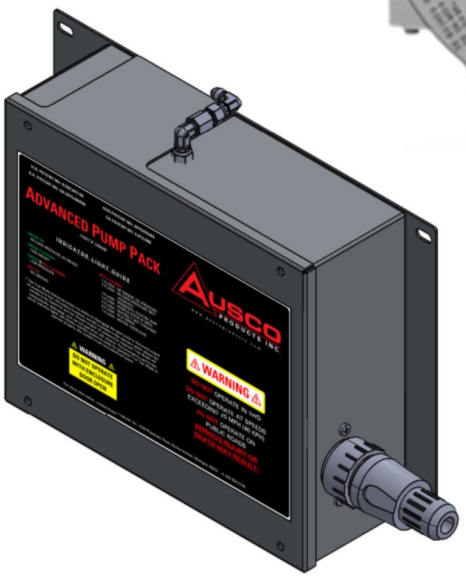
Ausco Products Inc.

LC Brake System
Wet Parking and Service
Installation Manual



Ausco's LC Brake is a braking system designed to survive the rugged conditions and harsh environments of the mining industry. Ausco's LC Brake is not intended or designed for on-highway driving. Ausco's LC Brake is a drop in replacement to the Toyota OEM brakes. This allows for simplicity in changeover and overall better performance and control of the braking system. This manual describes the installation procedures, daily operation and service requirements for optimum performance.

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FAILURE TO FOLLOW THESE SAFETY WARNINGS CAN RESULT IN SERIOUS INJURY OR DEATH.

- This brake is not safe or legal for on-highway use.
- This brake should only be used on vehicles whose maximum speed does not exceed 25 mph [40 kph].
- This brake should only be used on vehicles driven in 4WD.
- This brake should only be used with an Ausco pump kit. Do not use a pump kit from any other manufacturer.
- **NEVER USE AFTERMARKET PARTS WITH THIS BRAKE. AFTERMARKET PARTS MAY CAUSE THE BRAKE TO FAIL.**
- **It is unsafe to attempt any in-service brake adjustments. It can cause brake failure.**

Contact Ausco products (www.auscoproducts.com) for technical assistance with application or design questions.

LC Brake Advantages

The LC Brake is designed for the model 70 Toyota Land Cruiser. It is not designed for on-highway use. The LC Brake is designed expressly for mining applications. It is a drop in replacement to the OEM brakes. Minimal modifications are required to install it onto the OEM Toyota Land Cruiser axles. This brake is supplied pre-assembled and ready to install. The LC Brake design features Double 2-Stage technology, which utilizes the stock Toyota master cylinder and provides great pedal feel for strong, smooth stops. Operators and maintenance personnel alike will appreciate Ausco's commitment to reducing downtime through design features that include:

- High energy carbon lining for low maintenance and less downtime.
- Internal cooling chamber to lower operating temperatures for longer life.
- Fail-to-safe braking at the wheels allows for safe emergency stops with no driveline damage.
- Use of readily available fluid for easier service.
- Pre-assembled one piece design for easy installation and removal.
- Dual grease barrier sealing configuration to protect the hub and brake from water intrusion and contamination.
- Lightweight, hard-coat anodized aluminum housing design that:
    - Cools the brake faster for less fade
    - Increases brake life
    - Reduces corrosion in salty or acidic environments
    - Easier to handle for service

Description - What the LC Brake System Contains

The system contents include wet service and park brakes. They are fitted to the existing Toyota Land Cruiser OEM axle with little to no modification required. The Ausco service brakes use the existing stock Toyota master cylinder and vacuum booster. The addition of a supplementary hydro-boost or similar system is not necessary.

Parking brakes are integrated into the service brakes at wheel locations. The parking system is spring applied and hydraulically released. The park brakes are operated by an electric over hydraulic system that operates independent of the service brake system. The electric over hydraulic system, or Pump Pack, may be mounted along the interior back wall of the cab. It is sealed in a compact steel enclosure, and contains an electric motor, hydraulic pump, and PLC.

Operators have convenient access to park brake controls. The integrated dash panel control fits directly into the existing dash panel slot for the radio or can be mounted in an optional floor box. The dash panel control informs the operator of conditions that impact park brake ability. Through a series of light patterns, the operator is informed of the absence of engine oil pressure, an open door, low system pressure, or excessive leakage. A TOW MODE feature allows the operator to release the park brake for safe towing in the event of an engine failure.

As an option for the LC Brake, Ausco has designed a hose kit specifically for the Toyota Land Cruiser. It is highly recommended to be included in the purchase of the braking system. The convenience of this hose kit ensures a proper fit-up of lines and hoses to the Toyota Land Cruiser. This reduces installation time dramatically. It is also designed for high durability in the harsh underground mining environment. Contents include stainless-steel fittings, flexible hoses, brake

lines, brackets, and mounting hardware for service, parking, and venting lines. Service lines attach the master cylinder to the brakes. Parking lines connect the Pump Pack to the parking brakes. Vent lines connect service brakes to filtered vents located around the Toyota Land Cruiser.

Manual Layout

This manual describes the installation of the LC Brake System for the Toyota Land Cruiser. Installation must only be performed by a trained and certified maintenance mechanic and a qualified electrician. This manual provides a step-by-step method for removal of existing Toyota Land Cruiser braking hardware and the installation of Ausco Products Inc.'s LC Brake System.

! WARNING ! – Throughout this manual you will find: **! WARNING !, ! CAUTION !, ! NOTE !** and **! ALERT !,** notes.

DISREGARDING THESE SAFETY NOTICES MAY RESULT IN SERIOUS INJURY OR DEATH.

The safety of operators and those who service brakes is a primary concern.

!WARNING! Installation of the Ausco LC Brake System must only be performed by trained and certified mechanics. In absence of proper training and tools, damage and/or misadjustment to the LC Brake System can occur **RESULTING IN BRAKE FAILURE OR MALFUNCTION. SERIOUS INJURY OR DEATH CAN RESULT.**

When in doubt, do not hesitate to contact your LC Brake distributor or Ausco (www.auscoproducts.com) for assistance.

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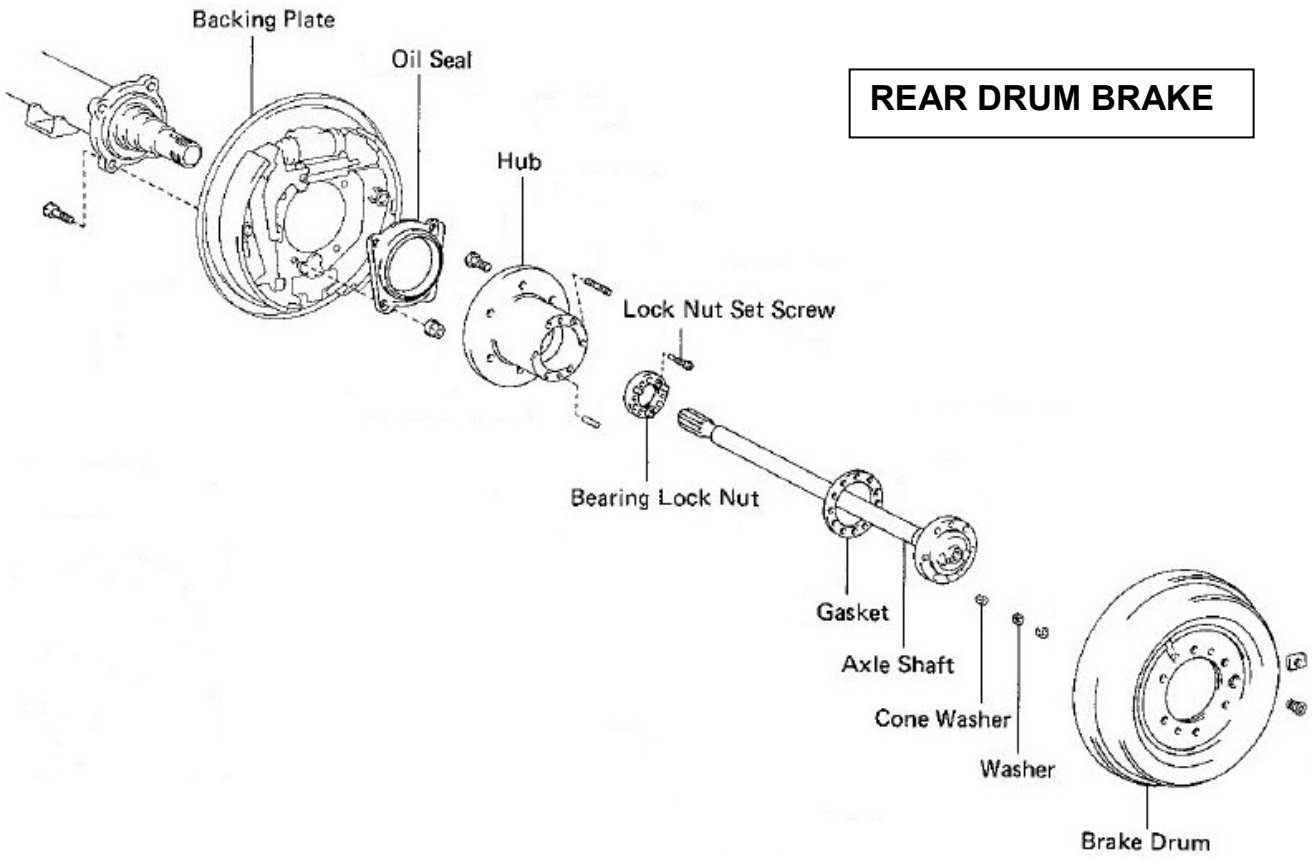
SECTION 1

PREPARING THE REAR WHEEL ENDS

FROM REAR DRUM BRAKES

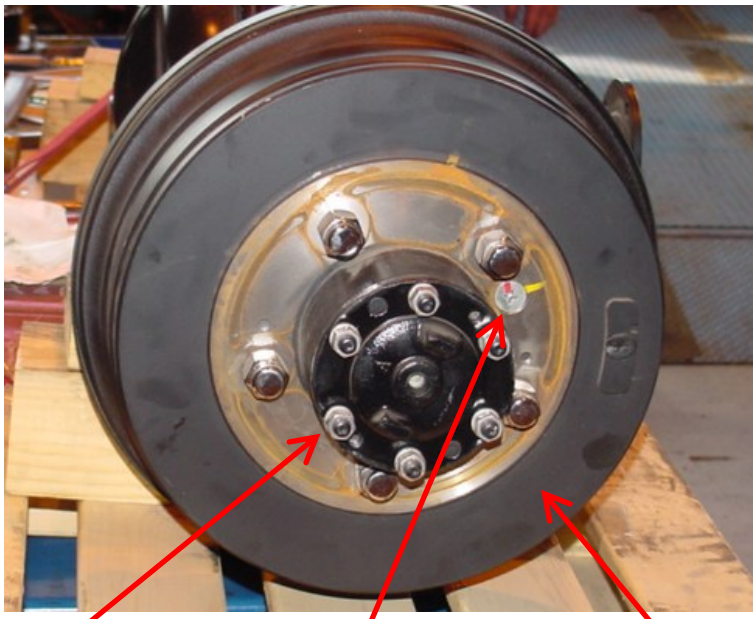
Follow the same procedure for both wheels. If you have rear disc brakes please skip to Section 2.

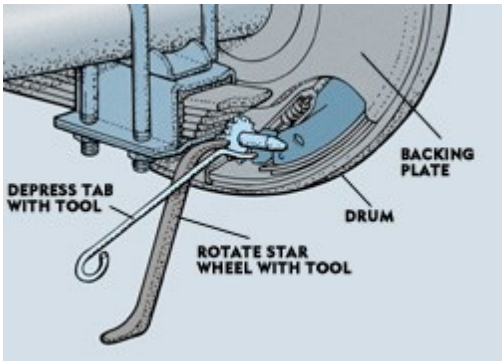


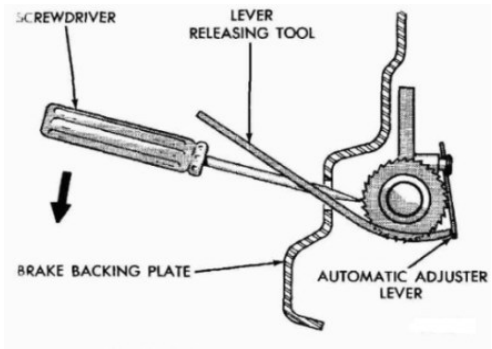
! NOTE ! If the brake line has not already been flushed it is **HIGHLY** recommended. This ensures that the system is clear of any contaminants in the brake lines and master cylinder.

1. Remove the drum brake from the rear axle.

! NOTE ! If the drum brake is not free to move, remove the plug on the back of the brake and adjust the star wheel adjuster as shown.





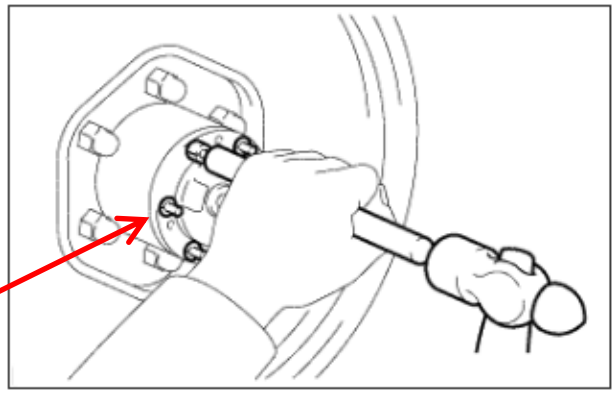


1. Remove the six axle nuts and six washers.

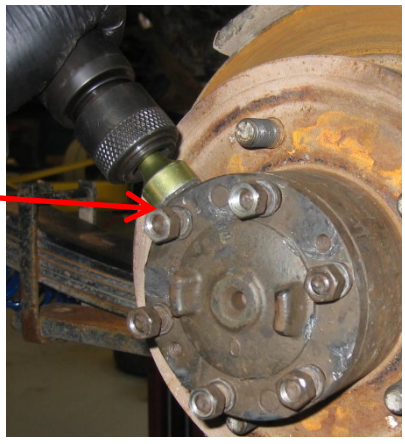
2. Remove the drum retainer screw.

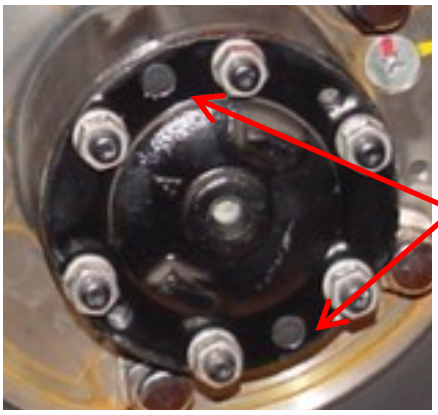
3. Remove the drum.

2. Remove the axle shaft

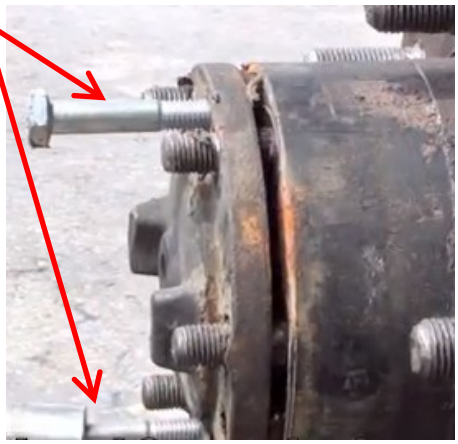


1. Tap out and remove the six cone washers. The cone washers can be difficult to remove. Toyota recommends using a brass punch and hammer to drive on the end of the stud (axially) to pop it apart. An air hammer driving axially on the end of the stud this same way can also be used, as long as the stud is not damaged. Sometimes, hammering radially on the side of the flange can help. See (a.) right. When all else fails, use a chisel to break the washer into pieces and replace the washers. Save the nuts, washers, and cone washers if possible.



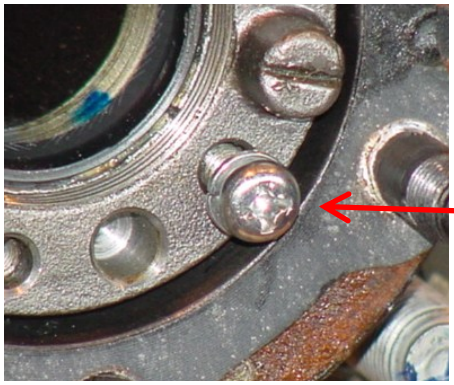


2. Acquire two class 10.9 12mm x 1.25 bolts with at least 30mm of thread length and screw them into the existing two holes on the face of the axle shaft flange to drive out the axle shaft. If needed run a tap through the existing holes to clean out debris. It is important to evenly drive the axle shaft out of the hub to ensure that the shaft does not bind.

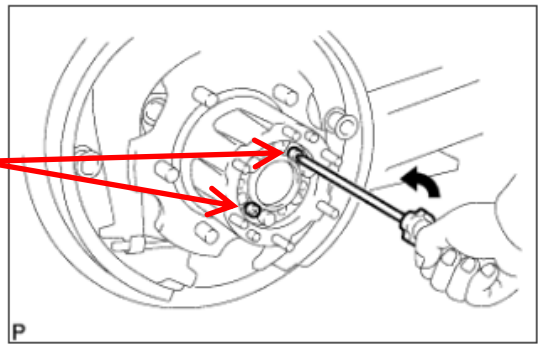


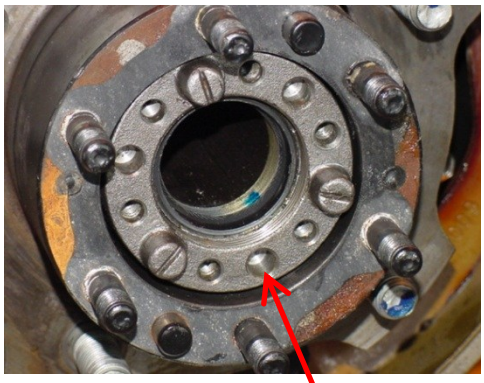
3. Remove the axle shaft and gasket carefully.

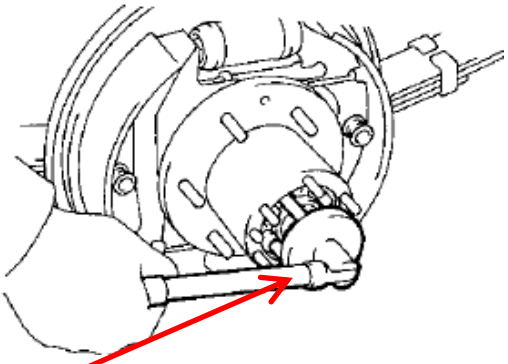
3. Remove the axle hub.



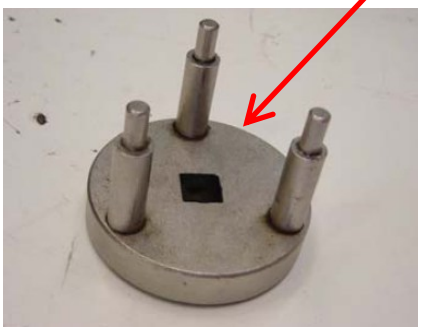
1. Remove the lock nut by removing the two button head screws.



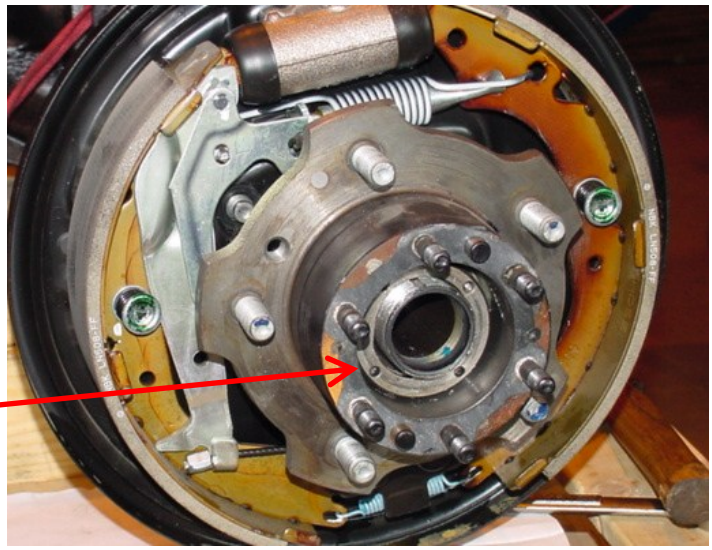




2. Remove bearing lock nut as shown above. Use Toyota Tool SST 09509-25011



3. Remove the hub.



4. Disconnect and remove the park brake and brake lever.

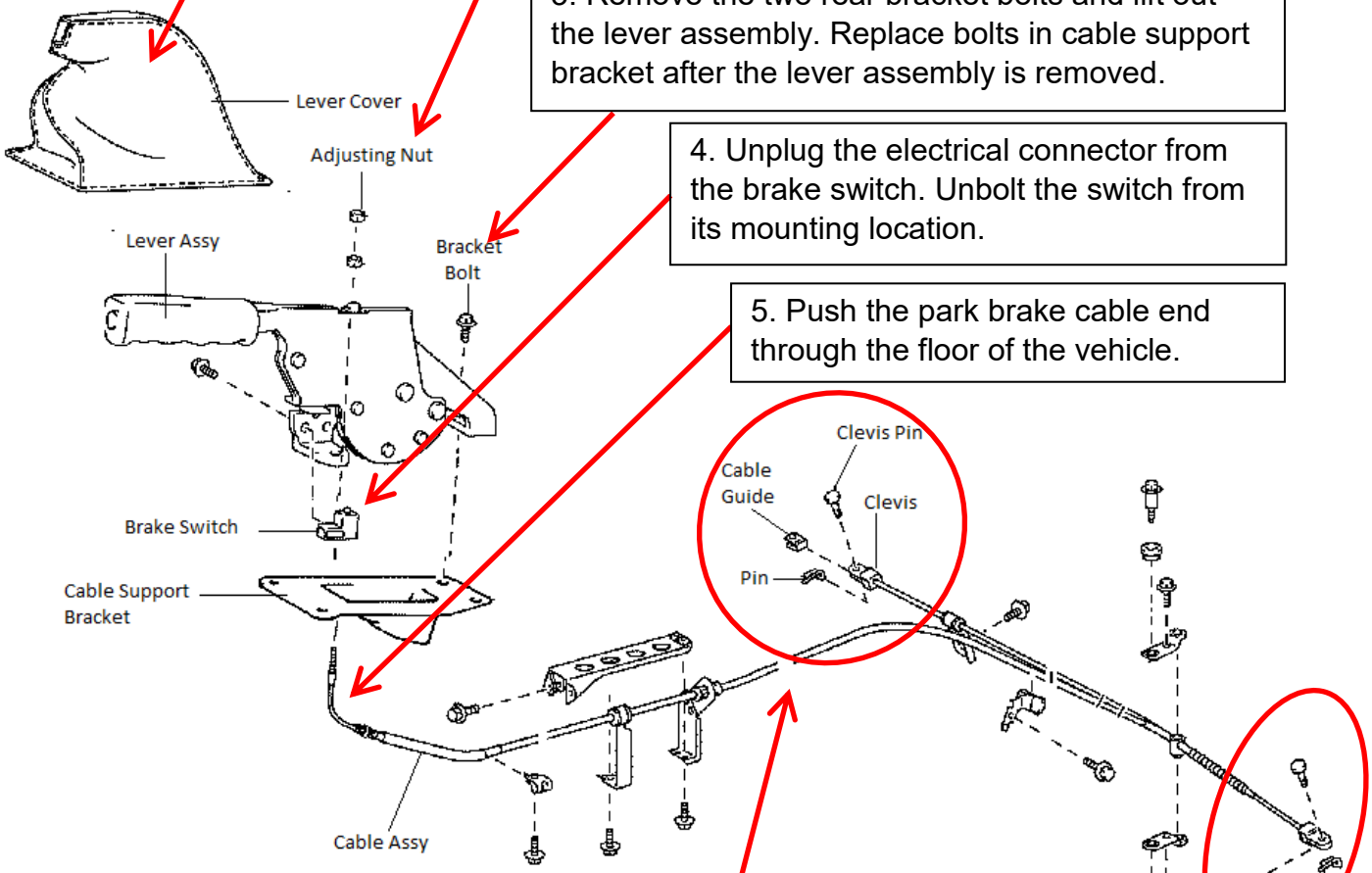
1. Pull up the park brake lever cover so that the adjusting nut is accessible.

