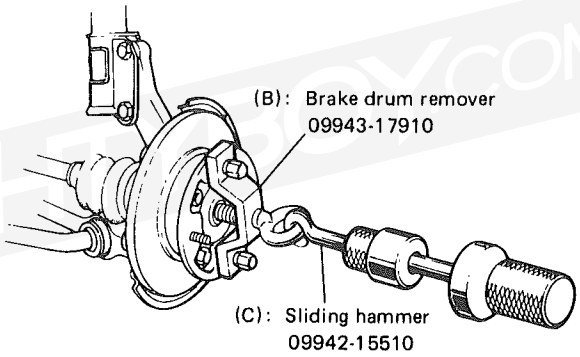
4) Remove caliper body from steering knuckle.

NOTICE:

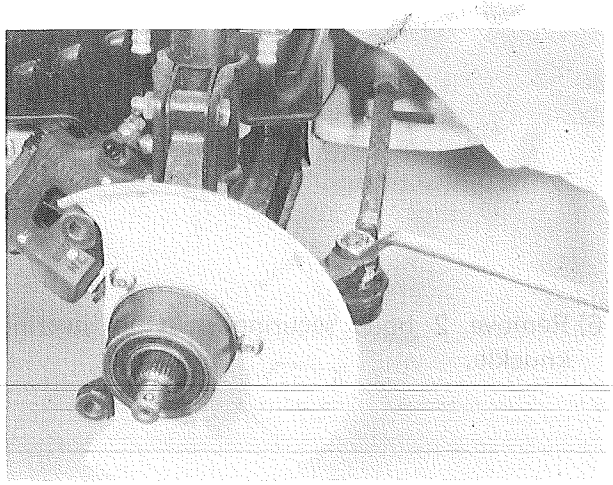
Be careful not to damage brake flexible hose after removing caliper body.



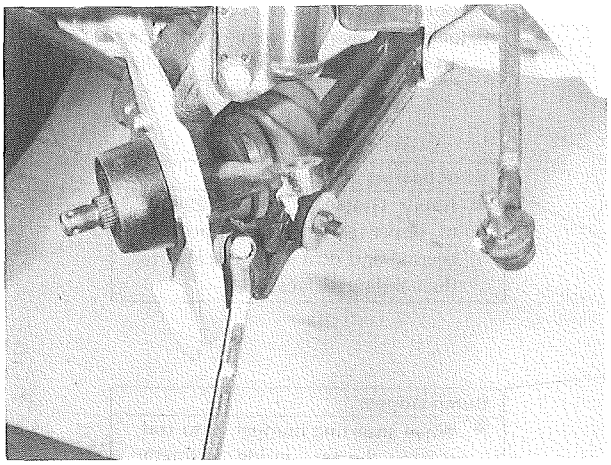
5) Install special tool (B) by utilizing hub bolts. Using sliding hammer (C), draw out wheel hub and brake disc.

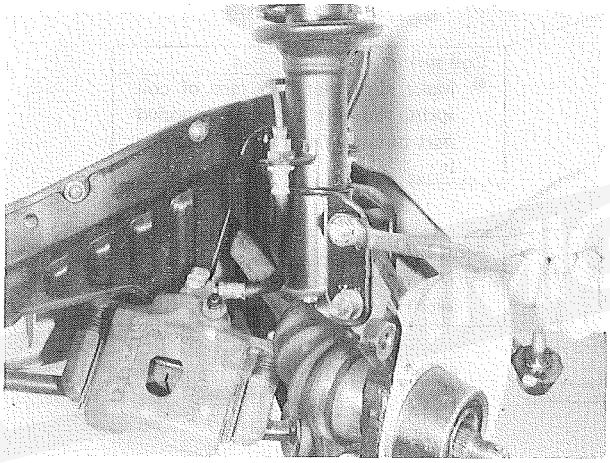


6) Detach tie rod end from steering knuckle by using special tool (A) (09913-65210) as shown in previous page.

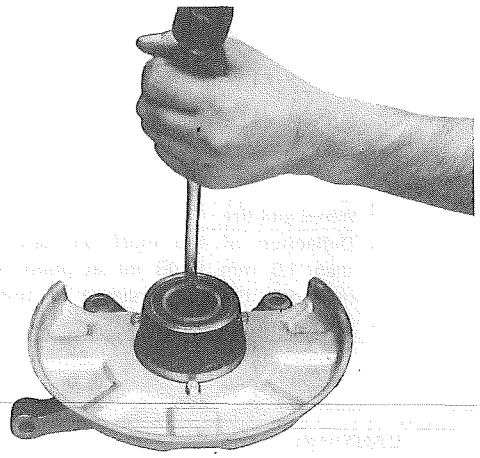


7) Loosen front suspension arm ball joint stud bolt and strut mounting bolts to remove steering knuckle.





8) Remove inner and outer bearings.



