SPECIFICATIONS

Type:	
Front	Disc
Rear	Drum
Operation:	
Footbrake	Vacuum servo assisted hydraulic
Handbrake	Mechanical on rear wheels
Front brakes:	
Brake disc minimum thickness—	
Solid discs	11.5 mm
Ventilated discs	19.0 mm
Maximum runout	0.15 mm
Brake pad minimum thickness	1.0 mm
Rear brakes:	
Brake drum inner diameter (standard)—	
RN36, 46 and YN65, 67 models	254 mm
YN63 Models	295 mm
Brake drum inner diameter machining limit—	
RN36, 46 and YN65, 67 models	256 mm
YN63 models	297 mm
Lining minimum thickness	1.0 mm
Handbrake lever travel:	
RN36, 46 models	7–15 notches
YN65, 67 models	4–8 notches
YN63 models	9–17 notches
Brake pedal:	
Height—	
RN36, 46 models	162–172 mm
YN63, 65, 67 models	151–156 mm
Pedal free play	3–6 mm
Master cylinder to servo unit pushrod clearance	0.60–0.65 mm
Load sensing proportioning valve eye bolt adjustment:	
Initial setting	120 mm
Adjusting range	114–126 mm

TORQUE WRENCH SETTINGS

Caliper mounting bolts	102 Nm
Disc to hub bolts:	
RN36, 46 and YN65, 67 models	54 Nm
YN63 models	64 Nm
Master cylinder stopper bolt:	
RN36, 46 models	14 Nm
YN63, 65, 67 models	10 Nm
Master cylinder outlet/check valve:	
RN36, 46 models	54 Nm
YN63, 65, 67 models	44 Nm

1. BRAKES TROUBLE SHOOTING

BRAKE PEDAL HARD

(1) Incorrect brake pads or shoe linings fitted: Check and replace with the recommended type.

(2) Frozen pedal pivot: Rectify or renew pivot pin.

(3) Restricted brake line from master cylinder: Check brake lines and remove restriction or renew line.

(4) Frozen wheel cylinder or caliper pistons: Check, free up or renew pistons.

(5) Vacuum servo system inoperative: Check servo system and rectify.

NOTE: The vacuum servo system can be checked as follows: With the engine switched off, pump the brake pedal several times to deplete any vacuum in the system. With the engine still switched off, press down firmly on the brake pedal and hold it there noting the position and pressure required. Holding down on the brake pedal, start the engine. If the vacuum servo unit is operating correctly, the brake pedal will sink slightly and the pressure required to hold it may even reduce. If the pedal does not sink slightly when the engine is started then the vacuum servo unit can be considered inoperative.

BRAKE DRAG

(1) Clogged master cylinder ports: Check and clean master cylinder and fluid reservoir.

(2) Frozen wheel cylinder or caliper pistons: Check, free up or renew pistons.

(3) Frozen handbrake linkage: Free up or renew linkage.

(4) Broken or stretched brake shoe return springs: Renew defective springs.

(5) Frozen handbrake cables: Free up or renew cables.

(6) Blocked vent in fluid reservoir cap: Check vent and remove obstruction.

NOTE: To check this condition jack up the vehicle, support on chassis stands and spin all wheels to check for binding.

If the wheels are not binding have an assistant apply and release the brakes. Check if the brakes are immediately releasing. A clogged master cylinder port will cause binding on the two wheels fed by that particular circuit from the master cylinder. Open the bleeder valve on one of the offending wheels to check if pressure build up is the cause for binding. A frozen handbrake cable will usually cause binding on both rear wheels. To check this condition disconnect the handbrake, cable at or as close to the rear backing plates as possible and check if the wheels will then turn freely.

LOW SPONGY BRAKE PEDAL

(1) Incorrectly adjusted brake shoes: Check and adjust brake shoes. Check self adjusters.

(2) Insufficient fluid in system: Check for leaks, replenish fluid to specified level and bleed brake system.

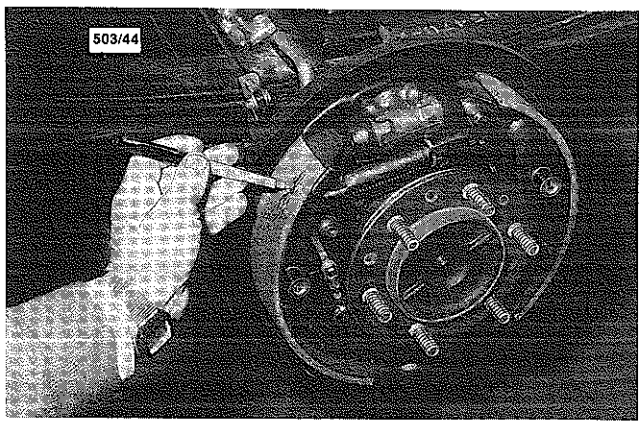
(3) Air in the brake hydraulic system: Bleed hydraulic system.

NOTE: A spongy brake pedal in most cases is caused by air in the hydraulic system. For air to enter the system one or more of the sealing rubbers or pipes must be sucking in air. Always rectify the cause of the trouble before bleeding the brake system. Faulty components usually show up as fluid leakage.

BRAKES LOCK ON APPLICATION

(1) Gummy linings or disc pads due to oil or fluid contamination: Renew linings or disc pads linings or disc pads.

(2) Eccentric brake drums: Check and renew faulty drums.



Check the brake linings for heat cracks and oil contamination.

(3) Incorrect linings fitted: Instal recommended linings as a set.

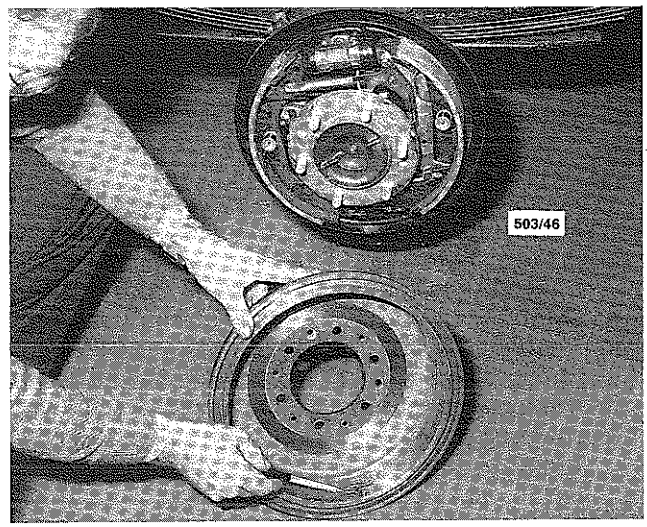
(4) Broken or stretched brake shoe return springs: Check and renew faulty shoe return springs.

(5) Faulty brake pressure proportioning valve: Replace brake pressure proportioning valve.

NOTE: If this condition arises, first remove all wheels and check the condition of the friction material both for oil contamination and excessive wear. Check the shoe return springs for stretching by comparing their free length with new springs. An eccentric brake drum will be indicated by pulsating on the brake pedal when the brakes are lightly applied.

BRAKE PEDAL PULSATES

(1) Eccentric brake drum or disc: Check machine or renew drums or discs as required.



Check the brake drums for scores, wear and distortion.

(2) Worn rear wheel hub bearings: Renew the rear wheel hub bearings.

(3) Loose or worn front hub bearings: Adjust or renew front hub bearings.

(4) Bent reat axle shaft: Check and renew faulty components.

NOTE: Adjust the hub bearings as outlined in the Front Axle section. Brake drums or discs that prove to be running out must be machined. This job is best entrusted to a brake specialist who will also be able to determine if a new disc or drum is required.

BRAKE FADE

(1) Incorrect shoe adjustment: Check and adjust shoe to drum clearance. Check self adjusters.

(2) Eccentric brake drum: Check and renew faulty component.

(3) Linings saturated with hydraulic fluid: Renew contaminated linings.

(4) Incorrect linings fitted: Check and instal recommended linings in sets.

NOTE: In most cases brake fade is caused by overuse of the footbrake, which in turn causes a build up of heat at the friction material and drums or discs. Once this excessive build up of heat is allowed to dissipate the brakes should again function normally.

BRAKES OVERHEAT

(1) Incorrect shoe adjustment: Check and adjust shoe to drum clearance. Check self adjusters.

(2) Broken shoe return springs: Renew faulty springs.

(3) Faulty handbrake cables or adjustment: Check cables, renew or adjust.

(4) Frozen wheel cylinder or caliper pistons: Free up or renew faulty components.

(5) Obstructed or damaged hydraulic hose or line: Remove obstruction or renew hydraulic hose or line.

(6) Obstructed master cylinder compensating port: Clear compensating port.

(7) Blocked vent in master cylinder reservoir cap: Check and remove obstruction in vent.

(8) Overuse of footbrake: Revise driving habits.

NOTE: To check for brake binding raise the vehicle and spin each wheel in turn by hand. If it is found that one wheel cylinder' or caliper piston is sticking then it is advisable to overhaul all cylinders including the master cylinder.

BRAKE FAILURE

(1) Faulty master cylinder: Remove and overhaul master cylinder.

(2) Loss of fluid due to leaking wheel cylinder: Overhaul or renew wheel cylinders and bleed hyraulic system.

(3) Loss of fluid due to leaking caliper: Overhaul or renew caliper assembly and bleed hydraulic system.

(4) Loss of fluid due to fractured pipe or faulty union: Renew faulty components as necessary and bleed hydraulic system.

(5) Air in hydraulic system: Locate source of air leak and rectify. Bleed hydraulic system.

(6) Water in hydraulic fluid: Drain, flush, refill and bleed hydraulic system.

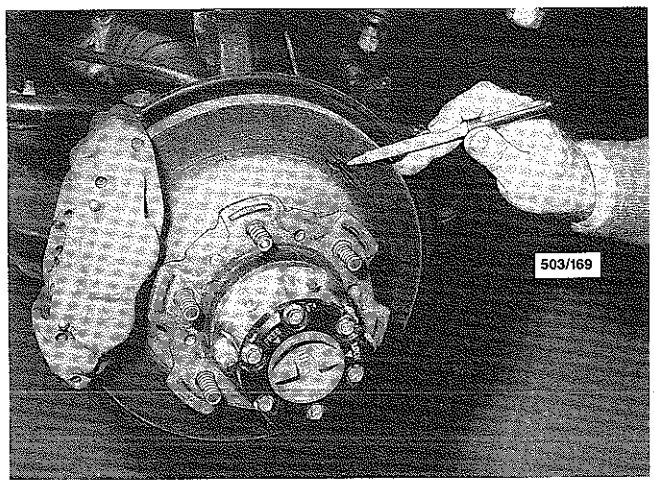
NOTE: To locate the source of a fluid leak refill the master cylinder reservoir with fluid and have an assistant hold constant pressure on the brake pedal. Observe if the pedal falls away, then check for obvious signs of external leakage, prior to dismantling and overhauling the braking system. If the pedal falls away without any external leakages, the master cylinder will have to be overhauled.

BRAKE NOISE

(1) Brakes squeal on application: Glazed friction material. Remove and inspect the brake pads and deglaze the friction material with emery paper.

(2) Grinding noise on application: Friction material worn away. Inspect the friction material on the brake pads and shoes, renew the brake pads or shoes as necessary and machine or renew the brake drum or discs.

