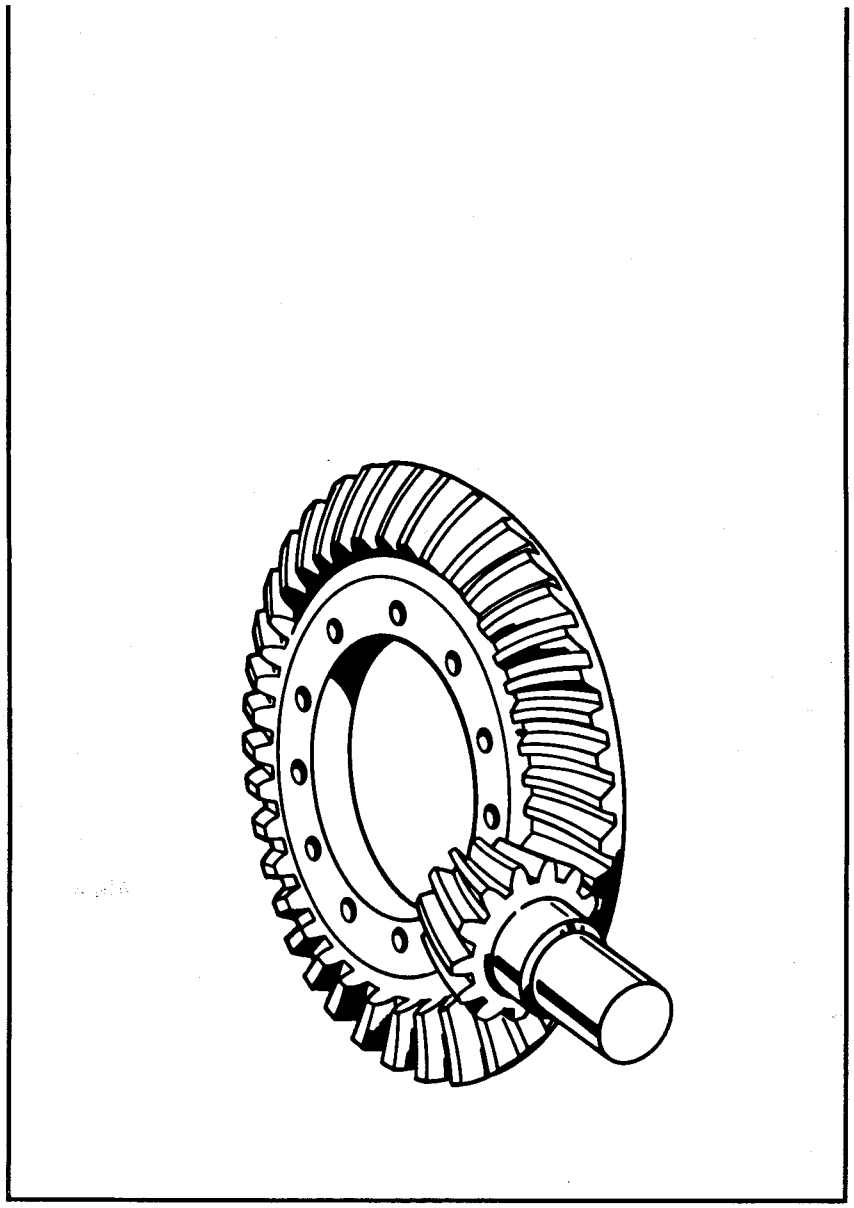
FORM NO. SENR2258-01
FOR USE IN SERVICE MANUAL:
950B WHEEL LOADER, FORM NO.
SENR2249



DISASSEMBLY AND ASSEMBLY

950B WHEEL LOADER POWER TRAIN

22Z1-UP
31R1-UP
63R1-UP
65R1-UP

Important Safety Information

Most accidents involving product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person should also have the necessary training, skills and tools to perform these functions properly.

Read and understand all safety precautions and warnings before operating or performing lubrication, maintenance and repair on this product.

Basic safety precautions are listed in the "Safety" section of the Service or Technical Manual. Additional safety precautions are listed in the "Safety" section of the owner/operation/maintenance publication. Specific safety warnings for all these publications are provided in the description of operations where hazards exist. WARNING labels have also been put on the product to provide instructions and to identify specific hazards. If these hazard warnings are not heeded, bodily injury or death could occur to you or other persons. Warnings in this publication and on the product labels are identified by the following symbol.

⚠ WARNING

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, maintenance and repair information.

Operations that may cause product damage are identified by NOTICE labels on the product and in this publication.

Caterpillar cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are therefore not all inclusive. If a tool, procedure, work method or operating technique not specifically recommended by Caterpillar is used, you must satisfy yourself that it is safe for you and others. You should also ensure that the product will not be damaged or made unsafe by the operation, lubrication, maintenance or repair procedures you choose.

The information, specifications, and illustrations in this publication are on the basis of information available at the time it was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service given to the product. Obtain the complete and most current information before starting any job. Caterpillar dealers have the most current information available. For a list of the most current publication form numbers available, see the Service Manual Contents Microfiche, REG1139F.

Index

⚠ WARNING

Disconnect batteries before performance of any service work.

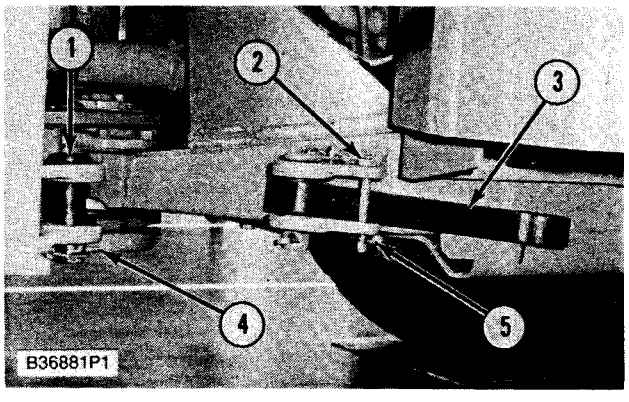
Steering Frame Lock Link

Separation And Connection Of Steering Frame Lock Link 7506-029

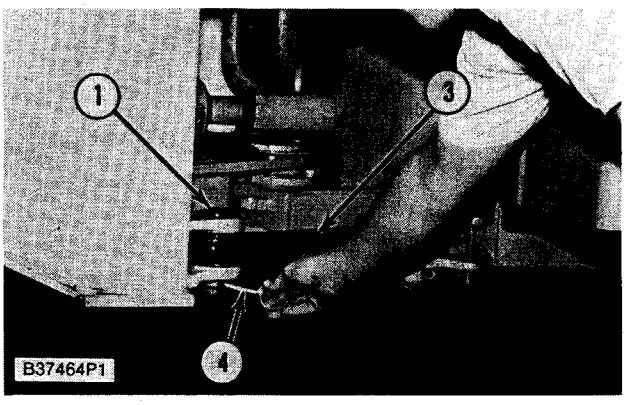
⚠ WARNING

No clearance for man in this area when turning vehicle. When machine is to be lifted, transported on another vehicle or service work being preformed near center of machine, connect steering frame lock link between front and rear frames to keep machine in straight ahead position. Before operation and when operating, be sure steering frame lock link, located near lower center of machine, is disconnected and pinned to retaining plates.

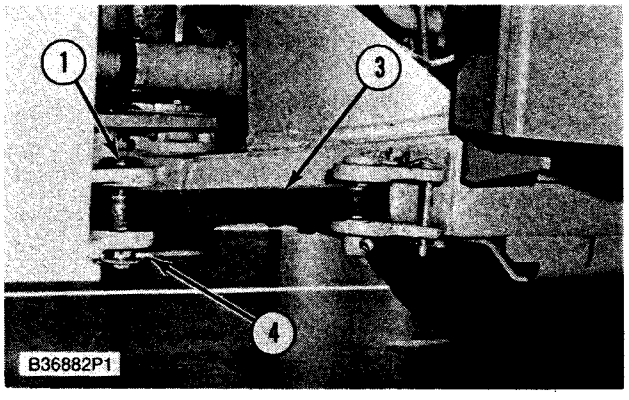
1. To connect the steering frame lock link, first put the machine in a straight ahead position.



2. Remove spring clip (5) and pin (2) that holds steering frame lock link (3).



3. Remove pin (4) and pin (1) from the bracket on the front frame.



4. Move steering frame lock link (3) to the front frame. Install pin (1) and pin (4) that holds steering frame lock link (3) in place.

NOTE: The following steps are for the separation of the steering frame lock link.

5. Remove pin (4) and pin (1) that holds steering frame lock link (3) in place on the front frame.

6. Move steering frame lock link (3) into the storage position. Install pin (2) and spring clip (5) that holds the steering frame lock link in place.

7. Install pin (4) and pin (1) to the bracket on the front frame.

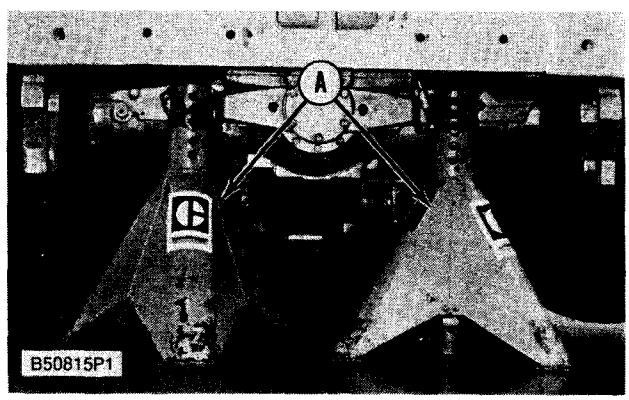
Tires And Rims

Remove And Install Tires And Rims 4202-010

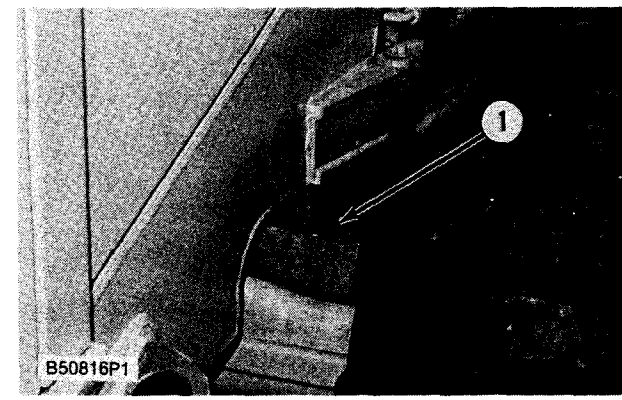
Tools Needed		A	B
8S7621	Tube	2	
8S7630	Stand	2	
8S7615	Pin	2	2
8S7640	Stand		2
8S7611	Tube		2

⚠ WARNING

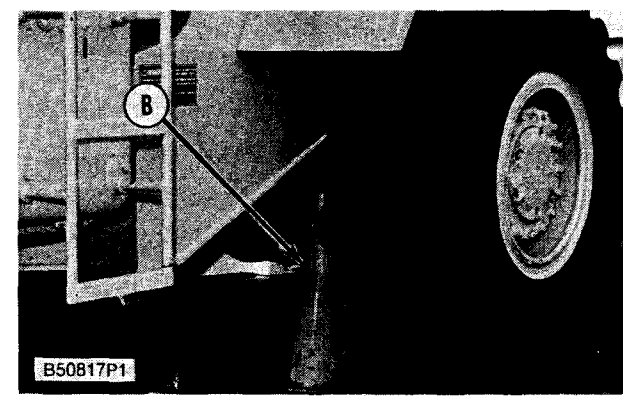
No clearance for man in this area when turning vehicle. When machine is to be lifted, transported on another vehicle or service work being performed near center of machine, connect steering frame lock link between front and rear frames to keep machine in straight ahead position. Before operation and when operating, be sure steering frame lock link, located near lower center of machine, is disconnected and pinned to retaining plates.



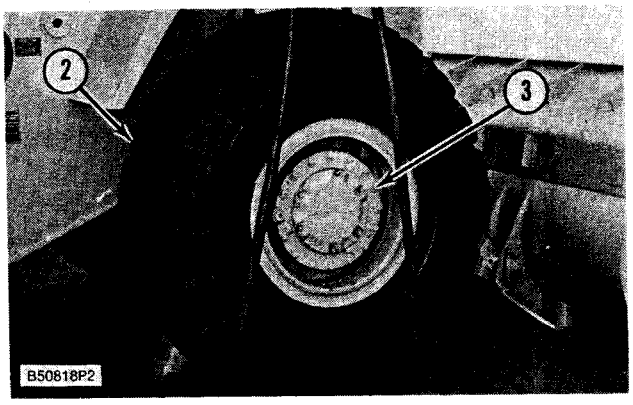
1. Lift the rear of the machine so the tires are off the ground and install tooling (A) under the rear frame.



2. Put wood blocks (1) between the rear axle housing and frame on each side of the machine to hold the axle housing in position when the tires and rims are removed.



3. For the removal of the front tires and rims put wood blocks behind the rear tires. Lift the front of the machine so the tires are off the ground and install tooling (B) under the loader frame as shown.



4. Fasten a hoist to tire and rim (2). Remove nuts and washers (3) that hold the tire and rim to the wheel assembly. Remove tire and rim (2) from the machine. The weight of each tire and rim is 544 kg (1200 lb.).

NOTE: The following steps are for the installation of the tires and rims.

5. Fasten a hoist to tire and rim (2) and put it in position on the wheel assembly.

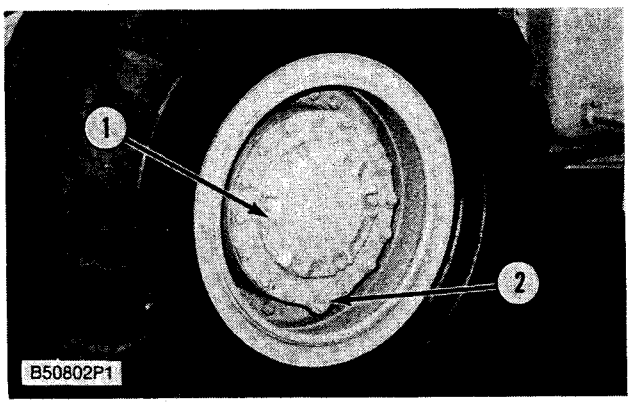
6. Install washers and nuts (3) to hold tire and rim (2). Tighten the nuts to a torque of 475 ± 50 N•m (350 ± 37 lb.ft.).

7. Lift the front of the machine and remove tooling (B) from the loader frame.

8. Remove blocks (1) from between the rear axle housing and frame.

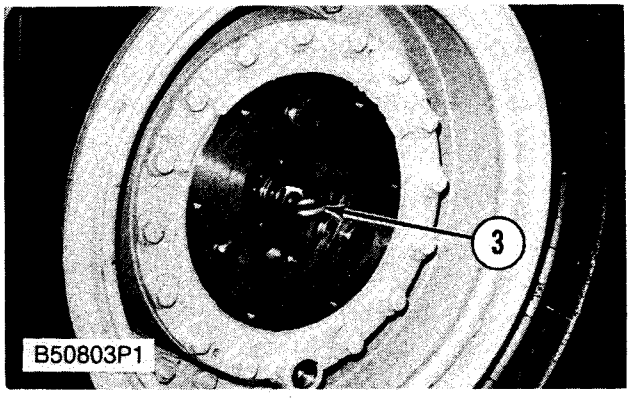
9. Lift the rear of the machine and remove tooling (A).

10. Disconnect the steering frame lock link from the main frames and put it in its storage position.



1. Move the machine to put drain plug (2) in the position shown. Remove plug (2) and drain the oil from the final drive.

2. Remove the bolts and cover assembly (1). Check the O-ring seal in the cover for wear or damage. If necessary, make a replacement.

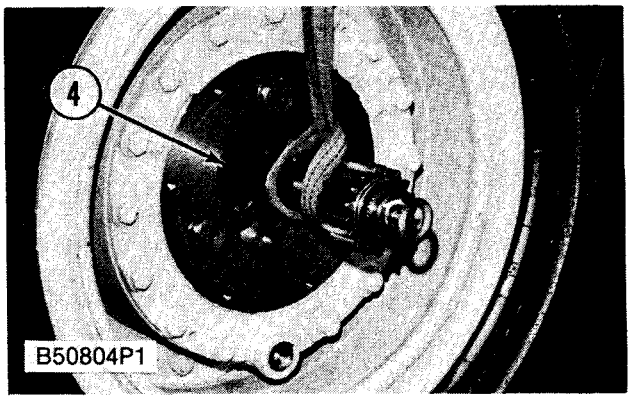


3. Install a 1/2" -13 NC forged eyebolt (3) in the end of the axle as shown. Pull the axle (4) out of the final drive until a hoist can be fastened to it.

Axles

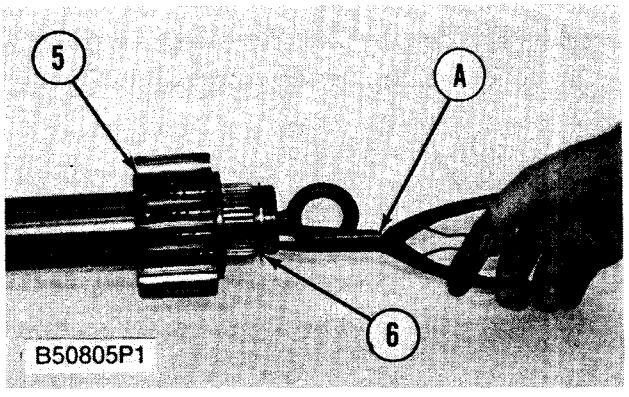
Remove Axles 3278-011

Tools Needed		A
2P8312	Pliers	1



4. Fasten a hoist and remove axle (4) from the machine. The weight of axle (4) is 23 kg (50 lb.).

NOTE: If the axle can not be removed, move the machine a small amount to the front or rear until the axle can be pulled from the differential and final drive.