IMPORTANT STEPS IN INSTALLATION

Recommended torque specification

	Fastening parts	N·m	kg-m (lb-ft)
①	Strut support nuts	18 - 28	1.8 - 2.8 (13.0 - 20.0)
②	Strut lock nuts	40 - 60	4.0 - 6.0 (29.0 - 43.0)
③	Front brake disc carrier bolt	70 - 100	7.0 - 10.0 (50.5 - 72.0)
④	Strut bracket lock nuts	70 - 90	7.0 - 9.0 (51.0 - 65.0)
⑤	Stabilizer bar mount bolts	30 - 55	3.0 - 5.5 (22.0 - 39.5)
⑥	Stabilizer bar castle nuts	40 - 90	4.0 - 9.0 (29.0 - 65.0)
⑦	Ball joint stud bolts	50 - 65	5.0 - 6.5 (36.5 - 47.0)
⑧	Drive shaft castle nuts	150 - 270	15.0 - 27.0 (108.5 - 195.0)
⑨	Wheel nuts	40 - 70	4.0 - 7.0 (29.0 - 50.5)
⑩	Lower arm bolts	50 - 70	5.0 - 7.0 (36.5 - 50.5)

For above No. 1 to 10, refer to P. 15-6.

Wheel bearing

- Apply wheel bearing grease to balls of wheel bearing.
- Press-fit outer bearing with its sealed side directed toward wheel hub side.
- Make sure to fit spacers before press-fitting outer bearing to steering knuckle.
- Make space "C" (between inner bearing and outer bearing) about 40% full with wheel bearing grease, and then press-fit outer bearing.
- Press-fit inner bearing so that resin side of its retainer faces toward inside (oil seal side) of car body.

Strut lock nut

- Keep lock nut screw and strut rod screw free from oil.
- After tightening lock nut, apply waterproof coating (paint or lacquer) all around nut and strut rod screw.

Strut bearing and dust seal

- Apply Grease A (99000-25010) to upper and lower surfaces of bearing and dust seal, and also to their sliding surfaces.

Bump stopper

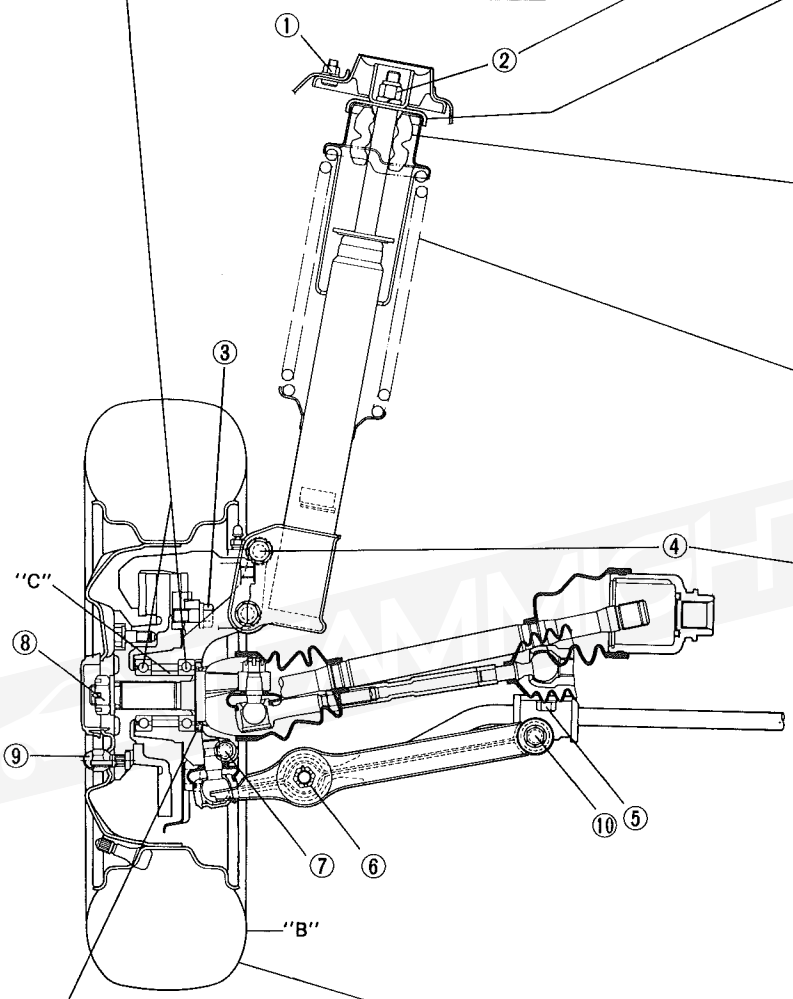
- When inserting bumper onto rod, direct shorter inside diameter side of bumper downward.

Coil spring

- Make sure that end face of coil spring doesn't lap over stepped part of spring seat when installing it.

Strut bracket bolts

- Mount bolts in the direction from rear side toward front side.



Oil seal

- Apply SUZUKI SUPER GREASE A (99000-25010) to its lip part.