2. Remove the adjusting nut so that the cable assembly is loose.

3. Remove the two rear bracket bolts and lift out the lever assembly. Replace bolts in cable support bracket after the lever assembly is removed.

4. Unplug the electrical connector from the brake switch. Unbolt the switch from its mounting location.

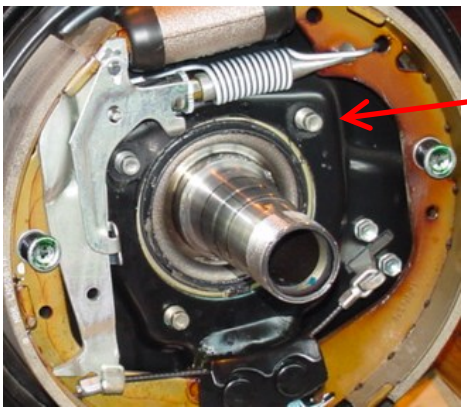
5. Push the park brake cable end through the floor of the vehicle.



6. At each wheel end behind the drum brake, remove the pin from the clevis. Remove the clevis from the back of the drum brake.

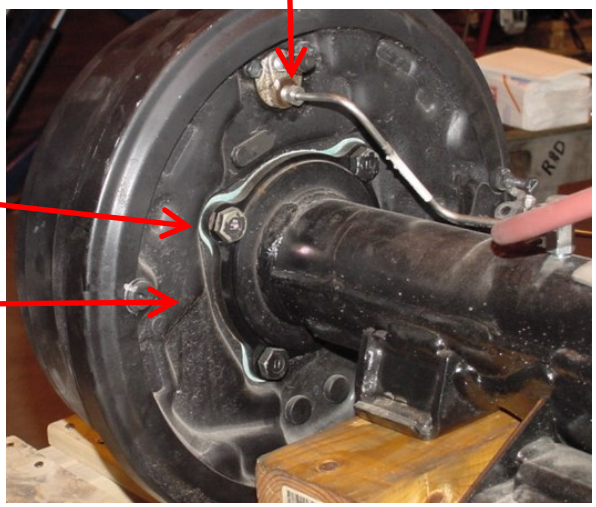
7. The park brake cable assembly ends may be secured to the frame or completely removed by unbolting at fastening points.

5. Remove the drum brake.



1. Remove the four nuts.

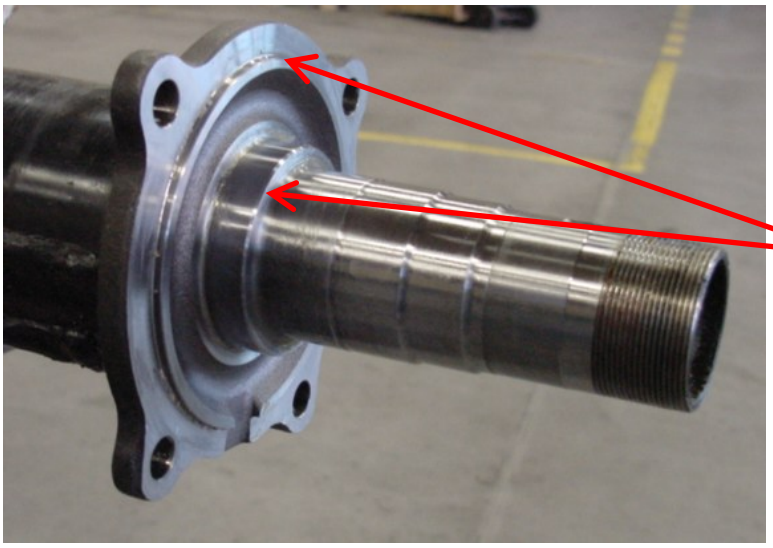
2. Disconnect the brake line.



3. Remove the four bolts.

4. Remove the drum brake.

6. Spindle view after OEM rear brake removal. Disassembly of rear axle is complete.



! NOTE ! Clean, inspect and repair the seal surfaces shown as needed. If the surfaces have gouging or score marks it is recommended that the spindle be replaced.

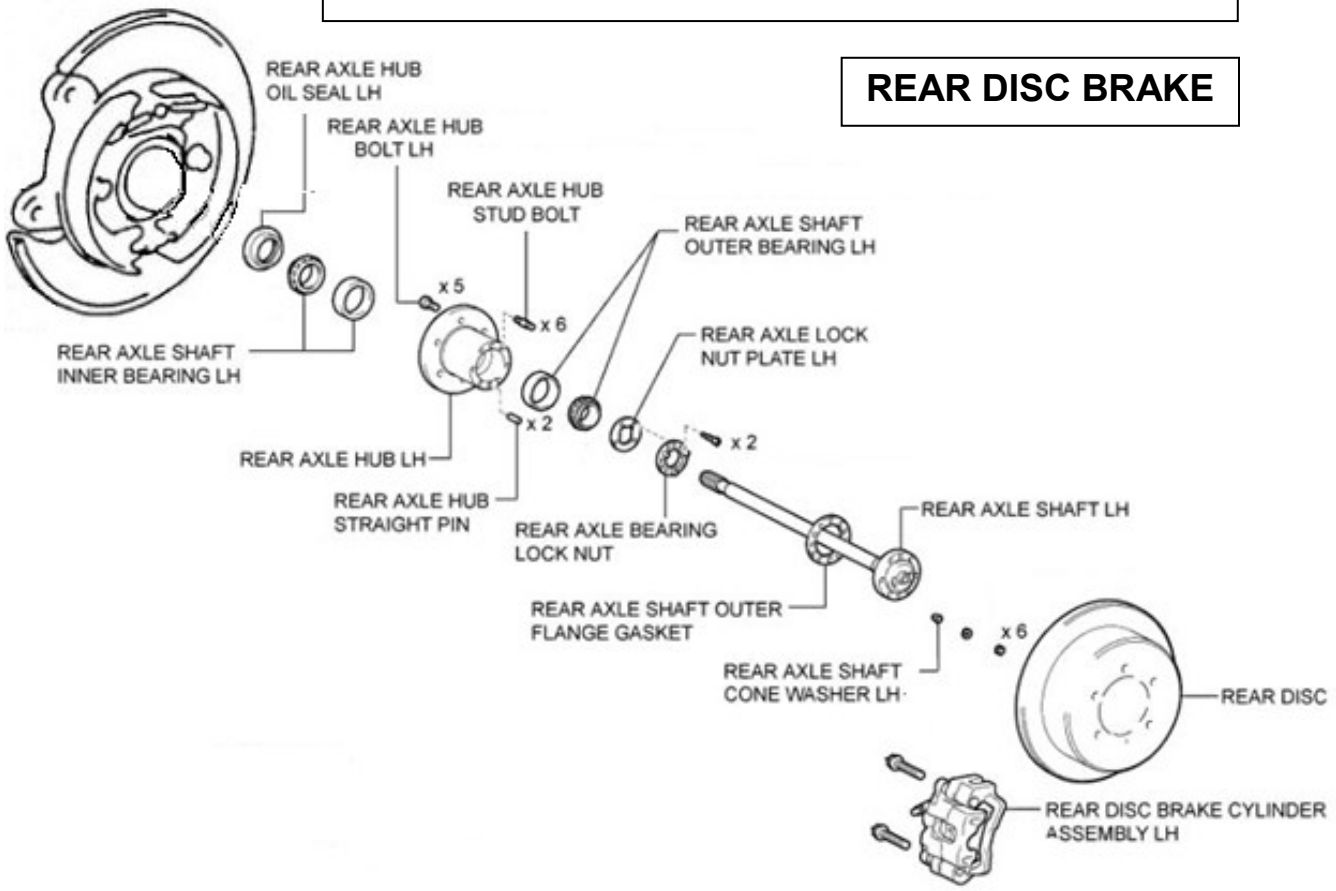
SECTION 2

PREPARING THE REAR WHEEL ENDS

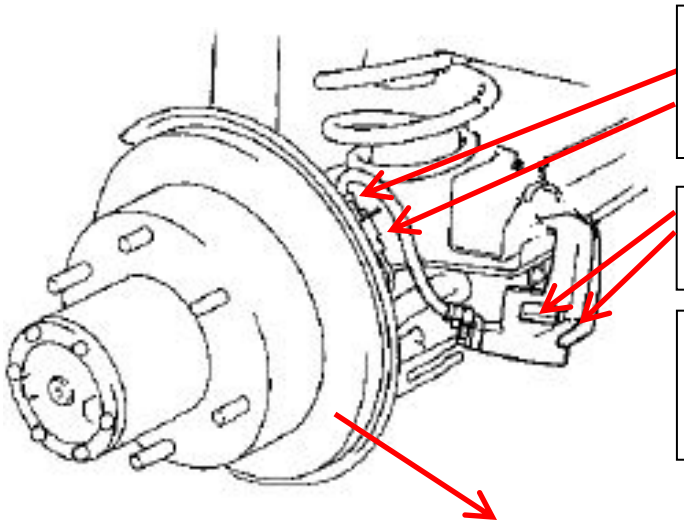
FROM REAR DISC BRAKES

Follow the same procedure for both wheels. If you have rear drum brakes please see Section 1.

! NOTE ! If the brake line has not already been flushed it is **HIGHLY** recommended. This ensures that the system is clear of any contaminants in the brake lines and master cylinder.



1. Remove the rear disc brake.



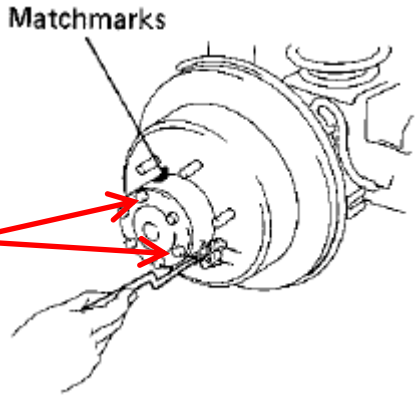
1. Remove brake line from this point. Slide the clip up and out to free the line. Save the clip.

2. Remove the two caliper mounting bolts.

3. Caliper will slide out away from the rotor. Tap it off with a hammer if needed.

2. Remove the disc.

1. Align the matchmarks on the disc and the rear axle shaft and then remove the rotor disc. If the drum is not easily removed turn the shoe adjuster until the wheel turns freely.



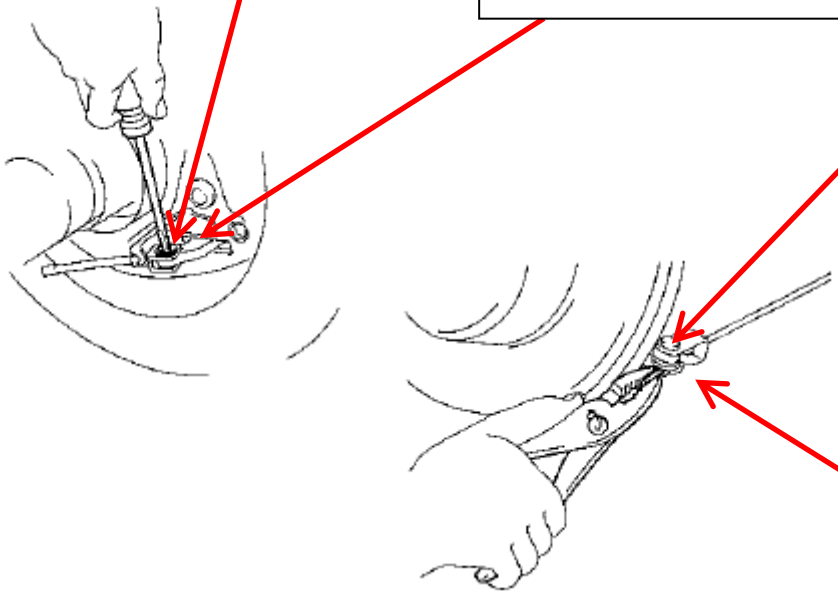
3. Disconnect the park brake.

1. Remove the C-washer.

2. Remove the pin and disconnect the parking brake cable from the bell crank.

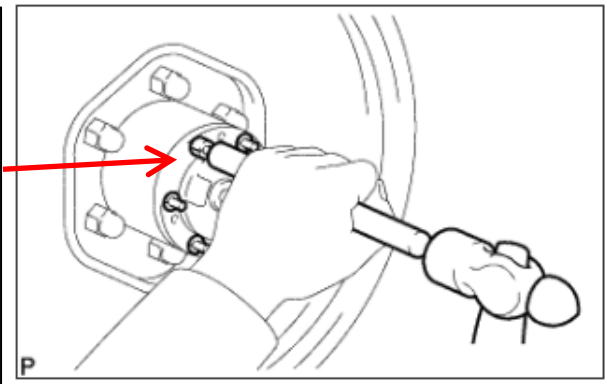
3. Remove the clip.

4. Remove the pin and the wave washer and then disconnect the park brake cable.

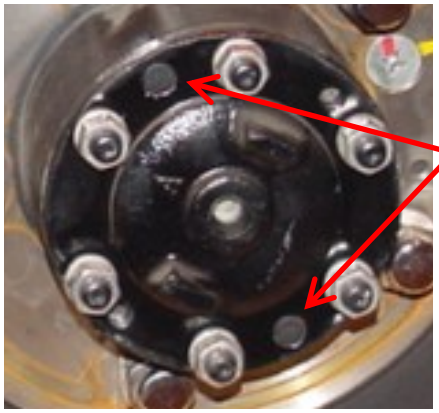


4. Remove the axle shaft.

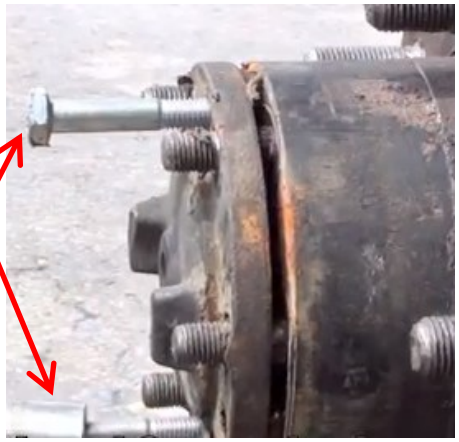
1. Tap out and remove the six cone washers. The cone washers can be difficult to remove. Toyota recommends using a brass punch and hammer to drive on the end of the stud (axially) to pop it apart. An air hammer driving axially on the end of the stud this same way can also be used, as long as the stud is not damaged. Sometimes, hammering radially on the side of the outer shaft flange can help. See (a.) right. When all else fails, use a chisel to break the washer into pieces and replace the washers. Save the nuts, washers and cone washers if possible.



(a).

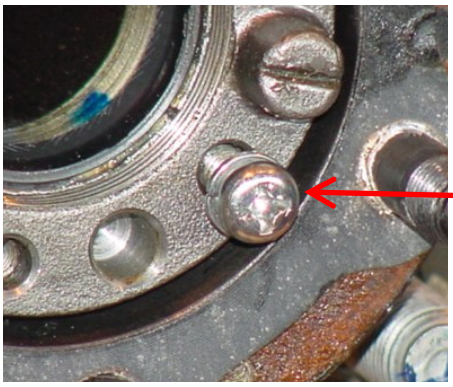


2. Acquire two class 10.9 12mm x 1.25 bolts with at least 30mm of thread length and screw them into the existing two holes on the face of the axle shaft flange to drive out the axle shaft. If needed run a tap through the existing holes to clean out debris. It is important to evenly drive the flange out of the hub to ensure that the axle shaft does not bind.

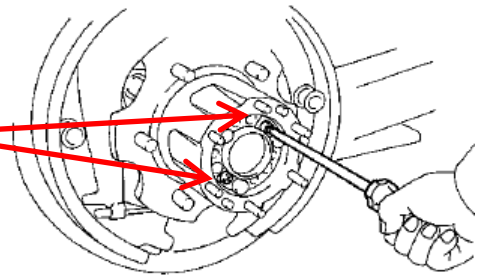


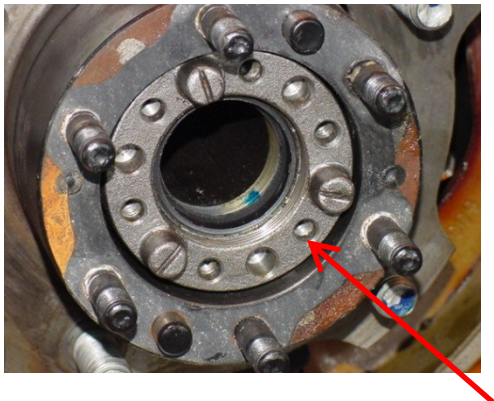
3. Remove the axle shaft and gasket carefully.

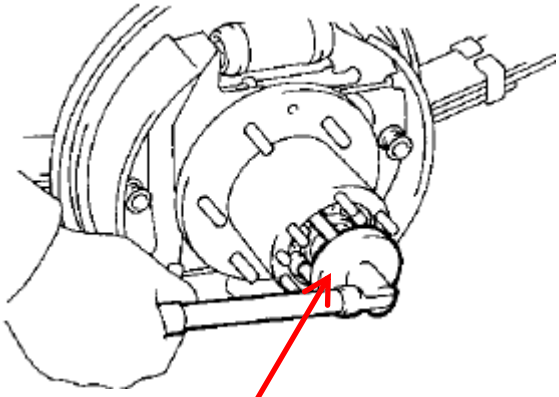
5. Remove the axle hub.

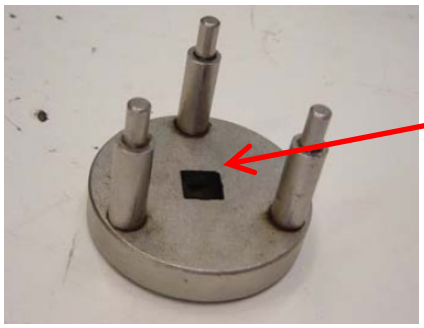


1. Remove the lock nut by removing the two button head screws.



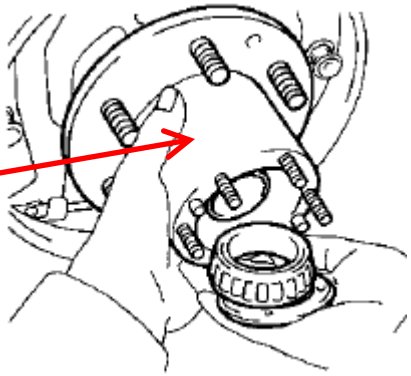




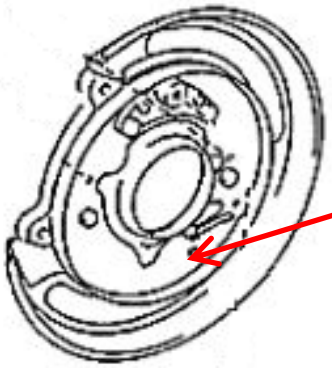


2. Remove bearing lock nut as shown above. Use Toyota Tool SST 09509-25011.

3. Remove the hub.

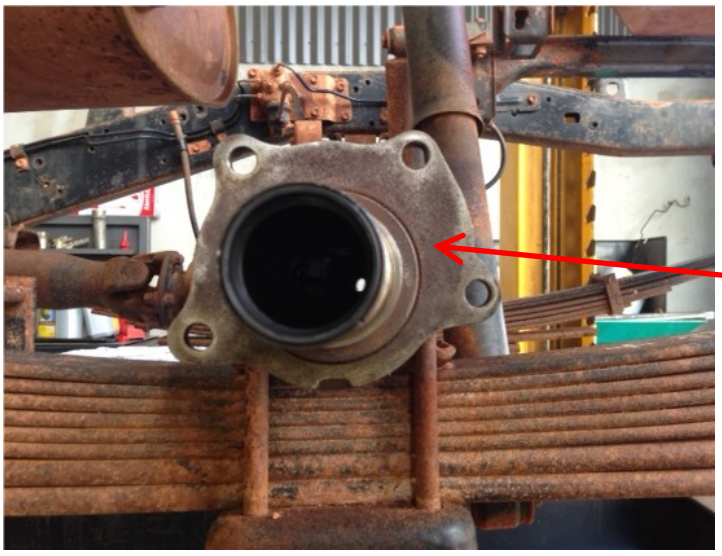


6. Remove the dust shield.



1. Remove the dust shield and any additional components outboard.

7. Spindle view after OEM rear disc brake removal. Disassembly of rear axle is complete.

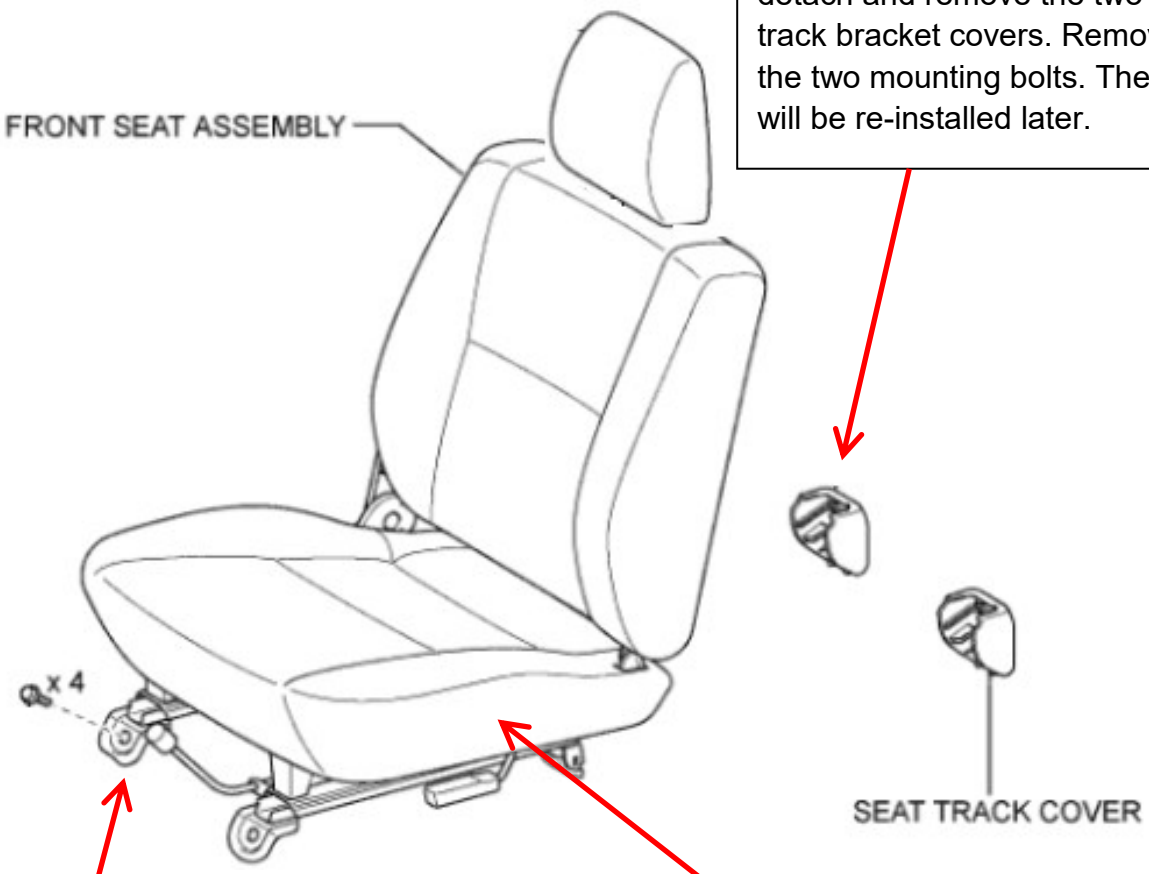


! NOTE ! Clean, inspect and repair the seal surfaces shown as needed. If the surfaces have gouging or score marks it is recommended that the spindle be replaced.