NOTE: Brake squeal in most cases is caused by the friction material on the brake pads or shoes becoming glazed. Unsuitable friction material or the omission of anti-squeal shims or anti-rattle springs may also cause brake noise.



Check the brake disc for scoring and wear.

If the brake pads or shoes are worn to metal always renew either the brake pads or shoes as a complete set of four. If scored, the brake drum or disc wil have to be machined or renewed otherwise braking efficiency will be impaired.

2. DESCRIPTION

The front and rear brakes are applied by independent circuits by means of a tandem dual circuit master cylinder. Should a malfunction occur in one circuit, the remaining circuit is capable of stopping the vehicle safely.

The four wheel hydraulically operated brakes utilise leading and trailing or duo servo drum brakes on the rear wheels and discs and calipers on the front wheels.

The rear brakes are of the self adjusting type but can be manually adjusted when required.

A load sensing proportioning valve is incorporated in the braking system. The proportioning valve is designed to prevent the premature locking up of the rear wheels during severe braking irrespective of vehicle load. If the rear wheels lock up before the front wheels, the proportioning valve should be checked and adjusted or if faulty, renewed.

On all models a vacuum servo unit is installed between the master cylinder and the bulkhead. Vacuum is supplied to the brake servo unit from the inlet manifold via a one way check valve. The one way check valve provides several asssisted stops with the engine switched off.

The front disc brake comprises a disc installed to the wheel hub and a caliper assembly attached to the swivel hub or steering knuckle.

The caliper is of the fixed type and each half of the caliper houses two pistons of different diameter which, on brake application, activate a brake pad. As pad wear takes place, the caliper pistons move

outward through the seals to take up new positions in the caliper bores.

When the brakes are in the off position, a constant clearance is maintained between the pad and the disc. Elastic deformation of the piston seals takes place when the brakes are applied and returns the pistons to the off position when the brakes are released.

The disc brakes are self adjusting and do not require periodical adjustment in service to compensate for pad wear.

The caliper assembly is constructed in two sections and is held together by four high tensile bolts. It is not advisable to separate the caliper sections.

The handbrake operates on the rear brake drums via cables and an equaliser and is self adjusting. The handbrake cable(s) can be adjusted manually by cable/rod adjusting nut(s) at the chassis.

3. MASTER CYLINDER

Special Equipment Required:
To Measure Master Cylinder to Servo Unit Pushrod Clearance — Vernier gauge

TO REMOVE

(1) Raise the engine bonnet and instal fender covers.

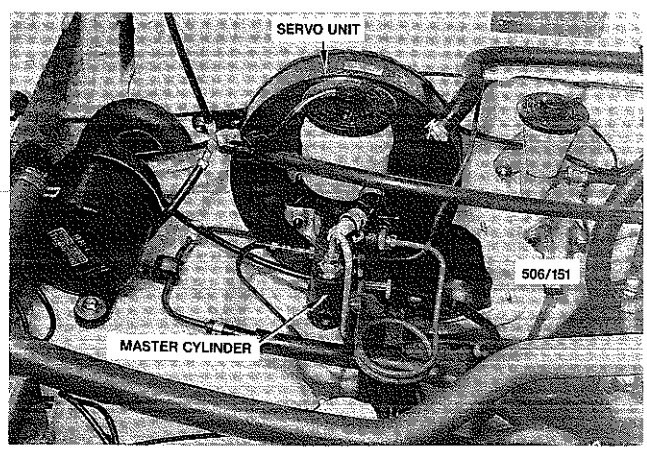
(2) Disconnect the negative battery terminal.

(3) Disconnect the fluid level warning lamp switch wiring connector.

(4) Disconnect the brake fluid outlet pipes from the master cylinder outlet/check valves and plug the pipe apertures to prevent the entry of dirt or loss of fluid.

(5) Remove the master cylinder retaining nuts and washers, carefully manoeuvre the brake pipe union bracket away from the work area and remove the master cylinder and gasket from the vehicle.

NOTE: Care should be exercised when removing or installing the master cylinder assembly to ensure that brake fluid is not permitted to drop on the surrounding paintwork of the vehicle. Brake fluid, if accidentally spilt should be immediately washed away with water and allowed to dry natually and not wiped with a cloth.



Installed view of the brake master cylinder. YN63, 65, 67 models.

TO CHECK AND ADJUST MASTER CYLINDER TO SERVO UNIT PUSHROD CLEARANCE

(1) Ensure that the vacuum in the system has been depleted and measure the protrusion of the pushrod from the master cylinder mating surface on the servo unit. See illustration. The measurement obtained will be dimension A. Note the dimension.

NOTE: Ensure that the gasket is positioned correctly on the servo unit before taking measurement.

(2) Measure the distance from the mating surface for the servo unit on the master cylinder to the end of the master cylinder. See illustration. The measurement obtained will be dimension B. Note the dimension.

(3) Using the vernier gauge, measure the distance from the end of the master cylinder to the bottom of the hole in the piston. See illustration. The measurement obtained will be dimension C. Note the dimension.

(4) Apply the dimensions obtained to the following formula:

Pushrod clearance = (C − B) − A

(5) Compare the pushrod clearance obtained with Specifications.

(6) If necessary, loosen the locknut on the pushrod and adjust the protrusion of the pushrod until dimension A, when applied to the formula, will achieve the specified master cylinder to servo unit pushrod clearance. Tighten the locknut.

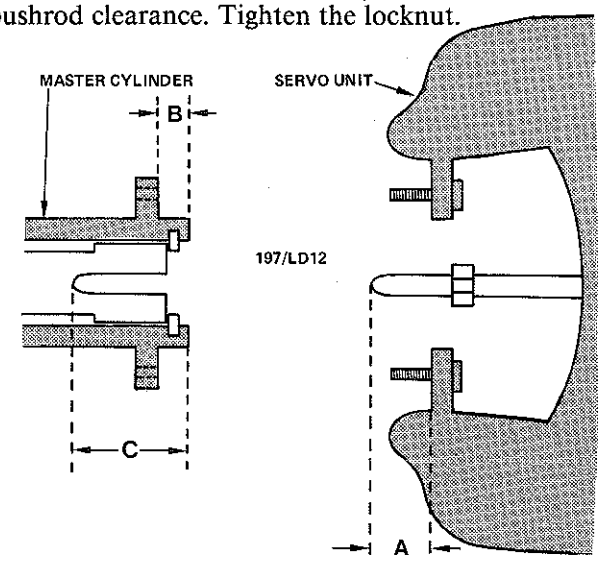


Illustration showing the measuring points for checking the master cylinder to servo unit pushrod clearance.

TO INSTAL

Installation is a reversal of the removal procedure with attention to the following points:

(1) Pour a small amount of clean brake fluid into the reservoir and pump the master cylinder pistons with a blunt rod until fluid begins to emerge from the outlets.

(2) Position the master cylinder and gasket on the vacuum servo unit, position the brake pipe union bracket on the master cylinder and instal the retaining washers and nuts loosely. Do not tighten the retaining nuts at this stage.

(3) Remove the brake pipe aperture plugs and instal the pipes to the master cylinder outlet check valves. Do not tighten the brake pipes at this stage.

(4) Tighten the master cylinder retaining nuts securely to the vacuum servo unit

(5) Tighten the brake pipes securely and connect the fluid level warning lamp switch connector.

(6) Fill the master cylinder with clean brake fluid and bleed the hydraulic system as described under the heading Hydraulic System.

TO DISMANTLE

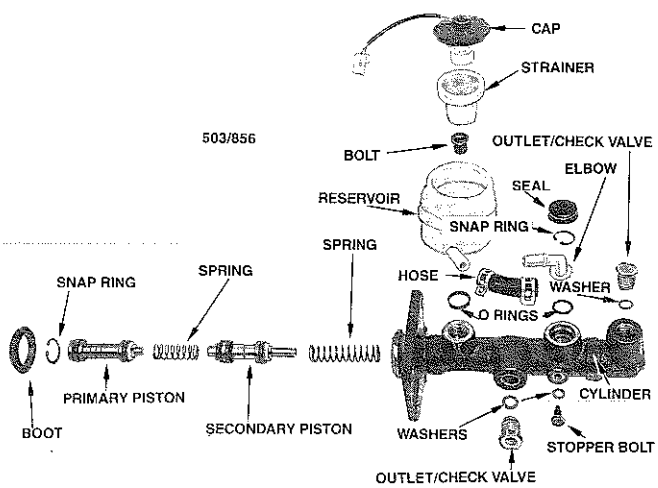
(1) Remove the master cylinder reservoir cap, strainer and float asembly from the master cylinder and drain the fluid into a suitable container.

(2) Secure the master cylinder in a suitable soft jawed vice and loosen the reservoir connecting hose clip.

(3) Remove the reservoir retaining bolt, manoeuvre the reservoir from the connecting hose and remove the reservoir and sealing washer from the master cylinder.

(4) On RN36, 46 models, remove the connecting hose banjo retaining bolt and washers and remove the connecting hose from the master cylinder.

(5) On YN63, 65, 67 models, lift the connecting hose elbow dust seal away from the master cylinder and using suitable snap ring pliers, remove the connecting hose elbow retaining snap ring and hose from the master cylinder.



Dismantled view of the master cylinder, YN63 model shown.

(6) Remove the outlet/check valve assemblies and washers from the master cylinder.

(7) Using a suitable blunt rod, push the piston assemblies into the master cylinder bore and remove the piston stopper bolt and washer.

(8) Remove the rubber boot from the rear of the master cylinder.

(9) Whilst holding the piston assembly forward and using a suitable pair of snap ring from the master cylinder bore.

(10) Tap the rear of the master cylinder gently on a block of wood to dislodge the piston assemblies and springs from the cylinder bore.

TO CLEAN AND INSPECT

(1) Wash all components thoroughly in methylated spirits. Do not use petrol, kerosene or other cleaning solvents.

(2) Check the cylinder bore for wear, scoring or pitting.

NOTE: Do not hone the master cylinder bore. If the bore is pitted or worn renew the master cylinder as an assembly.

(3) Ensure that all inlet and compensating ports between the reservoirs and the cylinder bore are free of any obstruction.

(4) Check the piston compression springs, and the check valve springs if fitted, for weakness or rusting.

(5) Note the piston seal installed positions as an aid to assembly. Using a blunt probe, remove the seals from the pistons and discard the seals. If a major repair kit is being used containing new piston assemblies, discard the used piston assemblies and seals.

NOTE: Where possible, use a genuine major repair kit which contains preassembled rubber seals and pistons when overhauling the master cylinder. The use of a major repair kit will ensure a thorough overhaul and long service from the unit.

TO ASSEMBLE

Assembly is a reversal of the dismantling procedure with attention to the following points:

(1) Apply rubber grease to the piston seals. Where applicable instal the seals to the pistons as noted on removal.

(2) Lubricate the cylinder bore with clean brake fluid. Instal the secondary piston spring, secondary piston, primary piston spring and primary piston into the cylinder bore.

NOTE: For ease of installation rotate the piston asssemblies while installing.

(3) Using a blunt rod, push the piston assemblies into the cylinder bore. Whilst holding the pistons in position, instal the piston assembly retaining snap ring into the cylinder bore.

(4) Whilst holding the piston assemblies forward, instal the piston stopper bolt and washer and tighten to Specifications.

(5) Check for free movement of the piston assemblies.

(6) Instal the outlet/check valves and washers to the master cylinder and tighten them to Specifications.