Wheel and tire

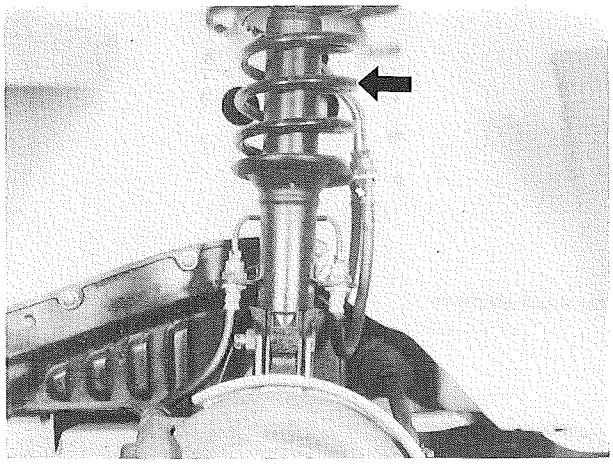
Deflection of tire must be kept less than 1.5 mm (0.06 in) at point "B" (provided that air pressure of tire is correct).

CAUTION:
After reinstalling brake pipe or hose which has been removed and disassembled, purge air from brake system.

MAINTENANCE SERVICE

Strut damper

1) Inspect strut for oil leakage. If strut is found faulty, replace it as an assembly unit, because it can not be disassembled.

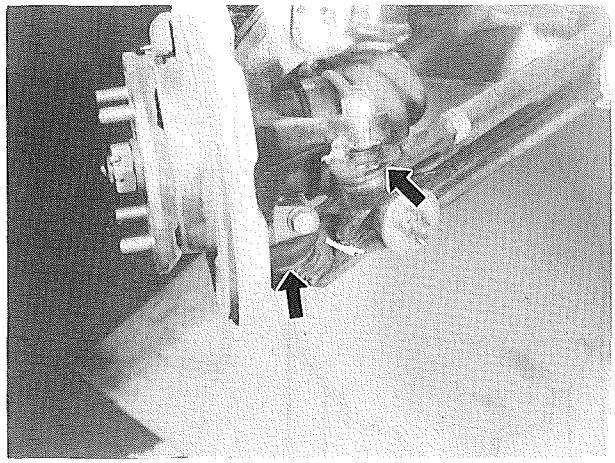


2) Strut function check
   Check and adjust tire pressures as specified. Bounce car body three or four times continuously by pushing front end on the side with strut to be checked. Apply the same amount of force at each push and note strut resistance both when pushed and rebounding.
   Also, note how many times car body rebounds before coming to stop after hands are off. Do the same for strut on the other side.
   Compare strut resistance and number of rebound on the right with those on the left. And they must be equal in both. With proper strut, car body should come to stop the moment hands are off or after only one or two small rebounds. If struts are suspected, compare them with known good car or strut.
3) Inspect for damage or deformation.
4) Inspect bearing for wear, abnormal noise or gripping.
5) Inspect for cracks or deformation in spring seat.
6) Inspect for deterioration of bump stopper.
7) Inspect rebound stopper and strut mount for wear, cracks or deformation.

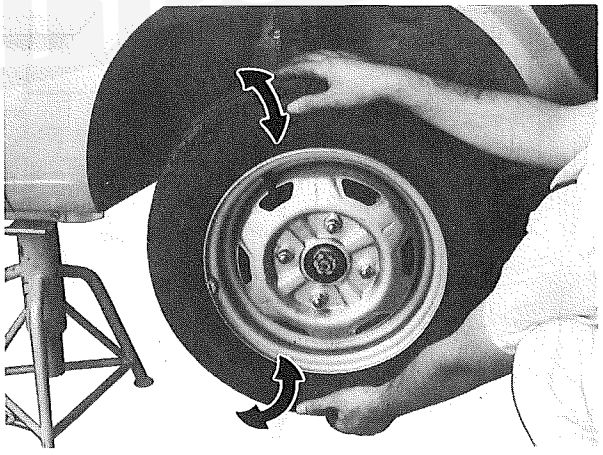
Replace any parts found defective in steps 2) — 7).