SECTION 3

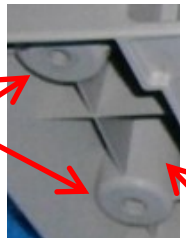
PREPARING THE VEHICLE CAB FOR THE PUMP PACK

1. Remove the RH side seat.

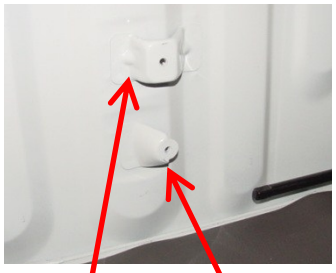


2. Remove bins on cab wall behind the seats.

1. There are four 10 mm bolts that attach the bin to the back wall of the cab. Remove the bolts.



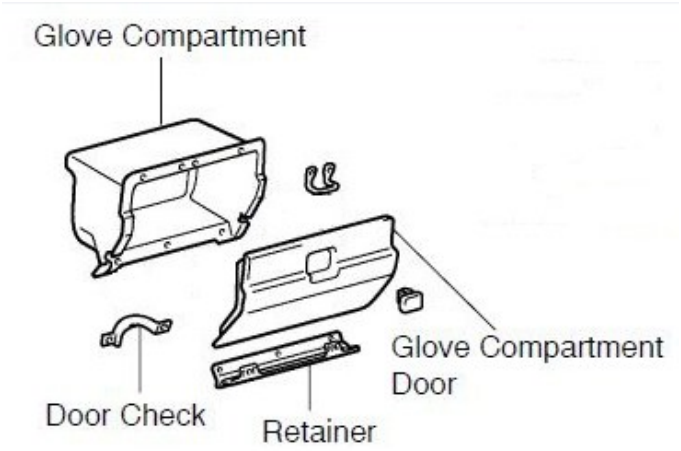
3. Cut off and finish bin holder brackets.

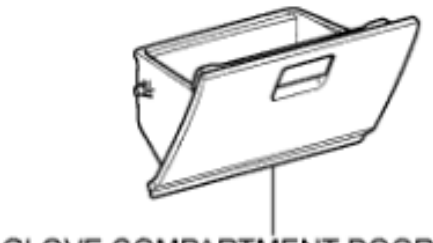


1. Using a cut off tool, remove the storage bin mounts from the back right-hand side of the cab.

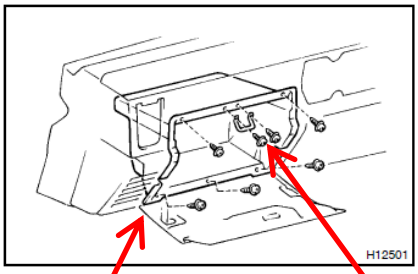
2. Use a hand grinder to smooth the rough edges down. Remove any residue with a damp cloth. Clean any debris using a Shop-vac. Paint the surface with touch-up paint and allow to dry fully.

4. Remove the glove compartment. Your Toyota Land Cruiser may have one of several different styles of glove compartment. Below are two common versions. If yours is different consult the Toyota Land Cruiser Owner's manual for instructions to remove it from the dash. Set the glove compartment aside. It will be re-installed.



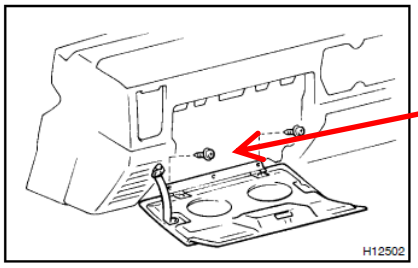


GLOVE COMPARTMENT DOOR ASSEMBLY

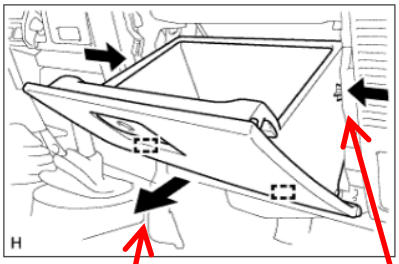


1. Remove the two screws and the door lock striker.

2. Remove the five screws and the glove compartment.



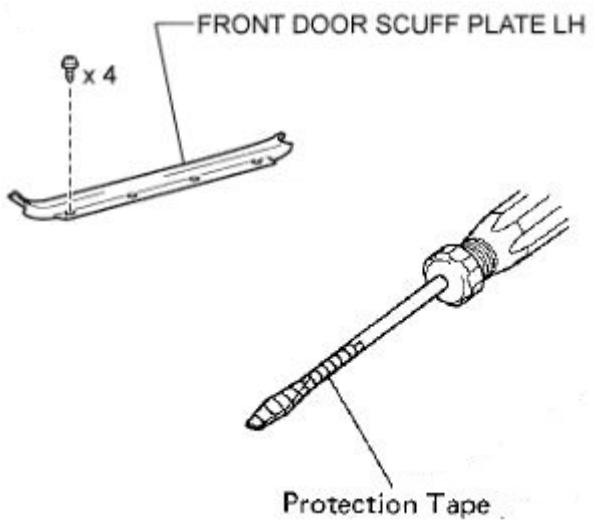
3. Remove the two screws and the door.

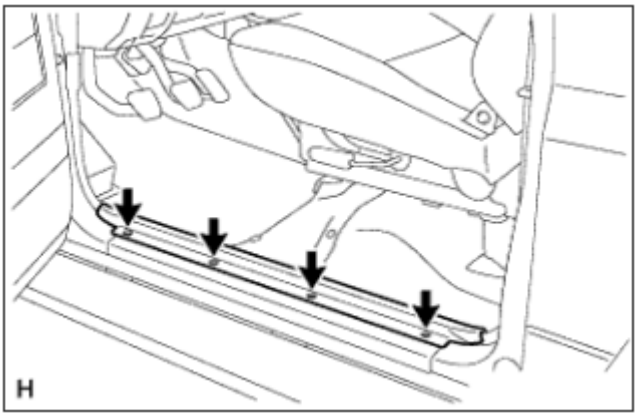


1. Push in the sides of the glove compartment door to release the two stoppers. Open the glove compartment door until it is horizontal.

2. Pull the glove compartment door toward the rear of the vehicle to detach the two hinges and remove the glove compartment door.

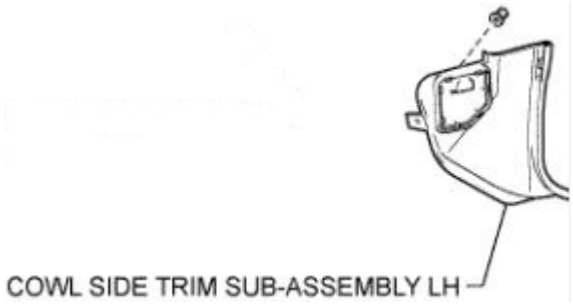
5. Remove the door sill/scuff plate on both door frames. Set aside to re-install later.

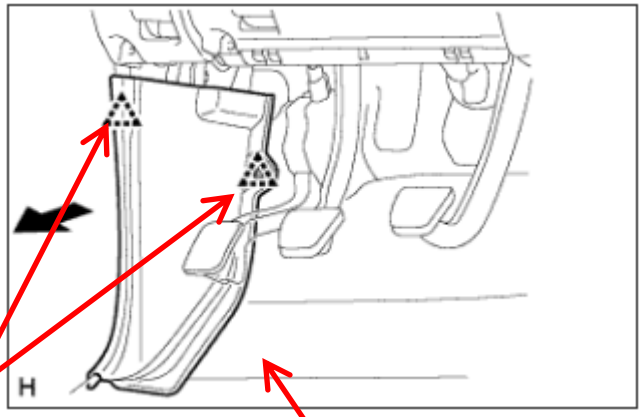




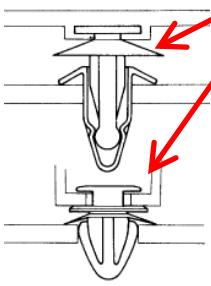
1. Remove the four screws from the door sill/scuff plate.

6. Remove the kick panel (cowl side trim) on both sides. Set aside to re-install later.

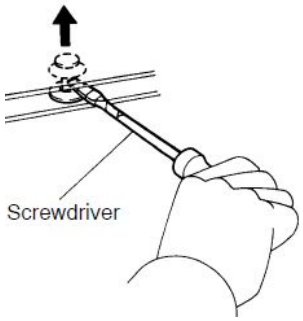




1. The kick panel is secured with two clips resembling one of the below. Locations noted right with a dotted triangle.



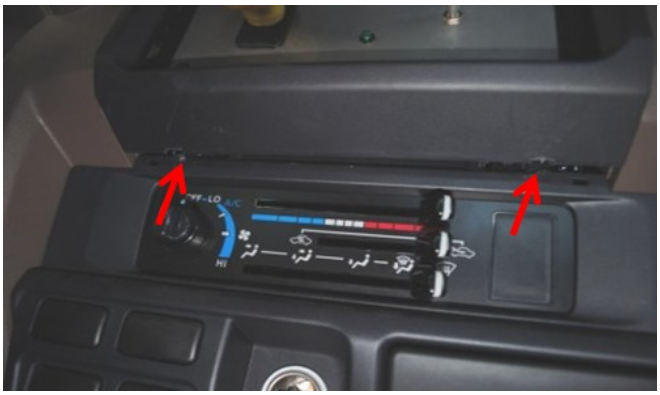
2. Pry up the clips as shown.



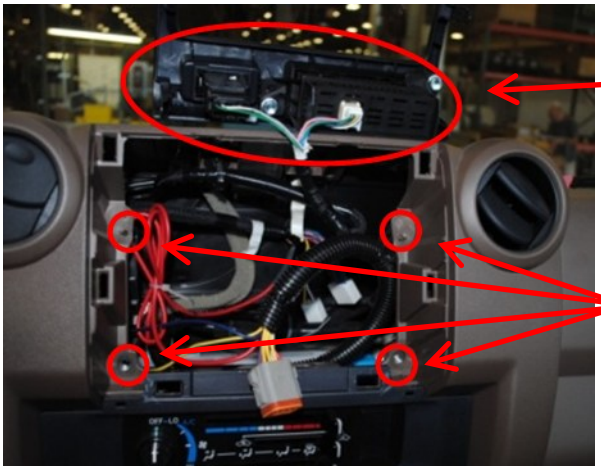
3. Slide the kick panel out as shown in the figure above.

7. Remove the radio or other device from dash slot.

1. Remove trim piece in the radio slot.



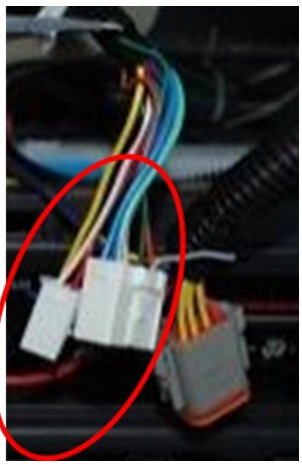
2. With a screwdriver locate the two slots along the bottom of the radio surrounding panel. The slots are located just above the climate controls. Insert screwdriver and gently pry the panel up.



3. Do not disconnect the wiring harnesses for the emergency control flashers and the dash board clock. Set the trim panel up on the dash, out of the way.

4. Disassemble the radio bracket assembly from the dash with a 10 mm socket and unscrew the four mounting screws located at each corner of the two mounting brackets. Save the radio brackets.

5. Lift out the radio assembly and disconnect the two radio wiring harnesses and the antenna (round connector) from the back of the radio. These harnesses are not used. Secure them in the dash.

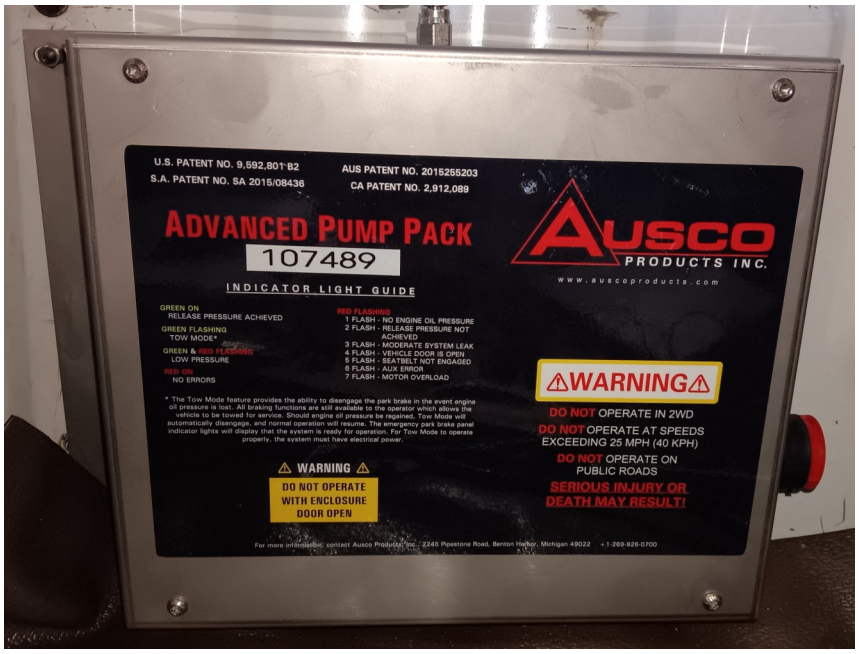


SECTION 4

INSTALLING THE

PUMP PACK

1. Placement of the Pump Pack



Mount the Pump Pack to the wall of the truck cab.

! NOTE ! Installation can be accomplished with or without the truck bed on the vehicle. If equipment is already mounted at this location, there are acceptable alternate locations for consideration.

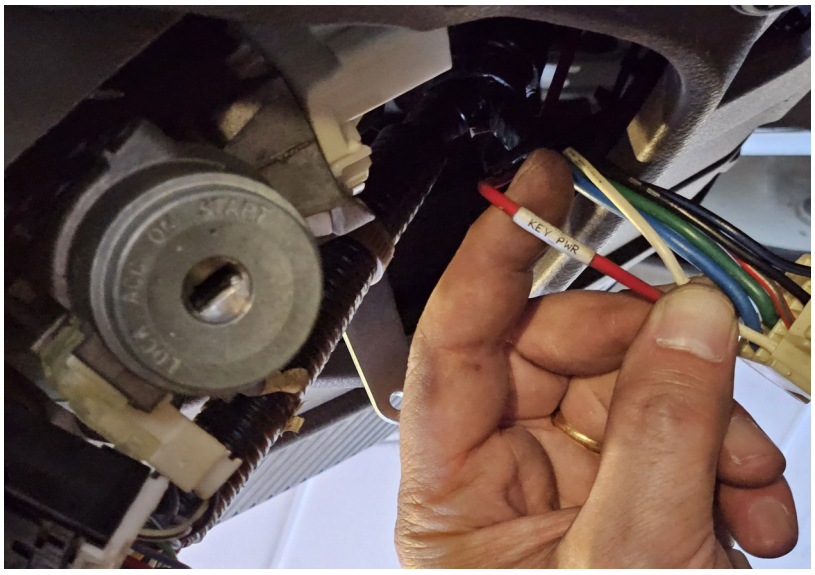
! NOTE ! Apply dielectric grease to all un-sealed electrical connections to ensure the electrical connections resist corrosion and maintain connectivity.

! NOTE! All electrical connections must be made compliant with worksite regulations.

1. Use a spacer to set the desired height of the Pump Pack. Place the spacer on the floor of the truck at the rear wall.
2. Set the Pump Pack on the spacer. Start with the left mounting holes centered on the truck cab rib closest to the right hand door.
3. Adjust Pump Pack as needed to ensure that the unit is as centered as possible across the two ribs.
4. Mark and drill holes in the cab wall using the mounting holes on the Pump Pack as a guide.
5. Remove spacer.
6. Fasten Pump Pack to the cab wall with four 5/16x 1” (or M8x 25mm) bolts. Use large outside diameter fender washers under the nuts to mount against exterior truck wall.

2. Route the power cable through the cab.

1. Route the main power wiring harness (10ga red and black wire) and “KEY_PWR” under the Pump Pack and along the back wall of the cab.
2. Pull up the floor mat at the left side door and locate the factory wire channel to the fire wall.
3. Route the main power wiring harness through the wire channel to the firewall. Alternately, the wire can be run down the center of vehicle.
4. Locate the hole through the factory firewall. If hole is not present, drill a hole and install a new grommet.
5. Route main power wiring harness and “E_OIL” wire through firewall. “KEY_PWR” and “BRK_LTS” remain inside the cab.



- Cap and coil the “BRK_LTS” wire. Secure under dash. Wire is unused at this time.

! WARNING ! Wire **must** be capped to prevent accidental

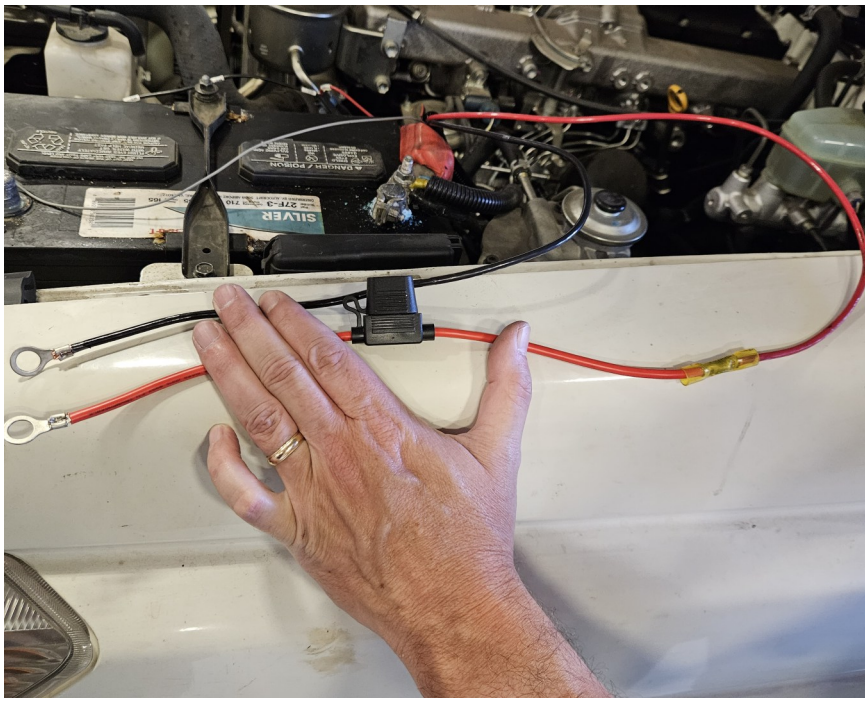
! WARNING ! Ensure that the battery is disconnected. Connect a 12 volt ignition engaged wire to the “KEY_PWR” wire. For proper system function this wire must lose power if ignition is turned off.

6. **! NOTE !** To access the connection in the steering column:

- Turn the steering wheel to the 3:00 position. You will see a screw head, remove the screw. Repeat with steering wheel in 9:00 position.
- Remove vinyl housing covering the lower half of the steering wheel. There is a 1” flexible tab that latches the cover to the dash. Be careful removing the cover as the latches could snap. Patient maneuvering to remove and replace the housing is required to prevent damage.

3. Install power wires & fuse.

1. Route main power wiring harness to the battery.
2. Trim black wire to an appropriate length to reach negative battery post and install a ring terminal.
3. Connect the black wire to the negative battery terminal or ground disconnect switch if equipped.
4. Trim red wire to an appropriate length to reach positive battery post. Leave room to include the fused wire.
5. Crimp fuse wire to red wire.
6. Install a ring terminal on end of red wire.
7. Connect the fused red wire to the positive battery terminal.
8. **! NOTE !** Fuse holder houses a 30 amp automotive style fuse.



4. Install oil pressure switch.

1. Locate the OEM oil pressure switch. It is normally located between the starter and the oil filter. The switch is most easily seen from under the engine.
2. Trim the “E_OIL” wire to an appropriate length. Splice the “E_OIL” into the OEM wire.

! NOTE ! V8 engines do not have an oil pressure switch. The V8 engine has a pressure gauge sending unit. This is not compatible with the Pump Pack’s engine oil pressure circuit without additional components. Without an oil pressure switch, the engine oil pressure safety feature **WILL NOT FUNCTION**.

! WARNING ! The oil pressure switch must be present for correct operation of the Pump Pack oil pressure safety feature. The affected safety features are:

- The park **BRAKE WILL NOT AUTOMATICALLY APPLY** if engine oil pressure is lost.
- The park brake can be released **WITHOUT** engine oil pressure when the ignition is on.

To maintain functionality of engine oil pressure safety features, a separate oil pressure switch **MUST** be added in-line with the stock pressure gauge sending unit. Connect the oil pressure switch to Pump Pack wiring as instructed above.

5. Connect door switches.

1. The Pump Pack has the capability to apply the brake if the vehicle doors are opened. To enable this feature, remove the door switch from behind the cab trim. Splice the harness door wire to the door switch. Re-install the door switch. Repeat process for the opposite side of vehicle.

! WARNING ! The door switches function as separate circuits. The Pump Pack “DOOR” wire must be spliced into both door switches to enable this safety features on both doors.

! NOTE ! If the door switch feature is not desired, cap the door wire and secure in cab.

! WARNING ! Wire **must** be capped to prevent unintended or accidental grounding.

! WARNING ! This disables a safety feature. Opening doors will not apply the park brake.

An alternate method to enable this feature is available. The wire for the door switch signal is also present in the connector behind the speedometer. Verify the appropriate wire and connector for your vehicle based on the manufacturer’s wiring schematic for your model and year.

This method has the added benefit of being a single splice connection in a protected environment. It will also enable this safety feature for all door switches on four door models.

6. Install seat belt switch.

1. If desired, the Pump Pack may be wired to the driver's seat belt switch. This allows the system to require the driver's seat belt to be fastened before releasing the brake.
2. Route the "ST_BLT" wire to the seat belt switch. Splice the "ST_BLT" into the black wire at the base of the driver's seat belt buckle.
3. If this feature is not desired, the wire may be trimmed or coiled and secured in cab.

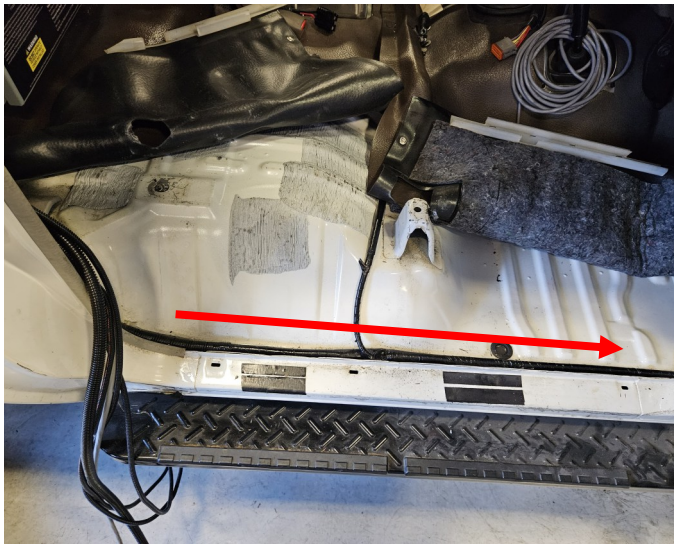
! WARNING ! Wire **must** be capped to prevent accidental grounding.