(7) Instal the sealing washer, reservoir and retaining bolt to the master cylinder and tighten the retaining bolt securely.

(8) Position the reservoir connecting hose on the reservoir.

(9) Where applicable, position the connecting hose elbow in the master cylinder and instal the elbow retaining snap ring. Position the rubber boot on the elbow.

(10) Where applicable, position the reservoir connecting hose banjo and washers, instal the banjo bolt to the master cylinder and tighten securely.

(11) Secure the connecting hose to the reservoir with the retaining clips.

(12) Instal the master cylinder to the vacuum servo unit as previously described, ensuring that the master cylinder to servo unit pushrod clearance is adjusted to Specifications.

4. BRAKE SERVO UNIT

Special Equipment Required:
To Measure Pushrod Clearance — Vernier gauge

TO CHECK OPERATION

(1) With the engine switched off, apply the footbrake several times to deplete all the vacuum from the system.

(2) Again apply the footbrake, but this time hold the brake pedal fully depressed.

(3) Start the engine. If the servo system is functioning satisfactorily, a distinct downward movement of the brake pedal should be noticed.

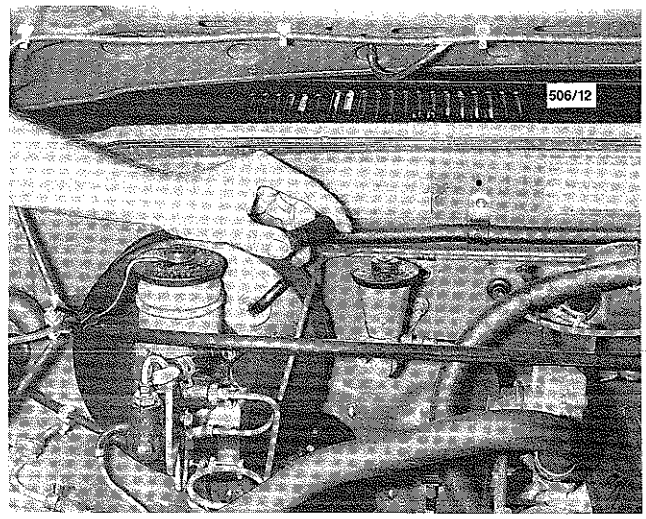
Should the pedal fail to fall away when the engine has been started, then the vacuum system can be considered inoperative.

NOTE: If the pedal continues to fall away there is a fault in the hydraulic system.

(4) Ensure that the brake pedal is fully off, start the engine and run it at medium speed. Stop the engine.

Allow the vehicle to stand for 1-2 minutes, then press the brake pedal two or three times and check the operation.

If there is no vacuum assistance, the vacuum system has developed a leak at the hoses and/or the one way check valve.



Check that vacuum is reaching the servo unit by running the engine with the hose disconnected.

NOTE: Before removing the servo unit from the vehicle for inspection, disconnect the vacuum supply hose from the servo unit, then start the engine and check that vacuum is in fact reaching the servo unit. Also check the operation of the one way check valve as described below.

TO TEST ONE WAY CHECK VALVE

(1) With the engine switched off apply the footbrake several times to exhaust all vacuum from the system.

(2) Squeeze the vacuum supply hose clips at the manifold and the servo unit, remove the bolts retaining the hose clamps to the bulkhead and remove the hose from the vehicle.

(3) Check the valve installed in the hose for sticking. Suction on the manifold side should allow air to flow through the valve. Air blown into the valve from the manifold side should not be able to flow through the valve.

(4) Renew the valve if necessary.

(5) Renew the hose if it shows signs of collapsing or bulging due to deterioration.

(6) Instal the hose to the vehicle in a reverse manner to removal, check the operation of the servo unit as previously described and check the hose connections for vacuum leaks.

TO REMOVE AND INSTAL SERVO UNIT

(1) Remove the brake master cylinder as previously described.

(2) Disconnect the vacuum hose from the servo unit and secure it away from the work area.

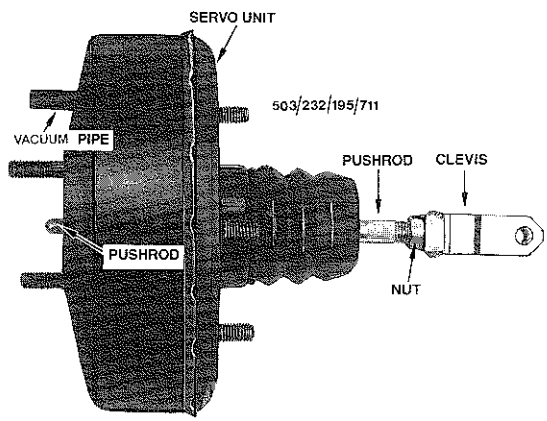
(3) Working inside the vehicle, disconnect the

brake pedal return spring from the pedal and remove the spring from the vehicle.

(4) Remove the servo unit pushrod clevis pin retaining clip and remove the pin from the clevis and the pedal.

(5) Remove the servo unit to bulkhead retaining nuts from the inner bulkhead and remove the servo unit from the vehicle.

Installation is a reversal of the removal procedure with attention to the following points:



View of the brake servo unit removed from the vehicle.

(1) Check and adjust the master cylinder to servo unit pushrod clearance as described under the Master Cylinder heading.

(2) Instal the servo unit and tighten the retaining nuts securely.

(3) Instal the master cylinder to the vehicle as previously described.

(4) Adjust the brake pedal height and free play as described later in this section.

5. LOAD SENSING PROPORTIONING VALVE

DESCRIPTION

A load sensing proportioning valve is installed on all models. Its function is to maintain a braking balance, front to rear, whether the vehicle is fully loaded, partly loaded or completely unloaded.

The load sensing valve reduces the hydraulic pressure available to the rear wheel cylinders when the vehicle is unloaded, thus preventing premature locking up of the rear wheels during severe braking.

When the vehicle is fully loaded the restrictive influence of the sensing proportioning valve on the hydraulic fluid pressure available to the rear wheels is minimised thus allowing maximum braking efficiency to be achieved.

The load sensing proportioning valve is located at the rear chassis and is connected to rear axle by a control rod and adjustable linkage.

TO TEST

On a road with a sealed surface and with good vision both forward and behind, apply the brakes hard at a speed of 50 km/h. The four wheels should lock up together or the front wheels should lock up slightly before the rear wheels.

If one or both of the rear wheels lock up before the front wheels, the proportioning valve can be considered faulty and should be renewed, providing of course the adjustment is correct and that the remaining components of the braking system have been inspected and proved to be serviceable.

NOTE: The above test procedure is only a basic method to test the operation of the proportioning valve.

Special equipment is required for accurate testing of the proportioning valve, therefore if necessary the vehicle should be taken to a Toyota workshop for testing.

TO REMOVE AND INSTAL

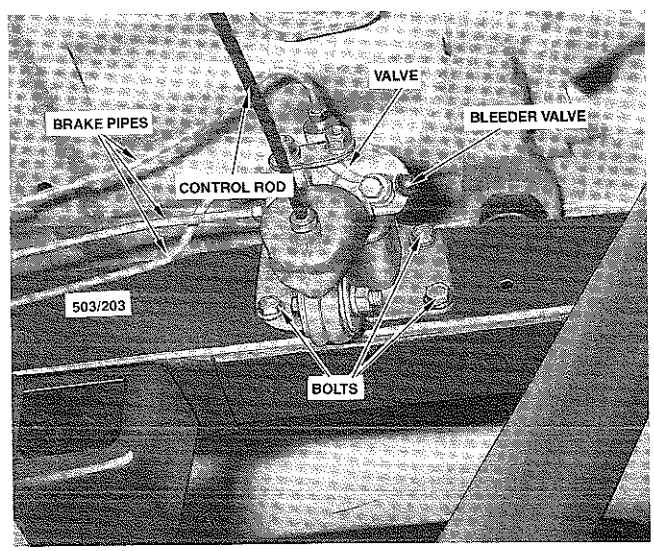
(1) Raise the rear of the vehicle to a suitable working height and support it on chassis stands.

(2) Remove the control rod adjusting eye bolt retaining nut split pin, retaining nut and washers. Withdraw the eye bolt cushion rubbers, sleeve and washer from the rear axle bracket stud.

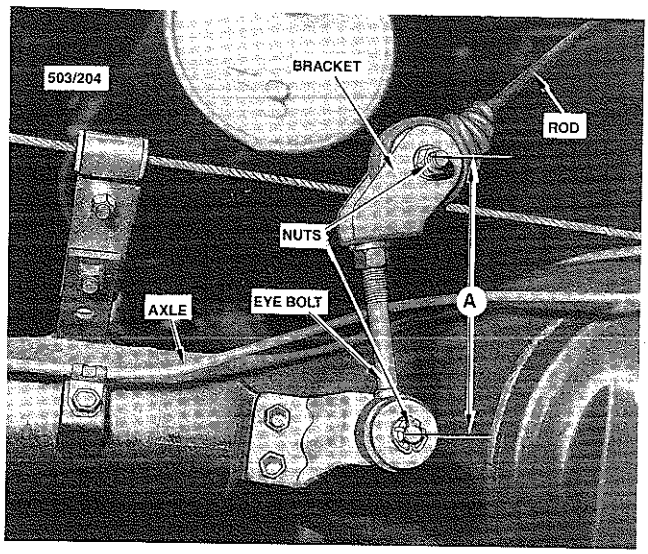
(3) Place a suitable container beneath the proportioning valve and disconnect the brake pipes from the valve allowing excess fluid to drain into the container. Ensure that the pipe apertures are plugged to prevent the entry of dirt and loss of fluid.

(4) Remove the valve assembly retaining bolts and remove the assembly from the chassis.

Installation is a reversal of the removal procedure with attention to the following points:



Installed view of the load sensing proportioning valve. YN63, 65, 67 models.



Installed view of the load sensing proportioning valve linkage showing eye bolt adjustments. Refer to Specifications for dimension A.

(1) Connect the brake pipes to the assembly. Do not tighten at this stage.

(2) Instal the assembly to the chassis and instal the retaining bolts. Tighten the retaining bolts and brake pipes securely.

(3) Instal the eye bolt, cushion rubbers, sleeve and washers to the rear axle bracket stud. Instal the eye bolt retaining nut, tighten and secure with a new split pin

(4) Bleed the hydraulic system as described under the heading Hydraulic System.

(5) Measure the distance between the centre of the eyebolt on the bracket stud and the control rod eye. This is specified as the proportioning valve eye bolt adjustment.

(6) If the proportioning valve eye bolt adjustment is not within. Specifications, the eye bolt length can be adjusted by the positioning of the eye bolt to bracket retaining nuts. When adjustment is complete tighten the retaining nuts securely.

(7) If, after adjustment of the eye bolt, the operation of the valve is still in doubt, the vehicle should be taken to a Toyota dealer for testing.

6. FRONT DISC BRAKES

Special Equipment Required:

To Check Brake Disc Runout — Suitable dial gauge

To Check Brake Disc Thickness — Vernier gauge

TO CHECK AND RENEW BRAKE PADS

(1) Loosen the front road wheel retaining nuts.

(2) Raise the front of the vehicle and support on chassis stands. Remove the front road wheels.

(3) Visually inspect the brake pads on both sides of the vehicle. Renew the brake pads when the lining thickness is less than Specifications, or if contaminated with brake fluid or grease.