Tie rod end ball joint and suspension lower arm ball joint

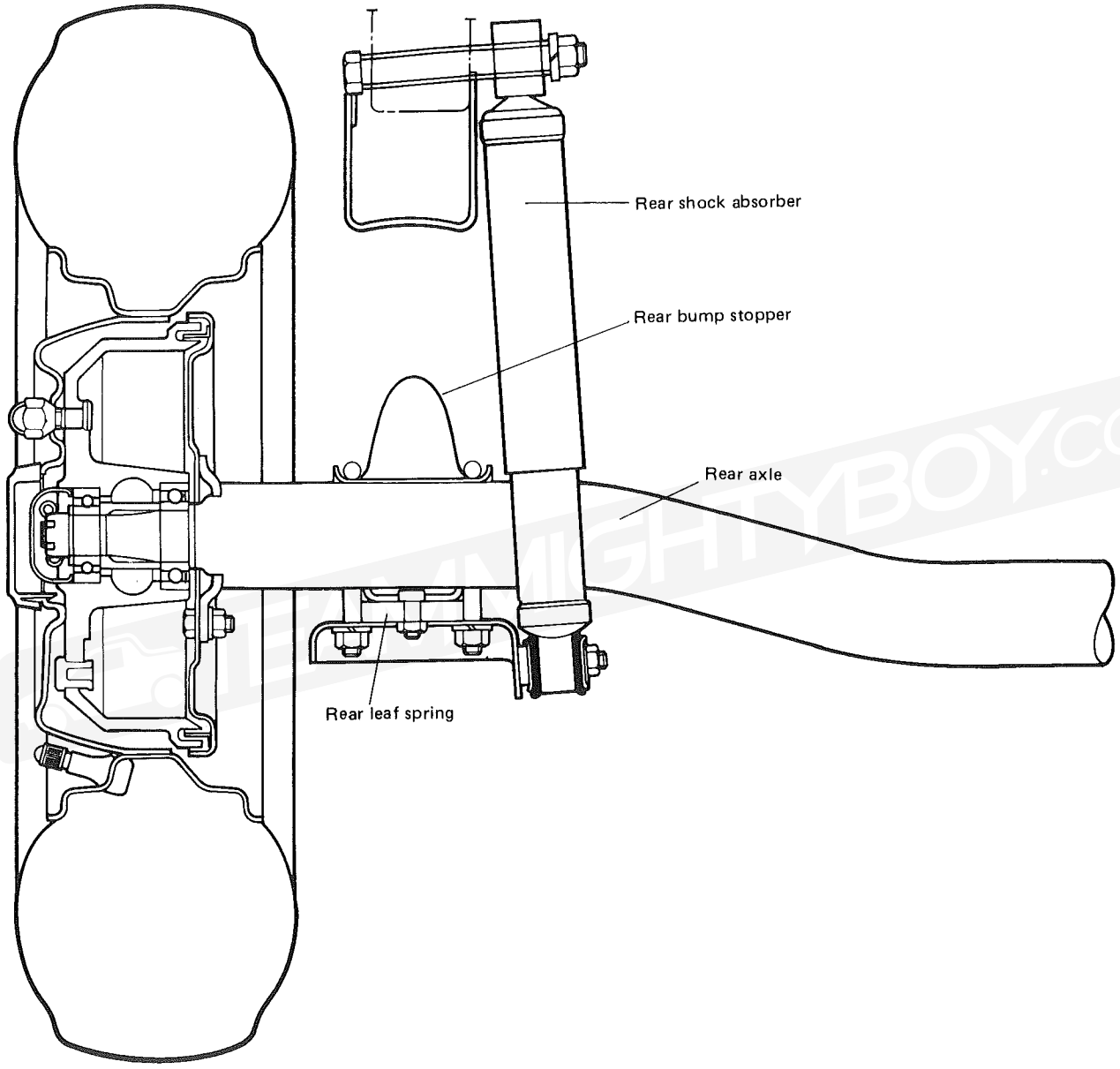
1) Check boots for breakage and replace if broken.



2) Check each ball joint for wear. If it is worn and play is found between ball joint stud and bush in joint case, replace defective parts.



15-3. REAR SUSPENSION



REMOVAL

Shock Absorber

1) Hoist car.
2) Remove lower mounting nut.
3) Remove upper mounting bolt and nut. Then remove shock absorber.