7. Auxiliary Input.

1. The Pump Pack may be wired to an auxiliary component such as pedestrian detection to apply the park brake when signaled.
2. The auxiliary signal should be wired, such that the circuit is connected to ground when it is desired to apply the park/emergency brake.
3. If this feature is not desired, the wire may be trimmed or coiled and secured in cab.

! WARNING ! Wire **must** be capped to prevent accidental grounding.

8. Install the dash panel controls.



1. Route the control cable from the Pump Pack around the back of the truck cab to the right hand door.
2. Run the cable along the right hand door and up through the kick panel into the dash-board.
3. Pull the control cable through the glove compartment and up into the radio slot opening. Alternately, run the wire up center of vehicle.
4. Attach OEM radio brackets to dash panel brackets.
5. Install brackets in radio slot.
6. Connect control cable wire harness to dash panel.
7. Attach dash panel to brackets and replace radio dashboard trim. Carefully guide wire harnesses into radio slot to prevent dam-age.
8. Clean the dash and apply warning label 102319 as shown. See warning label pam-phlet for additional instructions.
9. Replace all trim, guards, and vehicle com-ponents. Physical installation is complete.

SECTION 5

DISABLING THE ABS LIGHT AND RE-ROUTING THE SPEED SENSOR

Procedure to disable the ABS light located on the instrument cluster at the steering wheel.

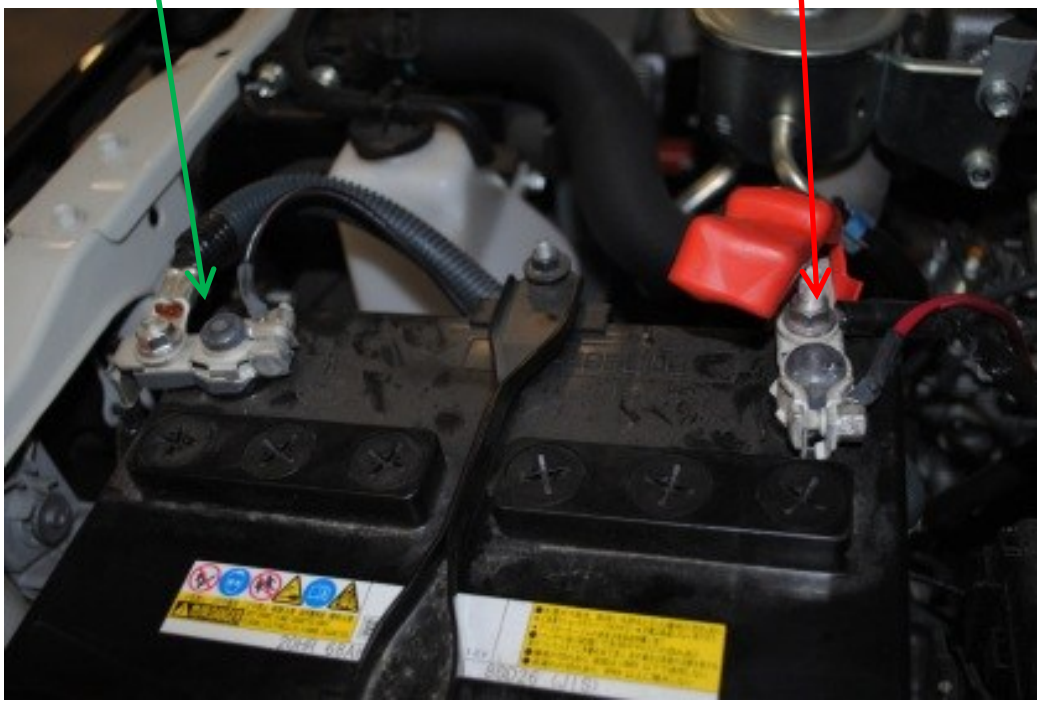
! Warning! To avoid electrical shock the vehicle battery must be disconnected before performing any electrical maintenance.

! NOTE ! This procedure is written for Toyota Land Cruiser Model VDJ79R-TJMNY and is to be used as a guide. You may be servicing a different model. The procedure to dismantle the dash at this location may differ. Additionally, the location of the ABS contact on the instrument cluster and the location of the ABS LED light may differ. Please refer to your owners manual for specific dismantling instruction and component location.

1. Disable the Toyota Land Cruiser battery.

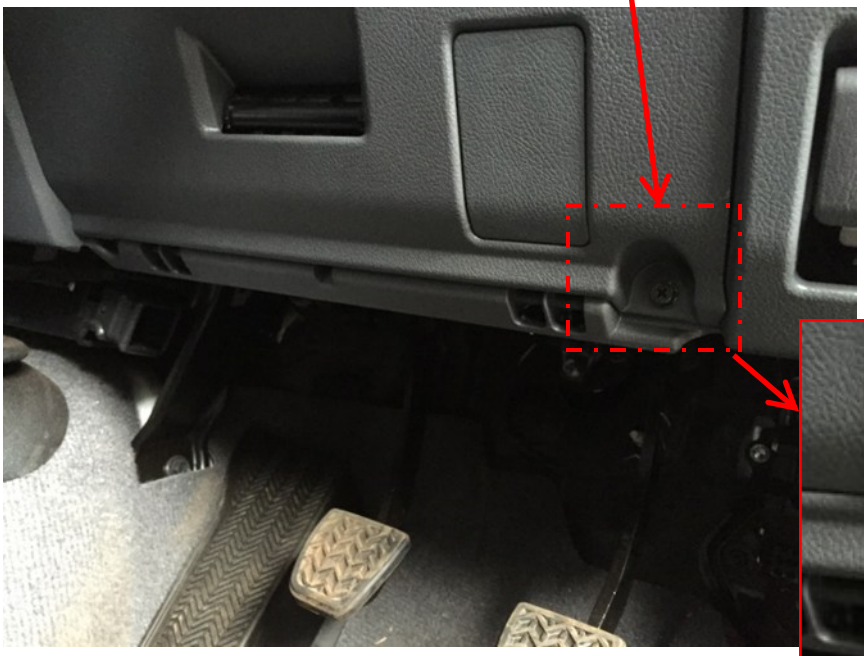
1. Disconnect the cable from the negative terminal.

2. Disconnect the cable from the positive terminal. Secure cable so that it does not touch any metal components.



2. Remove the screw at the base of the protective driver side panel below the steering wheel.

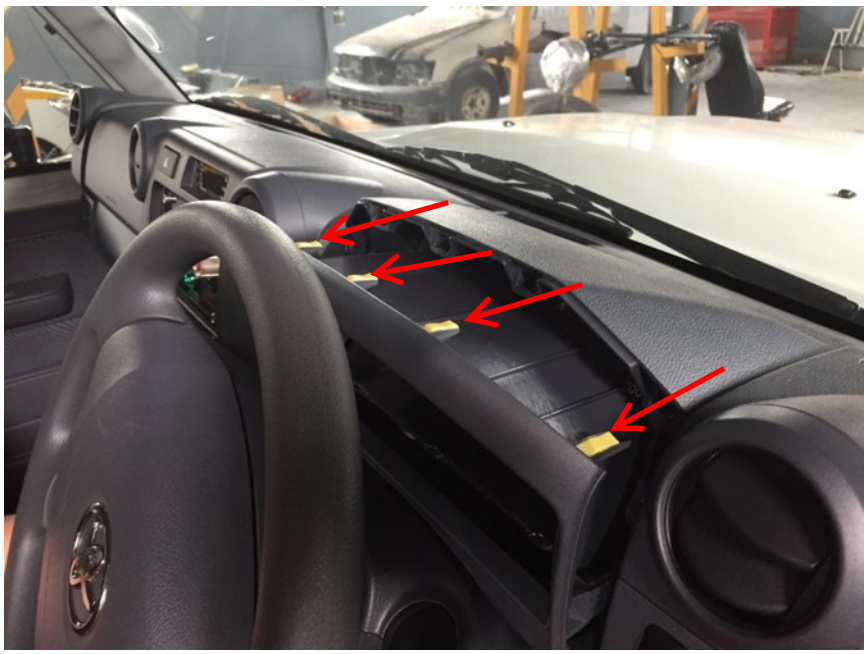
1. Removing the lower steering panel cover will allow the instrument cluster to be removed. Locate the screw on the lower cover panel.



2. Remove the screw.

3. Slide the lower steering panel cover out of the dash.

1. With the screw removed, plastic tabs secure the panel in place carefully loosen and disengage the tabs from the dash. This process will detach the lower panel cover from the dash so that it will slide out.



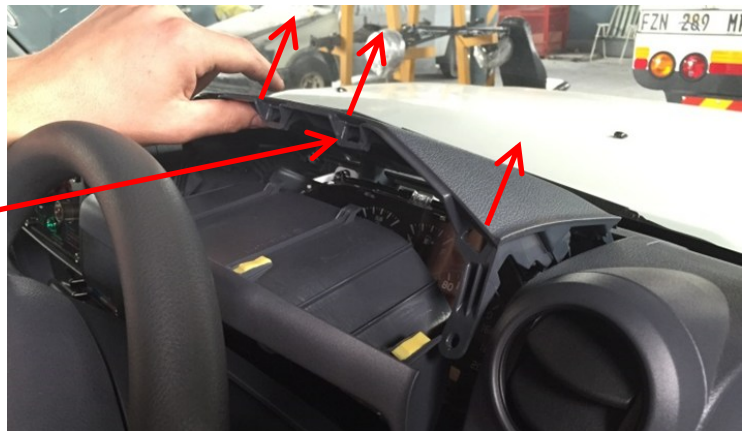
2. Slide the instrument cluster panel out from behind the steering wheel. Rest it on the steering column.

4. Unscrew the 10 mm bolt along the right side of the steering wheel.

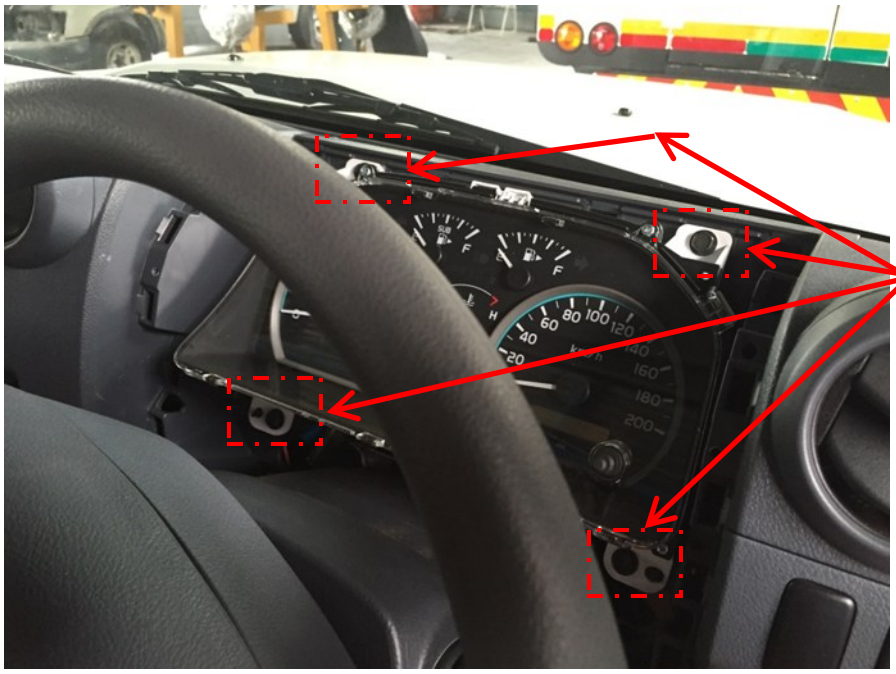
1. Locate the 10 mm bolt along the right side of the steering wheel.

2. This bolt removal will allow the dash cover over the instrument cluster to be removed. Remove the bolt.

3. Carefully detach the upper dash panel cover above the steering wheel.



5. Unscrew the instrument cluster from the dash board.

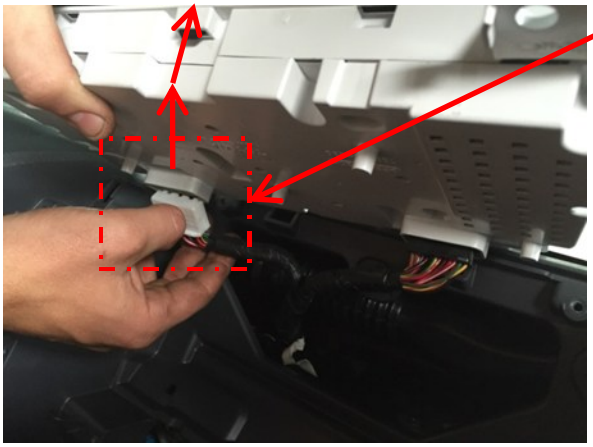


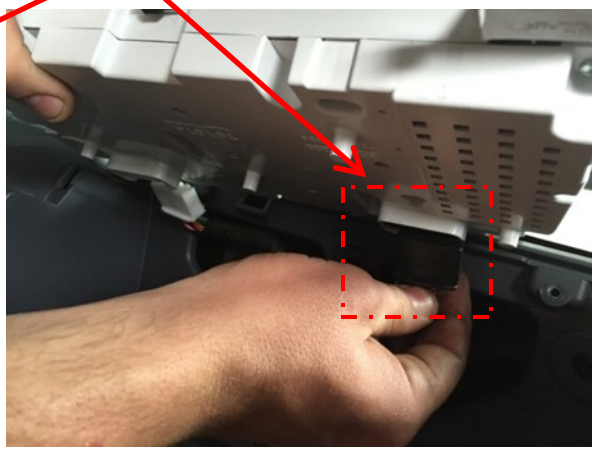
1. Locate the four 10 mm screws that attach the instrument cluster to the dashboard.
2. Remove the screws.

6. Disconnect the instrument cluster connectors.

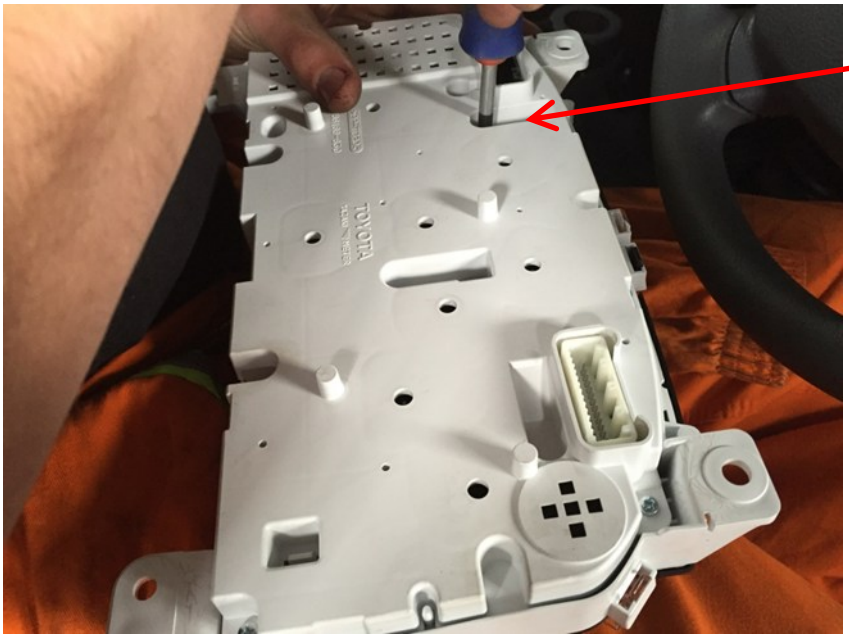
1. Lift the instrument cluster up and out of the dashboard. Take care not to pull too hard.

2. Disconnect the two connectors attaching the instrument cluster to the dashboard.





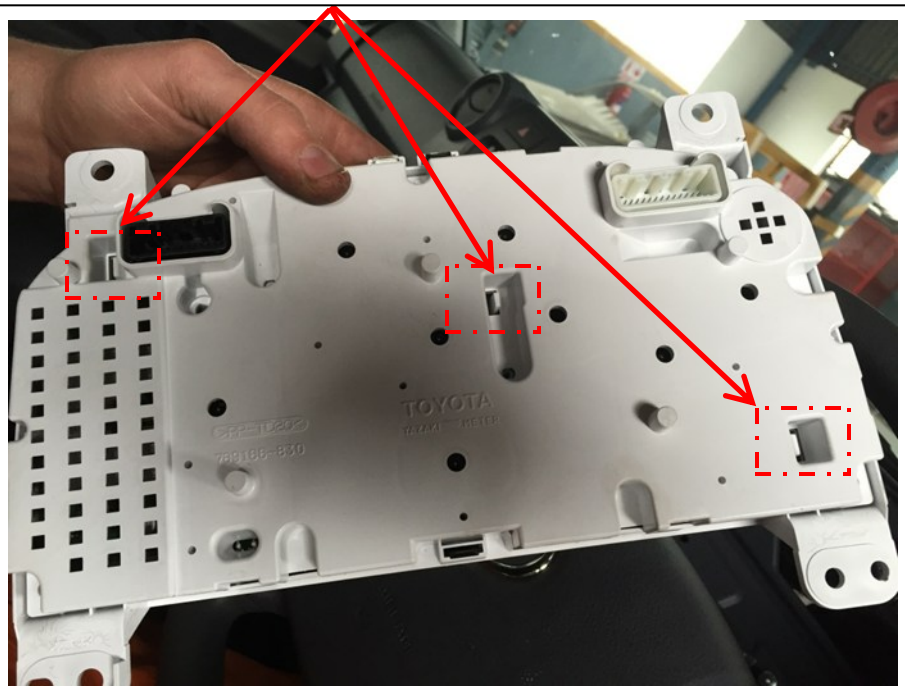
7. Remove the mounting panel from the instrument cluster.



1. Remove the screws that attach the instrument cluster mounting panel to the instrument cluster display.

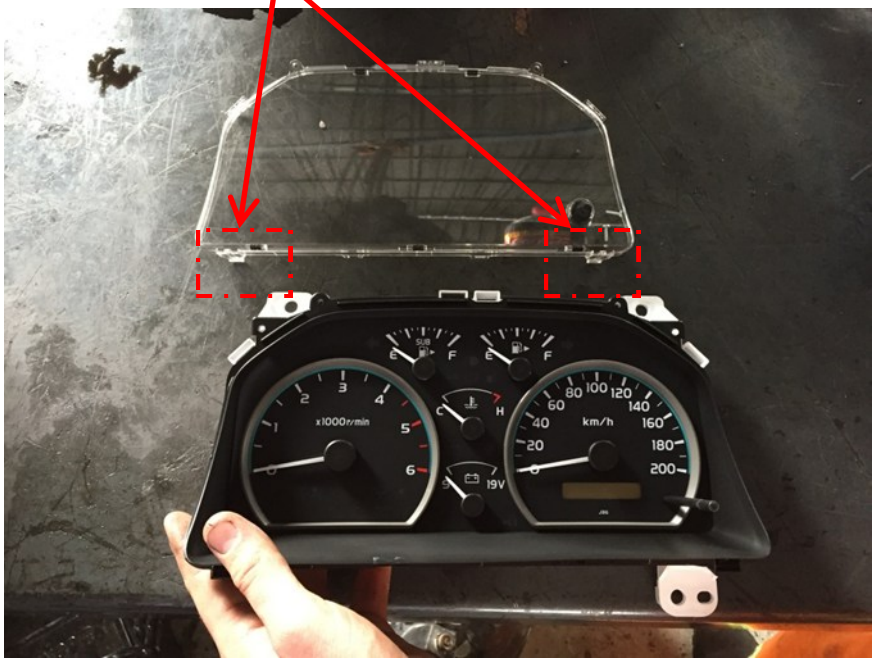
2. Locate the plastic tabs (shown below). Gently press the tabs away from the catch on the mounting panel one at a time. Slide the mounting panel towards you as you displace the tabs to loosen the mounting panel from the cluster display.

! NOTE ! : Do not apply too much pressure to the tabs. They may break.



8. Remove the instrument cluster shield.

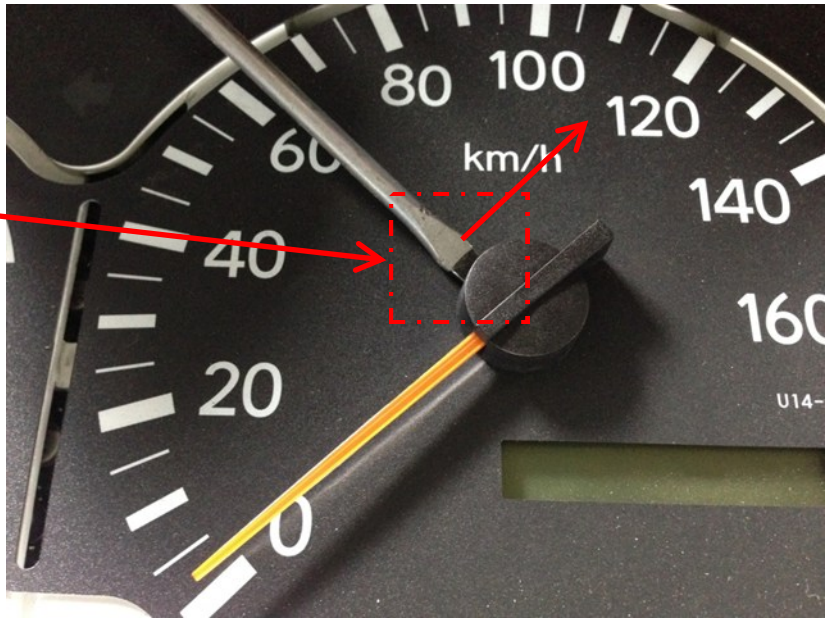
1. Lift up and unhinge the shield. Gently detach the instrument cluster shield.



! NOTE ! : Do not apply too much pressure to the hinges. They may break.

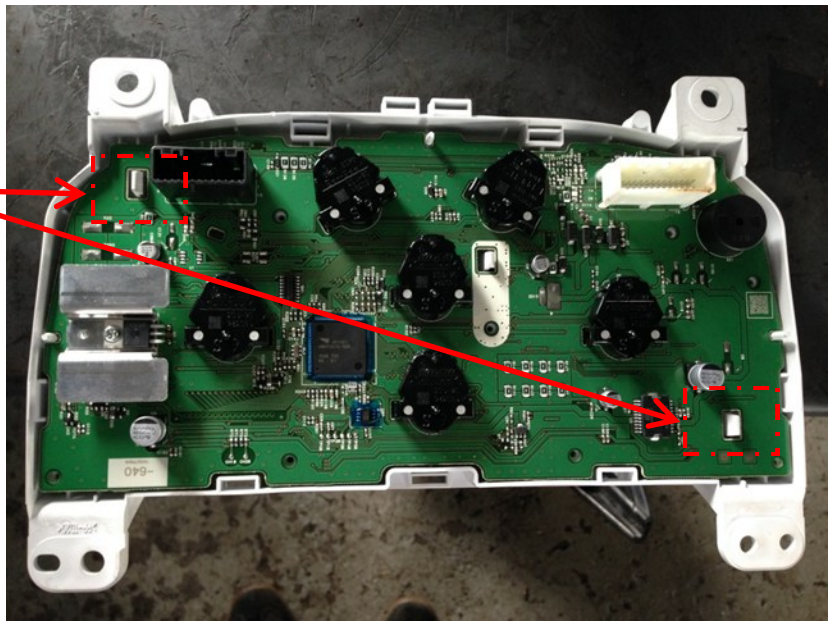
9. Remove instrument cluster gauge dials.