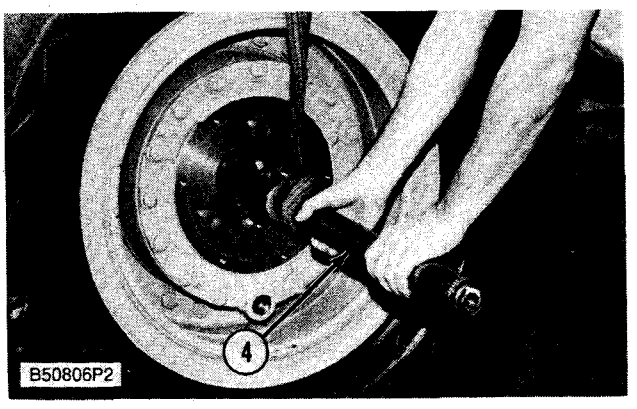
5. Use tool (A) and remove ring (6) from the axle.

6. Remove gear (5) from the axle.

Install Axles 3278-012

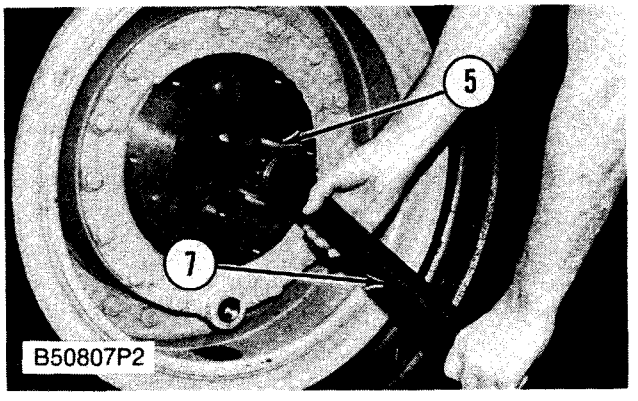
Tools Needed	A
2P8312 Pliers	1

1. Make sure the axles are clean and free of dirt and foreign material.

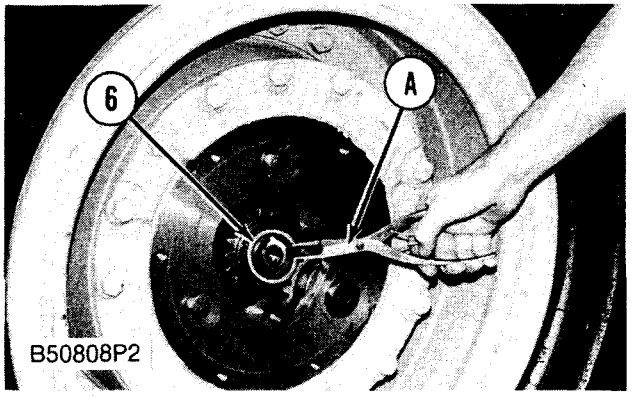


2. Fasten a hoist and put axle (4) in position.

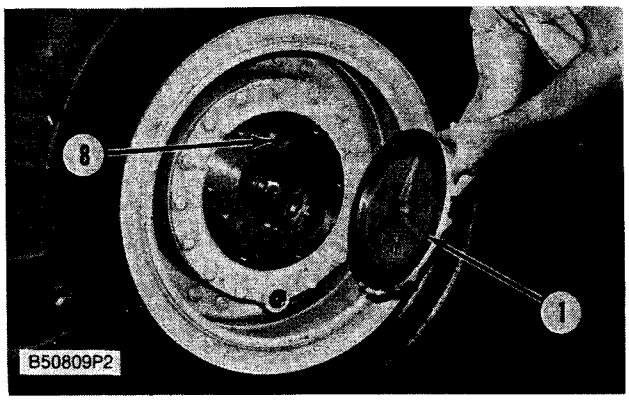
3. Install gear (5) half way on the axle.



4. Put a piece of pipe (7) which has a 5.1 cm (2 in.) outside diameter and 61 cm (24 in.) long in the end of gear (5) as shown. Push down on the pipe and slide the drive axle into position.



5. Remove the pipe. Slide gear (5) into position in the final drive planetary. Use tool (A) and install ring (6) that holds gear (5) in position on the axle.



6. Turn the flat sides of the three shafts (8) toward the outside as shown to give clearance for the counterbore in cover (1).

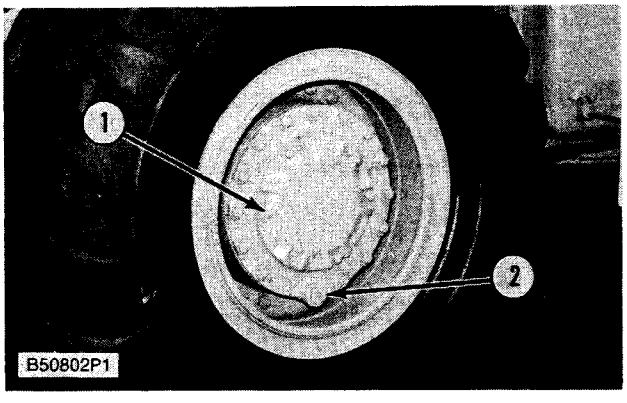
NOTICE

If the cover does not fit flat up against the final drive without force, remove the cover and do Step 6 again.

7. Put clean oil on the O-ring seal on cover (1) and install the cover.

8. Install the O-ring seal on plug (2) and install it in the final drive.

9. Fill the final drives with oil to the correct level. See the Maintenance Guide.

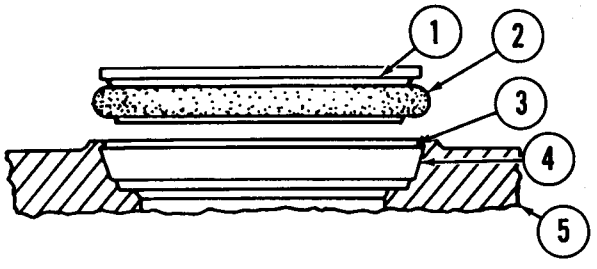


Assembly And Installation Of Conventional Duo-Cone Seals

Introduction

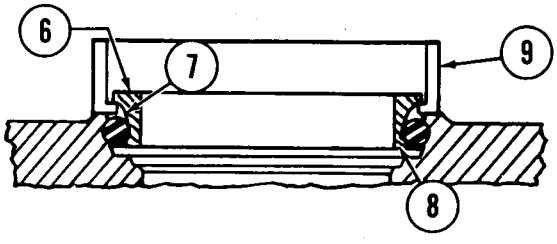
This instruction gives the procedure for installing Conventional Duo-Cone Seals.

It is most important that correct assembly and installation procedures are followed when Duo-Cone Seals are used. Many of the Duo-Cone Seal failures are the direct result of one or more mistakes made during assembly or installation of the seal components.



C20391P1

(1) Seal Ring (2) Rubber Toric Ring (3) Housing Retaining Lip (4) Housing Ramp (5) Seal Ring Housing



C20392P1

(6) Seal Ring Face (7) Seal Ring Ramp (8) Seal Ring Retaining Lip (9) Installation Tool

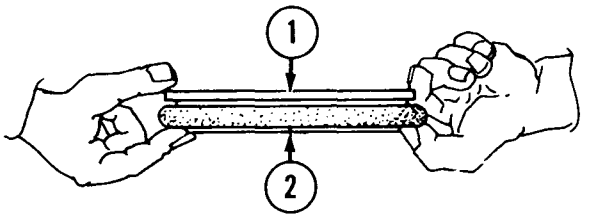
1. Remove any oil film, dust or other foreign matter from toric rubber rings (2) and from ramps (4) and (7) and lips (3) and (8) of both seal rings (1) and housings (5). Use trichloroethane and clean cloth or paper towels for wiping.

NOTICE

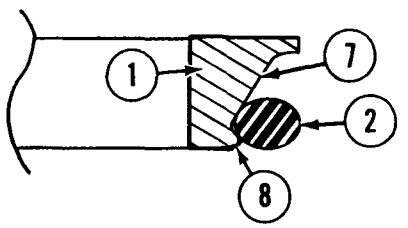
Never permit oil to get on the toric rings or ramps before both seal rings are put together in their final assembled position (Step 10).

⚠ WARNING

Avoid prolonged skin contact with trichloroethane. Avoid breathing the vapors in enclosed areas without adequate ventilation and do not smoke. Do not use near open flame or welding operations or other heated surfaces exceeding 482° C (900° F).



C20393P1

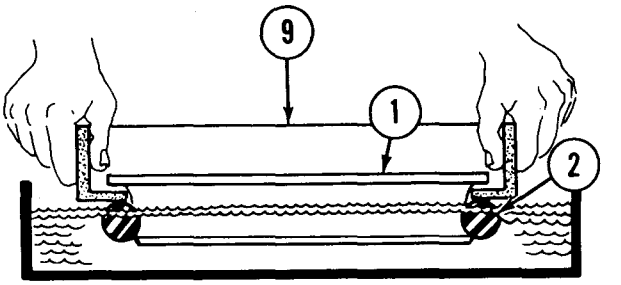


C20394P1

2. Put toric ring (2) on seal ring (1), at the bottom of seal ring ramp (7) and against retaining lip (8).

NOTICE

Make sure that toric ring (2) is straight on seal ring (1) and is not twisted. Be careful when you work on the rubber toric ring. Nicks, cuts and scratches can cause leaks.

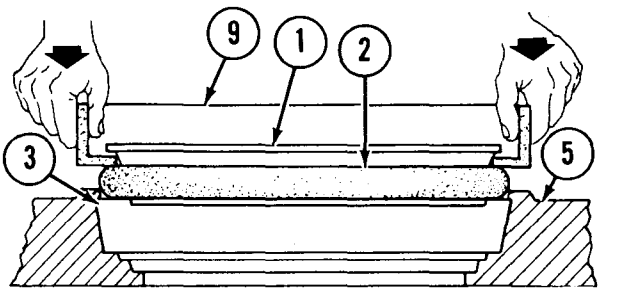


C20395P1

3. Put installation tool (9) onto seal ring (1) with toric ring (2). Lower the rings into a container with trichloroethane until all surfaces of toric ring (2) are wet.

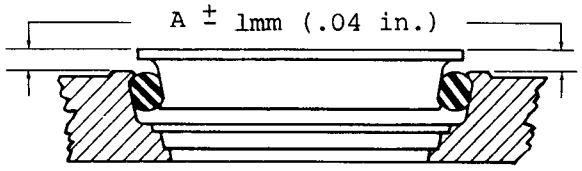
NOTICE

Do not use stanosol or any other liquid that leaves an oil film or does not evaporate quickly.



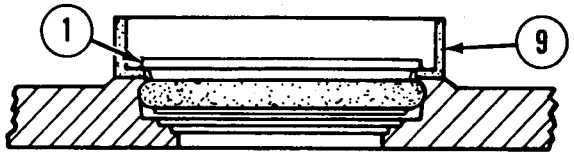
C20396P1

4. With all surfaces of toric ring (2) wet, use installation tool (9) to position seal ring (1) and toric ring (2) squarely against housing (5) as shown. Use sudden and even pressure to pop (push) toric ring (2) under retaining lip (3) of housing (5).



C20397P1

5. Check assembled height (A) in at least four places, 90° apart. The difference in height around the ring must not be more than 1 mm (.04").



C20398P1

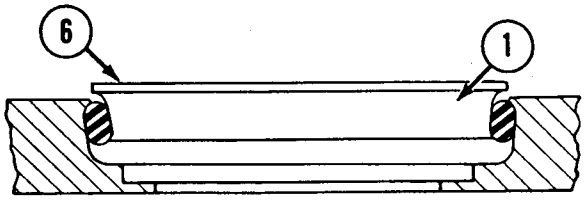
6. If small adjustments are necessary, do not push directly on seal ring (1); use installation tool (9).

7. Toric ring (2) can twist if it is not wet all around during installation or if there are burrs or fins on retaining lip (3) of housing (5).

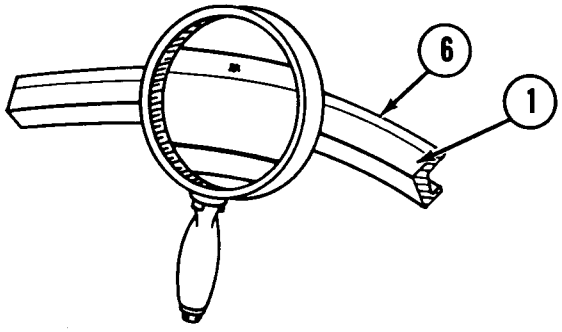
NOTICE

Misalignments, twists and bulges of the toric ring will cause Duo-Cone Seal failures. If correct installation is not obvious, remove seal from housing and repeat Steps 3 thru 6.

IMPORTANT: Toric rings (2) must never slip on the ramps of either seal rings (1) or seal ring housings (5). To prevent slippage, wait a minimum of two minutes to let the trichloroethane evaporate before further assembly. Once correctly in place, the toric ring must roll on the ramps only.

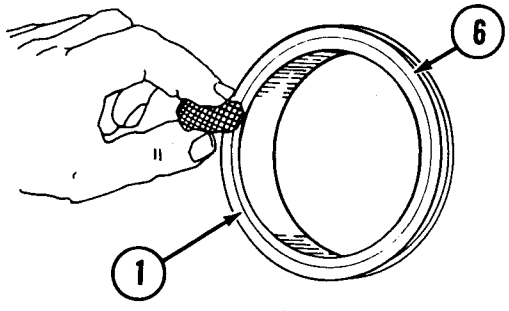


C20399P1



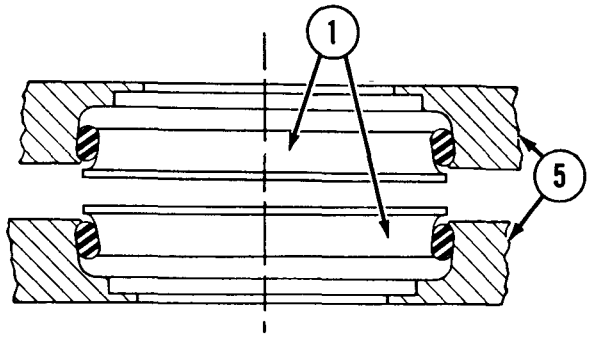
C20400P1

8. Wipe seal faces (6) of seal rings (1) clean. Use a lint free cloth or paper towel. No particles of any kind are permissible on the sealing surfaces. Even a small piece from a paper towel can hold the seal faces apart and cause leakage.



C20401P1

9. Put a thin film of clean oil on the seal faces. Use an applicator, a disposable tissue or a clean finger to distribute the oil evenly. Be careful not to get any oil on the rubber toric rings.



C20402P1

10. Make sure both housings (5) are in correct alignment and are concentric. Move the parts slowly and carefully toward each other.

NOTICE

Do not slam seals together. High impact can scratch or break the seal components. Once in place, fasten all parts tightly.

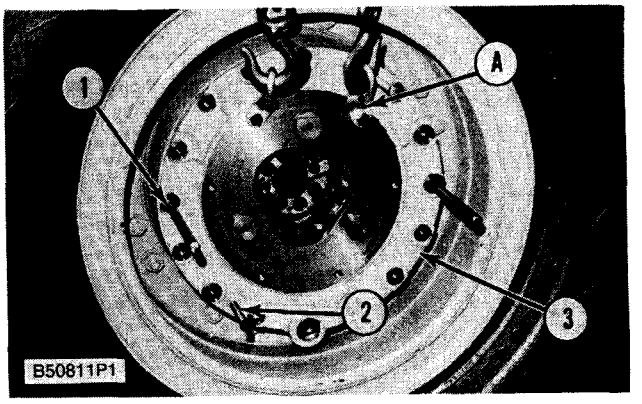
Final Drives

Remove And Install Final Drives 4050-010

Tools Needed		A
5P9736	Link Bracket	2

Start By:

a. remove axles



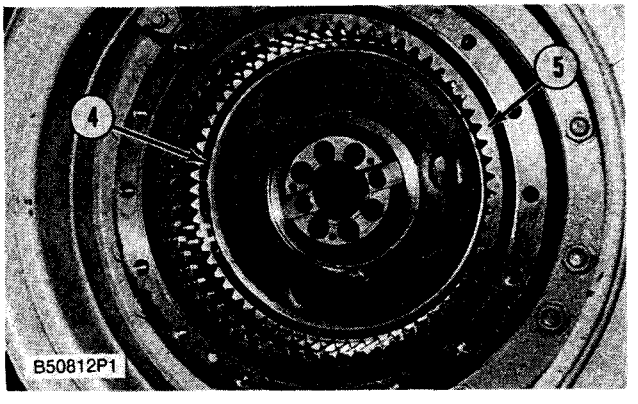
1. Remove two bolts from the wheel assembly and install two 5/8" -11 NC guide bolts (1) in their place.

2. Install tooling (A) on the final drive planetary carrier as shown.

3. Fasten a hoist to tooling (A). Remove the remainder of the bolts that hold the final drive planetary carrier to the wheel assembly.

4. Install two 1/2" -13 NC forcing screws (2) and loosen final drive planetary carrier (3) from the wheel assembly. Remove the final drive planetary carrier from the machine. The weight of the unit is 57 kg (125 lb.).

5. Remove the O-ring seal from the planetary carrier.



6. Remove ring (4) and gear (5) from the hub.

NOTE: The following steps are for the installation of the final drives.