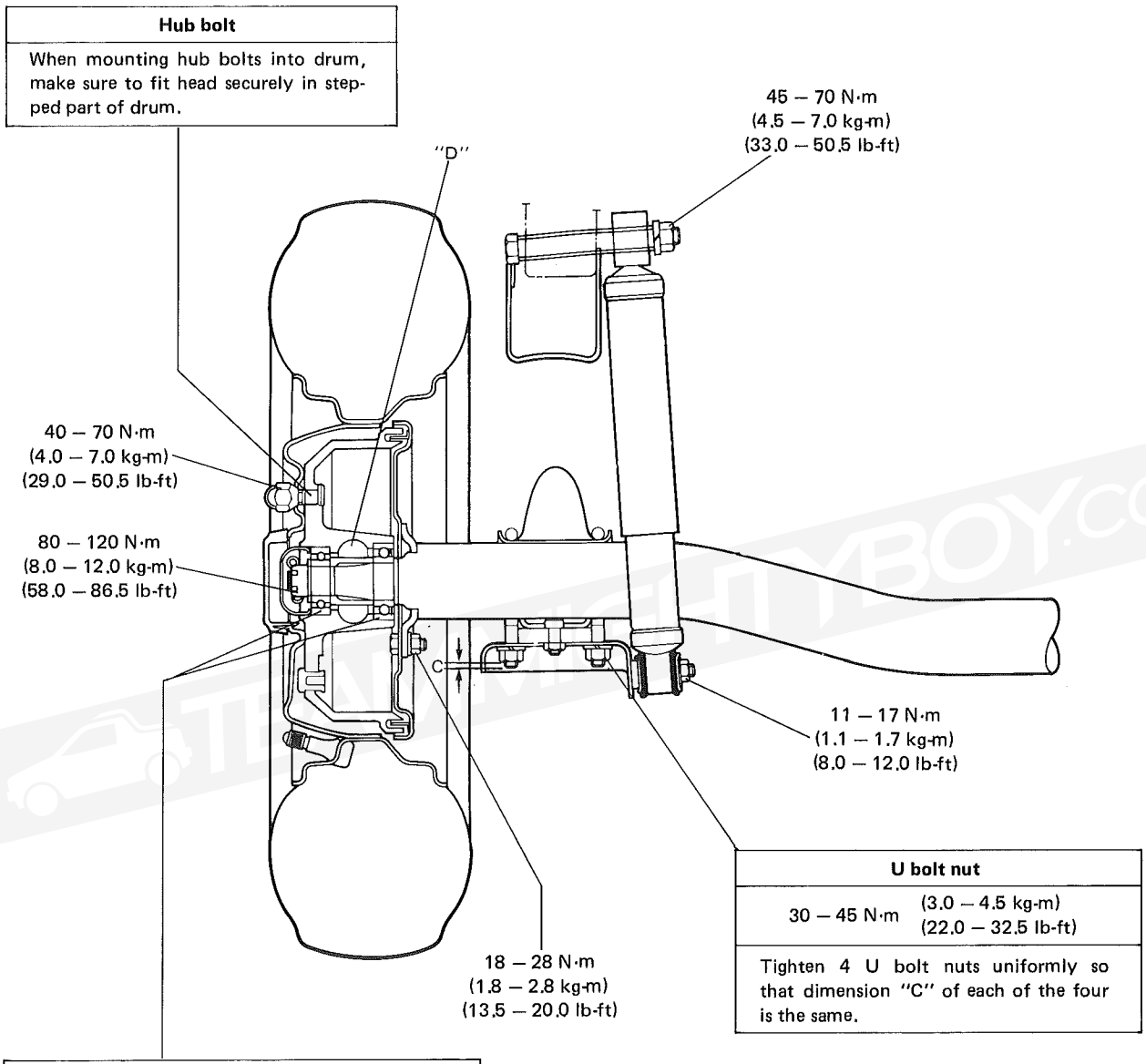
Leaf Spring

1) Raise car. In this operation, garage jack or hoist must not be positioned against rear suspension related parts. When garage jack is used, place safety stands under body to support raised body. Or, where possible, raise car body with body contact type hoist until tires are off the floor.

NOTICE:
Don't let rear axle hang on brake hose. If it occurs, hose may be damaged. To prevent it, always hold rear axle of raised car on safety stands.

2) Remove rear wheel.
3) Remove U-bolt nuts.
4) Remove shackle nuts and leaf spring front nut.
5) Pull out leaf spring front bolt and remove leaf spring from shackle pin.

IMPORTANT STEPS IN INSTALLATION



Hub bolt
When mounting hub bolts into drum, make sure to fit head securely in stepped part of drum.

U bolt nut
30 – 45 N·m (3.0 – 4.5 kg-m) (22.0 – 32.5 lb-ft)
Tighten 4 U bolt nuts uniformly so that dimension "C" of each of the four is the same.

Wheel bearing
● Make gap "D" (between inner bearing and outer bearing) about 40% filled with wheel bearing grease. ● Press-fit inner bearing with its sealed side directed toward backing plate side. ● Press-fit outer bearing so that resin side of its retainer faces toward outside of car body.

Spindle cap

- When installing spindle cap, hammer lightly several locations on collar of cap until collar comes closely into contact with brake drum.
- If fitting part of cap is deformed or damaged or if it is fitted loosely, replace with new one.

Rear leaf spring front bush

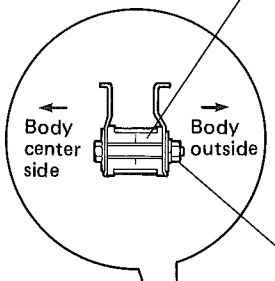
When press-fitting front bush, apply silicone grease to it as specified below.

Silicone grease: 99000-25190

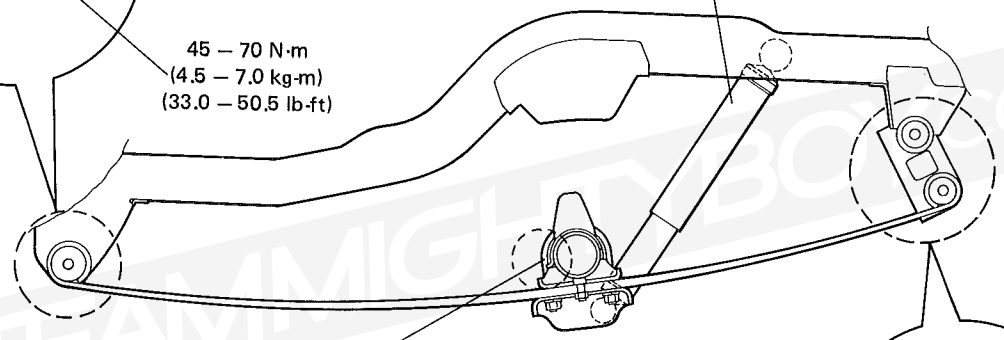
Apply silicone grease by spreading it hard into thin coat over entire area. (Be sure to use silicone grease that will not affect rubber.)