1. Use a flat head screw driver to apply enough easy pressure to lift off each of the six gauge dial indicators on the face of the instrument cluster.



10. Remove the circuit board from the instrument cluster panel.

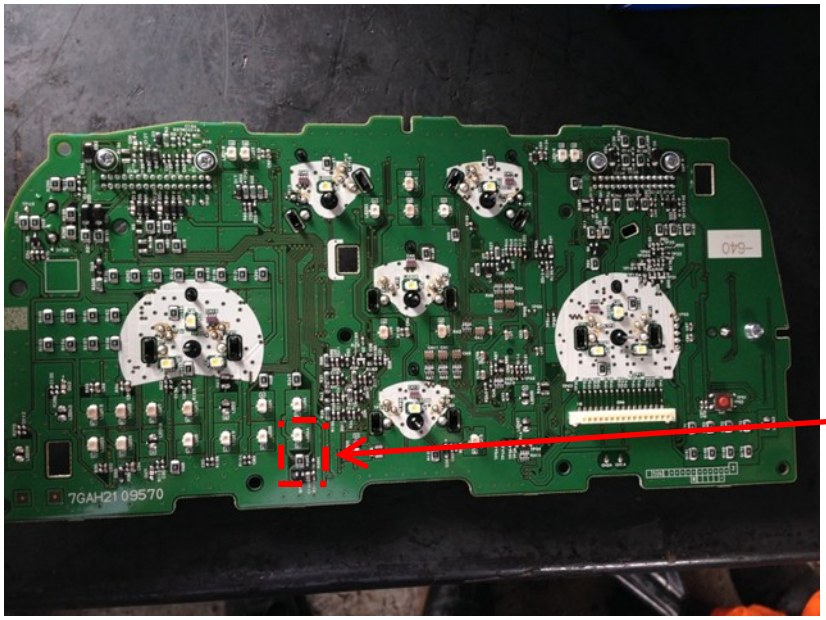
1. Gently press the indicated tabs to disengage the mounting panel from the catches on the circuit board.



! NOTE ! : Do not apply too much pressure to the tabs. They may break.

11. Disable the ABS LED light.

The LED location for the Toyota Land Cruiser Model VDJ79R-TJMNY is '**LED44**'.

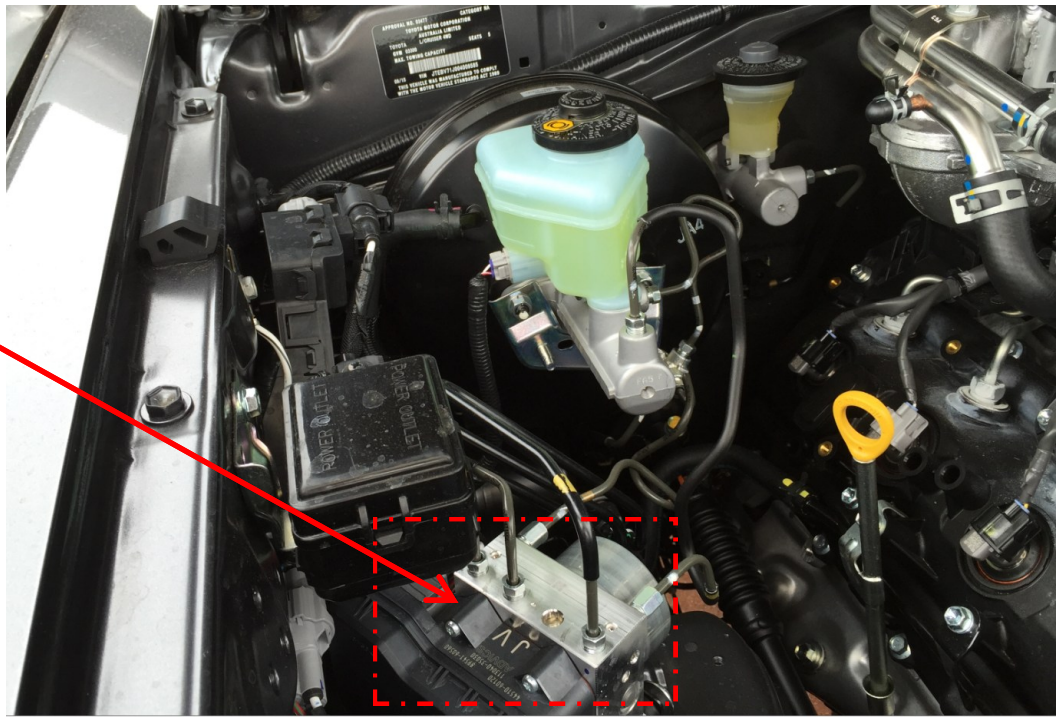


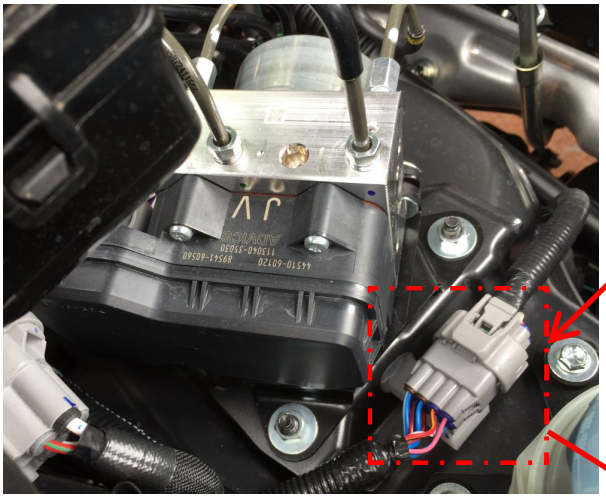
12. Re-assemble your instrument cluster and dash components.

13. Swap pin locations in ABS modulator wire harness connector.

This step insures that your speed sensor will continue to work properly.

1. Under the hood locate the abs module.





2. Locate the ABS wire harness connector.

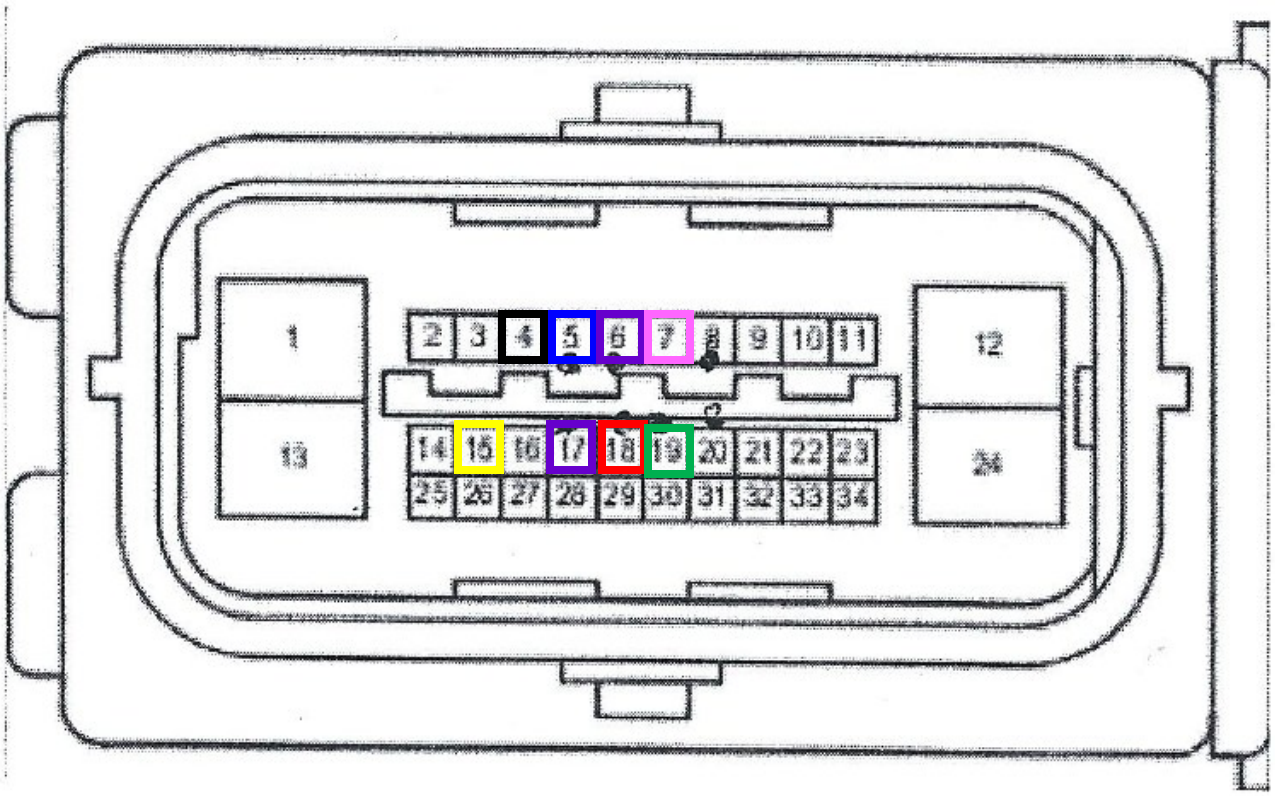
SWAP PINS

17 to 7

15 to 6

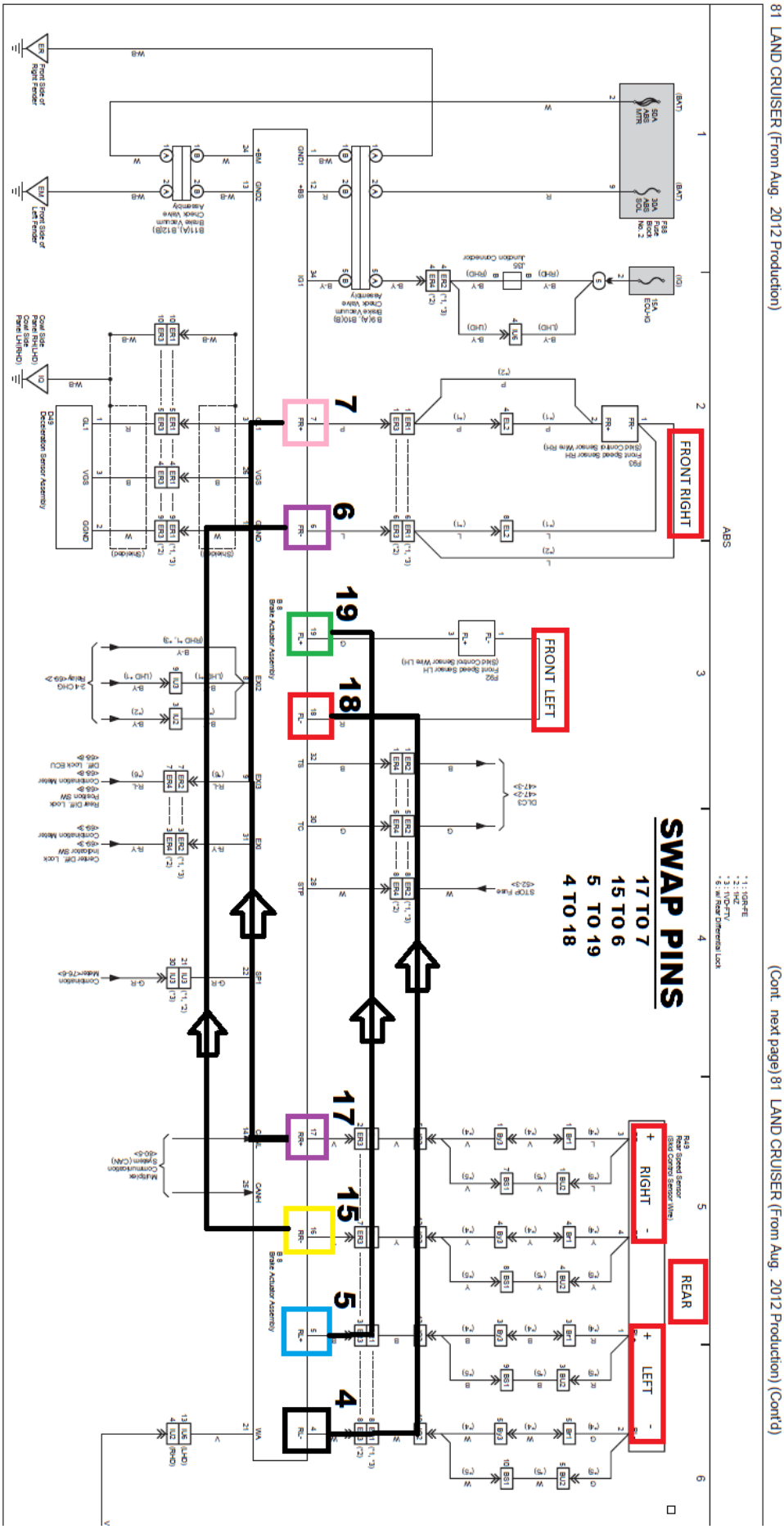
5 to 19

4 to 18



Wiring diagram on following page.

Section 5: Disabling the ABS Light and re-routing the Speed Sensor



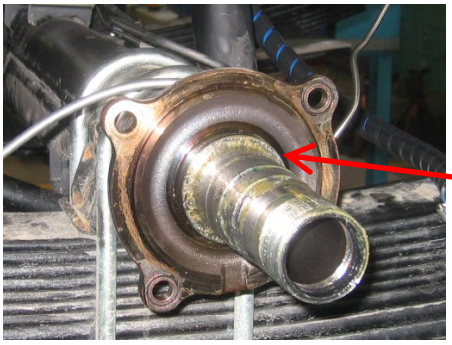
SECTION 6

INSTALLING THE REAR BRAKE

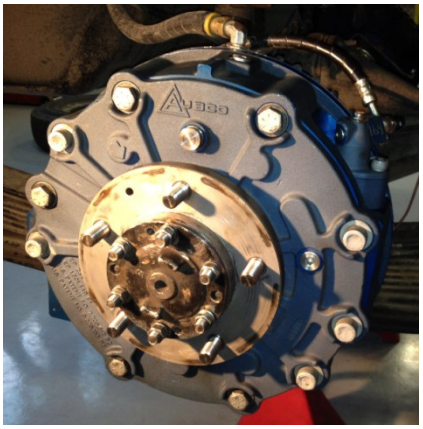
AFTER AN OEM DRUM BRAKE

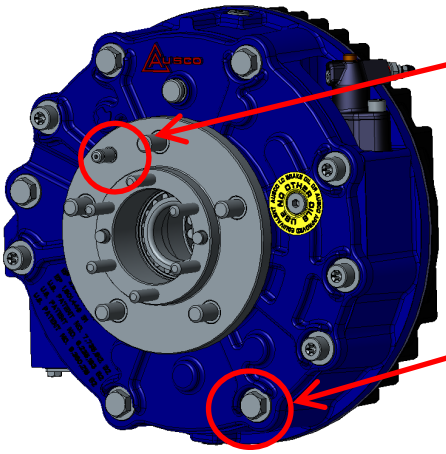
Perform same process for both sides of the vehicle. If the vehicle had been equipped with OEM rear disc brakes skip to Section 7. Lubricate O-rings with Dow Corning 200 unless otherwise noted or similar silicone assembly fluid.

1. Mount the LC adapters to rear hubs.



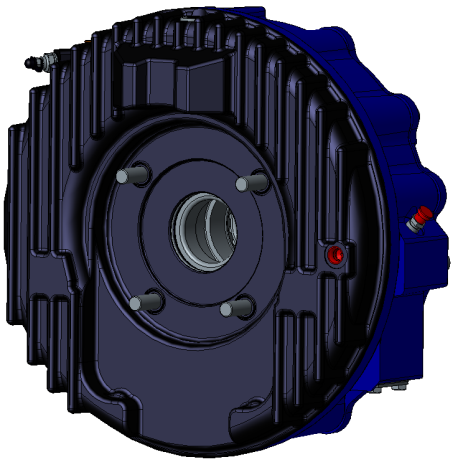
1. The rear axle should have the drum brake already removed. The surfaces should be clean and repaired as necessary.





! NOTE ! The brake assembly has a socket head shoulder screw installed with a spacer and washers in the location shown. DO NOT REMOVE until instructed.

2. Remove the five hex bolts to disconnect the mounting adapter. Set aside until needed. **! NOTE !** Do not remove Hex Socket Head Screws.



Front of Brake (Outboard side)

Adapter Side of Brake (Inboard Side)

3. Each LC Brake comes with a mounting adapter, three installation kits and the brakes that are ready to be assembled to the vehicle. You may want to familiarize yourself with the contents of the kits, the adapter and brake assembly.

Tapered Roller Bearing Cone Kit - P/N 97573

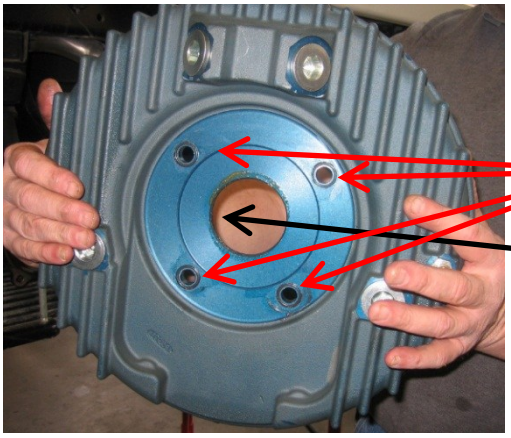
Mounting Adapter O-Ring Kit

P/N 97563

There may be more O-rings

Mounting Adapter Hardware Kit - P/N 97622

! NOTE ! See Section 11 for a list of approved greases to use in O-ring installation.



4. From the Mounting Adapter O-ring Kit locate:

(4) (P/N 84653) O-rings –hold in place with grease.

(1) (P/N 98126) O-ring - lubricate.

Install O-rings in the indicated locations.

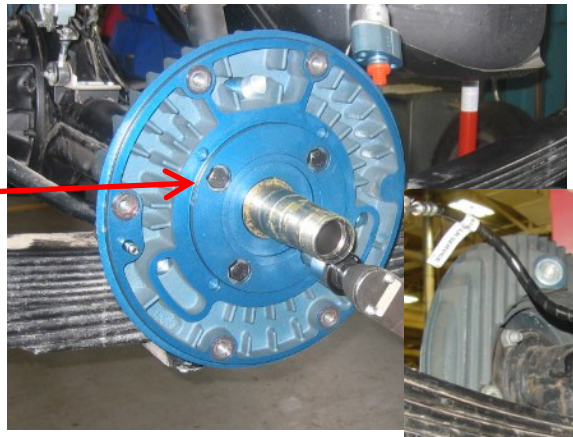
5. From the Mounting Adapter Hardware Kit locate:

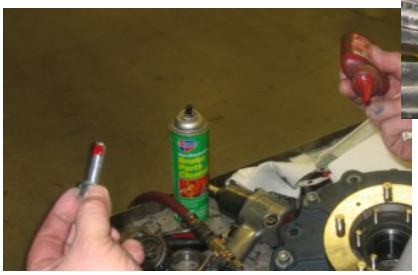
(4) (P/N 97629) M12-1.25 x 40 bolts. Apply Loctite 262 (Red) as shown. Note: Loctite 262 is preferred; if unavailable use SAF-T -LOK T62 or LOXEAL 55-04 or equivalent MIL SPEC S-46163 TYPE II GRADE 0.

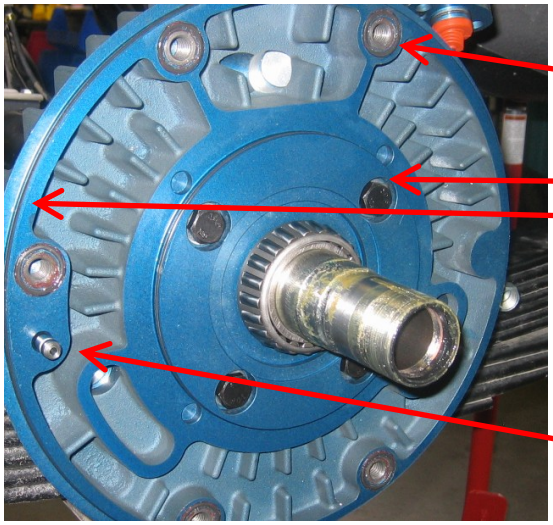
(4) (P/N 97631) M12 flat washers

(4) (P/N 97634) M12-1.25 hex nuts

Insert the washer and bolt then secure the nut from behind. Torque to 108 Nm (80 ft-lbs).







6. From Mounting Adapter O-ring Kit locate:

(5) (P/N 75036) O-rings (rear brake mounting locations) –lubricate.

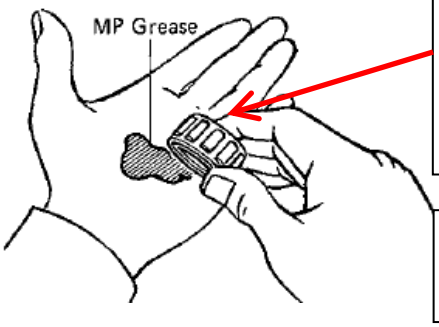
(1) (P/N 79654) O-ring – lubricate.

(1) (P/N 84216) O-ring – lubricate.

Assemble in location shown.

7. Lubricate and install connector tube (P/N 97574). This may require a tap using a soft faced mallet.

2. Mount the Rear LC brake and hub to mounting adapter.

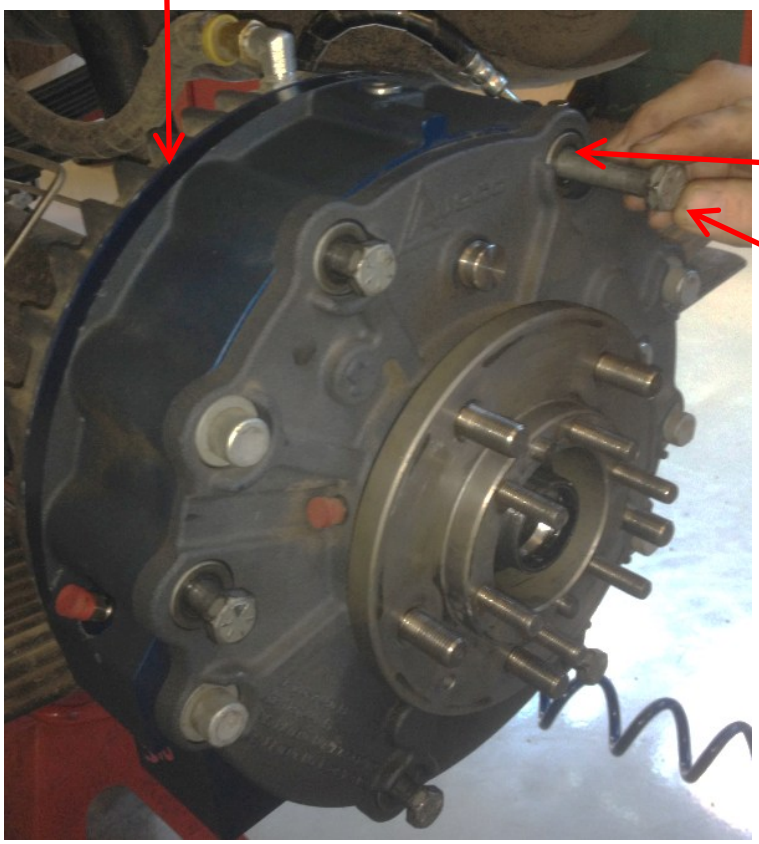


1. Locate the inboard bearing cone (P/N 96915) from the Bearing Cone Kit and pack with grease.

2. Install bearing cone on spindle.

3. Slide the rear brake assembly onto the spindle and snuggly fit it up to the mounting adapter. Use the connector tube to align.