7. Install gear (5) and ring (4) to the hub.

8. Install the O-ring seal around the final drive planetary carrier and put clean oil on it.

9. Install two 5/8" -11 NC guide bolts (1) in the wheel assembly as shown.

10. Fasten a hoist to final drive planetary carrier (3) with tooling (A) and put the unit in position.

11. Tighten the bolts that hold final drive planetary carrier (3) to a torque of 270 ± 25 N•m (200 ± 18 lb.ft.).

End By:

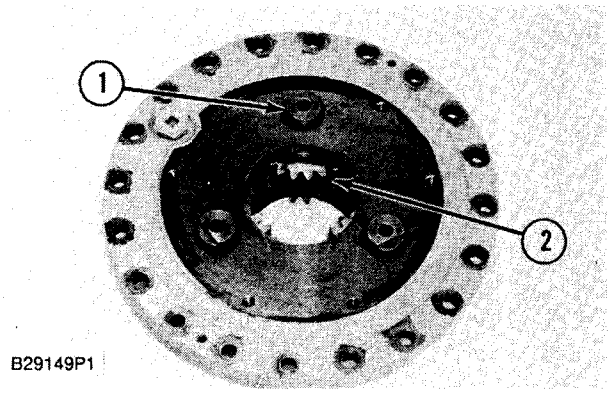
a. install axles

Final Drive Planetary Carriers

Disassemble And Assemble Final Drive Planetary Carriers 4092-017

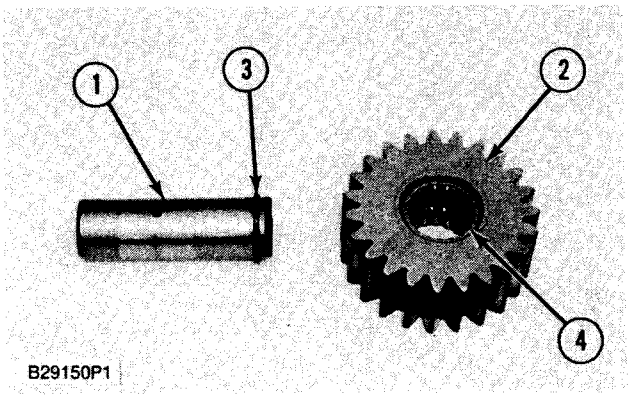
Start By:

a. remove final drives



1. Lift three shafts (1) out of the carrier.

2. Remove three gears (2) and twelve spacers from the carrier.



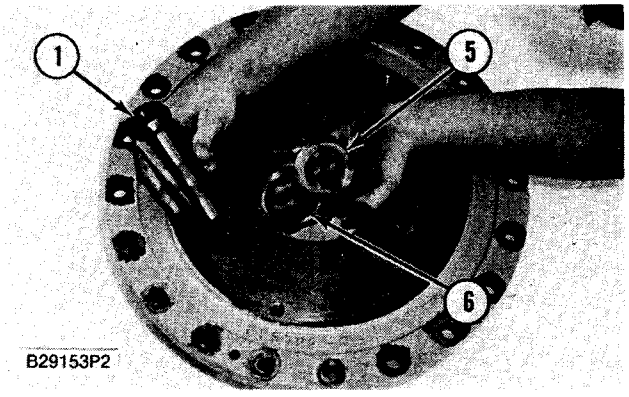
3. Remove retainer rings (3) from shafts (1).

4. Remove two bearings (4) from each gear (2).

NOTE: The following steps are for the assembly of the final drive planetary carriers.

5. Install bearings (4) in gears (2).

6. Install retainer rings (3) on shafts (1).



7. Put the gears in position in the carrier with steel spacers (6) next to the gears and bronze spacers (5) between the carrier and the steel spacers.

8. Install shafts (1) in the carrier. Make sure the flat side of the shafts are toward the outside of the carrier as shown.

End By:

a. install final drives

Wheels, Bearings And Duo-Cone Seals

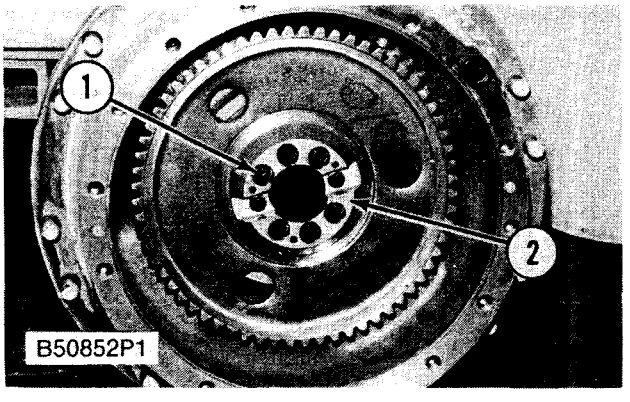
Remove Wheels, Bearings And Duo-Cone Seals 4208-011

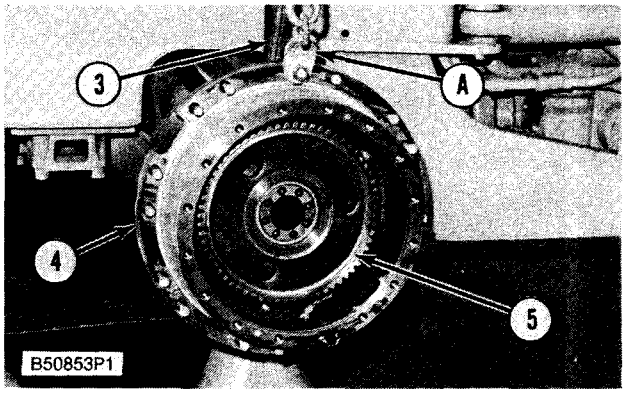
Tools Needed		A	B	C
6V2157	Link Bracket	1		
8S9906	Ratchet Puller	1		
1P520	Driver Group		1	1
1H3110	Bearing Puller Attachment			1
1H3107	Puller Assembly			1

Start By:

a. remove wheel brake assemblies

b. remove final drive

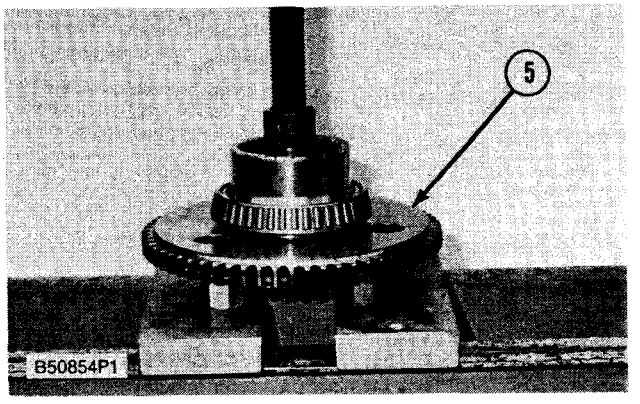




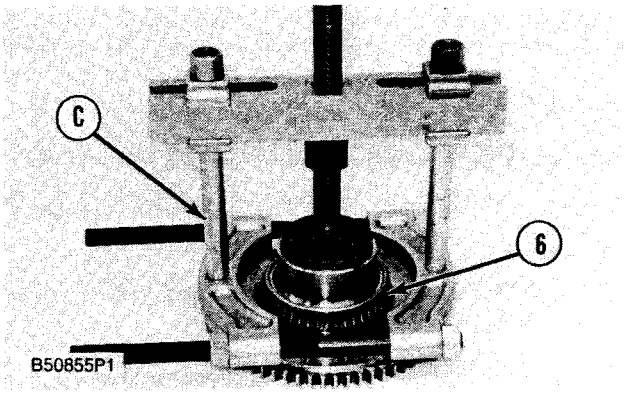
1. Fasten strap (3), tooling (A) and a hoist to wheel assembly (4) as shown.

2. Remove bolts (1), plate (2) and the shims from wheel assembly (4).

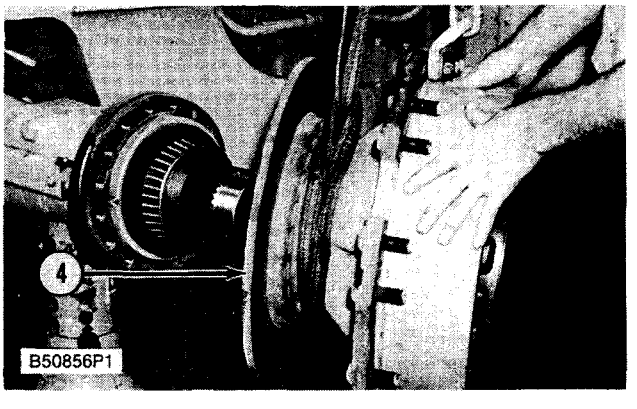
3. Remove hub (5) from the spindle.



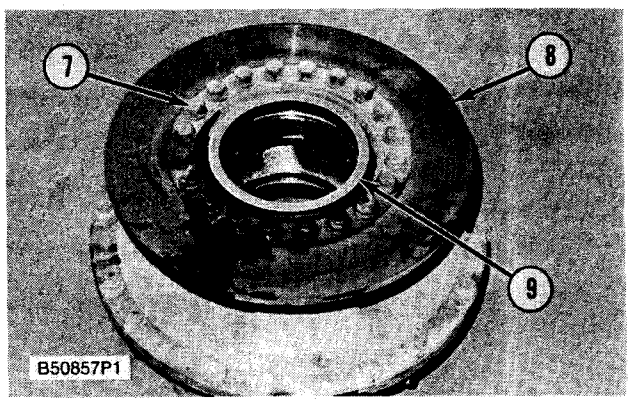
4. Use tool (B) and a press to remove the bushing from the inside of hub (5).



5. Use tooling (C) to remove bearing cone (6) from the hub.

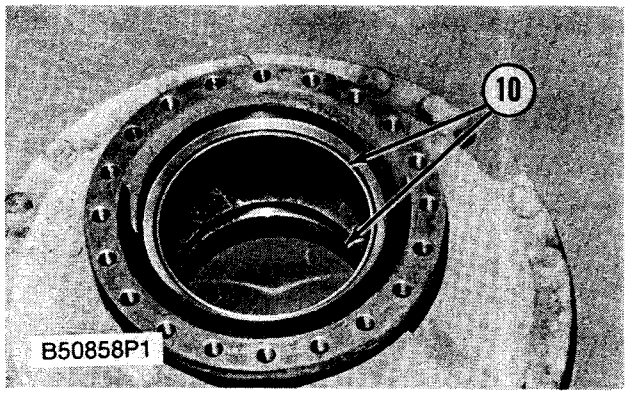


6. Remove wheel assembly (4) from the spindle. The weight of the wheel assembly is 98 kg (215 lb.).

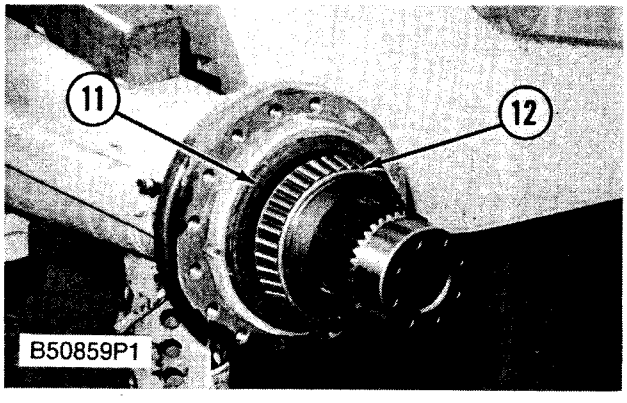


7. Remove the outer half of Duo-Cone seal (9) from the hub assembly.

8. Remove bolts (7) and brake disc (8) from the hub assembly.



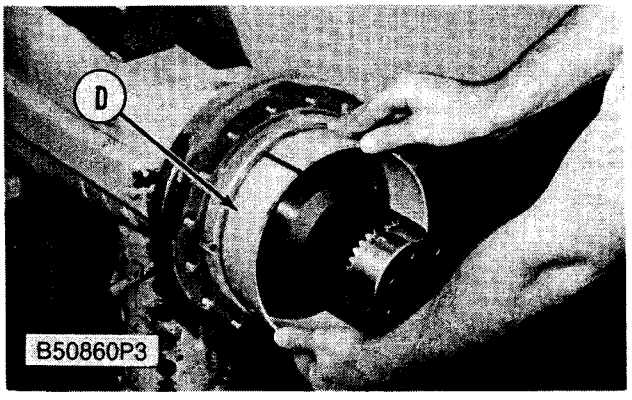
9. Remove bearing cups (10) from the hub.



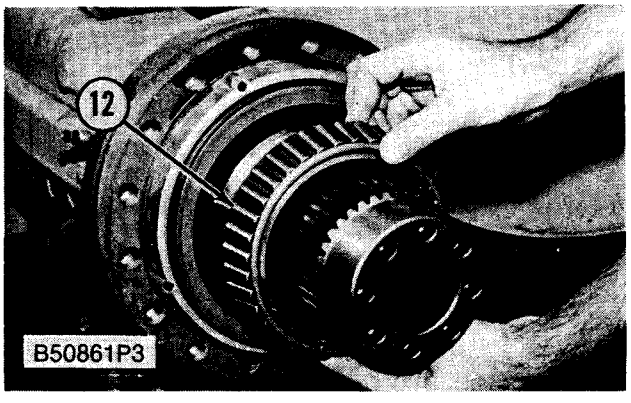
10. Remove inner half of Duo-Cone seal (11) and bearing cone (12) from spindle.

Install Wheels, Bearings And Duo-Cone Seals 4208-012

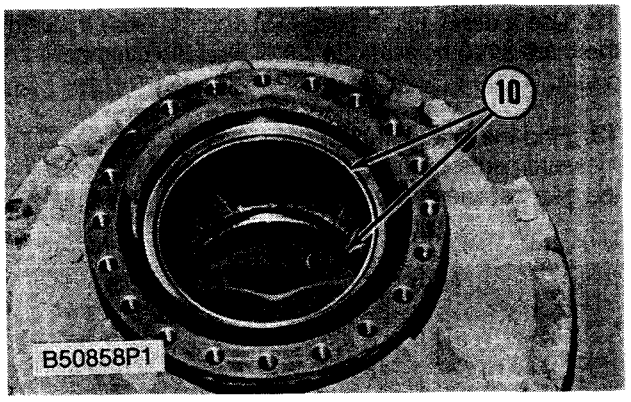
Tools Needed		A	B	D
6V2157	Link Bracket	1		
8S9906	Ratchet Puller	1		
1P520	Driver Group		1	
8M7911	Installer			1



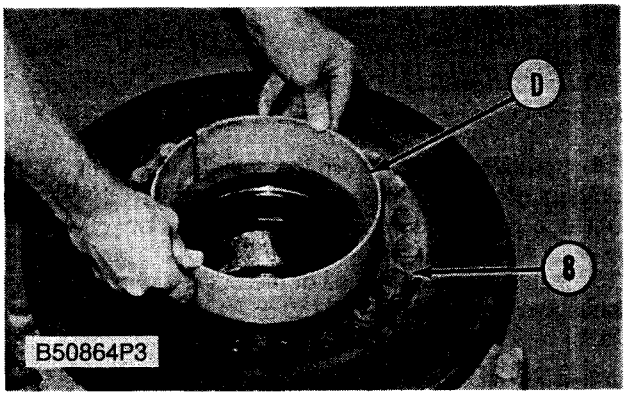
1. Make sure the rubber torus seals are clean and dry. Make sure all metal surfaces that make contact with the rubber torus seals are clean and dry. Use tool (D) to install the Duo-Cone seal in the retainer. Put a small amount of clean oil on the surfaces of the metal seals that make contact with each other.



2. Install bearing cone (12) on the spindle.



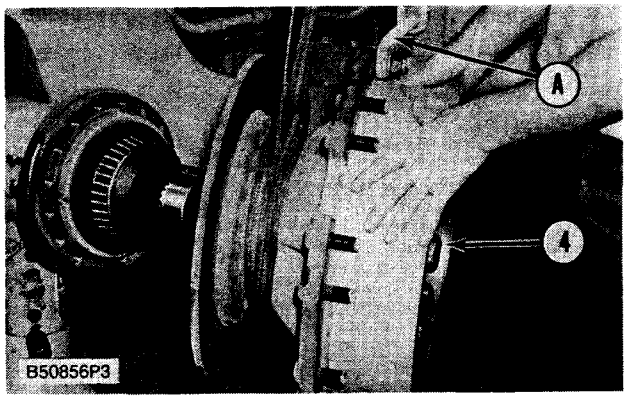
3. Lower the temperature of bearing cups (10) and install them in the wheel assembly.



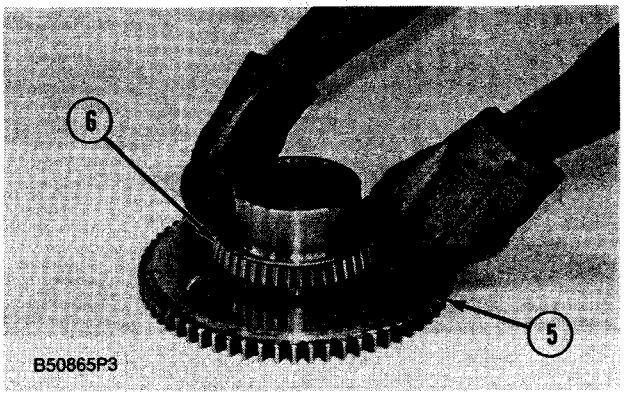
4. Put brake disc (8) in position on the wheel assembly and install the bolts. Tighten the bolts to a torque of 270 ± 25 N•m (200 ± 18 lb.ft.).

NOTE: To ensure proper installation of the Duo-Cone Seal, see the Topic, Conventional Duo-Cone Seals, Installation.

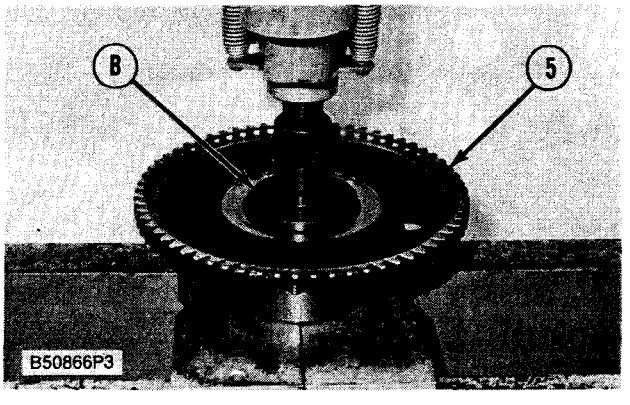
5. Make sure rubber torus seals are clean and dry. Make sure all metal surfaces that make contact with the rubber torus seals are clean and dry. Use tool (D) to install the Duo-Cone seal in the wheel assembly. Put a small amount of clean oil on the surfaces of the metal seals that make contact with each other.