(4) If the brake pads are contaminated, trace and rectify the leak prior to installing new brake pads. To ensure even braking renew the brake pads in sets of four.

(5) Drain approximately two thirds of the brake fluid from the master cylinder reservoir using a suitable syringe or ladle. Discard the drained fluid. The fluid is drained from the reservoir in order to prevent overflow when the caliper pistons are pushed back into their bores to facilitate pad renewal.

(6) Note or mark the installed position of the guide pins, retaining clip and the anti-rattle spring. Remove the guide pin retaining clip.

(7) Hold a finger across the anti-rattle spring and withdraw the two guide pins then the anti-rattle spring from the caliper assembly.

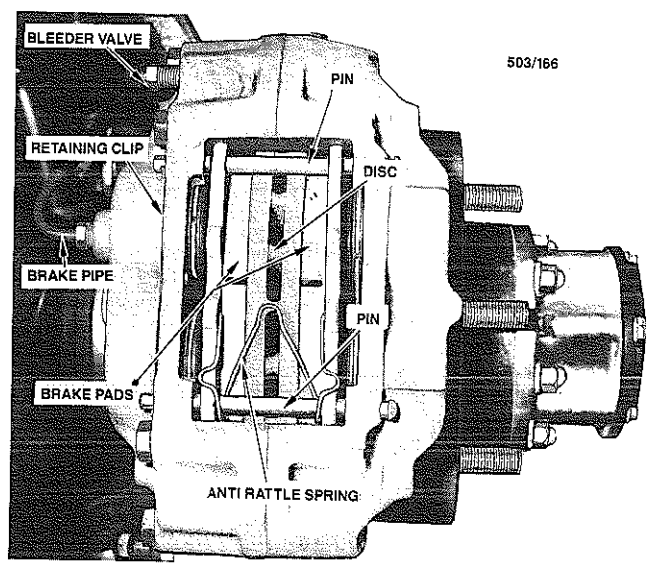
(8) Apply pressure to one brake pad and push the brake pad away from the brake disc and at the same time pushing the caliper pistons fully back into their bores in the caliper body.

(9) Remove the old brake pad and instal the new pad to that side to prevent the pistons from coming out when the pistons on the other side are pushed back into their bores.

(10) Apply pressure to the other brake pad and push the pistons fully back into their bores. Remove the old brake pad and instal the new brake pad.

(11) Instal the anti-rattle clip, the guide pins and the guide pin retaining clip(s) in the positions noted prior to removal.

(12) Top up the brake master cylinder reservoir with the recommended brake fluid and pump the brake pedal a few times to bring the pads to their normal position alongside the disc.



Installed view of the front brake caliper.

(13) Instal the road wheels and lower the vehicle to the ground. Tighten the road wheel nuts.

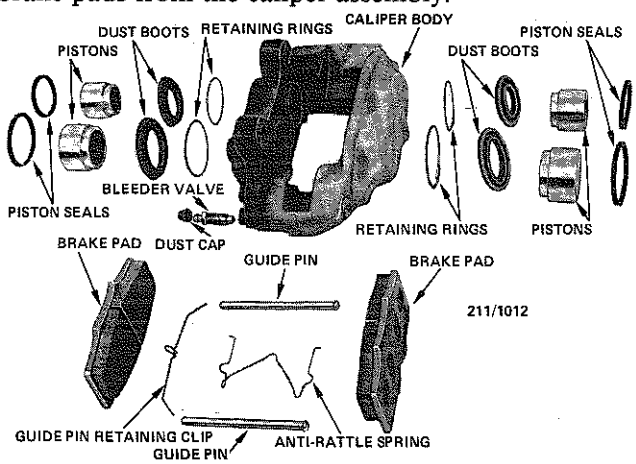
TO OVERHAUL CALIPER

(1) Loosen the front road wheel nuts, raise the front of the vehicle and support on chassis stands. Remove the front road wheels.

(2) Note or mark the installed position of the guide pins, the guide pins retaining clip(s) and the anti-rattle spring and remove them from the caliper assembly as previously described.

(3) If the brake pads are to be used again, mark the brake pads to ensure original replacement.

(4) Using a suitable pair of pliers, grasp the outer metal part of the brake pad and remove the brake pads from the caliper assembly.



Dismantled view of the front brake caliper.

(5) Disconnect the brake pipe from the rear of the caliper body. Plug the pipe end to prevent entry of dirt and loss of brake fluid.

(6) Remove the caliper retaining bolts and remove the caliper from the swivel hub or steering knuckle.

(7) Remove the piston dust cover retaining rings and remove the dust covers from the caliper body and pistons.

(8) Using a daub of quick drying paint, mark the installed position of each inner and outer caliper piston to ensure correct installation during assembly.

(9) Position a piece of wood approximately 16mm thick in the caliper slot between the pistons and, using low pressure compressed air applied to the caliper brake pipe aperture, carefully force the pistons out of their bores against the piece of wood.

(10) Remove the piece of wood and withdraw each piston from its bore

(11) Using a thin blunt probe made of wood or plastic, carefully remove the piston seals from the caliper bores.

NOTE: The caliper is constructed in two halves and is held together by four bolts, it is not advisable to separate the two halves. If seepage or distortion is evident, it is recommended that the caliper is renewed.

(12) Clean all caliper components except the brake pads in methylated spirits and examine for wear. Renew components that, upon inspection, prove to be excessively scored, pitted, worn or cracked.

Discard the piston seals and the dust covers.

NOTE:It is permissible to polish the caliper bore with very fine wet and dry paper to remove accumulated rust or foreign matter.

Do not attempt to use any type of abrasive paper or material to clean the caliper pistons.

(13) Smear the new piston seals with rubber grease or clean brake fluid and instal the seals to their respective grooves in the caliper bores. Ensure that the seals are not twisted and are correctly seated in their grooves.

(14) Instal the new dust covers to each piston and instal the pistons, one at a time and as marked prior to removal, squarely into their respective bores. Do not use more than thumb pressure to push the pistons fully into their bores.

(15) Fit the outer lips of the dust covers to the caliper and retain the dust covers with the retaining rings.

(16) Position the caliper assembly over the brake disc into the swivel hub or steering knuckle and instal and tighten the retaining bolts to Specifications.

(17) Instal the brake pads as previously described.

(18) Connect the brake pipe to the rear of the caliper and tighten securely.

(19) Bleed the brakes as outlined under the heading Hydraulic System.

(20) Start the engine to activate the brake servo unit and depress the brake pedal hard. Check for fluid leaks at the caliper.

(21) Instal the road wheel and lower the vehicle to the ground. Tighten the road wheel nuts.

TO REMOVE AND INSTAL BRAKE DISC

(1) Loosen the front road wheel retaining nuts, raise the front of the vehicle and support on chassis stands. Remove the road wheel.

(2) Disconnect the brake pipe from the caliper assembly and plug the pipe ends to prevent the entry of dirt and loss of luid.

(3) Remove the caliper retaining bolts and remove the caliper assembly from the swivel hub or steering knuckle.

(4) On models with free wheel hubs, proceed as follows:

(a) Set the free wheel control to the Free position and remove the cover retaining bolts. Remove the cover and gasket from the hub.

(b) Remove the retaining snap ring or bolt and washer from the drive shaft.

(c) Using a suitable drift, remove the split cone washers from the free wheel hub and remove the free wheel hub assembly from the hub.

(5) On models without free wheel hubs, proceed as follows:

(a) Remove the dust cap from the drive flange.

(b) Remove the retaining snap ring from the drive shaft.

(c) Remove the nuts retaining the drive flange to the hub

(d) Using a suitable drift, remove the split cone washers from the flange.

(e) Instal two suitable bolts in the threaded holes in the drive flange and tighten the bolts to remove the flange from the hub.

(6) Knock back the tabs on the lock washer and remove the locknut and the lock washer from the stub axle.

(7) If a dial gauge is available, slightly tighten the hub bearing adjusting nut and check the runout of the brake disc. See Specifications for run out limit.

(8) Remove the bearing adjusting nut, the thrust washer and the baring cone from the hub assembly.

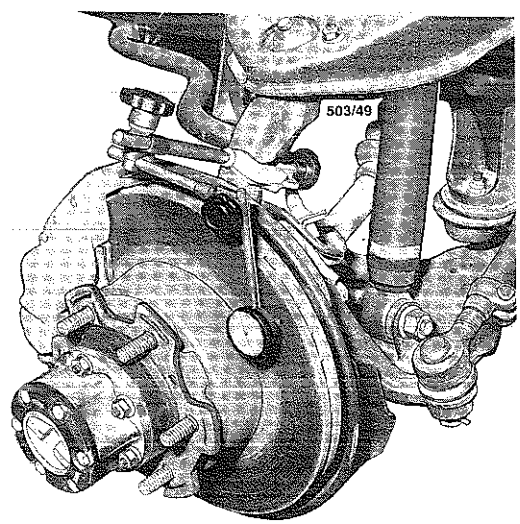
(9) Pull the hub assembly off the stub axle and plug each end of the hub with clean cloth to prevent the entry of dirt.

(10) Place the hub assembly in a vice fitted with soft jaws and mark the hub and disc to ensure correct alignment on assembly

(11) Remove the bolts retaining the brake disc to the hub and separate the two components.

(12) Clean the disc with a suitable solvent and examine the disc for damage., scoring and wear.

NOTE: Should the disc require machining remove only the amount required to eliminate the scoring, chipping or run out.

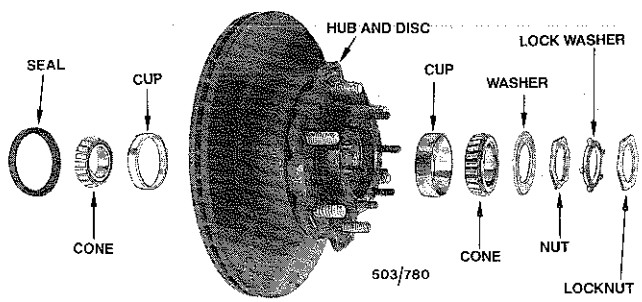


Checking the brake disc for runout. The brake disc runout should not exceed 0.15 mm.

(13) If necessary, service the hub bearings as described in the Front Axle section.

Installation is a reversal of the removal procedure with attention to the following points:

(1) Clean the mating surfaces of the disc and the hub flange, position the disc on the hub according to the mark made on removal and instal the retaining bolts and washers. Tighten the bolts to the specified torque.



Dismantled view of the front hub.

(2) Instal the hub and disc assembly to the stub axle.

(3) Instal the outer hub bearing, thrust washer and adjusting nut and adjust the hub bearings as described in the Front Axle section.

(4) Instal the lock washer and lock the adjusting nut by bending one of the lock washer tabs inward.

(5) Instal and tighten the locknut and lock the locknut by bending one of the lock washer tabs outward.

(6) Instal the drive flange or free wheel hub assembly.

Refer to the Front Axle section if necessary.

NOTE: If the drive shaft does not protrude enough through the drive flange or free wheel hub assembly to allow the installation of the snap ring, instal a suitable bolt into the centre of the drive shaft and pull the shaft outward through the flange.

(7) Instal the caliper and the brake pads as an assembly to the swivel hub or steering knuckle and instal and tighten the retaining bolts to Specifications.

(8) Instal the brake pipe to the caliper and bleed the brakes as outlined under the heading Hydraulic System.

(9) Depress the brake pedal to locate the brake pads to their normal running position alongside the disc.