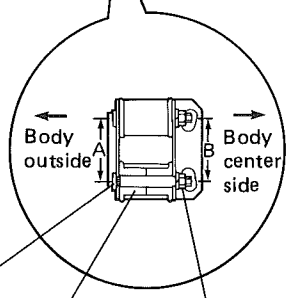
Rear shock absorber

After installing absorber, tighten lower nut first and then tighten upper nut.



45 – 70 N·m
(4.5 – 7.0 kg-m)
(33.0 – 50.5 lb-ft)





30 – 55 N·m
(3.0 – 5.5 kg-m)
(22.0 – 39.5 lb-ft)

Rear bump stopper

Install rear bump stopper bringing one end of its seat into contact with rear axle, and a proper degree is obtained.

Shackle pin

When installing shackle pin, use care for parallelness (A – B), which should be less than ±0.3 mm.

Shackle pin bush

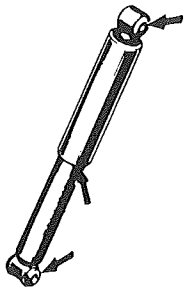
When press-fitting bush, apply silicone grease (99000-25190) to both inner and outer surfaces of it as described at the upper left of this page.

MAINTENANCE SERVICE

REAR SHOCK ABSORBER

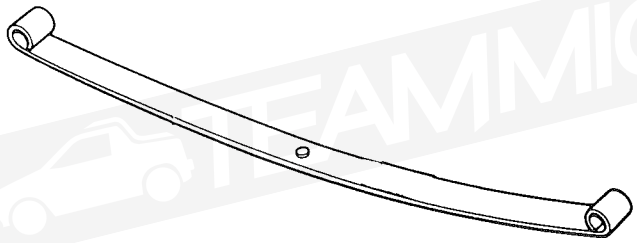
1) Inspect for deformation or damage.
2) Inspect bushings for wear or damage.
3) Inspect for evidence of oil leakage.

Replace any defective part.



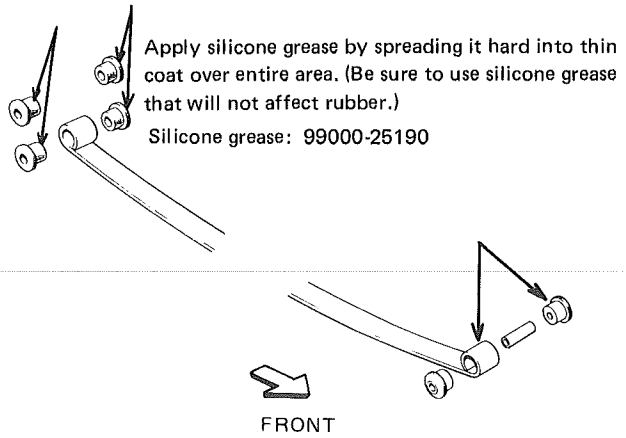
LEAF SPRING AND BUMP STOPPER

Inspect for crack and damage. If found defective, replace. Also inspect if bump stopper is seated properly. If it is off its seat, replace.



LEAF SPRING BUSHES

Inspect for wear and breakage. If found defective, replace. When shackle pin bush is not worn and yet abnormal sound is noted while driving, remove bushes and apply grease specified below.



WHEEL DISC, NUT & BEARING

1) Inspect each wheel disc for dents, distortion and cracks. Disc in badly damaged condition must be replaced.
2) Check wheel hub nuts for tightness and, as necessary, retighten to specification.

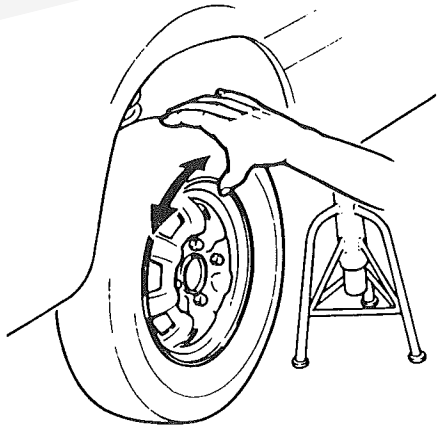
Tightening torque for wheel nuts	40 – 70 N·m (4.0 – 7.0 kg-m) (29.0 – 50.5 lb-ft)

3) Check wheel bearings for wear. When measuring thrust play, apply dial gauge to drum center after removing wheel center cap from wheel disc.

Thrust play limit	Rear	0.3 mm (0.012 in)

When measurement exceeds limit, replace bearing.

4) By rotating wheel actually, check wheel bearing for noise and smooth rotation. If it is defective, replace bearing.



15-4. TIRES AND WHEELS

Replacement Tires

When replacement is necessary, the original equipment type tire should be used. Refer to the Tire Placard.

Replacement tires should be of the same size, load range and construction as those originally on the car. Use of any other size or type tire may affect ride, handling, speedometer/odometer calibration, vehicle ground clearance and tire or snow chain clearance to car body and chassis.