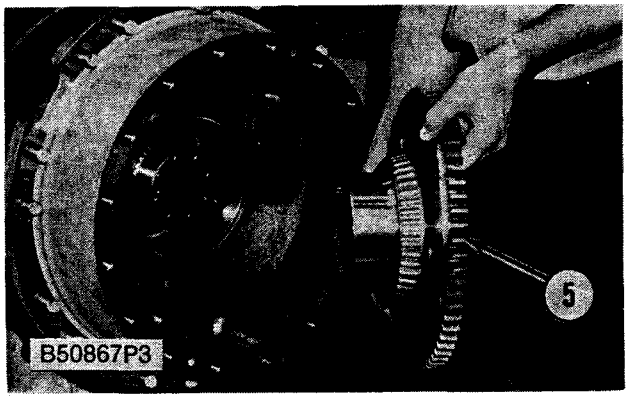
6. Attach tooling (A) and a nylon strap to wheel assembly (4) as shown. Put wheel assembly (4) in position on the spindle.



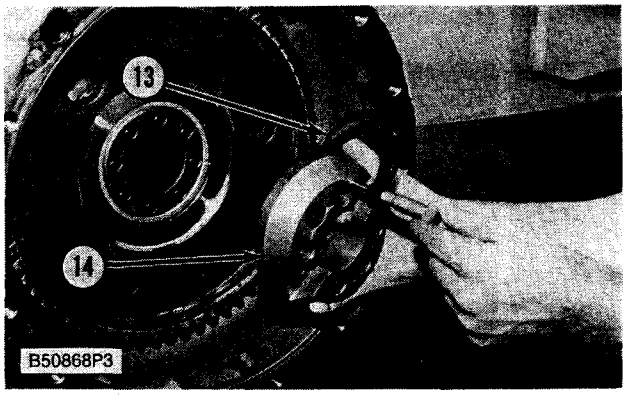
7. Heat bearing cone (6) to a maximum temperature of 135° C (275° F) and install it on hub (5) as shown.



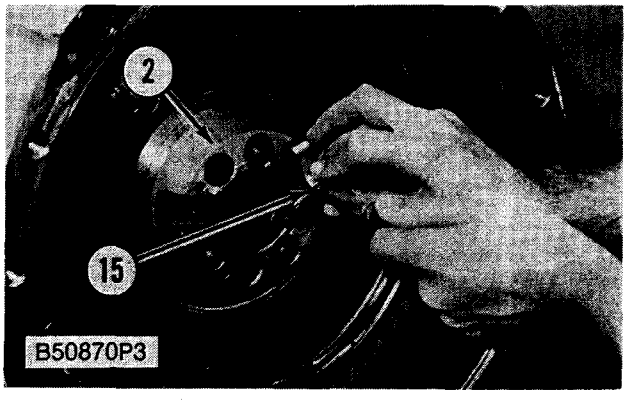
8. Use tool (B) and a press to install the bushing in hub (5).



9. Install hub (5) and the bearing on the spindle.



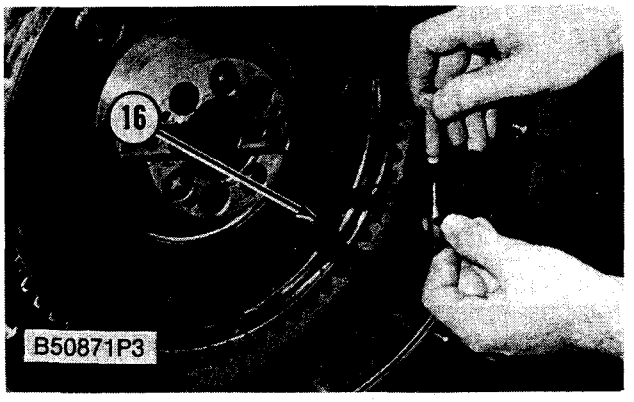
10. Use an outside micrometer (13) and measure the thickness of plate (14) at the three small holes. Find the plate average thickness.



11. Install plate (2) without shims on the spindle. Install three of the bolts that hold it so there are even spaces between the bolts. Turn wheel assembly slowly by hand, and tighten the bolts to a torque of 100 ± 15 N•m (75 ± 11 lb.ft.). Loosen the bolts until the plate is free. Tighten the bolts again to a torque of 25 ± 7 N•m (20 ± 5 lb.ft.).

12. Use a depth micrometer (15) and measure through the three small holes in the plate. Find the average depth.

13. Find the difference between the two average measurements in Steps 10 and 12. The difference is the gap between the end of the spindle and the plate.



14. Remove the plate from the spindle. Install an amount of shims (16), the same thickness as the average gap found in Step 13 plug 0.13 mm (.005 in.).

15. Install the plate and all of the bolts. Tighten the bolts evenly to a torque of 150 ± 20 N•m (110 ± 15 lb.ft.).

End By:

a. install final drive

b. install wheel brake assemblies

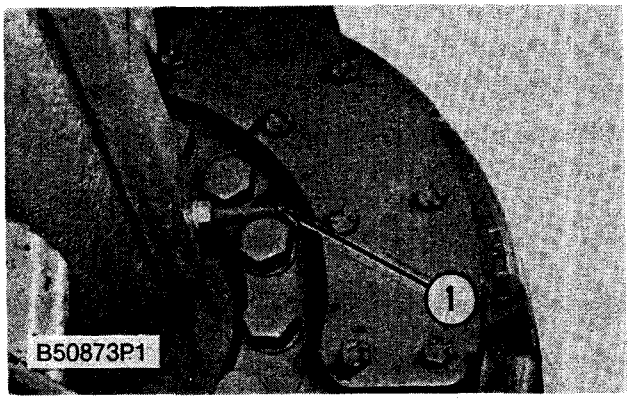
Wheel Brake Assembly

Remove And Install Wheel Brake Assembly 4255-010

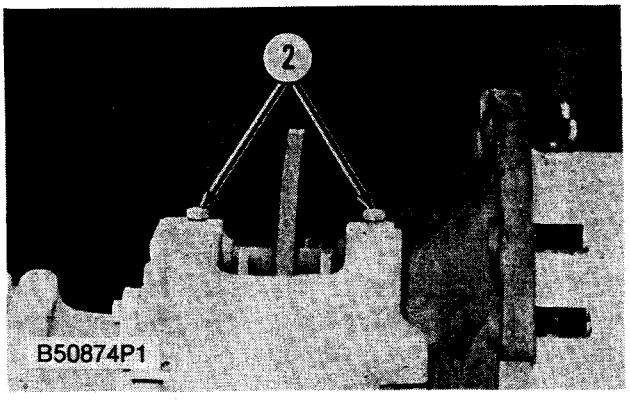
Tools Needed		A
6V2156	Link Bracket	2

Start By:

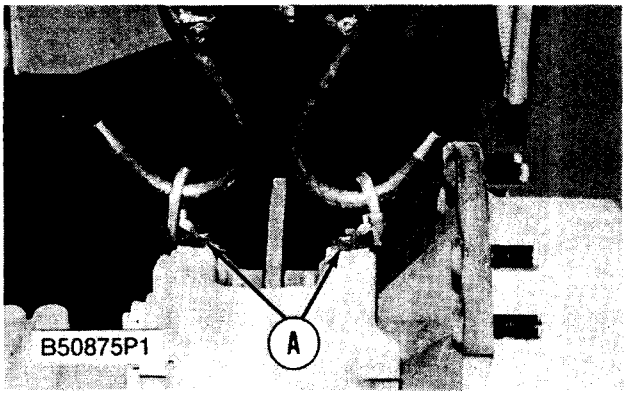
a. remove tires and rims



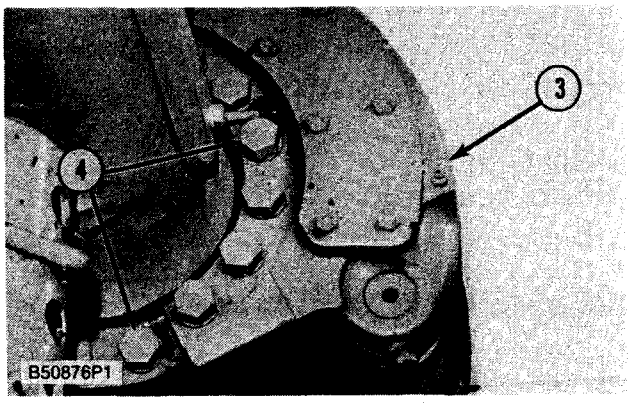
1. Disconnect brake line (1) from the brake assembly.



2. Remove bolts (2) from the brake assembly.



3. Install tooling (A) and a hoist on the brake assembly as shown.



4. Remove bolts (4) and brake assembly (3) from the axle. The weight of the brake assembly is 45 kg (100 lb.).

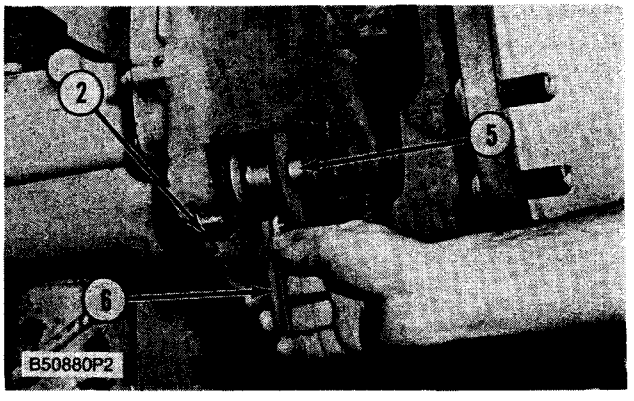
NOTE: It can be necessary to push the brake linings away from the disc to remove the brake assembly.

NOTE: The following steps are for the installation of the wheel brake assembly.

5. Fasten tooling (A) and a hoist to the brake assembly (3) and put it into position on the axle.

6. Install bolts (4) that hold brake assembly (3) to the axle. Tighten the bolts to a torque of 475 ± 50 N•m (350 ± 37 lb.ft.).

7. Connect brake line (1) to the wheel assembly.



8. Install bolts (2), but do not tighten. Use a feeler gauge (6) to make an adjustment of pins (5) so the distance between pins (5) and the disc is a minimum of 0.25 mm (.10 in.) and a maximum of 3 mm (.12 in.). Tighten bolts (4) to 45 ± 7 N•m (33 ± 5 lb.ft.).

9. Remove (bleed) the air from the brake system.

End By:

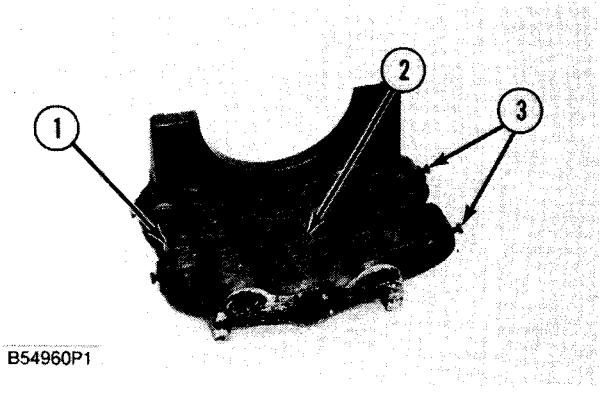
a. install tires and rims

Disassemble And Assemble Wheel Brake Assembly 4256-017

Tools Needed		A
3P2209	Compressor Tool	2

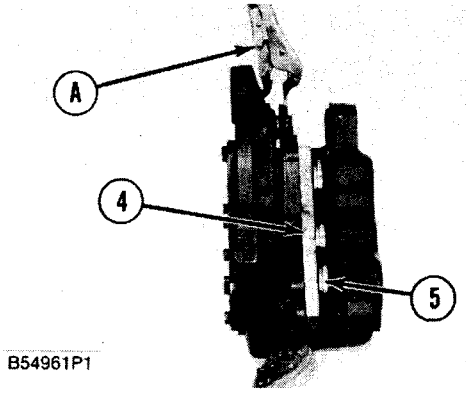
Start By:

a. remove wheel brake assembly



1. Remove four bolts (3) from the wheel brake assemblies.

2. Remove two pins (1) and brake carriers (2) from the wheel brake assembly.



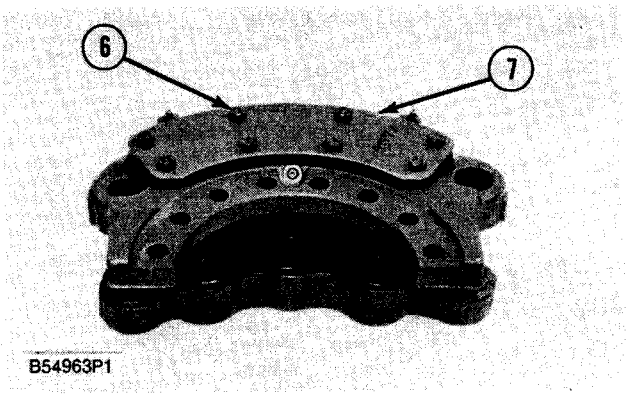
3. Install tooling (A) on the wheel brake assembly and the brake carrier (plate side) as shown.

4. Install block (4) so the maximum travel distance between block (4) and pistons (5) is not more than 35 mm (1.378 in.).

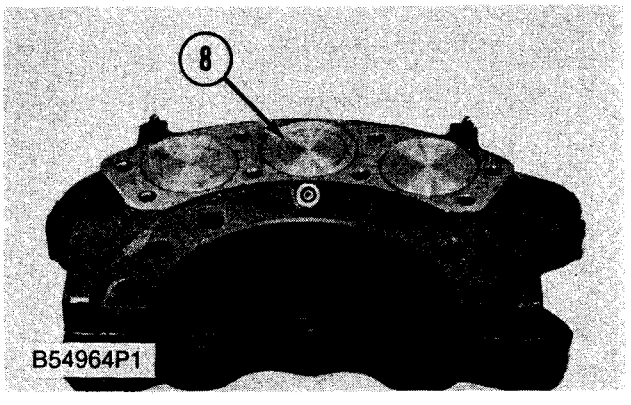
5. Put air free of water under a pressure of 690 to 1030 kPa (100 to 150 psi) into the wheel brake assembly to make force to move out pistons (5).

6. Remove the block tooling (A), the pins and brake carrier from the wheel brake assembly.

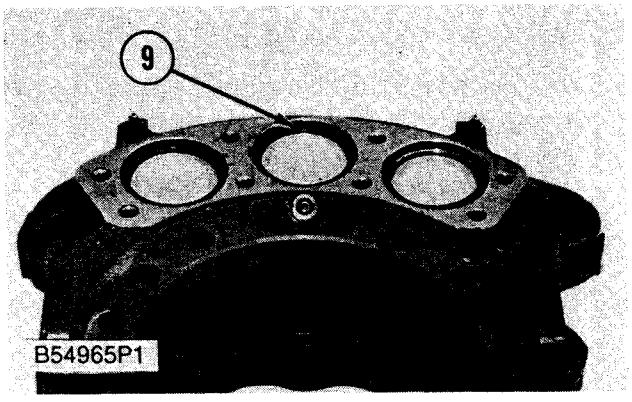
7. Remove pistons (5) from the wheel brake assembly.



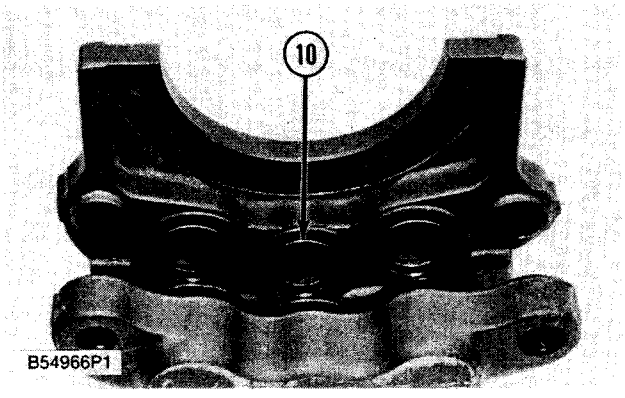
8. Remove bolts (6) and plate (7) from the wheel brake assembly.



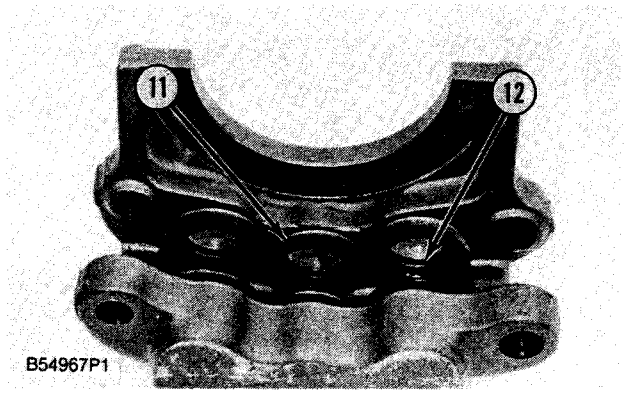
9. Remove plugs (8) from the wheel brake assembly.



10. Remove seals (9) from the wheel brake assembly.



11. Remove pistons (10) from the wheel brake assembly.



12. Remove boots (11) and seals (12) from both sides of the wheel brake assembly.

NOTE: The following steps are for the assembly of the wheel brake assembly.