7. REAR BRAKES

TO REMOVE AND DISMANTLE

RN36, 46 Models

(1) Chock both front road wheels and loosen the rear road wheel retaining nuts.

(2) Raise the rear of the vehicle and support it on chassis stands. Remove the road wheel.

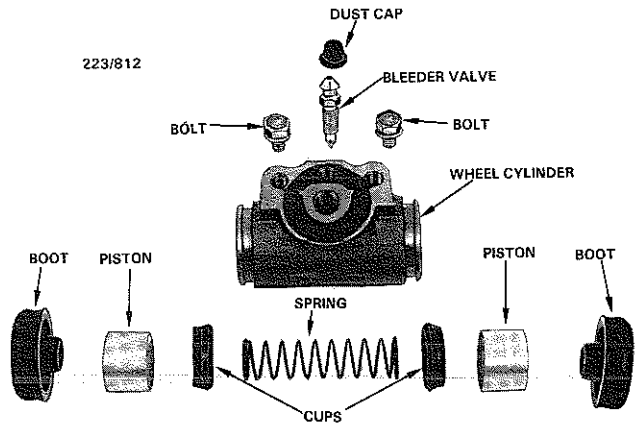
(3) Release the handbrake and remove the brake drum. If necessary, instal suitable bolts into the threaded holes in the brake drum and withdraw the drum from the drive shaft flange.

NOTE: Self adjusters are fitted to the rear brake assemblies which may have to be released to enable the brake drum to be removed. To carry out this operation remove the rubber grommet from the rear of the backing plate, insert a thin screwdriver into the aperture and push the self adjuster lever away from the adjuster screw. While holding the adjuster lever away from the adjusting screw insert an adjusting tool in through the aperture and engage the adjusting tool with the teeth on the adjusting screw. Rotate the adjusting screw until the brake drum can be removed from the drive shaft flange.

(4) Mark or note the installed position of each brake shoe and return spring to ensure correct assembly.

(5) Using a suitable pair of brake shoe pliers or vice grips, remove the adjuster assembly spring from the brake shoes.

(6) Compress the shoe hold down spring on the rear shoe, turn the hold down spring retainer through 90 degrees and remove the hold down spring components and pin from the brake shoe.



Dismantled view of the wheel cylinder. RN36, 46 and YN63 models.

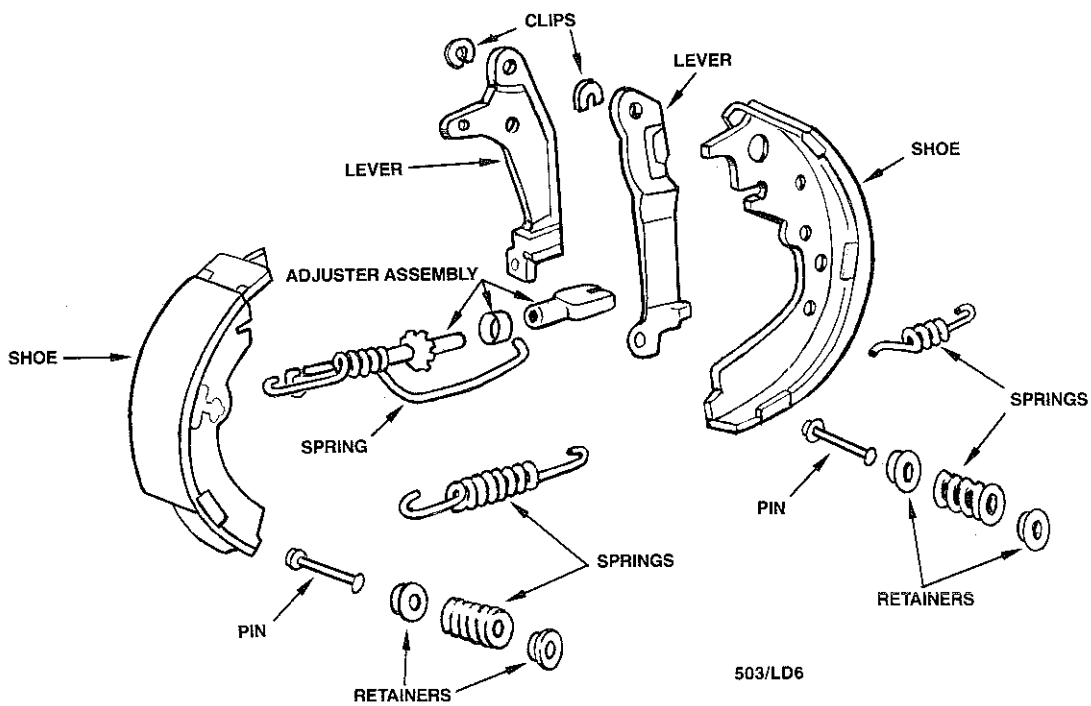
(7) Using a suitable pair of brake shoe pliers or vice grips remove the lower return spring from the brake shoes.

(8) Remove the rear shoe and adjuster assembly from the backing plate and remove the automatic adjusting lever tension spring and ratchet fork from the rear shoe.

(9) Using suitable pliers, remove the handbrake cable from the handbrake lever on the rear brake shoe.

(10) Remove the front shoe hold down spring assembly and remove the front shoe from the backing plate.

(11) If necessary, remove the handbrake lever and automatic adjusting lever retaining C clips and



Dismantled view of the rear brake assembly. RN36, 46 models.

remove the levers from the rear shoe pivot pin.

(12) If the wheel cylinder is not being removed, secure the pistons with a clamp or tying wire.

(13) If necessary, disconnect the brake pipe from the rear of the wheel cylinder and plug the pipe aperture to prevent the entry of dirt or loss of fluid.

(14) Remove the bleeder valve from the wheel cylinder. Remove the wheel cylinder retaining bolts and remove the cylinder from the backing plate.

(15) Remove the rubber boots, pistons, cups and spring from the wheel cylinder.

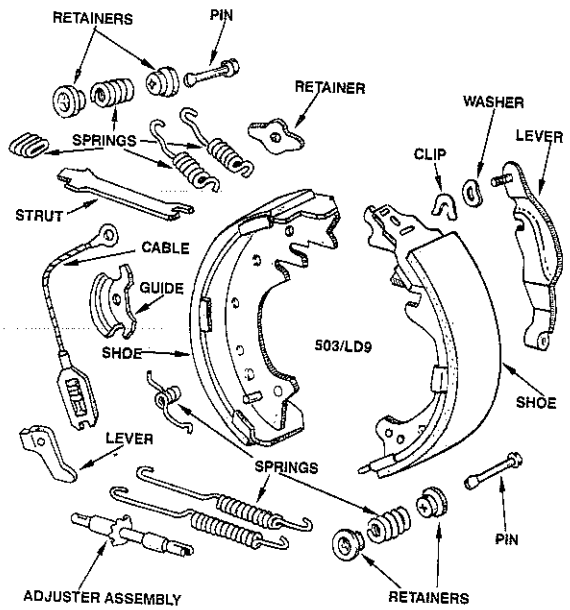
YN65, 67 Models

(1) Chock both front wheels and loosen the rear road wheel retaining nuts.

(2) Raise the rear of the vehicle and support it on chassis stands. Remove the road wheel.

(3) Release the handbrake and remove the brake drums. If necessary insert suitable bolts into the threaded holes in the brake drum and withdraw the drum from the drive shaft flange.

NOTE: Self adjusters are fitted to the rear brake assemblies which may have to be released to enable the brake drum to be removed. To carry out this operation remove the rubber grommet from the rear of the backing plate, insert a thin screwdriver into the aperture and push the self adjuster lever away from the adjuster screw. While holding the adjuster lever away from the adjusting screw insert an adjusting tool in through the aperture and engage the adjusting tool with the teeth on the adjusting screw. Rotate the adjusting screw until the brake drum can be removed from the drive shaft flange.



Dismantled view of the rear brake assembly. YN65, 67 models.

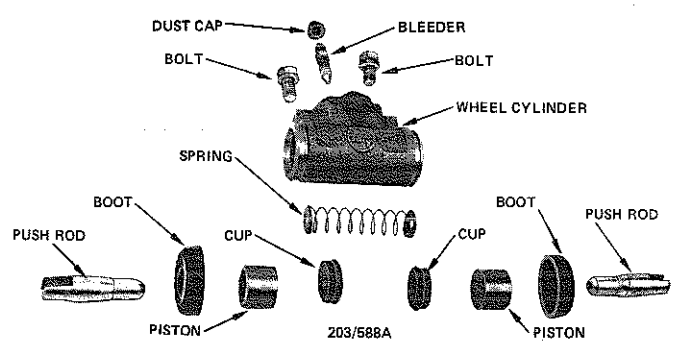
(4) Mark or note the installed position of each brake shoe and return spring to ensure correct assembly.

(5) Using suitable brake shoe pliers or vice grips, disconnect the brake shoe upper return springs from the backing plate pivot pin and remove the springs and automatic adjuster cable guide from the brake shoes.

(6) Lift the automatic adjusting lever and disconnect the adjusting cable from the lever. Remove the lever tension spring and remove the lever from the rear brake shoe.

(7) Remove the retaining plate and adjusting cable from the pivot pin.

(8) Compress the shoe hold down spring on the rear shoe, turn the hold down spring retainer through 90 degrees and remove the hold down spring components and pin from the brake shoe.



Dismantled view of the wheel cylinder components. YN65, 67 models.

(9) Using suitable brake shoe pliers or vice grips remove the lower return springs from the brake shoes and backing plate.

(10) Remove the handbrake strut and the adjuster assembly from the brake shoes.

(11) Remove the front shoe hold down spring assembly and remove the front shoe from the backing plate.

(12) Disconnect the hand brake cable from the pivot lever and remove the shoe.

(13) If necessary remove the retaining C clip and washer and remove the handbrake lever and cable from the front shoe.

(14) If the wheel cylinder is not being removed secure the pistons with a clamp or tying wire.

(15) If necessary, disconnect the brake pipe from the rear of the wheel cylinder and plug the pipe aperture to prevent the entry of dirt and loss of fluid.

(16) Remove the bleeder valve from the wheel cylinder. Remove the wheel cylinder retaining bolts and remove the cylinder from the backing plate.

(17) Remove the piston push rods, rubber boots, pistons and spring from the wheel cylinder.

(18) If necessary, remove the backing plate handbrake lever and pivot lever as follows:

(a) Using a suitable pair of pliers, remove the

return spring from the backing plate handbrake lever and backing plate.

(b) Remove the handbrake rear cable clevis pin retaining split pin. Remove the clevis pin and disconnect the cable from the lever.

(c) Using a suitable screwdriver, remove the cable pivot lever retaining C clip and remove the lever from the pivot pin on the backing plate.

(d) Remove the short handbrake cable from the pivot lever and backing plate handbrake lever.

(e) Remove the backing plate handbrake lever retaining bolts and remove the lever from the backing plate.

YN63 Models

(1) Chock both front wheels and loosen the rear road wheel retaining nuts.

(2) Raise the rear of the vehicle and support it on chassis stands. Remove the road wheels.

(3) Release the handbrake and remove the brake drum. If necessary insert suitable bolts into the threaded holes in the brake drum and withdraw the drum from the drive shaft flange.