NOTICE:

Do not mix different types of tires on the same car such as radial, bias and bias-belted tires except in emergencies, because car handling may be seriously affected and may result in loss of control.

It is recommended that new tires be installed in pairs on the same axle. If necessary to replace only one tire, it should be paired with the tire having the most tread, to equalize braking traction.

Replacement Wheels

Wheels must be replaced if they are bent, dented, have excessive lateral or radial runout, leak air through welds, have elongated bolt holes, if lug nuts won't stay tight, or if they are heavily rusted.

Replacement wheels must be equivalent to the original equipment wheels in load capacity, diameter, rim width, offset and mounting configuration. A wheel of improper size or type may affect wheel and bearing life, brake cooling, speedometer/odometer calibration, car ground clearance and tire clearance to car body.

Inflation of Tires

The pressure recommended for any model is carefully calculated to give a satisfactory ride, stability, steering, tread wear, tire life and resistance to bruises.

Tire pressure, with tires cold, (after car has set for three hours or more, or driven less than one mile) should be checked monthly or before any extended trip. Set to the specification on the tire placard.

It is normal for tire pressure to increase 28 kPa (4 psi) when the tires become hot during driving. **Do not** bleed or reduce tire pressure after driving. Bleeding reduces the "Cold Inflation Pressure".

Higher than recommended pressure can cause:

1. Hard ride
2. Tire bruising or carcass damage
3. Rapid tread wear at center of tire

Lower than recommended pressure can cause:

1. Tire squeal on turns
2. Hard steering
3. Rapid and uneven wear on the edges of the tread
4. Tire rim bruises and rupture
5. Tire cord breakage
6. High tire temperatures
7. Reduced handling
8. High fuel consumption

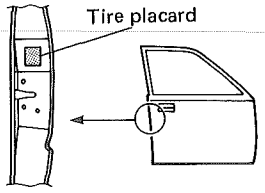
Unequal pressure on same axle can cause:

1. Uneven braking
2. Steering lead
3. Reduced handling
4. Swerve on acceleration

Valve caps should be on the valves to keep dust and water out.

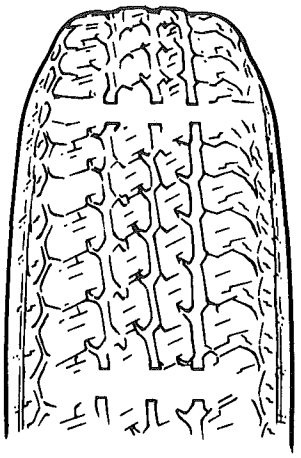
Tire Placard

The tire placard is located on the left door (right door for right-hand side steering vehicle) lock pillar and should be referred to for tire information. The placard lists the maximum load, tire size and cold tire pressure where applicable.



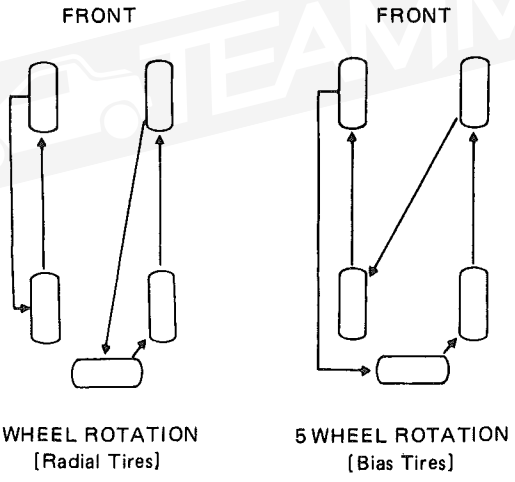
Wear Indicators

The original equipment tires have built-in tread wear indicators to show when tires need replacement. These indicators will appear as 12 mm (0.47 inch) wide bands when the tire tread depth becomes 1.6 mm (0.063 inch). When the indicators appear in 3 or more grooves at 6 locations, tire replacement is recommended.



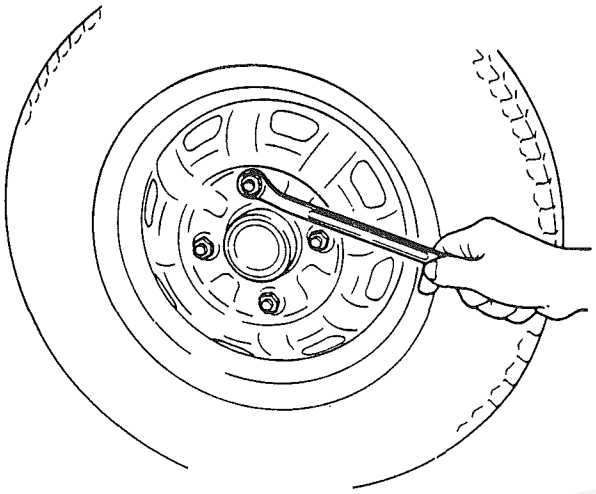
Tire Rotation

To equalize wear, rotate tires periodically as shown.