13. Install seals (12) and boots (11) on both sides of the wheel brake assembly.

14. Put pistons (10) into position in the wheel brake assembly.

15. Install seals (9) (plate side) in the wheel brake assembly.

16. Install plugs (8) in the wheel brake assembly.

17. Install plate (7) on the wheel brake assembly with bolts (6).

18. Put brake carriers (2) into position in the wheel brake assembly. Install pins (1) that hold the carriers in place.

19. Install bolts (3) that hold the pins in place. Tighten the bolts to a torque of 45 ± 7 N•m (33 ± 5 lb.ft.).

End By:

a. install wheel brake assembly

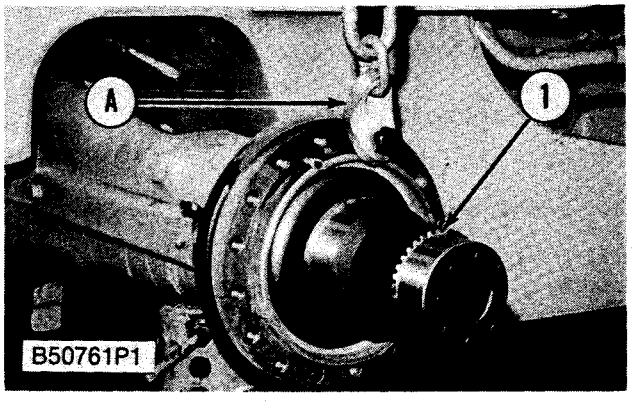
Wheel Spindles

Remove And Install Wheel Spindles 4205-010

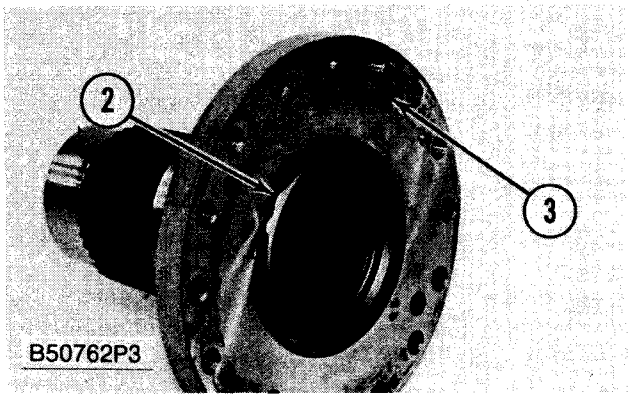
Tools Needed		A
6V2157	Link Bracket	1

Start By:

a. remove wheels, bearings and duo-cone seals

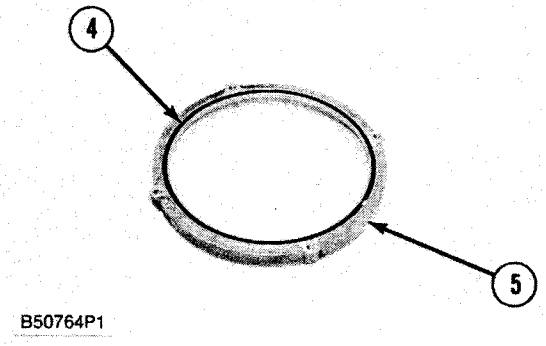


1. Fasten tool (A) and a hoist to spindle (1). Remove the bolts and spindle (1). The weight of the spindle is 27 kg (60 lb.).



2. Remove O-ring seal (2) from the spindle.

3. Remove bolts (3) and remove the retainer from the spindle.



4. Remove O-ring seal (4) from retainer (5).

NOTE: The following steps are for the installation of the wheel spindles.

5. Install O-ring seal (4) in position on retainer (5).

6. Install retainer (5) on the spline side of the spindle (3).

7. Install O-ring seal (2) on the back of the spindle.

8. Fasten tool (A) and a hoist to spindle (1). Put the spindle in position on the axle housing and install the bolts. Tighten the bolts to a torque of 475 ± 50 N•m (350 ± 37 lb.ft.).

End By:

a. install wheels, bearings and duo-cone seals

Front Axle Housing

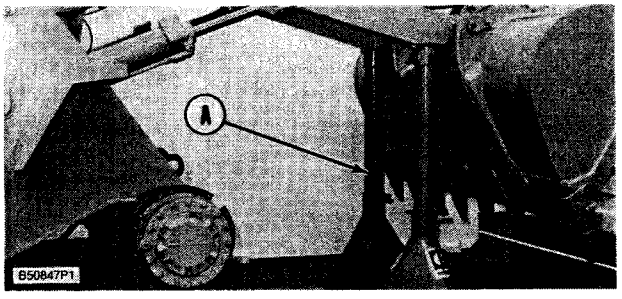
Remove And Install Front Axle Housing 3260-FR-010

	Tools Needed	A
8S7615	Pin	2
8S8048	Saddle	2
8S7630	Stand	2
8S7641	Tube	2

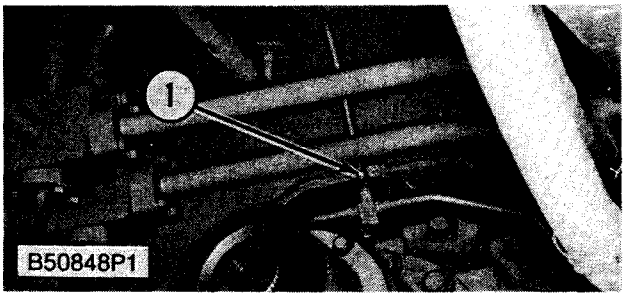
Start By:

a. remove tires and rims (front)

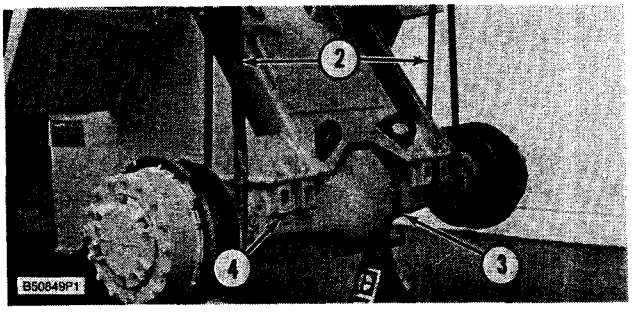
b. remove front drive shaft



1. Lift the bucket and put tooling (A) in position under the lift arms as shown. This will permit access to the front axle bolts.



2. Disconnect brake line (1) from the junction box as shown.



3. Fasten nylon straps (2) and hoist to front axle housing (3) as shown.

4. Remove nuts (4), the bolts and the washers. Carefully lower front axle housing from the machine. The weight of the axle housing is 953 kg (2100 lb.).

NOTE: The following steps are for the installation of the front axle housing.

5. Fasten nylon straps (2) and hoists to axle housing (3).

6. Put axle housing (3) into position on the machine as shown.

7. Install the bolts, the washers and nuts (4) that hold the axle housing to the machine. Tighten the nuts to a torque of 275 ± 35 N•m (200 ± 26 lb.ft.).

8. Connect brake line (1) to the junction box. Remove (bleed) the air from the brake system.

9. Remove tooling (A).

End By:

a. install front drive shaft

b. install tires and rims (front)

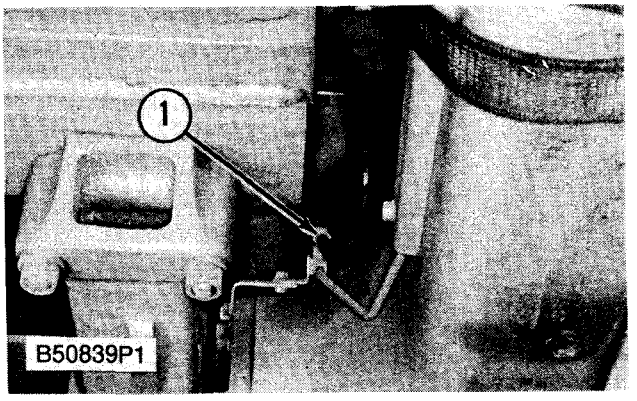
Rear Axle Housing

Remove And Install Rear Axle Housing 3260-RE-010

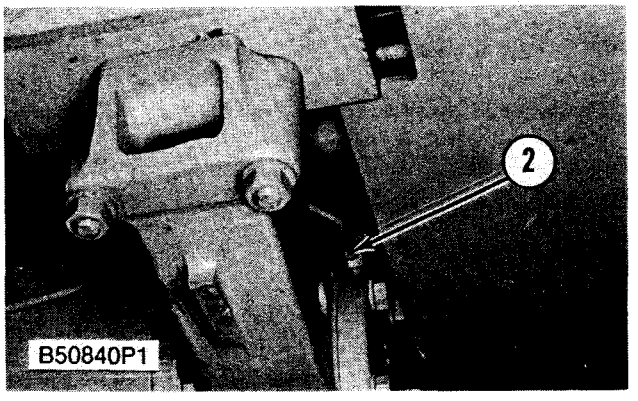
Start By:

a. remove tires and rims (rear)

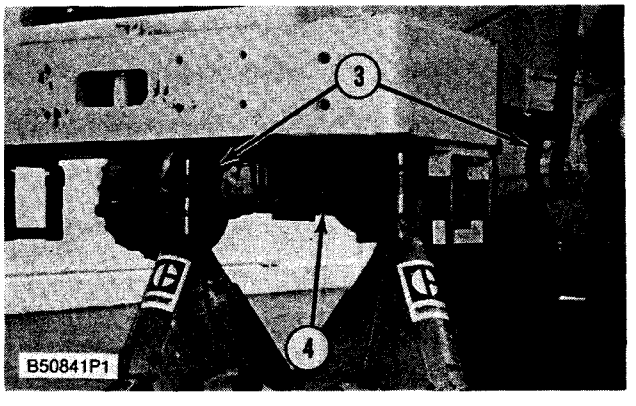
b. remove rear drive shaft



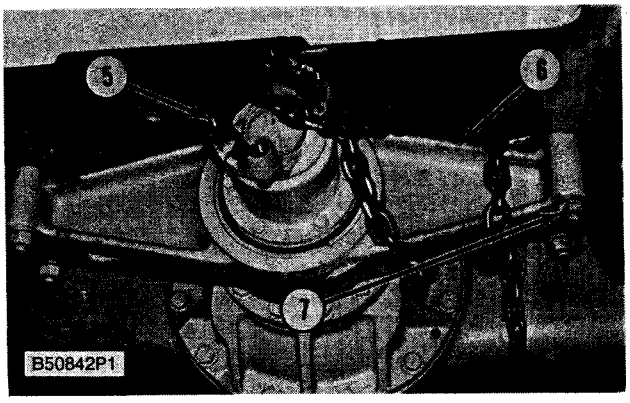
1. Disconnect brake line (1) from the top of axle housing.



2. Disconnect grease line (2) from the top of the rear support and the grease line from the top of the front support.



3. Fasten nylon straps (3) and a hoist to rear axle housing (4) as shown.



4. Fasten a chain around the axle housing front support (6) and yoke (5) to hold front support (6) and yoke (5) in position.

5. Remove nuts (7) and the washers from both the front and rear supports.

6. Make sure all lines are disconnected and carefully lower the rear axle housing from the machine. The weight of the rear axle housing is 1089 kg (2400 lb.).

NOTE: The following steps are for the installation of the rear axle housing.

7. Fasten a chain to front support (6) and yoke (5) to hold them in position.

8. Put nylon straps (3) in position on both sides of the rear axle housing. Lift the axle housing into position on the machine.

9. Make sure the dowels in front support (6) are in alignment with the holes in the frame.

10. Install the washers and nuts (7) to both supports. Tighten the nuts to a torque of 475 ± 50 N•m (350 ± 37 lb.ft.).

11. Connect grease line (2) to the rear support and the grease line to the top of the front support.

12. Connect brake line (1) at the top of the axle housing. Remove (bleed) the air from the brake system.

End By:

a. install rear drive shaft

b. install tires and rims (rear)

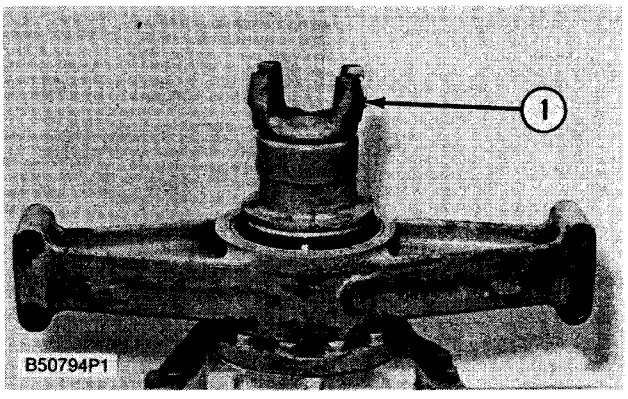
Rear Axle Housing Front Support

Remove And Install Rear Axle Housing Front Support 3268-FR-010

Start By:

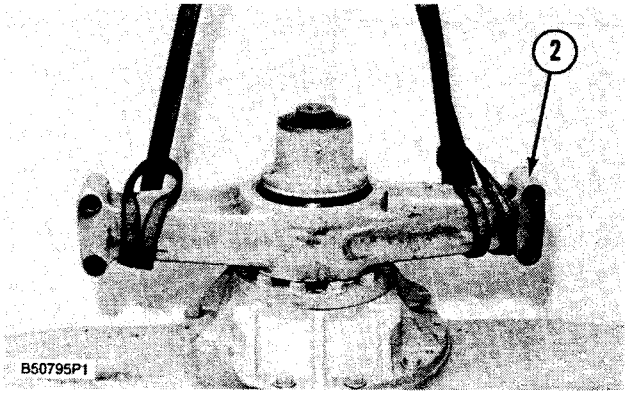
a. remove rear axle housing

Tools Needed		A	B
6V2086	Installer	1	
9S8874	Locator		1
1P520	Driver		1

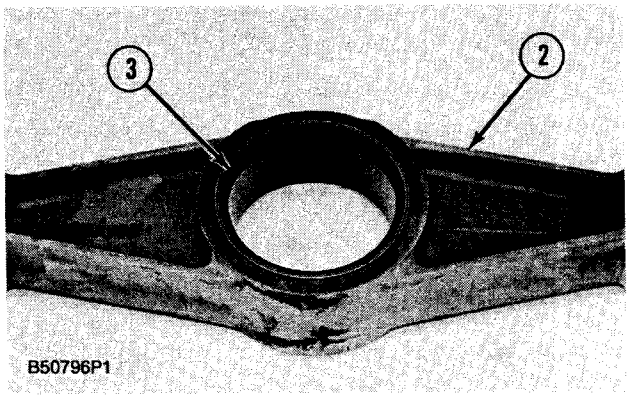


1. Put the rear axle housing on blocks with the differential pinion shaft in a vertical position as shown.

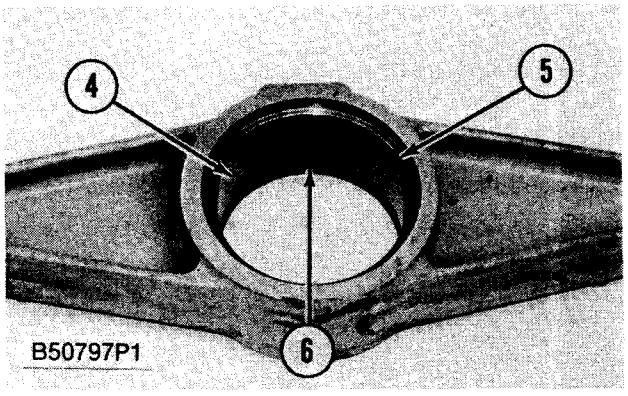
2. Pull yoke (1) off the differential pinion shaft.



3. Fasten nylon straps and a hoist and remove front support (2) from the differential pinion housing. The weight of front support (2) is 34 kg (75 lb.).



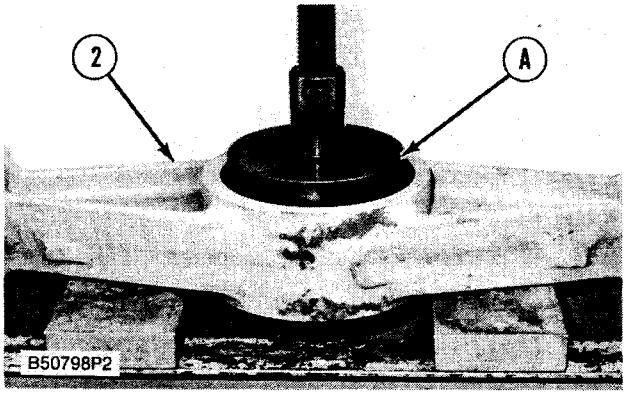
4. Remove lip type seals (3) from support (2).



5. Remove ring (5) that holds bearing (4) in the support.

6. Remove lip type seal (6) and push bearing (4) out of the support from the same side ring (5) was removed.

NOTE: The following steps are for the installation of the rear axle housing front support.



7. Use a press and tool (A) to push the bearing in support (2) until it makes contact with the shoulder in its bore.

8. Install ring (5) to hold the bearing in position.

9. Use tooling (B) to install lip type seals (3) in each side of the support. Make sure the lips of the seals are toward the outside of the support.

10. Fasten nylon straps a hoist to the front support and put front support (2) in position on the differential pinion housing. Make sure the side of support (2) with the snap ring in it is toward the yoke end of the pinion shaft. The grease fitting in support (2) must be toward the top of the axle housing.

11. Install yoke (1) on the differential pinion shaft.

End By:

a. install rear axle housing

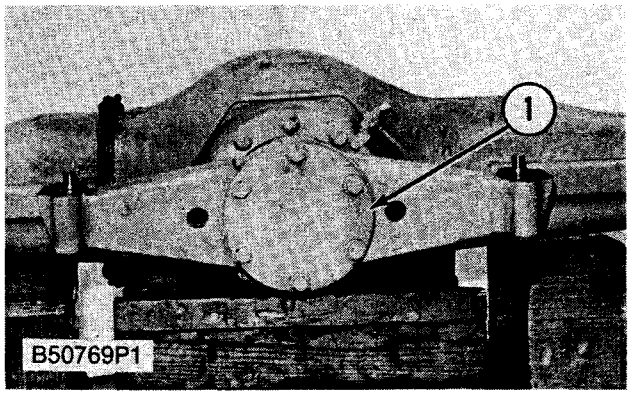
Rear Axle Housing Rear Support

Remove Rear Axle Housing Rear Support 3268-RE-011

Tools Needed		A
1P520	Driver Group	1

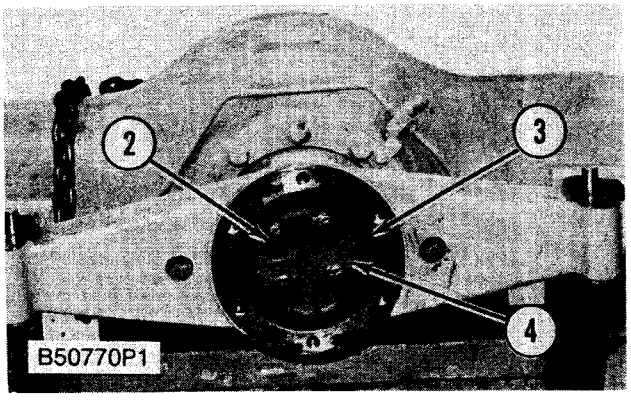
Start By:

a. remove rear axle housing

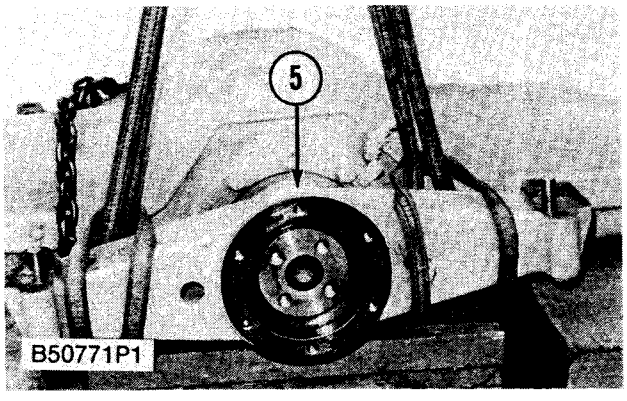


1. Put the rear axle housing on wooden blocks as shown.

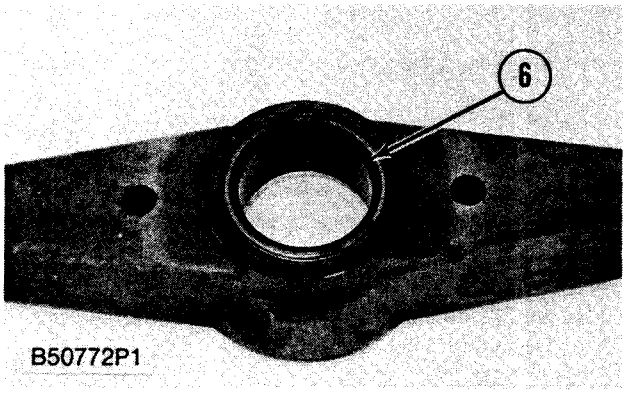
2. Remove the bolts and cover (1) from the rear support.