! NOTE ! DO NOT BEND CONNECTOR TUBE.



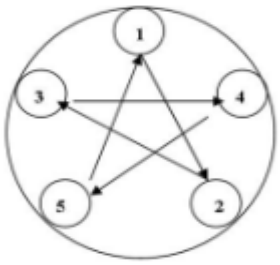
4. Locate (these parts were set aside)

(5) (P/N 96299) flat washers

(5) (P/N 93467) hex bolts

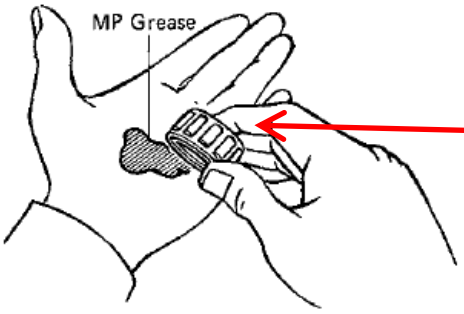
Insert the bolt through the flat washer and into the brake bolt mounting locations. Tighten bolts by working around the five bolt pattern as shown below, one to two turns per bolt.

Torque bolts to 115 Nm (85 ft-lbs).

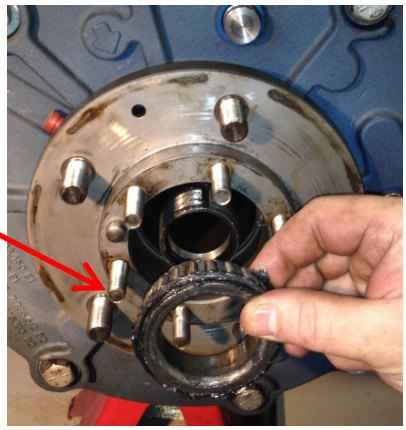


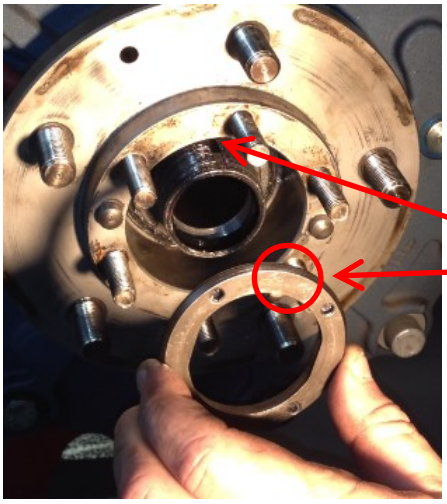
Five-Bolt

5. The brake assembly has a socket head shoulder screw with a spacer and washers in the location shown. It is there to hold the hub to the brake during shipping and assembly. Remove it. If not removed, it can bind and snap off.



6. Locate the outboard bearing cone (P/N 96916) from the Bearing Cone Kit and pack with grease. Install bearing cone.



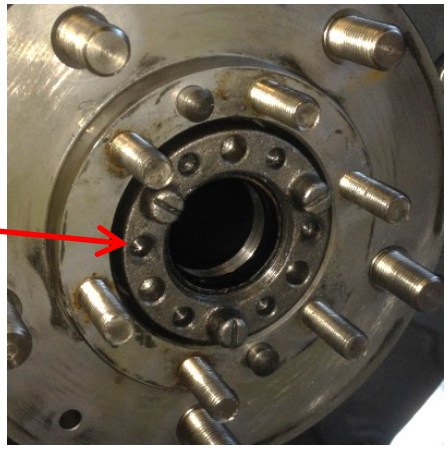


7. Install thrust washer. Be sure to align tab with the slot in the spindle.

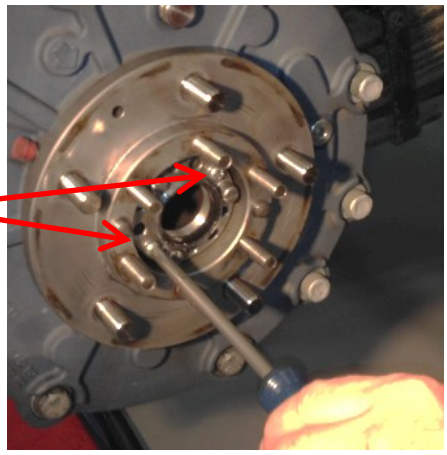
! WARNING ! To set the bearing properly ***the brake must be released***. This will require the Pump Pack and the SAHR Hose Kit to be installed (see Section 9).

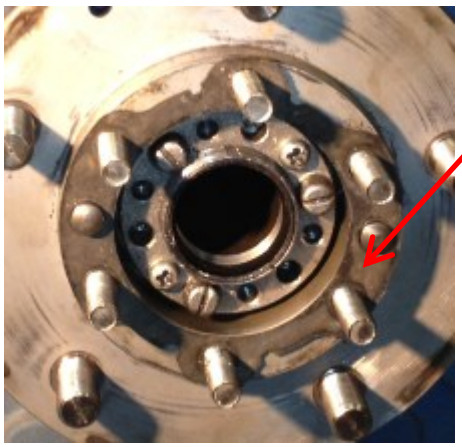
DO NOT PROCEED until brake is released.

8. Install adjusting nut using Toyota Retainer Socket SST 09607-6002. Torque to 59 Nm (43 ft-lbs). Turn the hub left and right several times. Loosen until the nut can be turned by hand. Retighten to 49 Nm (36 ft-lbs). Torque nut to 64 Nm (47 ft-lbs).

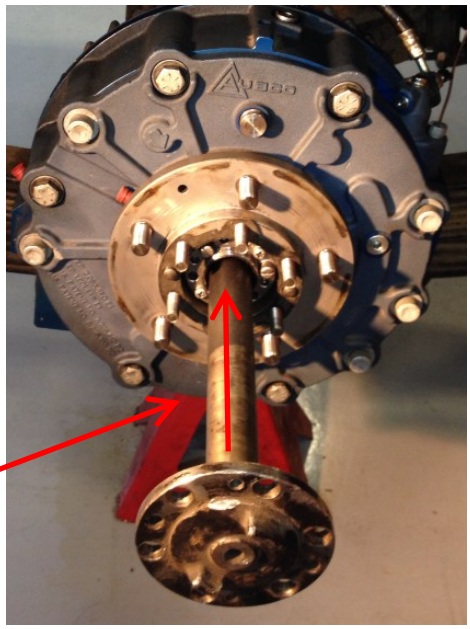


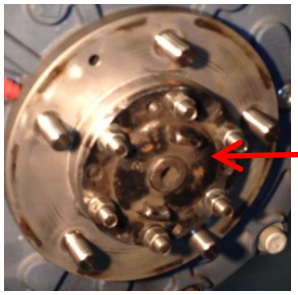
9. Install locking screws. Torque to 5.5 Nm (49 in-lbs).





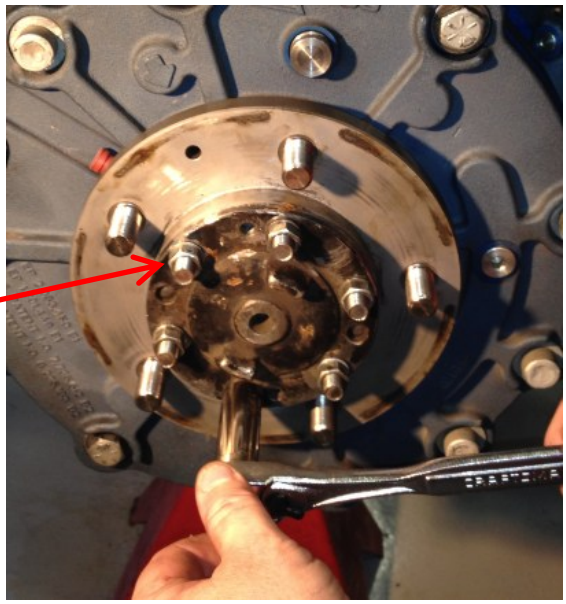
10. Install gasket.

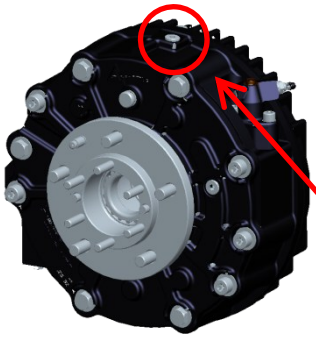




11. Install axle shaft. Gently tap into place if necessary.

12. Install cone washers, flat washers and nuts. Torque the six nuts to 37 Nm (27 ft-lbs).





13. After assembly is complete, verify that all the seals have been assembled and not damaged. This can be done by performing an air test and a leak test.

A. Air test is done by using a positive air pressure source and a regulator (example set-up left). Apply 0.7 Bar (10 psi) to the brake housing at the top port (vent port). **! WARNING !** DO NOT EXCEED 1.1 Bar (15 psi). Lock off air pressure source with ball valve. Hold for 60 seconds. No drop in air pressure allowed. If leak occurs check all seals, replace any damaged or missing O-rings and re-test.

B. Leak test is done by filling the brake with oil, leaving it sit for an hour and inspecting the mating faces for any traces of oil seeping from the mating surfaces. If leak occurs check all seals, replace any damaged or missing O-rings and re-test.

SECTION 7

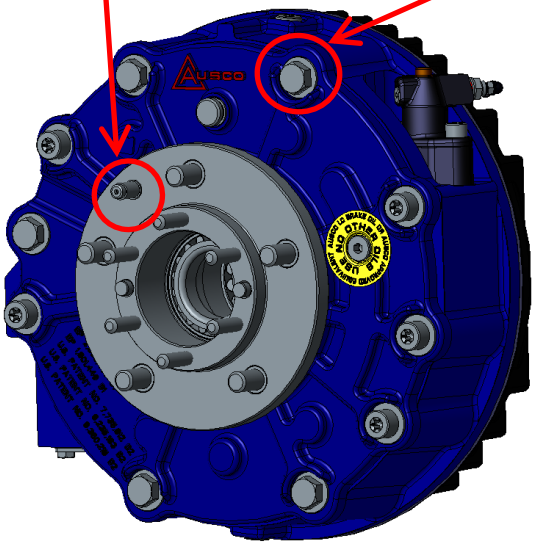
INSTALLING THE REAR BRAKE

AFTER OEM DISC BRAKES

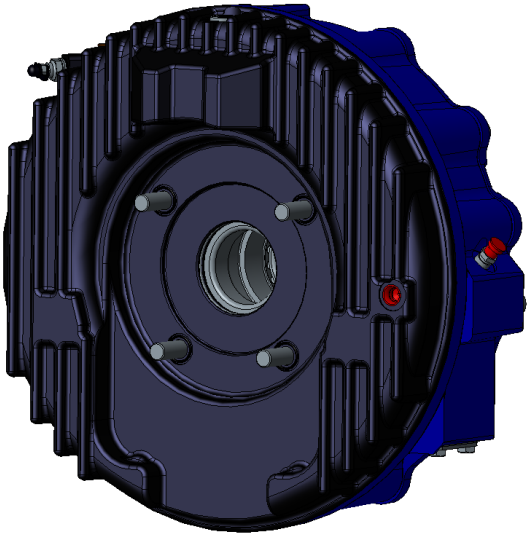
Perform same process for both sides of the vehicle. Lubricate O-rings with Dow Corning 200 unless otherwise noted or similar

! NOTE ! The brake assembly has a socket head shoulder screw with a spacer and washers installed in the location shown. DO NOT REMOVE until instructed.

1. Remove the indicated hex bolts to disconnect the mounting adapter. Set aside until needed. **! NOTE !** Do not remove the Hex Socket Head Cap Screws.



Front of Brake (Outboard Side)



Adapter Side of Brake (Inboard Side)

2. Each LC Brake comes with mounting adapter, three installation kits and the brakes that are ready to be assembled to the vehicle. You may want to familiarize yourself with the contents of the kits, adapter and brake assembly.

Tapered Roller Bearing Cone Kit - P/N 97573

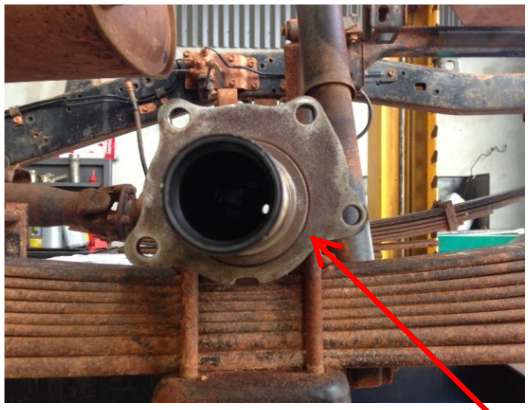
Mounting Adapter O-Ring Kit

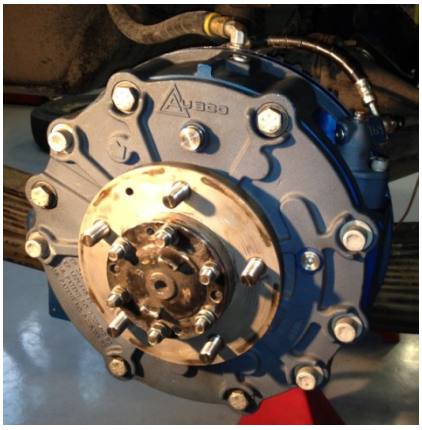
P/N 97563 There may be more O-rings in the kit than are re-quired.

Mounting Adapter Hardware Kit - P/N 97622

1. Install axle spacer and hardware for LC brake adapter.

! NOTE ! See Section 11 for a list of approved greases to use in O-ring installation.





1. The rear axle should have the disc brake already removed. The surfaces should be clean and repaired as necessary.

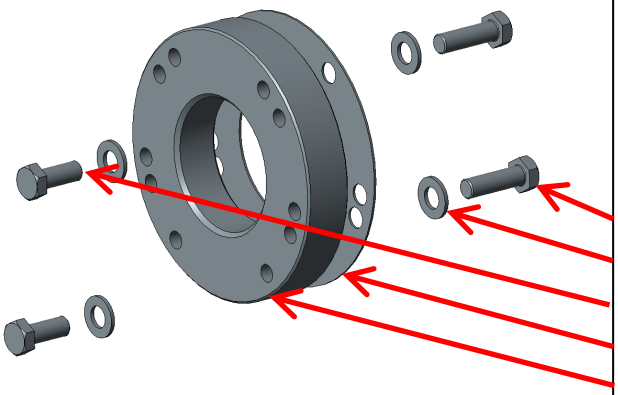
In addition to the brake kits received with the rear brake you will need Mounting Adapter Hardware Kit (P/N 97781) that contains:

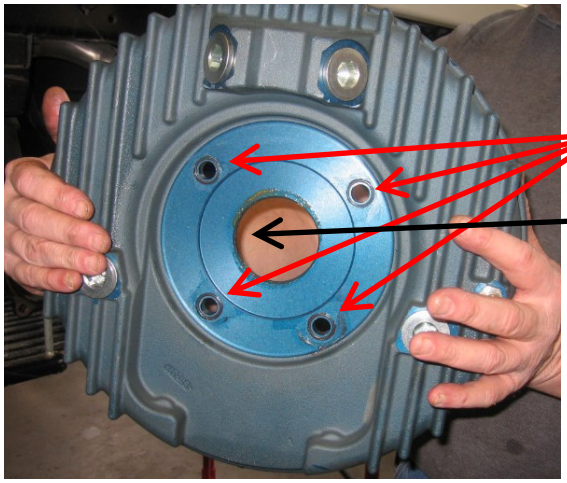
8 Hex Bolts – M12-1.25 x 30 (P/N 97668)

16 Washers (P/N 97631)

8 Hex Bolts – M12-1.25 x 40 (P/N 97629)

2 Adapter Shims (P/N 101164)





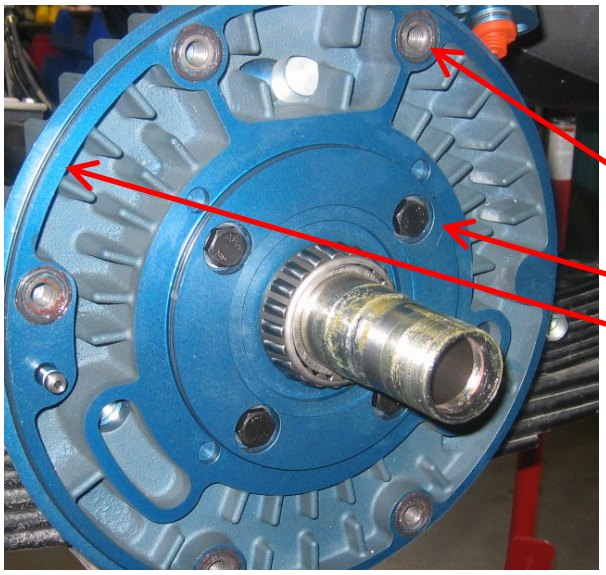
2. From the Mounting Adapter O-ring Kit locate:

(4) (P/N 84653) O-rings –hold in place with grease.

(1) (P/N 98126) O-ring – lubricate.

! NOTE ! See Section 11 for a list of approved greases to use in O-ring installation.

2. Mount the Rear LC brake and hub to mounting adapter.



1. From the Mounting Adapter O-ring Kit locate:

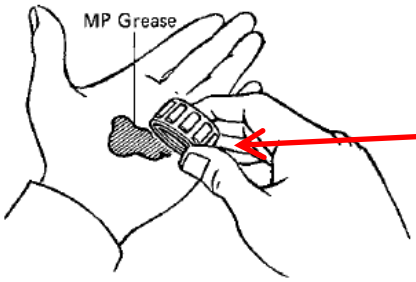
(5) (P/N 75036) O-rings (rear brake mounting locations) -lubricate.

(1) (P/N 79654) O-ring - lubricate.

(1) (P/N 84216) O-ring - lubricate.

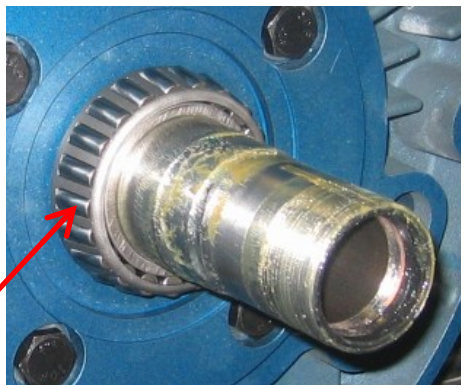
Assemble in location shown.

2. Lubricate and install connector tube (P/N 97574). This may require a tap with a soft faced mallet.

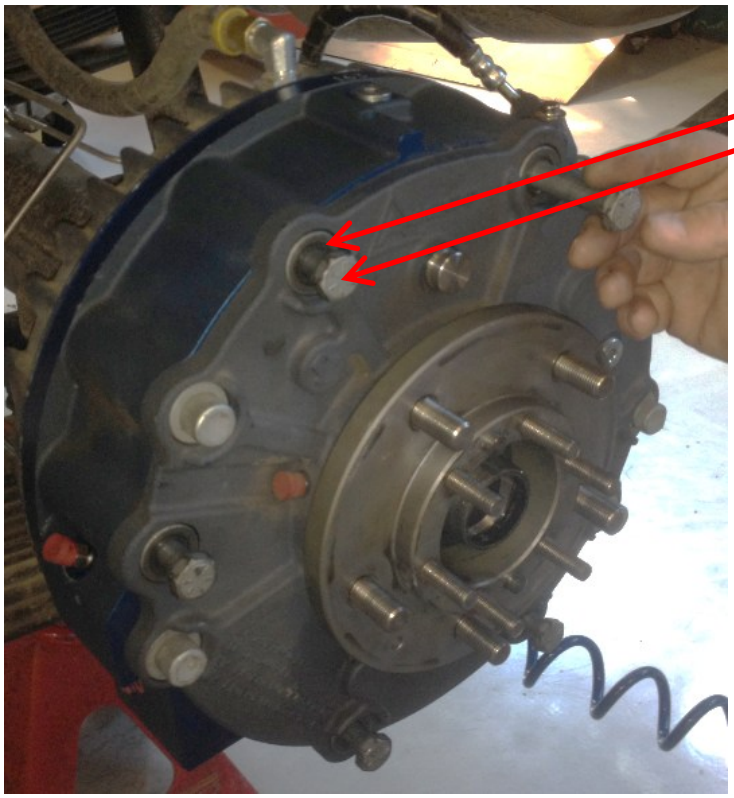


3. Locate the inboard bearing cone (P/N 96915) from the Bearing Cone Kit and pack with grease.

4. Install the bearing cone on the spindle.



5. Slide the rear brake assembly onto the spindle and snuggly fit it up to the mounting adapter.

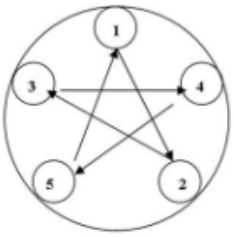


6. Locate (previously set aside):

(5) (P/N 96299) flat washers
(5) (P/N 93467) hex bolts

Insert the bolt through the flat washer and into the brake bolt mounting locations. Tighten bolts by working around the five bolt pattern as shown below. Turning one to two turns per bolt.

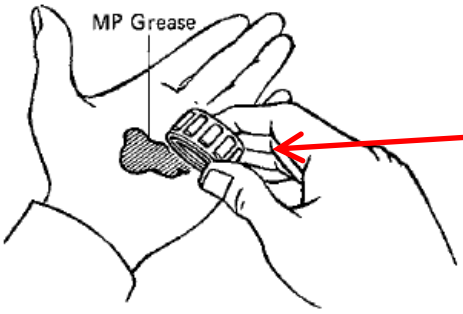
Torque bolts to 115 Nm (85 ft-lbs).



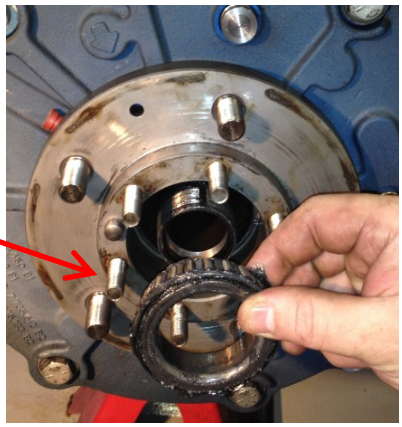
Five-Bolt

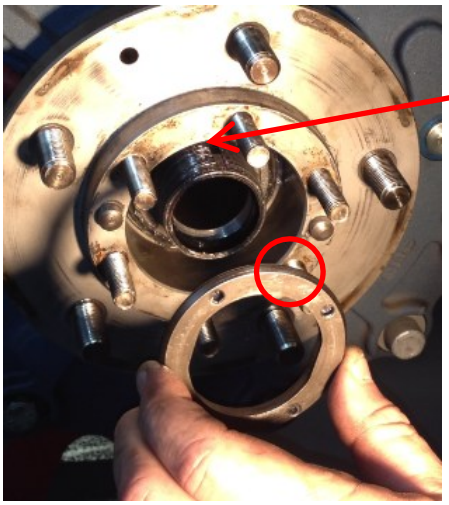
7. The brake assembly has a socket head shoulder screw with a spacer and washers installed in the location shown. It is there to hold the hub to the brake during assembly. Remove them prior to mounting the wheel.

If not removed it can bind and snap off.



8. Locate the outboard bearing cone (P/N 96916) from the Bearing Cone Kit and pack with grease. Install the bearing cone.