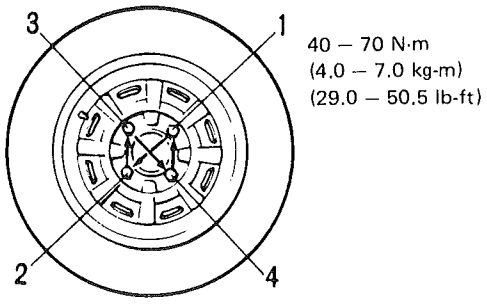
Wheel Removal

1) Loosen wheel nuts by approximately 180° (half a rotation).
2) Hoist car.
3) Remove wheel.



NOTICE:
Never use heat to loosen tight wheel because application of heat to wheel can shorten life of wheel and damage wheel bearings.

Wheel nuts must be tightened in sequence and to proper torque to avoid bending wheel or brake drum or disc.



NOTICE:
Before installing wheels, remove any build-up of corrosion on the wheel mounting surface and brake drum or disc mounting surface by scraping and wire brushing. Installing wheels without good metal-to-metal contact at the mounting surfaces can cause wheel nuts to loosen, which can later allow a wheel to come off while the car is moving.

Tire Mounting and Demounting

Use a tire changing machine to mount or demount tires. Follow the equipment manufacture's instructions. Do not use hand tools or tire irons alone to change tires as they may damage the tire beads or wheel rim.

Rim bead seats should be cleaned with a wire brush or coarse steel wool to remove lubricants, old rubber and light rust. Before mounting or demounting a tire, the bead area should be well lubricated with an approved tire lubricant.

After mounting, inflate to specified pressure and check that beads are completely seated.

IMPORTANT:
Do not stand over tire when inflating.
When inflating, if specified pressure will not seat beads, deflate, re-lubricate and reinflate. Over inflation may cause the bead to break and cause serious personal injury.

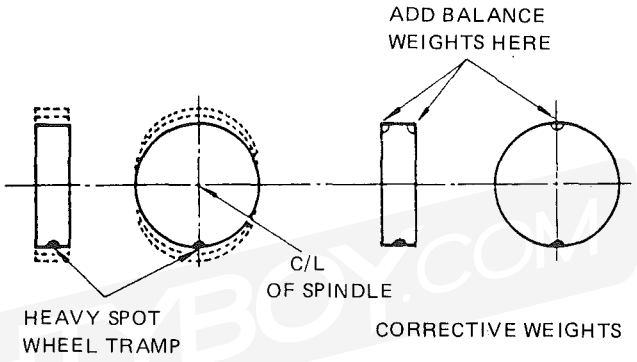
Wheel Maintenance

Wheel repairs that use welding, heating, or peening are not approved.
All damaged wheels should be replaced.

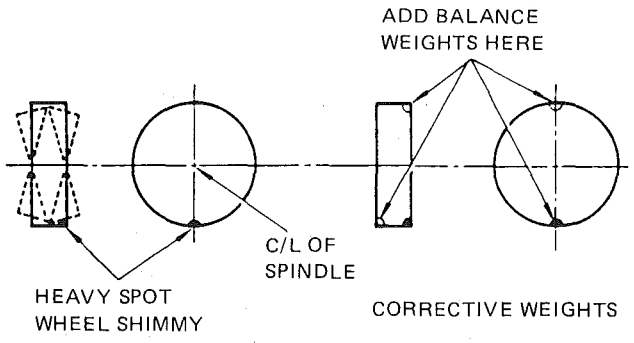
Balancing wheels

There are two types of wheel and tire balance: static and dynamic. Static balance is the equal distribution of weight around the wheel. Wheels that are statically unbalanced cause a bouncing action called tramp. This condition will eventually cause uneven tire wear.

Dynamic balance is the equal distribution of weight on each side of the wheel centerline so that when the tire spins there is no tendency for the assembly to move from side to side. Wheels that are dynamically unbalanced may cause shimmy.



STATIC UNBALANCE CORRECTION



DYNAMIC UNBALANCE CORRECTION

General Balance Procedures

Deposits of mud, etc. must be cleaned from the inside of the rim.

> **IMPORTANT:**
> **Stones should be removed from the tread in order to avoid operator injury during spin balancing and to obtain a good balance.**

The tire should be inspected for any damage, then balanced according to the equipment manufacturer's recommendation.

Off-Car Balancing

Most electronic off-car balancers are more accurate than the on-car spin balancers. They are easy to use and give a dynamic (two plane) balance. Although they do not correct for drum or disc unbalance as does on-car spin balancing, this is overcome by their accuracy, usually to within 1/8 ounce.

On-Car Balancing

On-car balancing methods vary with equipment and tool manufacturers. Be sure to follow each manufacturer's instructions during balancing operation.

> **IMPORTANT:**
> **The wheel spin should be limited to 35 mph (55 km/h) as indicated on the speedometer. This limit is necessary because the speedometer only indicates one-half on the actual wheel speed when one drive wheel is spinning and the other drive wheel is stopped. Unless care is taken in limiting drive wheel spin, the spinning wheel can reach excessive speeds. This can result in possible tire disintegration or differential failure, which could cause serious personal injury or extensive car damage.**