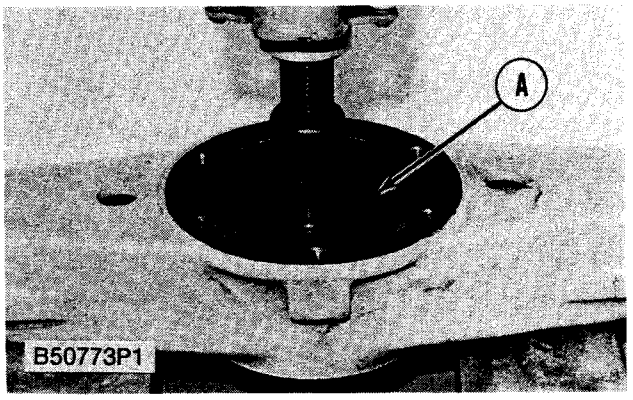
3. Remove bolts (2), washer (3), plate (4) and the washer from the end of the trunnion.



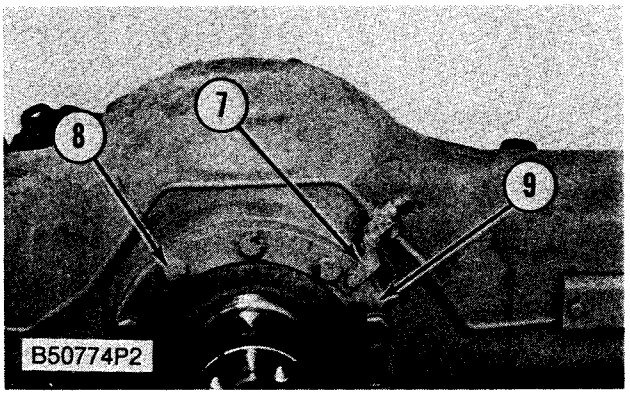
4. Fasten straps and a hoist to support (5) and remove it from the axle housing. The weight of the support is 39 kg (85 lb.).



5. Remove seal (6) from the support.



6. Use tooling (A) and a press and remove the bearing from the support.



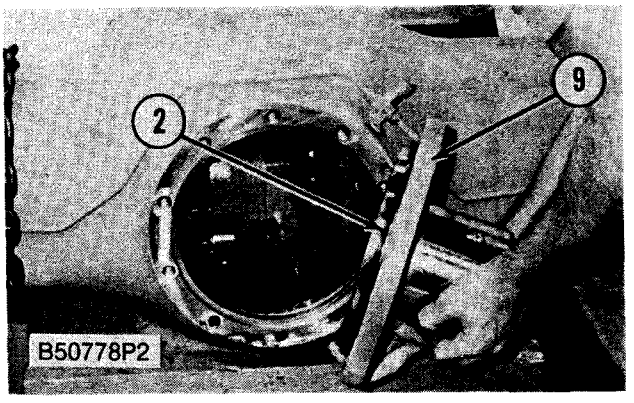
7. Remove the bolts and disconnect bracket (7) from the trunnion.

8. Remove bolts (8) and trunnion (9) from the rear axle housing.

9. Remove the O-ring seal from the trunnion.

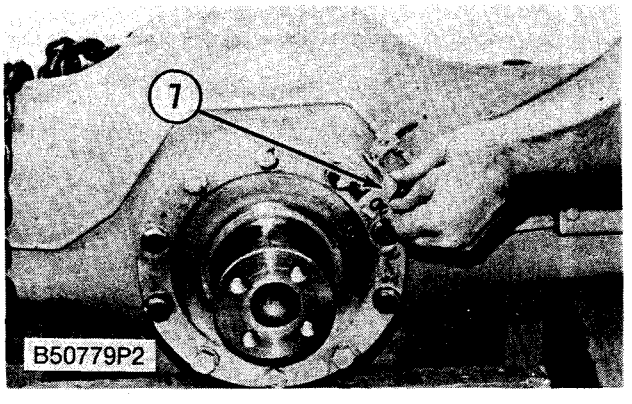
Install Rear Axle Housing Rear Support 3268-RE-012

Tools Needed		A
1P520	Driver Group	

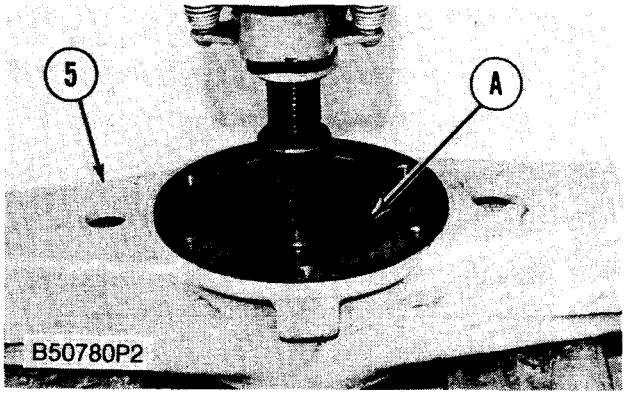


1. Put O-ring seal (2) in position on the back of trunnion (9). Put clean differential oil on the O-ring seal.

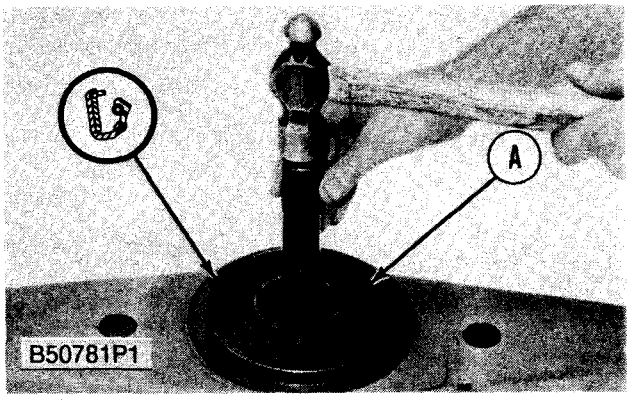
2. Install trunnion (9) on the axle housing and install the bolts. Tighten the bolts to a torque of 270 ± 25 N•m (200 ± 18 lb.ft.).



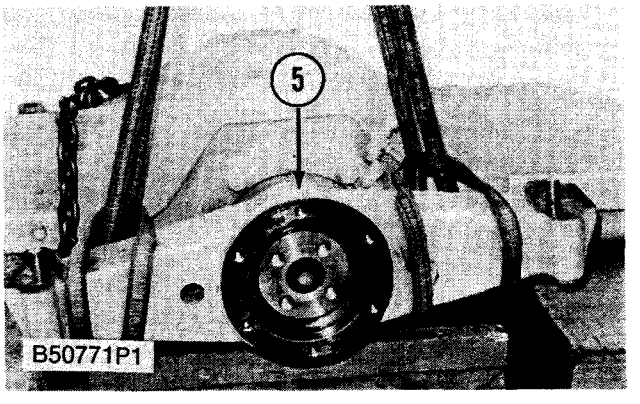
3. Connect bracket (7) to the trunnion.



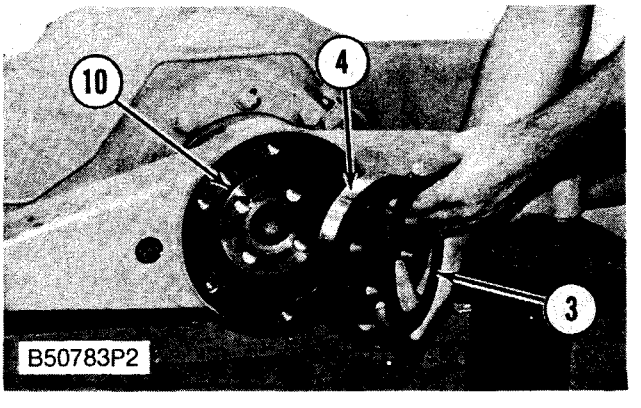
4. Use tooling (A) and install the bearing until it is even with the counterbore in support (5).



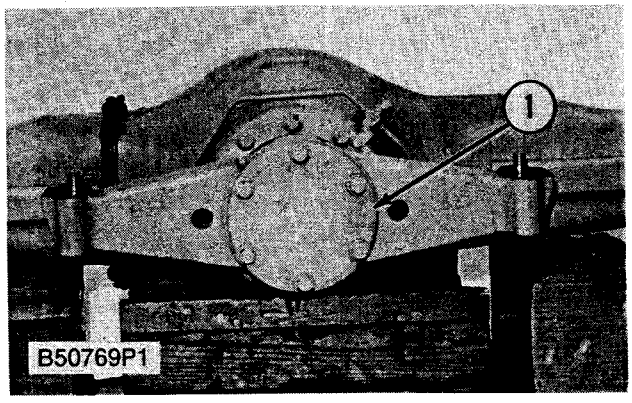
5. Use tool (A) and install seal (6) in the support. Make sure the lip of the seal is toward the outside as shown. Put clean differential oil on the seal.



6. Fasten straps and a hoist to support (5) and put it in position on the trunnion.



7. Install washer (10), plate (4) and washer (3) in the end of the support as shown.



8. Install cover (1) and the bolts on the end of the support. Tighten the bolts to a torque of 475 ± 50 N•m (350 ± 37 lb.ft.).

End By:

a. install rear axle housing

Front Drive Shaft And Carrier Bearing

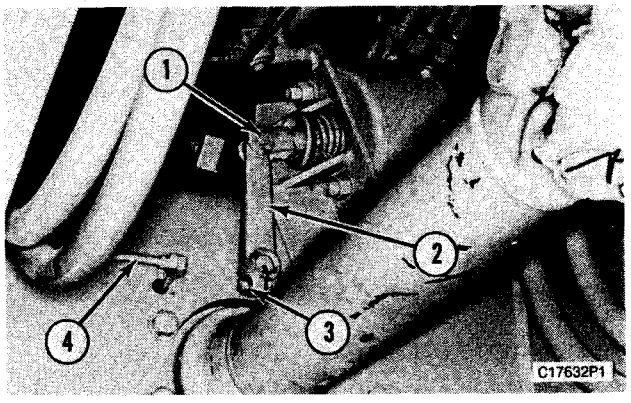
Remove Front Drive Shaft And Carrier Bearing 3253-FR & 3267-011

Tools Needed		A	B
5P9736	Link Bracket	1	
8S9906	Ratchet Assembly		1

Start By:

a. connection of steering frame lock link

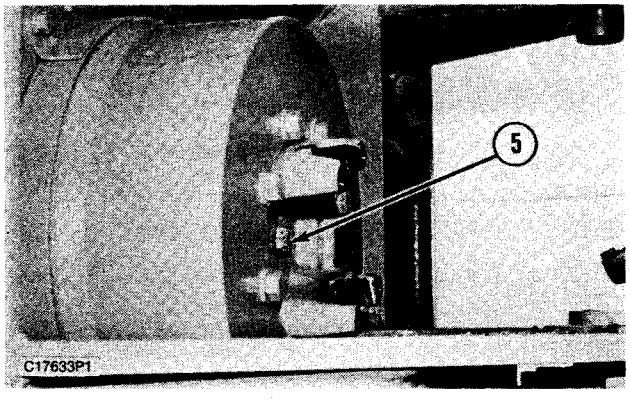
b. remove center drive shaft



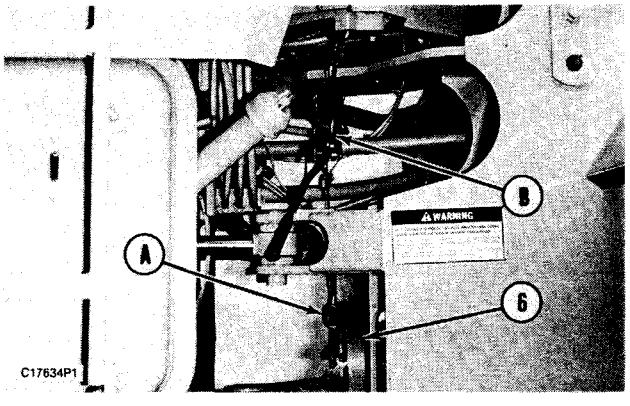
NOTE: Block the wheels and release the parking brake prior to the removal operation.

1. Mark the position of lever (2) on the shaft. Remove pin (1), bolt (3), and lever (2).

2. Disconnect grease line (4) from the fitting.

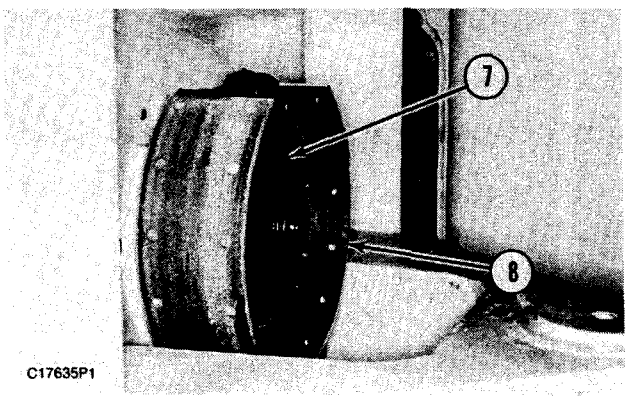


3. Remove center bolt and washer (5) from the yoke assembly.

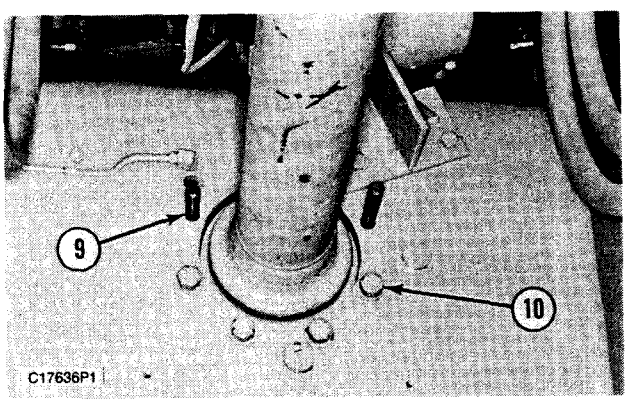


4. Attach tool (A) to drum assembly (6). Install tool (B) to tool (A) as shown.

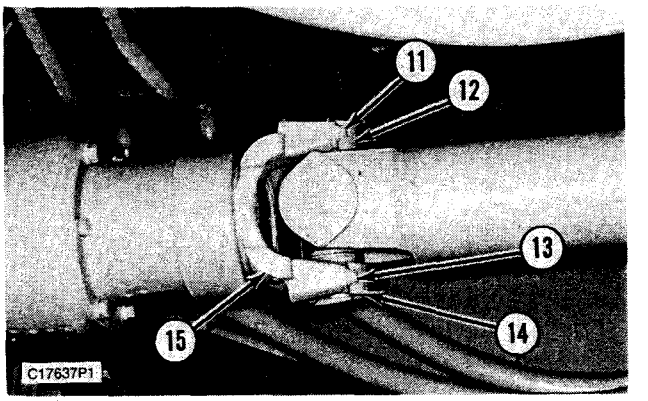
5. Slide the yoke and drum assembly (6) off of the brake shoe assembly and lower them to the ground. The weight of the yoke and drum assembly is 31.7 kg (70 lb.).



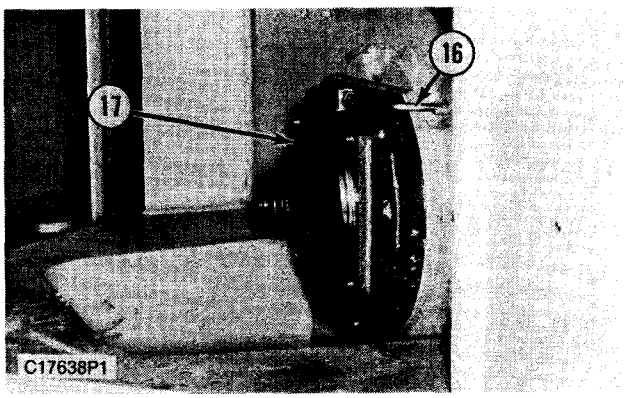
6. Remove four bolts (7), and remove brake shoe assembly (8).