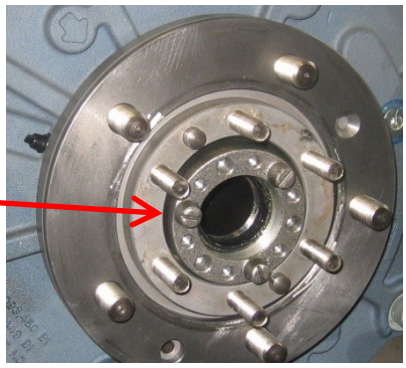




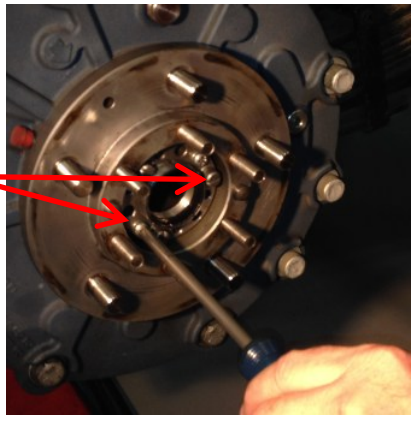
9. Install the thrust washer. Be sure to align tab with the slot in the spindle.

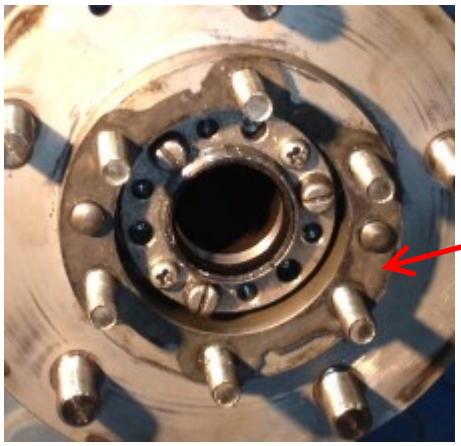
! WARNING ! To set the bearing properly ***the brake must be released***. This will require the Pump Pack and the SAHR Hose Kit to be installed (see Sections 8 & 9). DO NOT PROCEED until brake is released.

10. Install adjusting nut using Toyota Retainer Socket SST 09607-6002. Torque to 59 Nm (43 ft-lbs). Turn the hub left and right several times. Loosen until the nut can be turned by hand. Retighten to 49 Nm (36 ft-lbs). Torque nut to 64 Nm (47 ft-lbs).

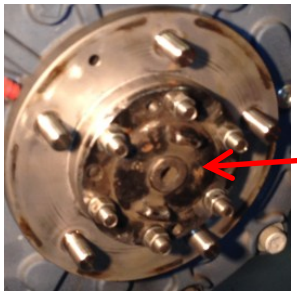


11. Install locking screws. Torque to 5.5 Nm (49 in-lbs).

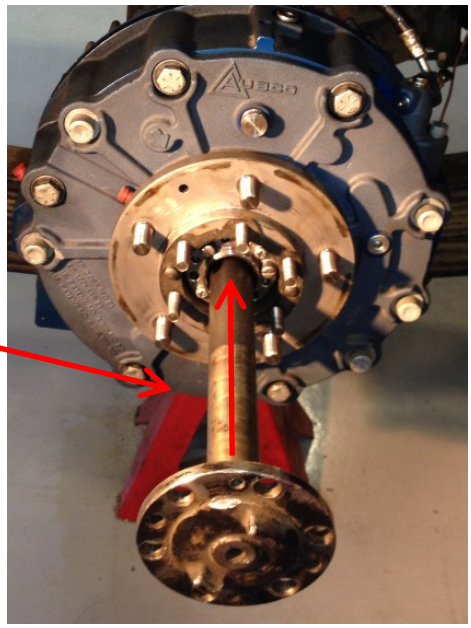


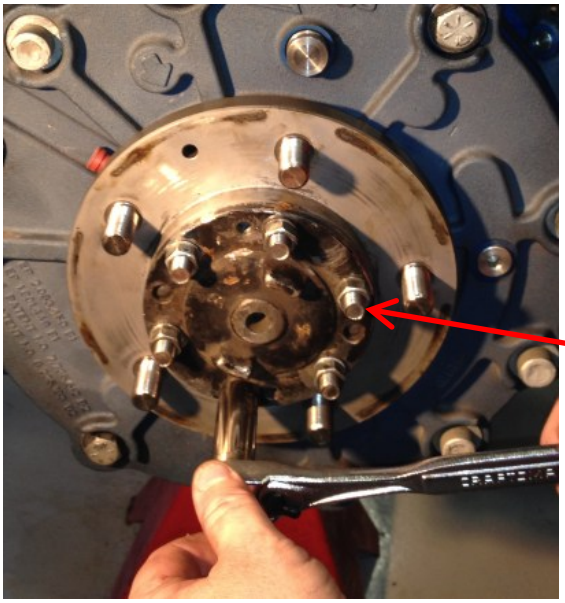


12. Install gasket.



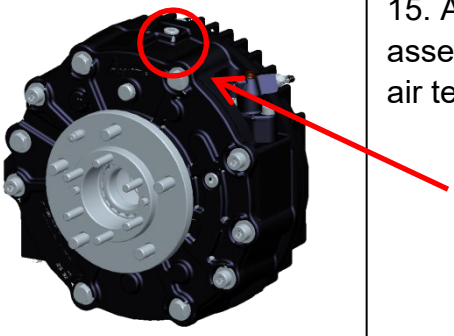
13. Install axle shaft. Gently tap into place if necessary.





14. Install cone washers, flat washers and nuts.

Torque the six nuts to 37 Nm (27 ft-lbs).



15. After assembly is complete, verify that all the seals have been assembled and not damaged. This can be done by performing an air test and a leak test

A. Air test is done by using a positive air pressure source and a regulator (example set-up left). Apply 0.7 Bar (10 psi) to the brake housing at the top port (vent port).

! WARNING ! DO NOT EXCEED 1.1 Bar (15 psi). Lock off air pressure source with ball valve. Hold for 60 seconds. No drop in air pressure allowed. If leak occurs check all seals, replace any damaged or missing O-rings and re-test.

B. Leak test is done by filling the brake with oil, leaving it sit for an hour and inspecting the mating faces for any traces of oil seeping from the mating surfaces. If leak occurs check all seals, replace any damaged or missing O-rings and re-test.

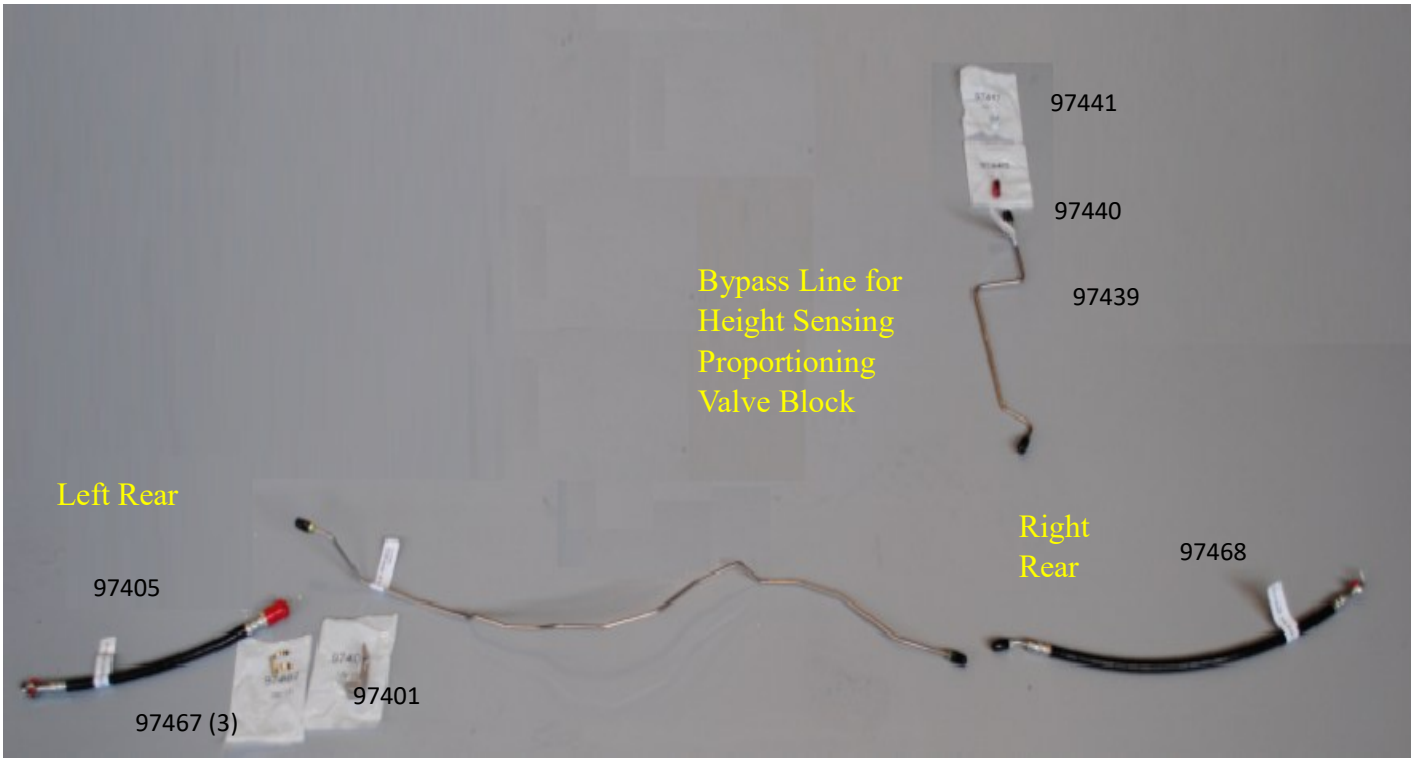
SECTION 8

INSTALLING THE PLUMBING

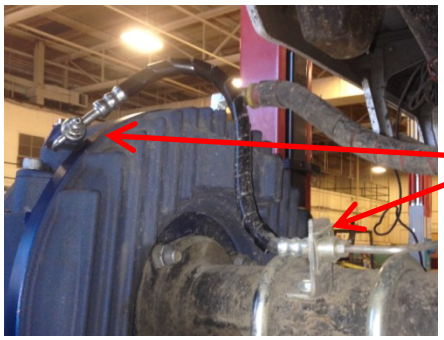
The LC Brake Hose Kit (P/N 98822) is designed for model years 2007 and post-2007 Toyota Land Cruiser models. The kit will install on both left and right hand drive versions.

1. Assemble and install service brake lines.

Service brake line assembly components from the Hose Kit box.



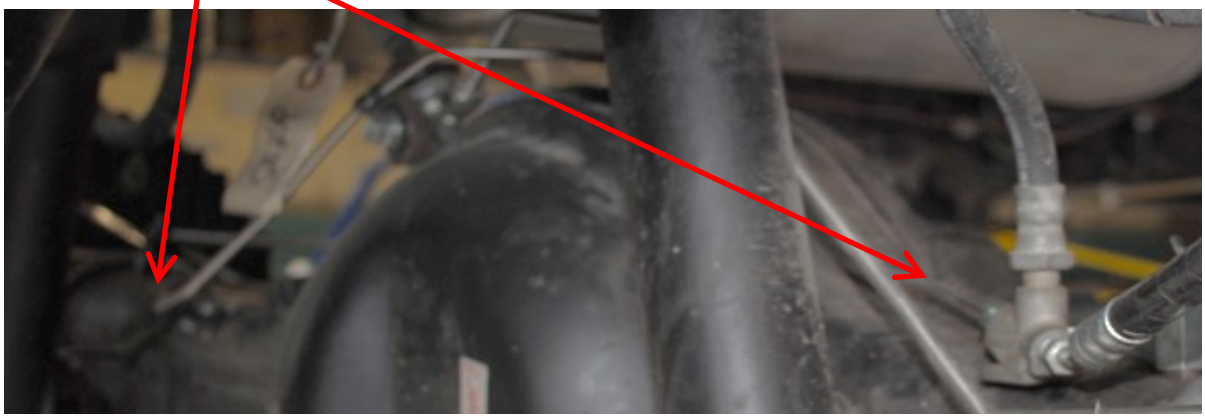
A. Assemble and install rear service brake lines.



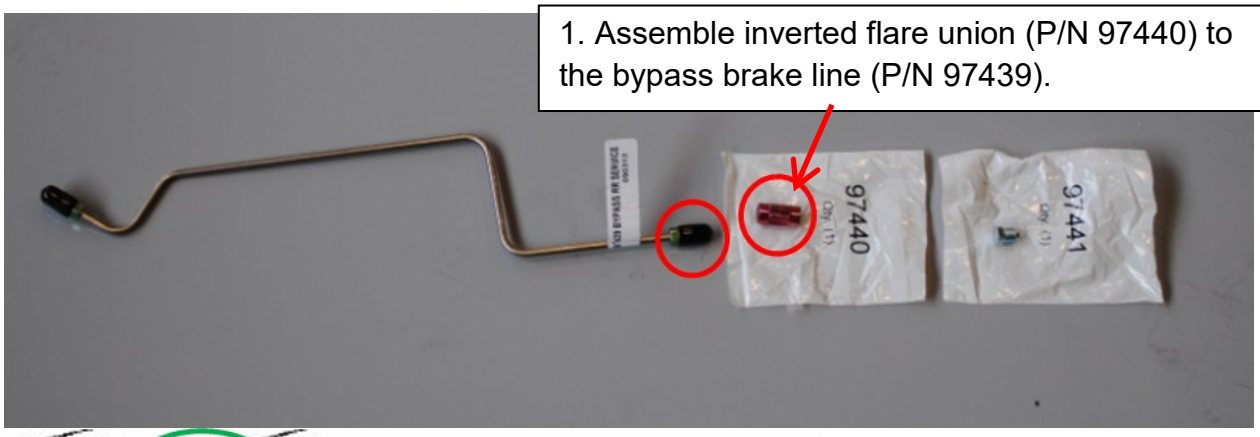
1. Assemble the left rear flexible line (P/N 97405) from the service slave cylinder to the (P/N 97401) bracket. Torque Banjo Bolt to 15 ft-lbs (20.3 Nm). Use clip (P/N 97467) to hold in place.

2. Assemble the right rear flexible line (P/N 97468) from the service slave cylinder to the OEM tee.

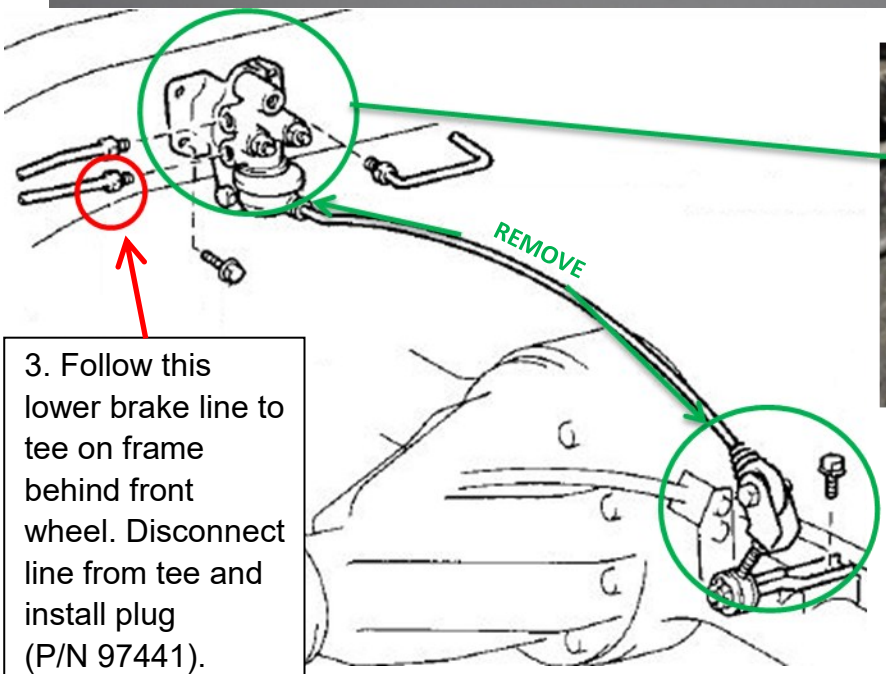
3. Assemble rear brake line (P/N 97404) from the tee to the fitting on the bracket to the right side.



B. Assemble and install bypass for the height sensing proportional valve.

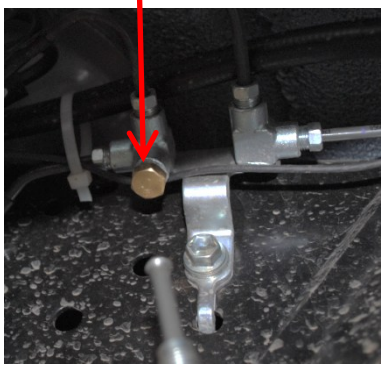


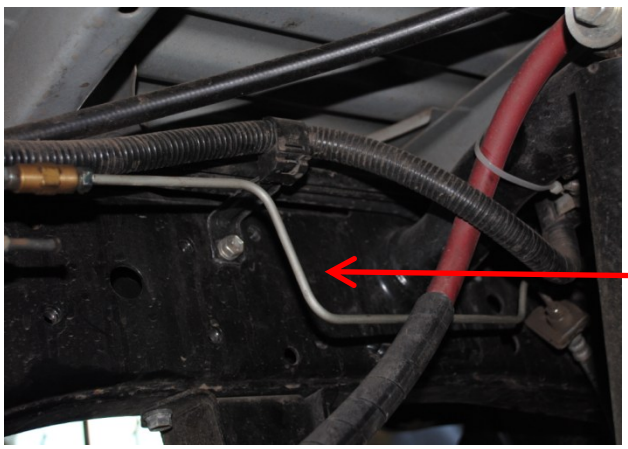
1. Assemble inverted flare union (P/N 97440) to the bypass brake line (P/N 97439).



2. Remove the proportioning valve block and lines.

3. Follow this lower brake line to tee on frame behind front wheel. Disconnect line from tee and install plug (P/N 97441).

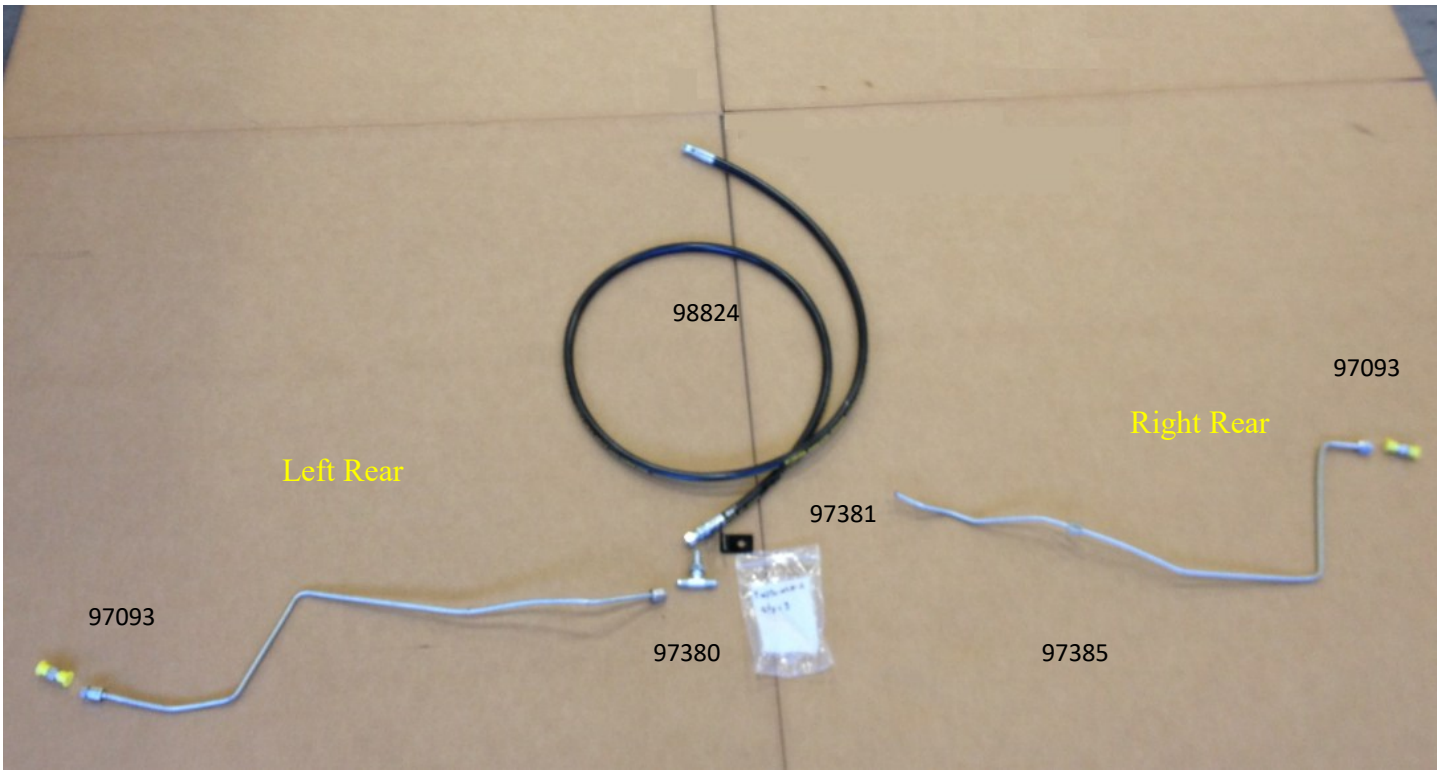




4. Install the bypass brake line (P/N 97439) & inverted flare union (P/N 97440) to the top OEM line.

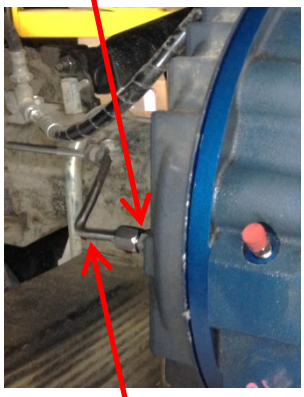
2. Assemble and install SAHR hydraulic park brake lines.

SAHR Park brake line assembly components from the Hose Kit box.



A. Assemble and install the SAHR rear park brake lines.

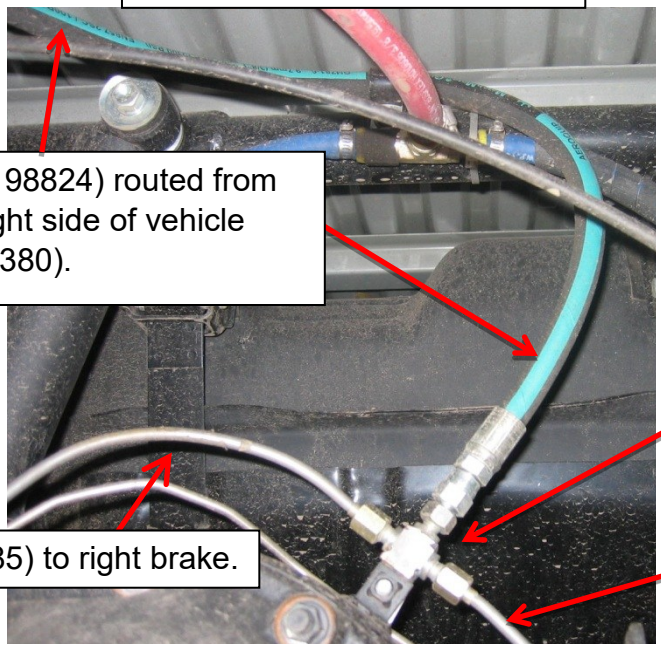
1. Assemble fitting (P/N 97093) to the rear mounting adapter of the brake. One for each side.