NOTE: Self adjusters are fitted to the rear brake assemblies which may have to be released to enable the brake drum to be removed. To carry out this operation remove the rubber grommet from the rear of the backing plate, insert a thin screwdriver into the aperture and push the self adjuster lever away from the adjuster screw. While holding the adjuster lever away from the adjusting screw insert an adjusting tool in through the aperture and engage the adjusting tool with the teeth on the adjusting screw. Rotate the adjusting screw until the brake drum can be removed from the drive shaft flange.

(4) Mark or note the installed position of each brake shoe and return spring to ensure correct assembly.

(5) Using a suitable pair of brake shoe pliers or vice grips, remove the upper return spring from the brake shoes.

(6) Compress the shoe hold down spring on the rear shoe, turn the hold down spring retainer through 90 degrees and remove the hold down spring components and pin from the brake shoe.

(7) Remove the front shoe hold down spring assembly from the backing plate.

(8) Using a suitable pair of brake shoe pliers or vice grips, remove the lower return spring and remove the rear shoe from the backing plate.

(9) Remove the handbrake cable from the backing plate pivot lever and remove the front shoe and adjuster assembly. Remove the adjuster assembly from the brake shoe.

(10) Using a suitable pair of pliers remove the handbrake cable from the handbrake lever on the front shoe.

(11) Using a suitable pair of pliers remove the automatic adjusting lever tension spring from the brake shoe.

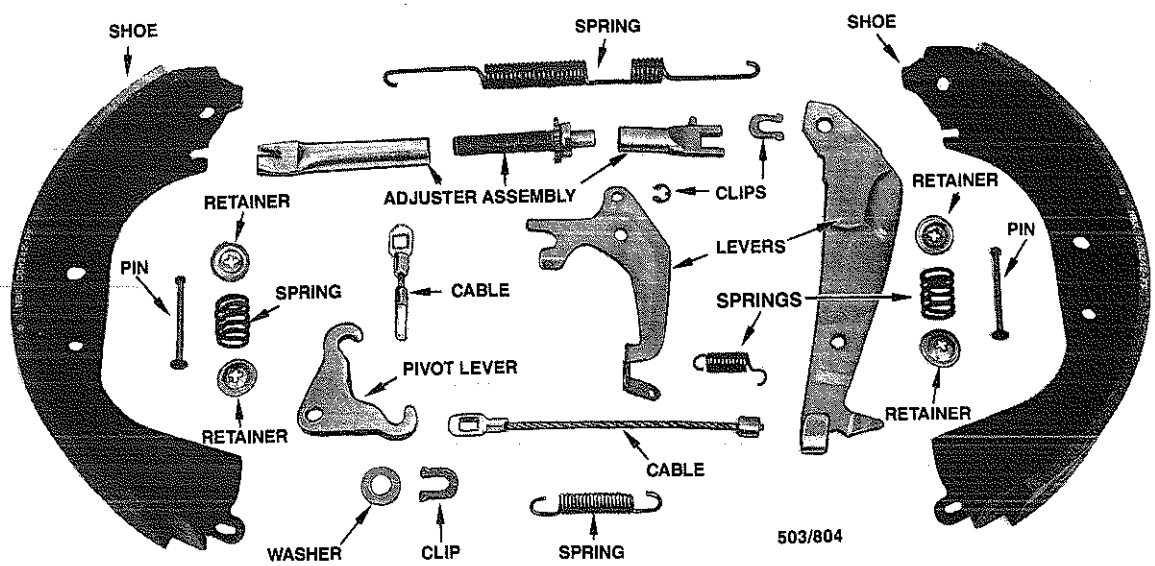
(12) If necessary remove the handbrake lever and automatic adjusting lever retaining clips and remove the levers from the front shoe. Discard the retaining clips.

(13) If the wheel cylinder is not being removed secure the pistons with a clamp or tying wire.

(14) If necessary disconnect the brake pipe from the rear of the wheel cylinder and plug the pipe aperture to prevent the entry of dirt and loss of fluid.

(15) Remove the bleeder valve from the wheel cylinder. Remove the wheel cylinder retaining bolts and remove the cylinder from the backing plate.

(16) Remove the rubber boots, pistons, cups and



Dismantled view of the rear brake assembly. YN63 model.

spring from the wheel cylinder.

(17) If necessary, remove the backing plate handbrake lever and pivot lever as follows:

(a) Using a suitable pair of pliers, remove the return spring from the rear of the backing plate handbrake lever and backing plate.

(b) Remove the handbrake rear cable clevis pin retaining split pin. Remove the clevis pin and disconnect the cable from the lever.

(c) Using a suitable screwdriver, remove the cable pivot lever retaining C clip and remove the lever from the pivot pin on the backing plate.

(d) Remove the short handbrake cable from the pivot lever and backing plate handbrake lever.

(e) Remove the backing plate handbrake lever retaining bolts and remove the lever from the backing plate.

TO CLEAN AND INSPECT

(1) Check the brake shoe linings for wear. If the thickness of the lining remaining is less than Specifications, renew the linings.

(2) If the linings are still serviceable check for oil saturation and gumminess and renew as required.

NOTE: If the brake shoes are contaminated trace and rectify the leak prior to installing new brake shoes.

Never renew brake shoes on one wheel without renewing the brake shoes on the opposite wheel as dangerous variable braking effects could occur.

(3) Check the brake drums for cracks, scoring and ovality. Renew or machine the brake drums as necessary.

(4) Check the operating cables for damage and fraying and renew as required.

(5) Check the levers for damage and wear and renew as required.

(6) Compare the tension of the brake shoe return springs with new springs and renew as necessary.

(7) Ensure that the ratchet wheel on the adjuster assembly is free to turn and screw the ratchet wheel fully on to the adjuster.

NOTE: Keep the self adjuster components separate as they cannot be interchanged from one side to the other.

(8) Wash the wheel cylinder components in methylated spirits and blow dry with compressed air.

(9) Check the wheel cylinder pistons and the cylinder bore for wear and pitting and renew or hone as necessary.

NOTE: Check the bleeder valve for blockage. Always renew the rubber cups and boots.

TO ASSEMBLE AND INSTAL

RN36, 46 Models

Assembly and installation is a reversal of the removal and dismantling procedure with attention to the following points:

(1) Apply rubber grease to the cylinder cups and piston.

(2) Apply high melting point grease to the brake shoe contact surfaces on the backing plate and the threaded components of the adjuster assembly.

(3) Lubricate the cylinder bore with clean brake fluid and instal the spring, cups, pistons and rubber boots to the wheel cylinder. Ensure that the piston cups are facing the pressure end of the cylinder and that the cup lips are not distorted.

(4) Instal the wheel cylinder and retaining bolts to the backing plate. Do not tighten the retaining bolts at this stage.

(5) Instal the brake pipe and bleeder valve to the wheel cylinder and tighten the cylinder retaining bolts, brake pipe and bleeder valve securely.

(6) Where applicable, instal the handbrake lever and automatic adjusting lever to the rear brake shoe and secure with the retaining C clips.

(7) Instal the handbrake cable to the handbrake lever.

(8) Instal the automatic adjusting lever tension spring and adjuster assembly fork to the rear brake shoe. Position the brake shoe on the backing plate.

(9) Ensure that the brake shoe is correctly located and instal the retaining hold down spring assembly.

(10) Position the front brake shoe on the backing plate.

(11) Ensure that the brake shoe is correctly located and instal the retaining hold down spring assembly. Where applicable, remove the wheel cylinder clamp or tying wire.

(12) Instal the brake shoe lower return springs to the brake shoes.

(13) Instal the adjuster assembly and connect the return spring to both brake shoes. Check the automatic adjuster mechanism operation and decrease the adjuster length to the minimum.

(14) Instal the brake drums and manually adjust the brakes as described under the heading Brake Adjustments.

(15) Bleed the hydraulic system as described under the heading Hydraulic System.

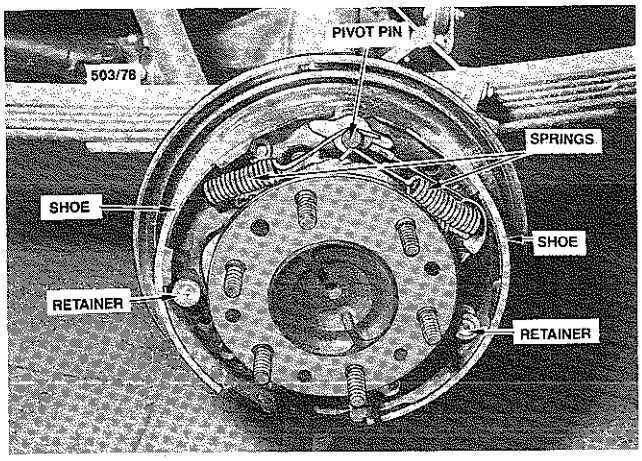
(16) Instal the road wheels, lower the vehicle to the ground and tighten the wheel nuts.

YN65, 67 Models

Assembly and installation is a reversal of the removal and dismantling procedure with attention to the following points:

(1) Apply rubber grease to the cylinder cups and piston.

(2) Apply high melting point grease to the brake



Installed view of the rear brake assembly. YN65, 67 models.

shoe contact surfaces on the backing plate and the screwed components of the adjuster assembly.

(3) Lubricate the cylinder bore with clean brake fluid and instal the spring, cups, piston and rubber boots to the wheel cylinder. Ensure that the piston cups are facing the pressure end of the cylinder and that the cup lips are not distorted.

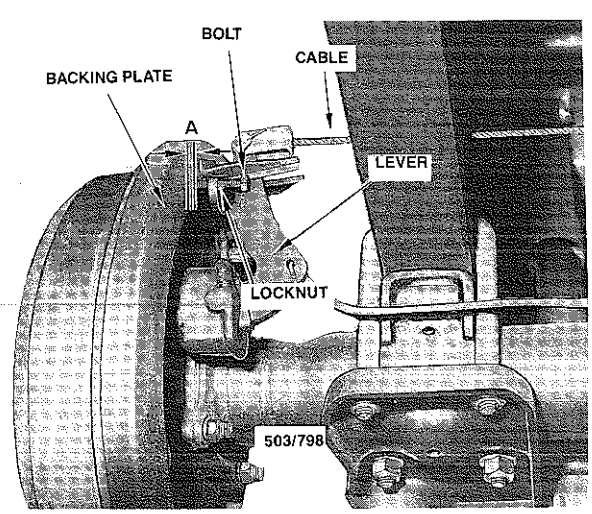
(4) Instal the wheel cylinder and retaining bolts to the backing plate. Do not tighten the retaining bolts at this stage.

(5) Instal the brake pipe and bleeder valve to the wheel cylinder and tighten the cylinder retaining bolts, brake pipe and bleeder valve securely.

(6) Instal the piston push rods to the cylinder ensuring that they are firmly located in the rubber boots.

(7) If necessary, instal the backing plate handbrake lever and pivot lever as follows:

(a) Instal the backing plate handbrake lever and retaining bolts to the backing plate and tighten the retaining bolts securely.



View of the backing plate handbrake lever showing the adjusting bolt and adjustment location. A = adjustment measuring location.

(b) Position the short handbrake cable on the backing plate handbrake lever and the pivot lever.

(c) Instal the pivot lever on the pivot pin on the front of the backing plate and secure it with a new C clip.

NOTE: Apply a thin coat of high melting point grease to all contact surfaces as required.

(8) Where applicable, instal the handbrake lever to the front shoe and retain it with a new C clip.

(9) Instal the front shoe handbrake cable to the backing plate pivot lever and front shoe handbrake lever. Position the front shoe on the backing plate.