7. Remove the top two bolts of bolts (10) and install two 5/8" -11 NC guide bolts (9). Remove the remaining bolts (10).



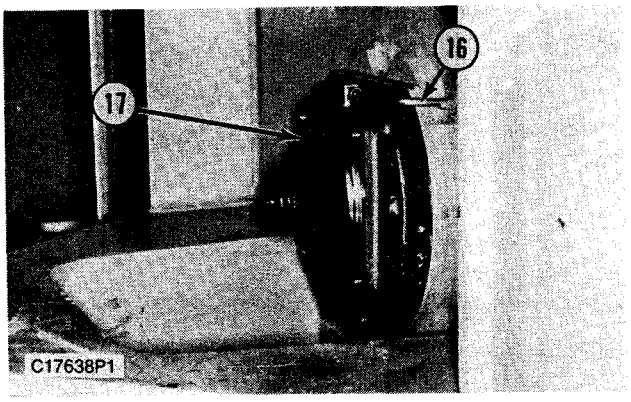
8. Remove bolts (11) and (13). Remove straps (12) and (14) that hold the front drive shaft to yoke assembly (15).



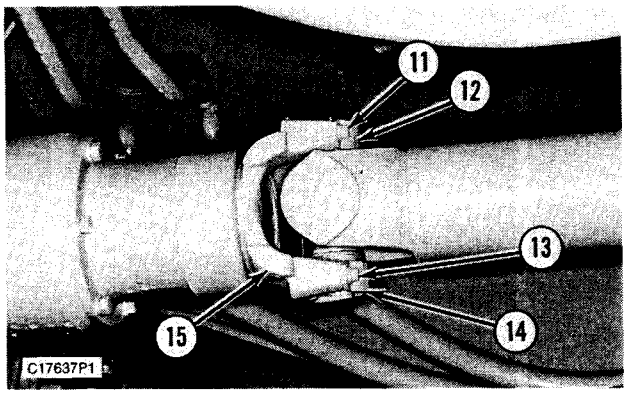
9. Remove grease line (16). Use two persons to push the front drive shaft and carrier bearing assembly (17) to the rear of the machine and remove it. The weight of the front drive shaft and carrier bearing assembly is 31.7 kg (70 lb.).

Install Front Drive Shaft And Carrier Bearing 3253-FR & 3267-012

Tools Needed		A	B
5P9736	Link Bracket	1	
8S9906	Ratchet Assembly		1

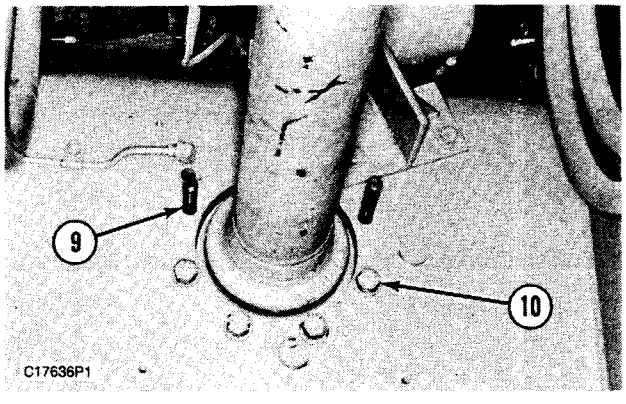


1. Use two persons to position front drive shaft and carrier bearing assembly (17) on the machine. Install grease line (16).

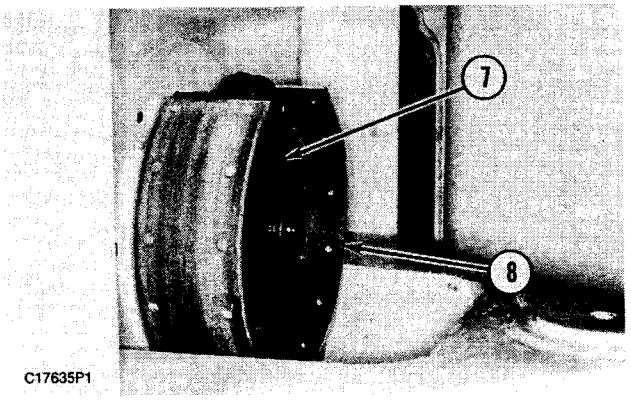


2. Install straps (12) and (14), and install bolts (11) and (13) that hold the front drive shaft to yoke assembly (15).

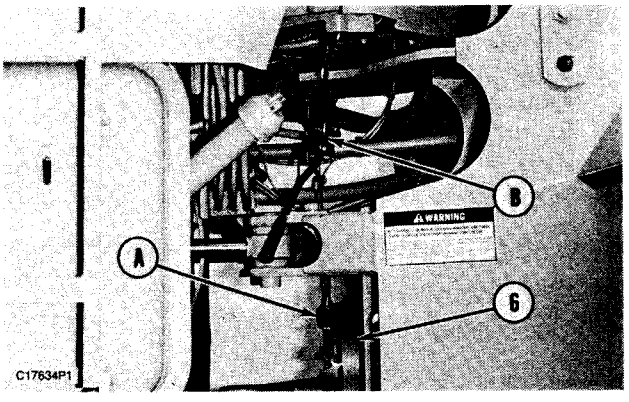
3. Tighten bolts (11) and (13) to a torque of 55 ± 7 N•m (41 ± 5 lb.ft.).



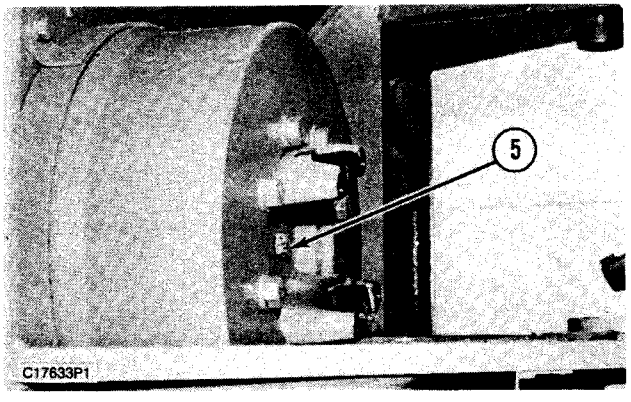
4. Install bolts (10). Remove the two 5/8" -11 NC guide bolts (9), and install the two remaining bolts (10).



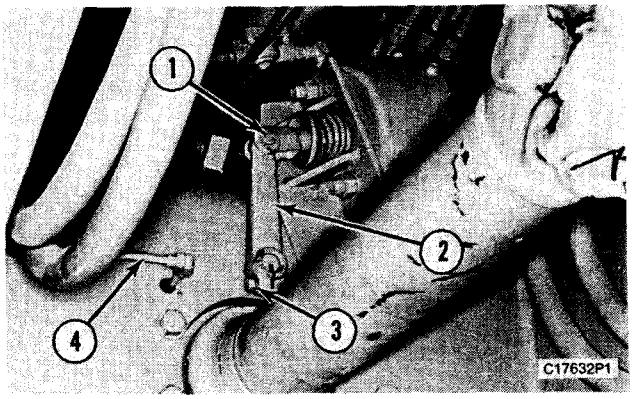
5. Position brake shoe assembly (8), and install four bolts (7).



6. Attach tool (A) to drum assembly (6). Install tool (B) to tool (A), and raise and slide the yoke and drum assembly in position as shown.



7. Install center bolt and washer (5) on the yoke assembly. Tighten the bolt to a torque of 135 ± 15 N•m (100 ± 11 lb.ft.).



8. Connect grease line (4) to the fitting.

9. Align lever (2) with the mark on the shaft. Install lever (2), bolt (3), and pin (1).

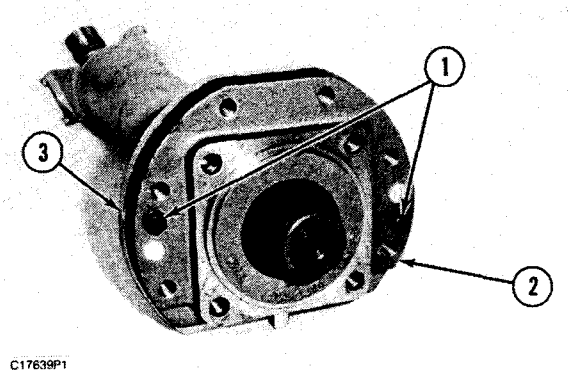
End By:

a. install center drive shaft

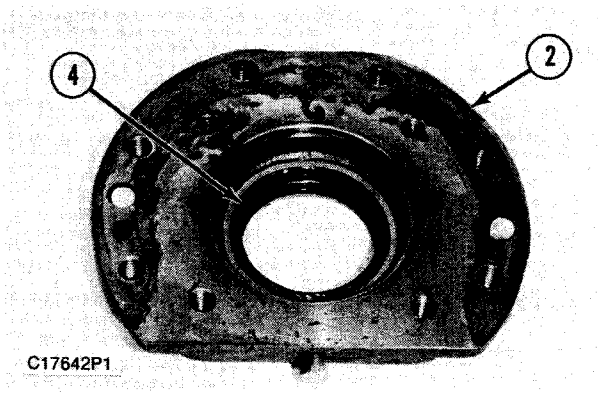
b. separation of steering frame lock link

Disassemble Front Drive Shaft And Carrier Bearing 3253-FR & 3267-015 tx1» Start By:

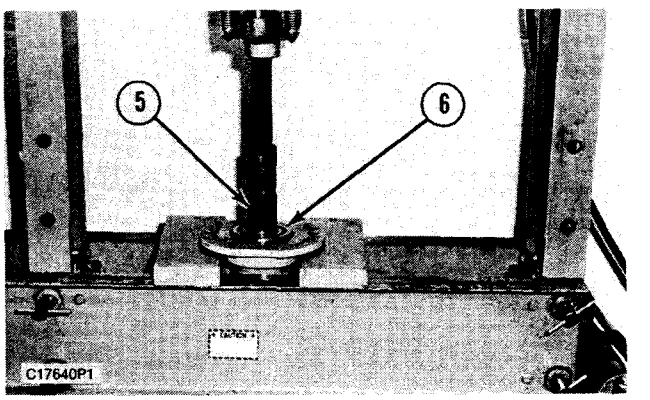
a. remove front drive shaft and carrier bearing



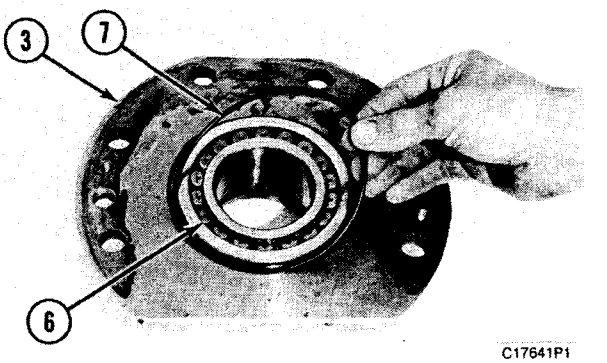
1. Remove two bolts (1), and remove housing (2) from housing (3).



2. Remove lip type seal (4) from housing (2).



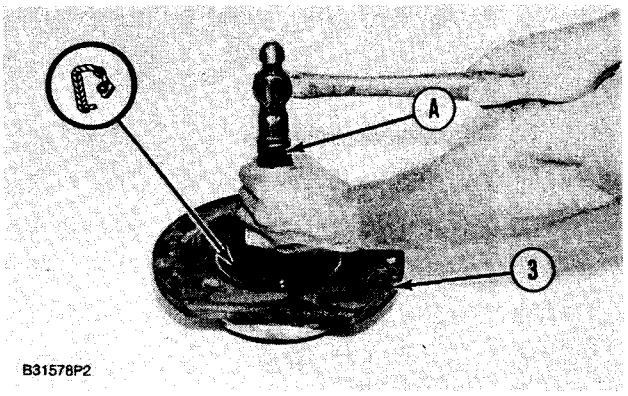
3. Use a press as shown, and press shaft (5) out of bearing (6).



4. Remove O-ring seal (7) from housing (3). Remove bearing (6) from housing (3).

Assemble Front Drive Shaft And Carrier Bearing 3253-FR & 3267-016

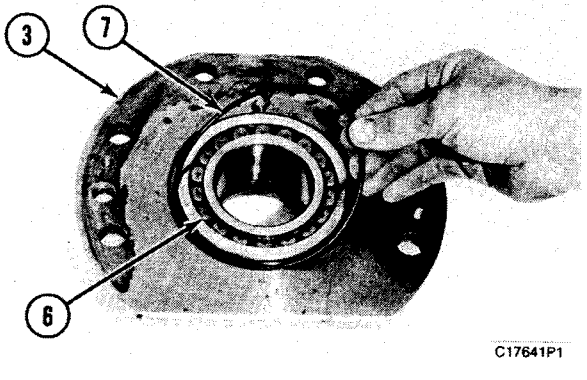
Tools Needed		A
1P520	Driver Group	1



1. Use tool group (A) to install the lip type seal in housing (3). Make sure the lip of the seal is toward the inside of the housing as shown.

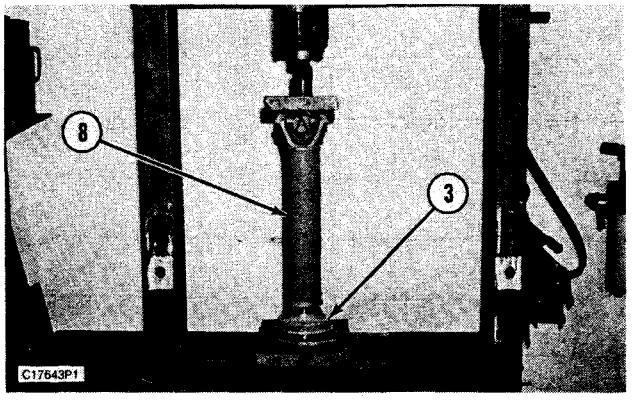
NOTICE

Both lip type seals for the carrier bearing housings must be installed so the lips of the seals are toward the front drive shaft at assembly to keep grease out of the parking brake.

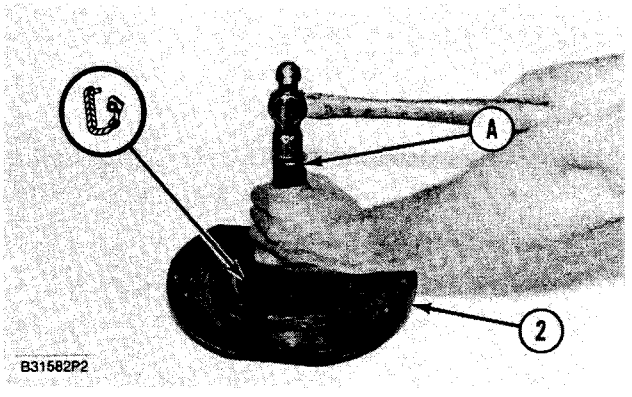


2. Lower the temperature of bearing (6), and install it in housing (3).

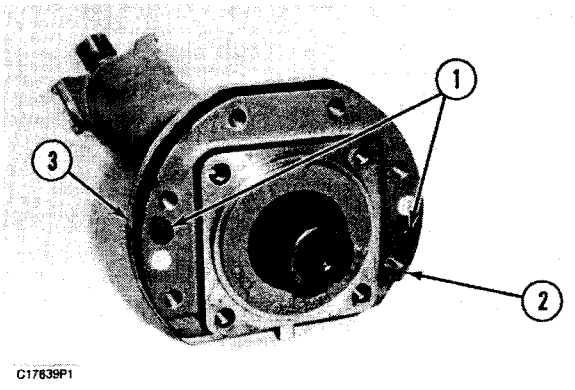
3. Put clean grease on O-ring seal (7), and install it on housing (3) around the bearing.



4. Use a press as shown, and press front drive shaft assembly (8) into the bearing in housing (3).



5. Use tool group (A) to install the seal in housing (2). Make sure the lip of the seal is toward the inside of the housing as shown.



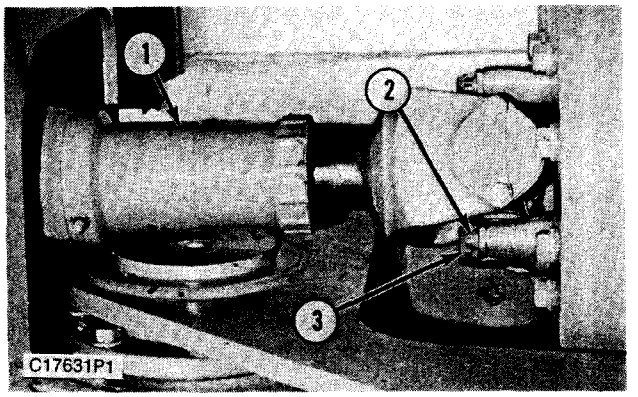
6. Put clean grease on the lip of the seal in housing (2). Install housing (2) on housing (3) and install bolts (1).

End By:

a. install front drive shaft and carrier bearing

Center Drive Shaft

Remove And Install Center Drive Shaft 3253-CE-010



1. Make sure the parking brake is released so the drive shaft can be turned.

2. Remove bolts (2) and straps (3) from both ends of drive shaft (1). Remove the drive shaft.

NOTE: The following steps are for the installation of the center drive shaft.

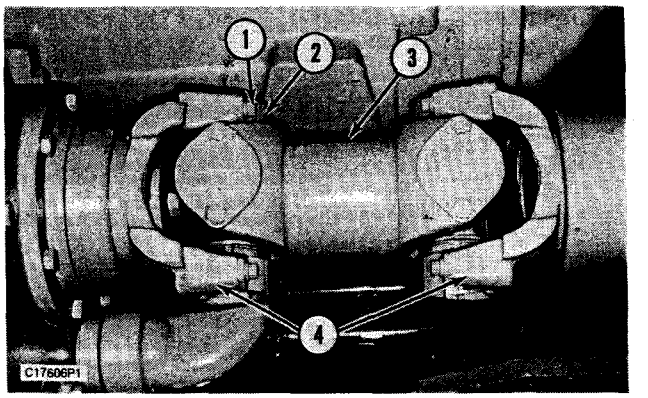
NOTE: Make sure all drive shaft yokes are on the same center line as the center drive shaft is installed.

3. Put drive shaft (1) in position. Install straps (3) and bolts (2).

4. Tighten bolts (2) to a torque of 55 ± 7 N•m (41 ± 5 lb.ft.).

Rear Drive Shaft

Remove And Install Rear Drive Shaft 3253-RE-010



1. Remove four bolts (1), and two straps (2) that hold drive shaft (3) on each end to joint groups (4).

2. Remove drive shaft (3) from the machine.

NOTE: The following steps are for the installation of the rear drive shaft.