2. Assemble brake line (P/N 97384) to fitting (P/N 97093) on the left hand brake and tee fitting (P/N 97380).

3. Assemble brake line (P/N 97385) to fitting (P/N 97093) on the right hand brake and tee fitting (P/N 97380).

View from Front of Vehicle



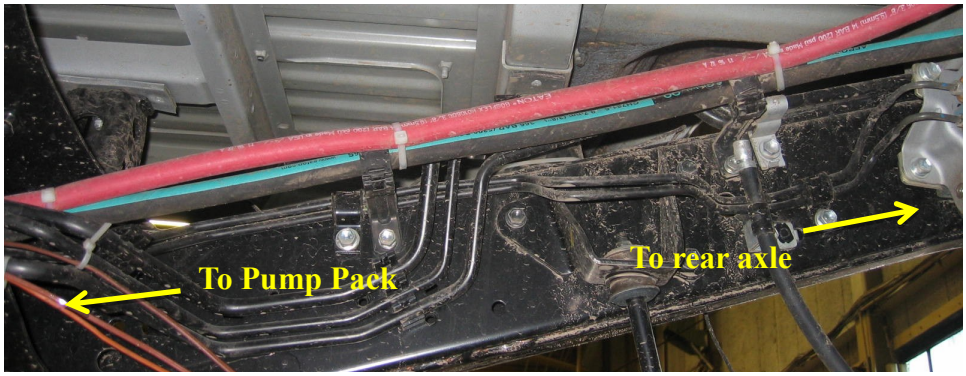
Hydraulic hose (P/N 98824) routed from Pump Pack along right side of vehicle frame to tee (P/N 97380).

4. Mount bracket (P/N 97381) to the rear differential as shown. Assemble tee (P/N 97380) to the bracket. Then attach the hoses and brake lines as shown.

Brake line (P/N 97385) to right brake.

Brake line (P/N 97384) to left brake.

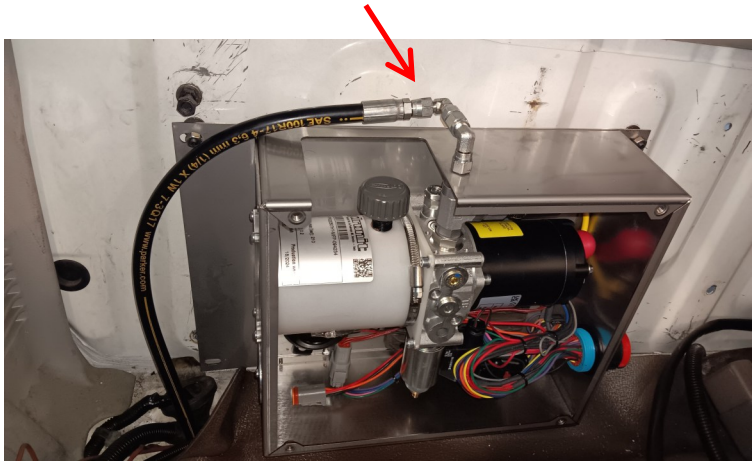
1. Locate P-clamps along axle to secure brake lines as needed.



2. Route hydraulic hose (P/N 98824) from rear axle toward the Pump Pack along the right side of the frame. Secure the hose as shown.

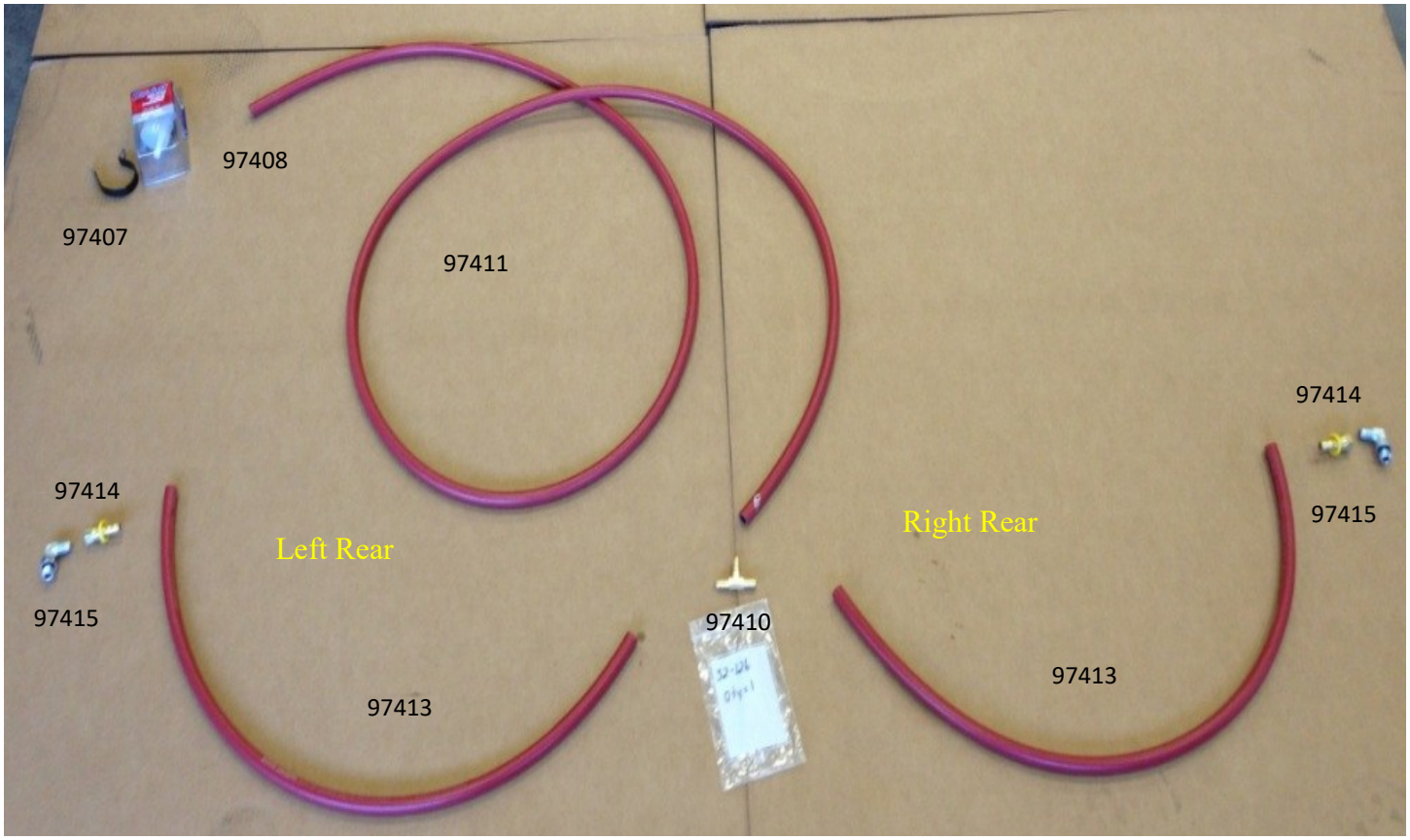
B. Attach to the Pump Pack.

1. Hydraulic hose (P/N 98824) from tee fitting (P/N 97380) on rear differential connects to the elbow located on the top of the Pump Pack.



3. Assemble and install hoses and vents.

Vent assembly components from the Hose Kit box.

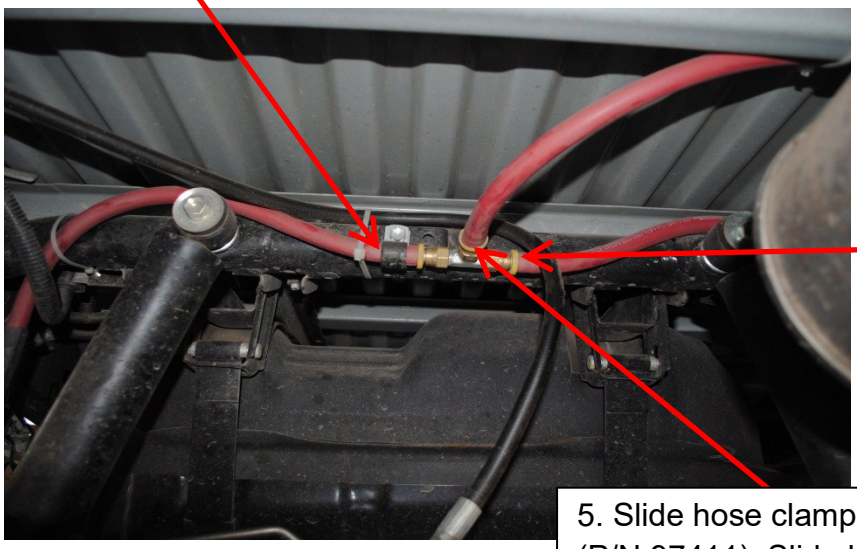


A. Install the rear vent line.

1. Install elbow fitting (P/N 97415) into vent port of both mounting adapters. Follow up by installing hose fitting (P/N 97414) into the elbow fitting.

2. Slide hose clamps (P/N 97409) over vent hoses (P/N 97413). Slide vent hose over the fitting (P/N 97414). Tighten clamps (P/N 97409) securely. Do not over tighten.

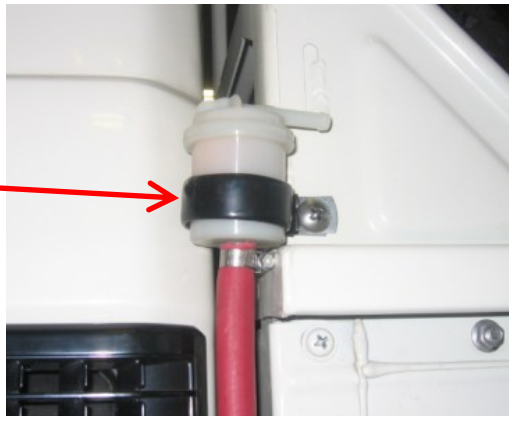
3. Secure the tee (P/N 97410) to the vehicle frame at a convenient location where the hoses meet using a p-clip.



4. Slide hose clamps (P/N 97409) over both vent hoses (P/N 97413). Slide the vent hoses onto tee fitting (P/N 97410). Tighten hose clamps. Do not over tighten.

5. Slide hose clamp (P/N 97409) onto end of hose (P/N 97411). Slide hose end onto tee fitting (P/N 97410). Tighten hose clamp securely. Do not over tighten.

6. Route vent hose (P/N 97411) behind left-hand side door. Slide hose clamp (P/N 97409) onto the end of the vent hose. Insert filter (P/N 97408) into the end of the vent hose. Tighten hose clamp securely. Do not over tighten. Attach hose clamp (P/N 97407) to filter and fasten it to the bed of the truck with a self-tapping screw.



SECTION 9

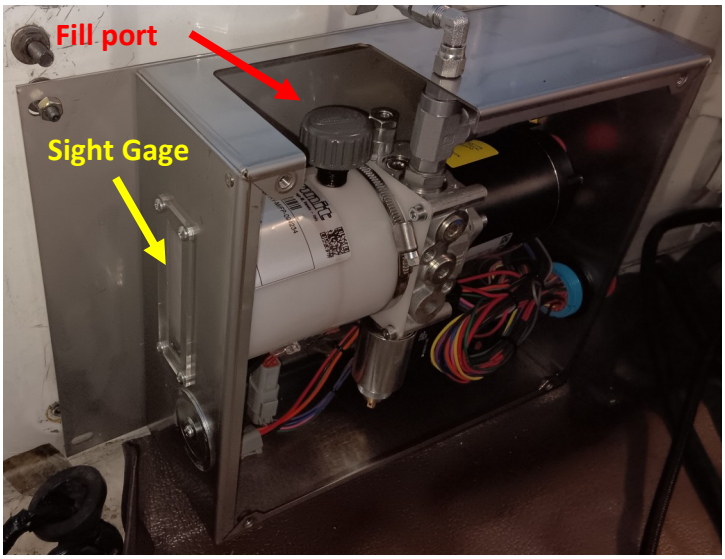
POWERING UP THE PUMP PACK

9. System Preparation

1. With parking brake applied, fill the pump reservoir between 1/2 and 2/3 full. **DO NOT OVER-FILL.** The empty capacity is required for fluid returning from the brake release circuit.

- Use Dex/Merc AFT fluid in normal operating environments (temperatures above 0° C).
- Use Kendall Glacial Blue fluid in cold operating environments (temperatures below 0° C).

2. Verify power is available to system (battery connected and ground disconnect switch engaged).
3. Turn ignition switch to “ON” position.
    - It is not necessary to start the engine.
    - Vehicle doors must be shut (if door safety option is enabled).
    - Seatbelt must be buckled (if seat belt safety option is enabled).
    - Auxiliary system must be disengaged (if an auxiliary safety option is enabled).
4. Push in Emergency/Park Brake button.
5. Press and release the “Tow Mode” button. Green light should flash.
6. Twist to release the Emergency/Park Brake button. Pump will activate and release brake.
7. Have a helper watch the fluid reservoir as the system fills the brake lines. Add fluid if level drops below 1/2 full.



10. Bleeding the Parking Brake

CAUTION ! Monitor the pump reservoir fluid level while bleeding. Add fluid as necessary to keep reservoir level between 1/2 and 2/3 full. **DO NOT OVERFILL.**

The empty capacity is required for fluid returning from the brake release circuit.

1. Place a clear hose on the bleeder shown in top picture. Hold open end of hose in a container.

! CAUTION ! Take care when bleeding the parking release circuit. The Pump Pack generates significant pressure. Always open the bleeder **slowly**. Air and fluid will be under increased pressure and discharge rapidly.

2. Crack the bleeder to remove air from the system. When you get fluid, close the bleeder and repeat for the other brake.
3. The pump may shut down if the pump runs for too long. To restart the pump, push the PARK BRAKE button back in, press and release the TOW MODE button. Then twist to release the PARK BRAKE button. Pump will restart.
4. Bleed each parking circuit a second time to ensure all air is out of the system. **! NOTE !** This only bleeds the park circuit of brakes. Service circuit must be bled separately.

11. Testing the Pump Pack

To test Engine Oil Pressure:

1. Turn the ignition key to the “ON” position. DO NOT start the engine. The red light on the dash panel will be on.
2. Push in the PARK BRAKE button.
3. Twist to release the PARK BRAKE button. The pump will not start because there is no engine oil pressure. Red light will flash one time, pause, and repeat.

To test Tow mode:

1. With vehicle doors closed, and driver seat belt buckled, turn the ignition switch to the “ON” position. DO NOT start engine.
2. Push PARK BRAKE button in. This will apply the park brake. Red light will turn on.
3. Press and release the TOW MODE button. DO NOT hold button down. The green light will begin flashing while the red light stays on.
4. Twist to release the PARK BRAKE button. The red light will flash as Pump Pack builds pressure. When release pressure is achieved, the red light will turn off and the green light will continue to flash.

Tow Mode is now active with the parking brake released.

If engine oil pressure is restored (engine started), Tow Mode will automatically disengage and normal operation will resume. The indicator lights on the dash panel with display that the system is ready for operation. The green light will stop flashing and remain on continuously.

12. Testing the Safety Features

The Pump Pack is designed to include several safety features. If there features were enabled, they must be tested for proper function.

! CAUTION ! Each safety feature must be isolated during tests. Ensure all safety features are engaged. For example, door switches must be closed to test the seat belt switch. This also applies to any auxiliary system.

Testing the door switches.

1. Push in the PARK BRAKE button.
2. Close vehicle door(s) and verify all other safety features are engaged.
3. Start the engine.
4. Twist to release the PARK BRAKE button to activate the pump.
5. Open vehicle door. The pump pack should dump pressure and the red light will flash 4 times, pause, and repeat the flash.
6. Push in PARK BRAKE button. The red light should be on continuous.
7. Repeat test for additional door switches.

Testing the seat belt switch.

1. Push in the PARK BRAKE button.
2. Latch seat belt and verify all other safety features are engaged.
3. Start the engine.
4. Twist to release the PARK BRAKE button to activate the pump.
5. Unlatch the seat belt. The pump pack should dump pressure and the red light will flash 5 times, pause, and repeat the flash.
6. Push in PARK BRAKE button. The red light should be on continuous.

Repeat test for additional seat belt switches.

See next page for full list of error codes.

Testing the auxiliary system.

1. Push in the PARK BRAKE button.
2. Initialize auxiliary system and verify all other safety features are engaged.
3. Start the engine.
4. Twist to release the PARK BRAKE button to activate the pump.
5. Activate auxiliary system to generate brake signal. The pump pack should dump pressure and the red light will flash 6 times, pause, and repeat the flash.
6. Push in PARK BRAKE button. The red light should be on continuous.

13. Error Codes

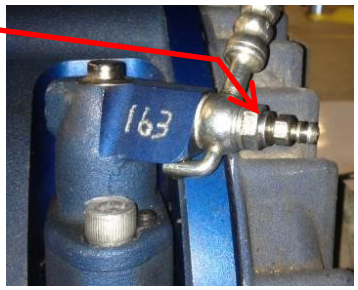
Number of Red Flashes	Diagnostic	Problem / Corrective Action
1	No engine oil pressure	• Vehicle not on • Low engine oil level • Check the oil pressure switch
2	Does not achieve system hydraulic pressure within 15 seconds	• Low fluid level in Pump Pack reservoir. • Leaks in hoses, brake tubes, or fittings. • The system may have overheated. Remove the enclosure cover to allow pump to cool. • Pump Pack pump/motor not generating pressure. • Faulty pressure transducer/dump valve. • Internal pump relief valve set too low.
3	Slow leak—pump runs 3 times within 3 minutes	• Check fluid level in Pump Pack reservoir. • Check hoses, brake tubes, and fittings for leaks. • Fluid may be leaking into the brakes. Check oil level in the brakes.
4	Vehicle door is open	• Shut vehicle door. • Verify door switches are functional. • Chase door wire and verify wire is intact.
5	Seat belt not engaged	• Latch seat belt. • Verify seat belt switch is functional. • Chase seat belt wire and verify wire is intact.
6	Auxiliary System Error	• Auxiliary system has signaled to apply brake.
7	Motor Overload	• Pump motor is overheated. Allow to cool. • Fuse at battery is blown. Replace with 30 amp automotive fuse. Look for shorts and wire damage.

SECTION 10

BLEEDING THE SERVICE BRAKES

1. Be sure all brake line connections are secure and that the lines are free of any temporary clamps used during installation.

2. You will need a box-end or line wrench sized to fit the service brake bleeder, a clear plastic tube to fit over the bleeder and a container to collect the brake fluid. Note that using an open end wrench may lead to stripping the hex off the bleeder.



3. For a quicker bleed time, a power bleeder may be used to initially fill and bleed the system. **! WARNING !** A power bleeder will not reliably get all of the air from the slave cylinders. Use the two person bleed procedure to ensure that all of the air is removed.

4. **! WARNING !** For proper service brake bleeding, the park brakes must be released. See Section 9, Powering up the Pump Pack.

5. Be sure the master cylinder reservoir is full of DOT-3 brake fluid. During the bleed procedure, it is important to keep the master cylinder reservoir filled with brake fluid.

6. Two people are required to perform this bleed procedure. Working together, one person slowly pumps the brake pedal while the other person connects a clear tube and a wrench to the bleeder on the brake and puts the other end of the tube into a container. The bleeder is opened to allow the air to escape from the brake line. To keep air from backing into the line, be sure to keep the end of the tube below the fluid line in the container.

   ! IMPORTANT ! Push and hold the pedal. Open the bleeder. When fluid flow stops, close the bleeder and then release the pedal.

7. Repeat this procedure until all of the air is out of the system for all four brakes.

8. Check for leaks at the banjo bolt fittings. Make sure there are no leaks.

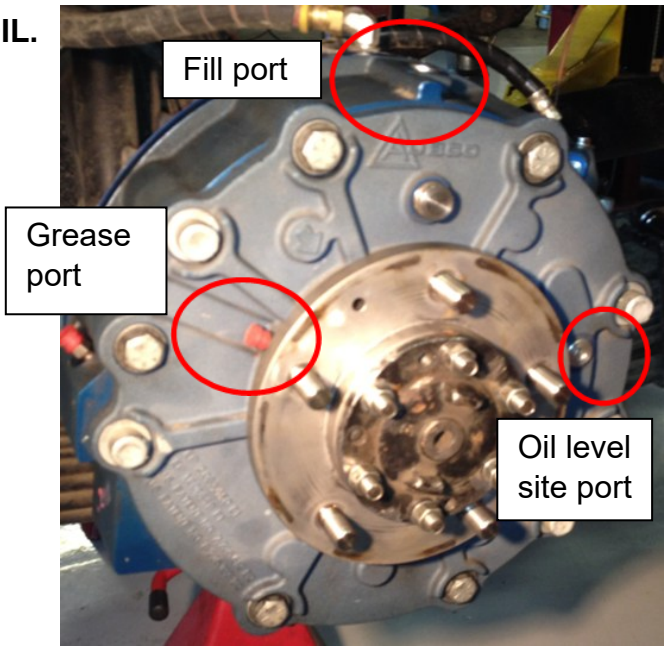
SECTION 11

FILLING THE BRAKE WITH OIL

AND GREASING THE HUB SEALS

! WARNING ! USE ONLY AUSCO APPROVED OIL.

1. Remove the oil level sight port plug and the fill port plug from the LC brake.
2. Use a funnel or carefully pour Ausco Approved Brake Oil into the brake.
3. Watch the oil level sight port and continue to fill until the oil reaches the site port. If filling a new brake the volume of oil will be approximately 1700 mL (1.8 US qt).
4. Reinstall the fill port and oil level sight port plugs.



! WARNING ! OIL TYPE AFFECTS BRAKING PERFORMANCE. USE ONLY AUSCO APPROVED OILS. CONTACT YOUR LC BRAKE DISTRIBUTOR OR AUSCO FOR APPROVED OIL LIST. USE OF UNAPPROVED OILS OR "EQUIVALENTS" CAN RESULT IN SERIOUS INJURY OR DEATH.

Grease hub seals.

Grease is applied to the brake on the production assembly line. However, you may want to add grease should there be any doubt.

Apply grease at zerk fitting until grease appears around lip of outer seal, then rotate hub 90 degrees. Repeat greasing in this manner 3 times. Clean any excess grease.

Approved Greases
BP ENERGREASE LS3
SHELL GADUS S 5 T100
SHELL GADUS S 5 V100
MAGNALUBE-G

! NOTE ! Parking Brake must be released. To apply, add grease to the grease port while rotating hub until grease appears around seal. Clean up any grease that squeezes out.

SECTION 12

OPERATING AND MAINTENANCE PROCEDURES

See Operations and Maintenance Manual 107752

Visit auscoproducts.com to download this manual.

SECTION 13

TESTING THE BRAKE SYSTEM

The Service Brake

1. Find a flat, no-traffic area with enough space to allow the vehicle to accelerate into third gear. Step on the Service Brake Pedal to stop the vehicle. Note while testing the brake system, that there may be a slight noise during normal braking.

Items to consider after a few stops	Driving in 2nd gear Stop observations			Driving in 3rd gear Stop observations		
Pedal feel						
Pedal travel						
Straight stopping – hit brake hard watch for pulling						

2. Service any issues from the above testing and retest or move to next step.

3. Once braking is completed check connections and hoses for leaks.

The Parking Brake

Find a flat, no-traffic area with enough space to allow the vehicle to accelerate into third gear. Push the parking brake button on the dash panel to stop the vehicle. Note while testing the brake system, that there may be a slight noise during normal braking. The vehicle should stop straight in a smooth, even stop. Watch for pulling.