(10) Ensure that the shoe is correctly located in the cylinder push rod and instal the retaining hold down spring assembly.

(11) Instal the strut assembly and rear shoe to the backing plate ensuring that the strut spring is to the rear.

(12) Ensure that the strut spring assembly and shoe are located correctly and instal the retaining hold down spring assembly.

(13) Using suitable brake shoe pliers or vice grips instal the brake shoe lower return springs.

(14) Using a suitable screwdriver to hold the shoes apart, instal the adjuster assembly. Ensure that the shoes are positioned in the locating slots with the adjuster ratchet opposite the backing plate rubber grommet.

(15) Instal the cable guide to the rear brake shoe.

(16) Instal the adjusting cable to the brake shoe pivot pin ensuring that the cable is located in the cable guide.

(17) Instal the shoe retaining plate to the pivot pin, using a suitable pair of brake shoe pliers or vice grips instal the upper return springs to the shoes and pivot pin as noted on removal.

(18) Instal the automatic adjusting lever tension spring and lever to the rear shoe.

(19) Instal the adjusting cable to the adjusting lever and position the lever tension spring. Check the automatic adjuster mechanism operation and decrease the adjuster assembly length to the minimum.

(20) Instal the brake drums and manually adjust the brakes as described under the heading Brake Adjustment.

(21) Bleed the hydraulic system as described under the heading Hydraulic System.

(22) If necessary, instal the handbrake rear cable as follows:

(a) Pull the backing plate handbrake lever rearwards until there is no free play on the connecting short cable and measure the distance between the handbrake lever adjusting bolt and the backing plate surface. If necessary loosen the lever adjusting bolt locknut and adjust the bolt until a clearance of 1.0-2.0

mm is gained between the bolt and the backing plate and secure the bolt with the locknut.

(b) Instal the rear handbrake cable to the backing plate lever, instal the cable clevis pin and new retaining split pin.

(c) Instal the backing plate lever return spring to the lever and backing plate.

(23) Instal the road wheels, lower the vehicle to the ground and tighten the wheel nuts.

YN63 Models

Assembly and installation is a reversal of the removal and dismantling procedure with attention to the following points:

(1) Apply rubber grease to the cylinder cups and pistons.

(2) Apply high melting point grease to the brake shoe contact surfaces on the backing plate and the threaded components of the adjuster assembly.

(3) Lubricate the cylinder bore with clean brake fluid and instal the spring, cups, piston and rubber boots to the wheel cylinder. Ensure that the piston cups are facing the pressure end of the cylinder and that the cup lips are not distorted.

(4) Instal the wheel cylinder and retaining bolts to the backing plate. Do not tighten the retaining bolts at this stage.

(5) Instal the brake pipe and bleeder valve to the wheel cylinder and tighten the cylinder retaining bolts, brake pipe and bleeder valve securely.

(6) Where applicable, instal the handbrake lever and automatic adjusting lever to the rear shoe and secure with new retaining clips.

(7) If necessary, instal the backing plate handbrake lever and pivot lever as follows:

(a) Instal the backing plate handbrake lever and retaining bolts and tighten the retaining bolts securely.

(b) Position the short handbrake cable on the backing plate handbrake lever and the pivot lever.

(c) Instal the pivot lever on the pivot pin on the backing plate and secure it with a new C clip.

NOTE: Apply a thin coat of high melting point grease to all sliding parts as required.

(8) Instal the adjuster assembly to the handbrake lever on the front brake shoe.

(9) Instal the automatic adjusting lever tension spring to the front brake shoe.

(10) Instal the handbrake cable to the pivot lever on the backing plate and the handbrake lever on the front brake shoe.

(11) Position the front shoe on the backing plate. Ensure that the shoe is correctly located and instal the retaining hold down spring assembly.

(12) Instal the brake shoe lower return springs to the shoes and position the rear brake shoe on the backing plate.

(13) Ensure that the rear shoe is correctly located and instal the retaining hold down spring assembly.

(14) Using a suitable pair of brake shoe pliers or vice grips, instal the upper return spring to the brake shoes.

(15) Check the automatic adjuster mechanism operation and decrease the adjuster length to the minimum.

(16) Instal the brake drums and manually adjust the brakes as described under the heading Brake Adjustment.

(17) Bleed the hydraulic system as described under the heading Hydraulic System.

(18) If necessary, instal the handbrake rear cable as follows:

(a) Pull the backing plate handbrake lever rearwards until there is no free play on the connecting short cable and measure the distance between the handbrake adjusting bolt and the backing plate surface. If necessary loosen the lever adjusting bolt locknut and adjust the bolt until a clearance of 0.4-0.8 mm is gained between the bolt and the backing plate and secure the bolt with the locknut.

(b) Instal the rear handbrake cable to the backing plate lever, instal the cable clevis pin and new retaining split pin.

(c) Instal the backing plate lever return spring to the lever and backing plate.

(19) Instal the road wheels, lower the vehicle to the ground and tighten the wheel nuts.

8. HANDBRAKE CABLES AND LEVER ASSEMBLY

HANDBRAKE LEVER ASSEMBLY

To Remove and Dismantle

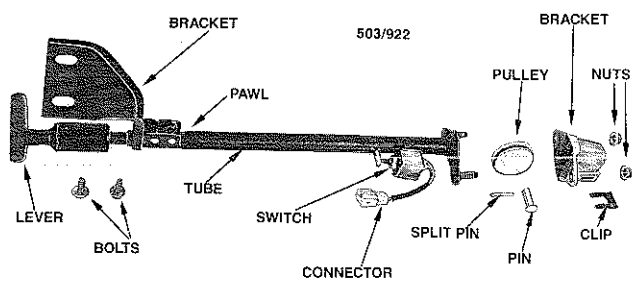
(1) Disconnect the negative battery terminal.

(2) Working in the passenger compartment, ensure that the handbrake is fully released and disconnect the handbrake warning lamp switch wiring connector.

(3) On YN63, 65 and 67 models proceed as follows:

(a) Remove the lower trim panel retaining screws and withdraw the panel from the dash.

(b) Disconnect the rheostat switch wiring connector and secure the trim panel to the side away from the work area.



Dismantled view of the handbrake lever and components, YN63, 65, 67 models.

(4) Remove the handbrake lever assembly upper retaining bolts.

(5) Working in the engine compartment, remove the outer cable retaining clip and retaining nuts from the pulley bracket.

(6) Raise the front of the vehicle and support on chassis stands. Working under the vehicle, remove the handbrake cable/rod adjusting nut at the cable fulcrum lever.

(7) Working in the vehicle, remove the handbrake warning lamp switch retaining nut and switch from the handbrake lever.

(8) Raise the ratchet pawl, push the handbrake lever shaft completely down to the fully released position and disconnect the inner cable nipple from the lever shaft.

(9) Lightly clamp the handbrake lever assembly in a vice and, using a suitable drift, remove the retaining pin from the lever handle. Remove the handle.

(10) If the handbrake pawl and spring assembly are to be renewed, use a suitable pin punch and remove the pawl retaining pin, spring and ratchet pawl from the assembly.

(11) Clean all the components as necessary and inspect them for distortion, damage and wear. Renew components as necessary.

To Assemble and Instal

Assembly and installation is a reversal of the removal and dismantling procedure with attention to the following points:

(1) Position the shaft in the guide and instal the ratchet pawl spring and new retaining pin to the lever assembly.

(2) Instal the warning lamp switch and tighten the retaining nut securely.

(3) Position the handle on the shaft and secure with the retaining pin.

(4) Working in the passengers compartment, position the handbrake assembly under the dash and connect the inner cable nipple to the shaft. Position the handbrake assembly to the bulkhead and instal the assembly upper retaining bolts. Do not tighten the retaining bolts at this stage.

(5) Working in the engine compartment, ensure that the inner cable is correctly located and position the pulley bracket on the bulkhead. Instal the bracket retaining nuts and tighten them securely.

(6) Ensure that the outer cable is securely located in the pully bracket and instal the cable retaining clip to the bracket.

(7) Working in the passengers compartment, tighten the lever assembly upper retaining bolts securely and connect the wiring connector to the warning lamp switch.

(8) If necessary, instal the dash lower trim panel and retaining screws and tighten them securely.

(9) Working under the vehicle, instal the adjusting nut to the inner cable and adjust the handbrake cable as described under the heading Brake Adjustments.

FRONT HANDBRAKE CABLE

To Remove and Instal

(1) Ensure that the handbrake is fully released, raise the vehicle to a suitable working height and support it on chassis stands.

(2) Working in the engine compartment, remove the front outer cable retaining clip and retaining nuts from the pulley bracket.

(3) Working under the vehicle, remove the handbrake cable/rod adjusting nut from the fulcrum lever.

(4) If necessary, remove the cable guard retaining bolt and remove the guard from the chassis bracket.

(5) Remove the front outer cable retaining clip at the chassis bracket.

(6) On RN36 and 46 models, disconnect the inner cable nipple from the fulcrum lever.

(7) On YN63, 65 and 67 models, remove the front cable clevis pin retaining split pin and remove the clevis pin and cable from the fulcrum lever.

(8) If necessary, remove the front cable stone guard retaining bolts and remove the stone guard from the vehicle.

(9) Remove the cable from the retaining clamps and manoeuvre if from the rear chassis crossmember.

(10) Working in the passenger compartment, remove the handbrake lever assembly upper retaining bolts, withdraw the lever assembly and disconnect the handbrake inner cable nipple from the lever shaft lower end.

(11) Working in the engine compartment, remove the cable retaining clamps and remove the cable from the vehicle.

Installation is a reversal of the removal procedure with attention to the following point:

Adjust the handbrake cable as described under the heading Brake Adjustments.

REAR HANDBRAKE CABLES

To Remove and Instal

Two types of handbrake cables are fitted to the range of vehicles covered by this manual.

On RN36 and 46 models the handbrake cable is of two piece construction.

On YN63, 65 and 67 models the handbrake cable is one piece with an integral equaliser bracket.

(1) Ensure that the handbrake is fully released, raise the vehicle to a suitable working height and support it on chassis stands.

(2) Working under the vehicle, remove the rear cable adjusting nut and locknut.

(3) On RN36 and 46 models, disconnect the rear inner cable nipple from the equaliser bracket.

(4) On YN63, 65 and 67 models proceed as follows:

(a) Remove the rear cable clevis pin retaining split pin and remove the clevis pin and cable from the fulcrum lever.

(b) Remove the rear outer cable retaining clip from the chassis bracket.

(5) Remove the fuel tank as described in the Fuel System section and remove the cable clamp retaining bolts and clamps. Remove the cable(s) from the vehicle.

(6) On RN36 and 46 models proceed as follows:

(a) Remove the rear brake drum and brake shoe from the backing plate as previously described under the heading Rear Brakes.

(b) Remove the handbrake cable outer cable retaining bolts and remove the cable from the rear of the backing plate.

(7) On YN63, 65 and 67 models proceed as follows:

(a) Remove both the handbrake cable clevis pin retaining split pins and remove the clevis pins and cables from the handbrake backing plate lever.

(b) Remove the cable guide retaining bolt and nut and separate the cable from the guide.

(c) Remove the cable/equaliser assembly retaining bolt, nut and washers from the rear axle.

(8) Manoeuvre the cable(s) from the chassis and remove them from the vehicle.

Installation is a reversal of the removal procedure with attention to the following point:

Adjust the handbrake cable(s) as described under the heading Brake Adjustments.

9. BRAKE PEDAL

TO REMOVE AND DISMANTLE

(1) Disconnect the negative battery terminal.

(2) Working inside the vehicle beneath the dash, disconnect the brake pedal return spring from the brake pedal clevis pin.

(3) On YN63, 65 and 67 models proceed as follows:

(a) Remove the lower trim panel retaining screws and withdraw the panel from the dash.

(b) Disconnect the rheostat switch wiring connector and secure the trim panel to the side away from the work area.

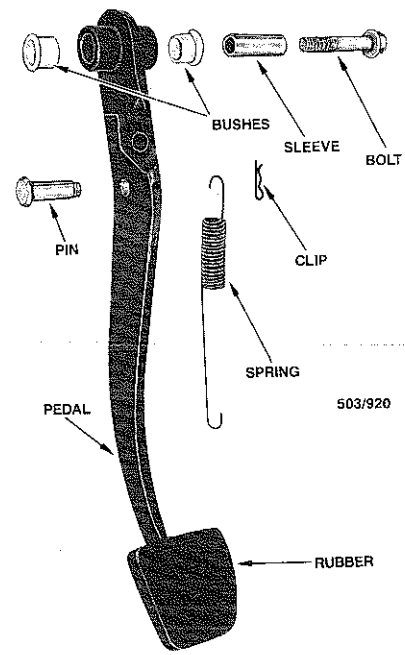
(c) Disconnect the heater ducting from the heater and vent and remove it from the vehicle.

(4) Remove the clip and remove the clevis pin from the servo unit pushrod and from the brake pedal.

(5) Disconnect the wires from the stop lamp switch, loosen the switch locknut and rotate the switch away from the brake pedal stop.

(6) Remove the brake pedal pivot bolt and withdraw the brake pedal from the vehicle.

(7) Remove the bushes and the sleeve from the brake pedal.



Dismantled view of the brake pedal and components.

(8) Inspect the components for wear, bending or cracks.

(9) Check the return spring for damage and loss of tension.

TO ASSEMBLE AND INSTAL

Installation is a reversal of the removal procedure with attention to the following points:

(1) Apply a coating of high melting point grease to the pivot bolt, the sleeve and the pivot bolt bushes.

(2) Insert the bushes and the sleeve into the pedal boss.

(3) Manoeuvre the pedal into position and instal the pivot bolt. Tighten the bolt securely.

(4) Fit the servo unit pushrod to the brake pedal, instal the clevis pin and its retaining clip and connect the pedal return spring.

(5) Measure the pedal height and free play and if necessary adjust the pedal height and free play as described below.

(6) Where necessary, instal the heater ducting to the heater and the vent.

(7) Where necessary, connect the rheostat switch wiring and instal the dash lower trim and retaining screws to the dash. Tighten the retaining screws securely.

TO ADJUST PEDAL HEIGHT

The dimension for the brake pedal height is measured between the uppermost edge of the pedal pad and the floor. Refer to Specifications for the correct dimension. If adjustment is necessary proceed as follows:

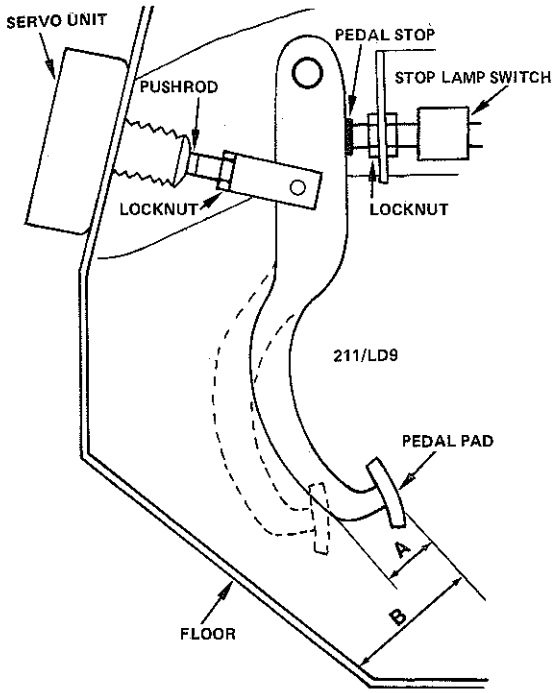


Illustration showing the brake pedal free play and height measuring and adjusting points. Dimension A = brake pedal free play. Dimension B = brake pedal height.

(1) Disconnect the negative battery terminal.
(2) Disconnect the wiring connector from the stop lamp switch.
(3) Loosen the locknut on the stop lamp switch and rotate the stop lamp switch away from the brake pedal.
(4) Loosen the locknut on the pushrod and adjust the pushrod to achieve the pedal height as listed in Specifications. Tighten the pushrod locknut.
(5) Screw in the stop lamp switch until the switch plunger is fully pushed in and the switch body slightly contacts the brake pedal stop rubber. Tighten the switch locknut.
(6) Connect the stop lamp switch wiring connectors and check the brake pedal free play as described below.

TO ADJUST PEDAL FREE PLAY

(1) Ensure that the brake pedal height is correct as previously described.
(2) Loosen the locknut on the servo unit pushrod and adjust the pushrod to achieve the correct pedal free play.
(3) When adjustment is complete tighten the pushrod locknut securely.

10. BRAKE ADJUSTMENTS

FRONT BRAKES

The front disc brakes are self adjusting and no manual adjustment is required or provided for.

REAR BRAKES

To Adjust in Service

Apply and release the handbrake lever several times to adjust the rear brake shoes.

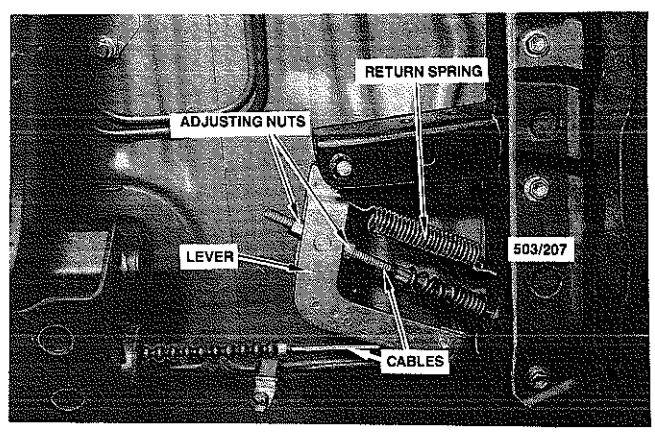
To Adjust Manually

(1) Chock the front wheels, raise the rear of the vehicle to a suitable working height and support it on chassis stands.
(2) Release the handbrake and with the transmission in neutral, check that the rear wheels turn freely without binding. If necessary slacken off the handbrake cable adjusting nuts until the wheels turn freely.
(3) Working under the vehicle loosen the locknut and adjust the tension of the cable(s) until the handbrake lever stroke is within the Specifications.
(4) Insert a suitable adjusting tool through the backing plate slot and rotate the adjusting ratchet wheel until the brake shoes lock the drum.
(5) With a small screwdriver also inserted in the backing plate slot, push the automatic adjusting lever away from the adjusting ratchet wheel and back off the adjusting ratchet between 10–12 notches or until the wheel turns freely without brake drag. Instal the rubber grommet to the backing plate.
(6) Using the same procedure adjust the remaining rear wheel and again check that the wheels rotate freely.
(7) Adjust the handbrake cable as described under the following heading.

NOTE: The rear self adjusting brakes do not need adjusting in service. The procedure described will be necessary to either back off the shoes in order to remove the brake drum or to initially adjust the shoes after renewal.

TO ADJUST HANDBRAKE

(1) Chock the front wheels, raise the rear of the vehicle to a suitable working height and support it on chassis stands.



View showing the handbrake cable adjusting points, YN63, 65, 67 models.

(2) If necessary adjust the rear brake shoes as previously described.

(3) Working under the vehicle loosen the locknut and adjust the tension of the cable(s) until the handbrake lever stroke is within the Specifications.

(4) When the cable(s) adjustment is complete tighten the cable/rod locknut securely.

(5) Lower the vehicle to the ground and check the handbrake operation on an incline. Check that when the handbrake is fully released the wheels turn freely and are not binding.

11. HYDRAULIC SYSTEM

TO BLEED

Bleeding the hydraulic system should only be necessary when some portion of the hydraulic system has been disconnected or fluid drained off, allowing air to enter the system.

The brake fluid in the hydraulic system should be changed at regular intervals, refer to the Lubrication and Maintenance section. The procedure for changing the brake fluid and bleeding the hydraulic system are similar with attention to the note in the text.

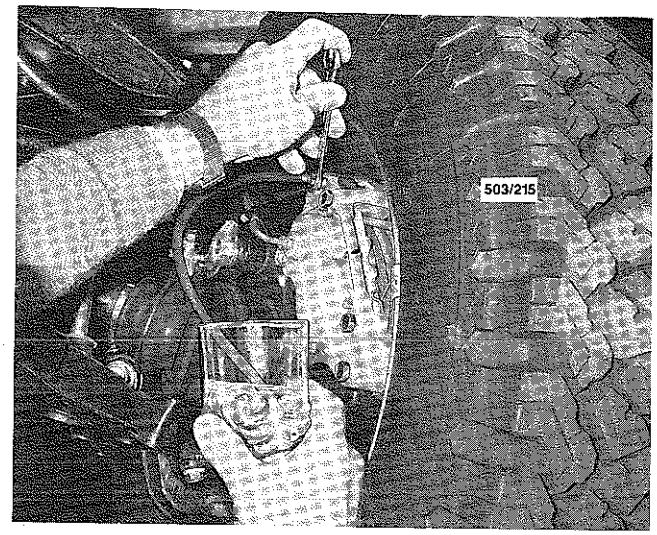
On all models there are five points in the system where bleeder valves are installed. One on each front caliper, one on each rear cylinder and one on the load sensing proportioning valve. The load sensing proportioning valve bleeder has a bolt which must be withdrawn to allow fluid to flow from the spout on the valve.

(1) Fill the fluid reservoirs with clean hydraulic brake fluid and maintain at least one-third full throughout the entire bleeding operation.

(2) Attach a transparent hose to the bleeder valve on the left rear wheel cylinder and immerse the other end of the hose in a small amount of clean brake fluid contained in a clean glass jar.

(3) Unscrew the bleeder valve one complete turn.

(4) Have an assistant depress the brake pedal slowly to the full extent of its travel. Close the bleeder valve and allow the brake pedal to return without assistance.



Method of bleeding the hydraulic system.

(5) Repeat operation (4) until a constant stream of fluid, without any air bubbles, is being discharged into the glass jar, hold the brake pedal down and tighten the bleeder valve.

NOTE: If changing the brake fluid, continue bleeding the system until clean new fluid flows from the bleeder hose.

Do not allow the fluid level in the reservoir to fall below one third full level at any time during the bleeding operation or air will enter the system and a fresh start will have to be made. Always use new brake fluid for topping up the reservoir.

(6) Carry out the bleeding operations, in the same manner, on the remaining bleeder valves in the system. Always work from the longest line in the system down to the shortest.

(7) After bleeding the system the brake pedal should be firm when depressed with no evidence of sponginess. Ensure that all the bleeder valves are tight.

(8) Top up the master cylinder reservoirs with clean brake fluid.