3. Make sure all the drive shaft yokes in the powertrain are on the same center line.

4. Put drive shaft (3) in position.

5. Install two straps (2) and four bolts (1) on each end. Tighten bolts (1) to a torque of 55 ± 7 N•m (41 ± 5 lb.ft.).

Front Differential

Remove And Install Differential 3258-FR-010

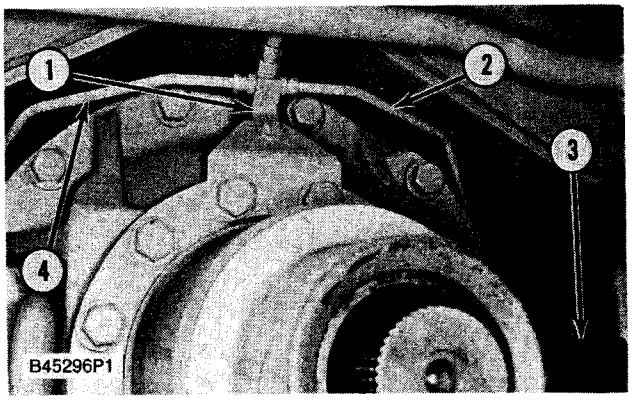
Tools Needed	A
OTC Model 1790 Transmission Jack	1

Start By:

a. remove front drive shaft

b. remove drive axles (front)

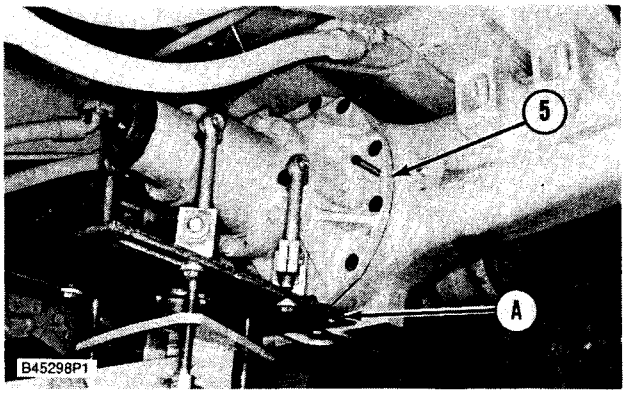
1. Drain the oil from the front axle housing.



2. Remove the bolts and brake line guards (3) from both sides of the axle housing.

3. Remove brake lines (2) and (4) from the machine.

4. Remove the bolt and nut and tee bracket (1) from the machine.



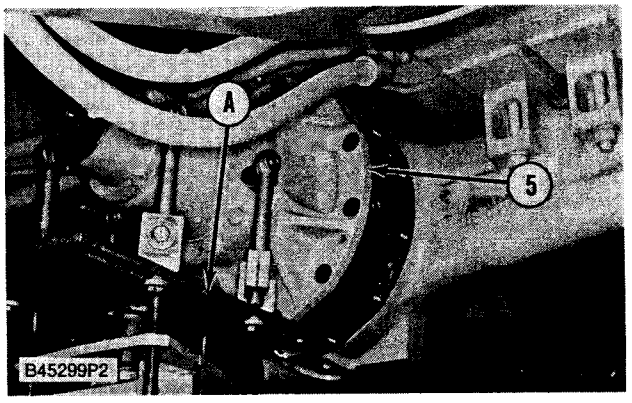
5. Fasten tool (A) to differential (5) as shown.

6. Remove the bolts and use two 1/2" -13 NC forcing screws to loosen differential from the axle housing.

7. Remove the differential from the machine. The weight of the differential is 204 kg (450 lb.).

NOTE: It can be necessary to make an adjustment to tool (A) to remove the differential from under the machine.

NOTE: The following steps are for the installation of the front differential.



8. Fasten differential (5) to tool (A) as shown.

9. Make sure the O-ring seal is installed around the differential carrier and put clean oil on it.

10. Put differential (5) in position in the front axle housing. If necessary use two 3/4" -10 NC guide bolts to keep the differential in alignment.

11. Install bolts that hold the differential in place, and tighten them to a torque of 270 ± 25 N•m (200 ± 20 lb.ft.).

12. Install tee bracket (1) on the differential.

13. Install brake lines (2) and (4). Remove (bleed) the air from the brake system.

14. Install brake line guards (3).

15. Fill the axle housing and final drives with clean oil.

End By:

a. install axles (front)

b. install front drive shaft

Rear Differential

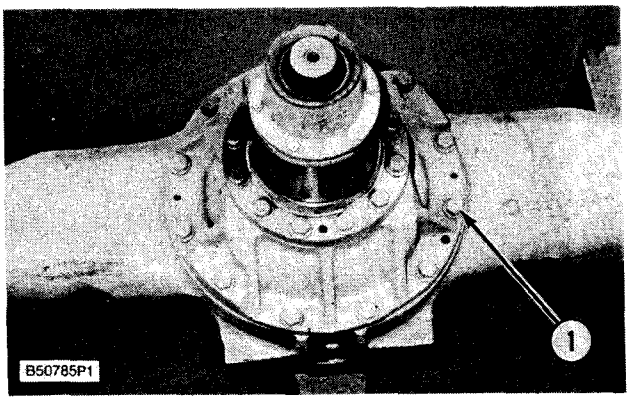
Remove And Install Rear Differential 3258-RE-010

Tools Needed		A
5P9736	Link Bracket	1

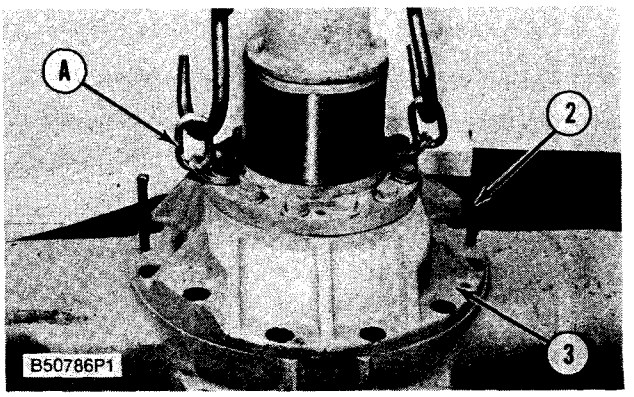
Start By:

a. remove rear axle housing front support

b. remove axles (rear)



1. Remove bolts (1) that hold the differential to the axle housing.

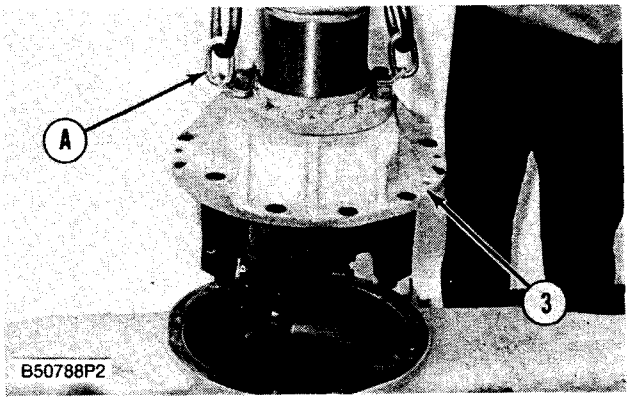


2. Fasten tool (A) to differential (3) and remove it from the axle housing. The weight of the differential is 150 kg (330 lb.).

NOTE: Two 1/2" -13 NC forcing screws (27) can be used to loosen differential (3) from the axle housing.

3. Remove the large O-ring seal from the differential.

NOTE: The following steps are for the installation of the rear differential.



4. Make sure the O-ring seal is installed around the differential and put clean oil on it.

5. Fasten tool (A) and a hoist to differential (3) as shown.

6. Put differential (3) in position in the outer housing with the bevel gear toward the right hand wheel assembly.

7. Install bolts (1) and tighten them to a torque of 270 ± 25 N•m (200 ± 18 lb.ft.).

End By:

a. install rear axle housing front support

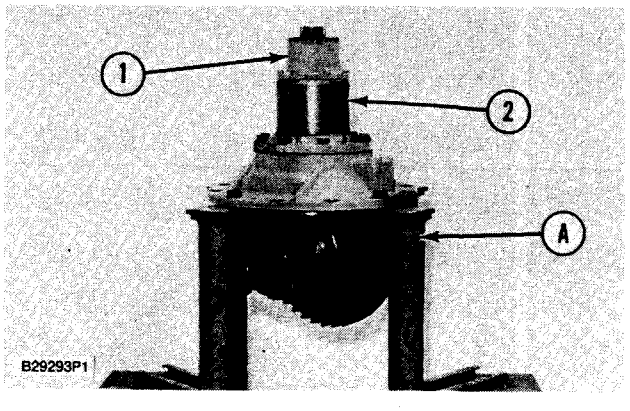
b. install axles (rear)

Disassemble Front And Rear Differentials 3258-015

Tools Needed		A	B	C	D	E	F
1P2420	Transmission Repair Stand	1					
FT957	Adapter Group	1					
FT996	Positioning Group	1					
6V2156	Link Bracket		2				
6V4070	Spanner Wrench			1			
8B7548	Puller Assembly				1		
8B7557	Adapter				2		
8H684	Ratchet Box Wrench				1		
8B7560	Step Plate				1		
1P820	Hydraulic Puller Group					1	1
5P3100	Pump Group (or electric)					1	
1B4207	Nut					2	2
3H465	Plate					4	4
8B7551	Bearing Puller Attachment					1	1
5P4170	Step Plate					1	1
5F7369	Leg					2	
8B7549	Leg						2

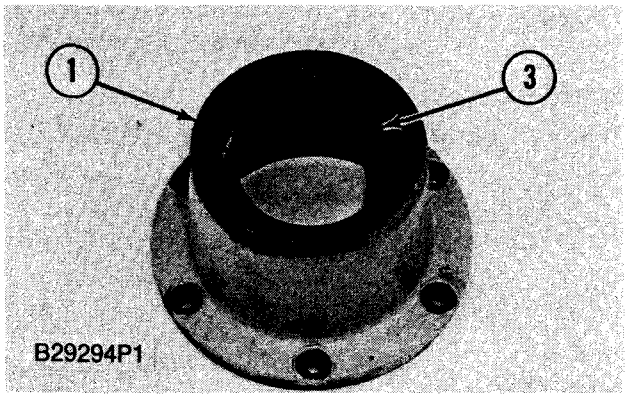
Start By:

a. remove front or rear differential

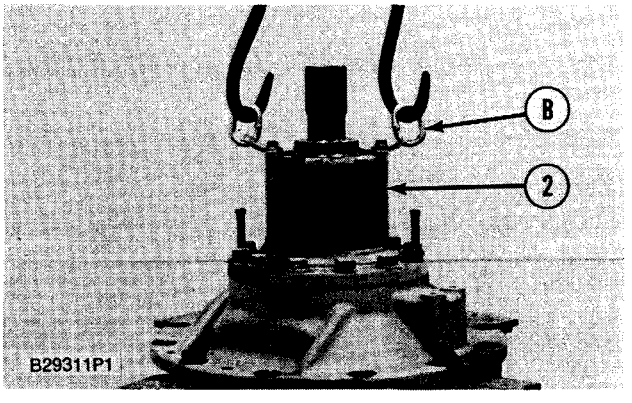


1. Put the differential and carrier assembly on tooling (A) with the bevel gear down as shown.

2. Remove retainer (1) from pinion housing (2).

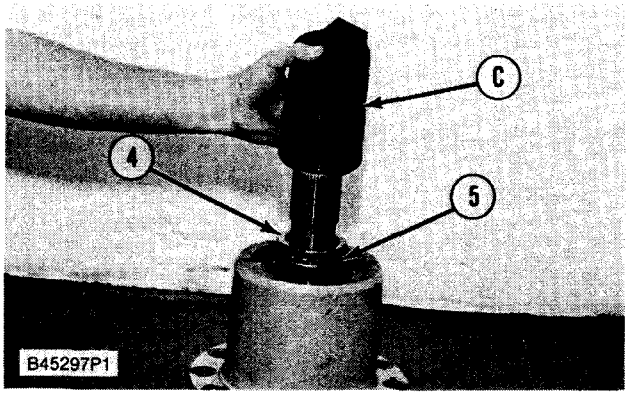


3. Remove lip type seal (3) from retainer (1).

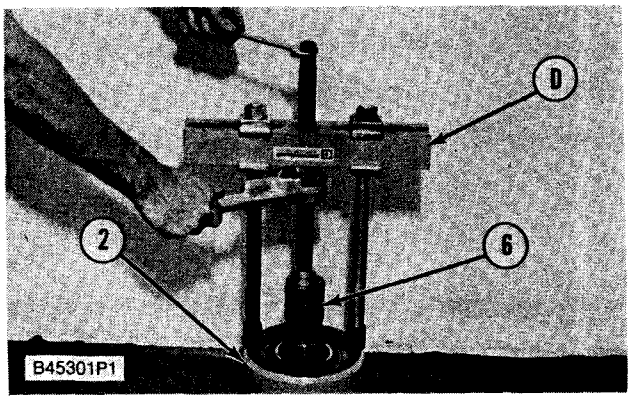


4. Remove the bolts that hold housing (2) to the carrier assembly. Fasten a hoist to housing (2) with tooling (B).

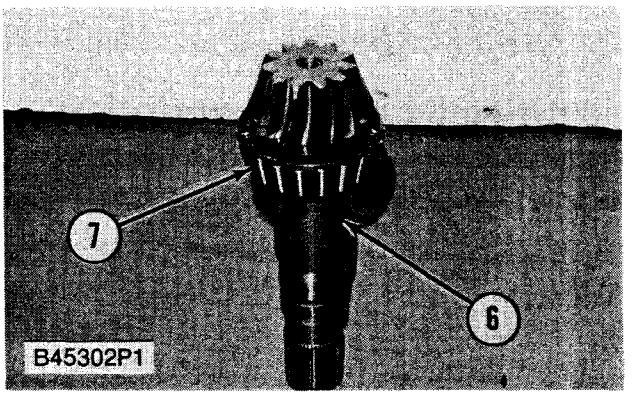
5. Use two 1/2" -13 NC forcing screws and loosen housing (2) from the carrier assembly. Remove housing (2) and pinion from the carrier assembly. The weight of the unit is 41 kg (90 lb.).



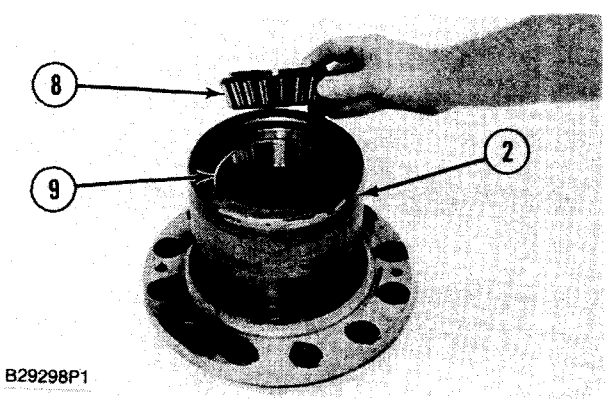
6. Bend the tab of the lock from nut (4). Install tool (C) and remove nut (4), the lock and nut (5) from the pinion shaft.



7. Use tooling (D) to push pinion shaft (6) out of housing (2).

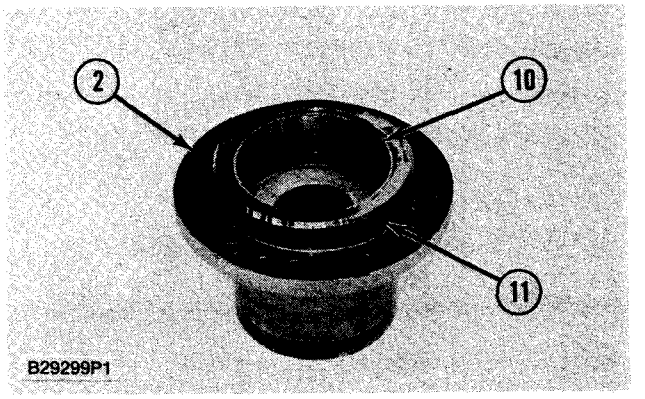


8. Remove bearing cone (7) from pinion shaft (6).



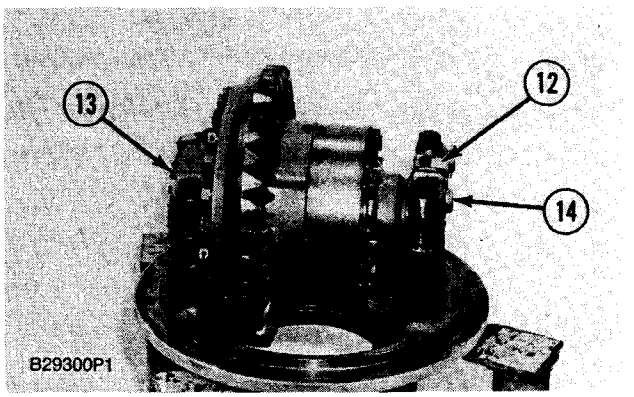
9. Remove bearing cone (8) from housing (2).

10. If necessary, remove bearing cup (9) from housing (2).



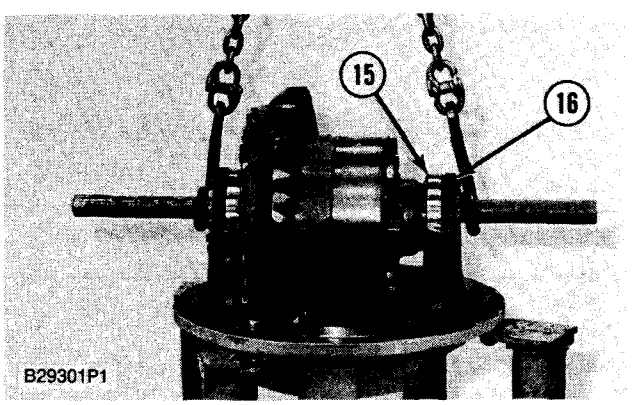
11. Remove O-ring seal (11) from housing (2).

12. If necessary, remove bearing cup (10) from housing (2).



13. Remove locks (12) from bearing caps (13) and (14).

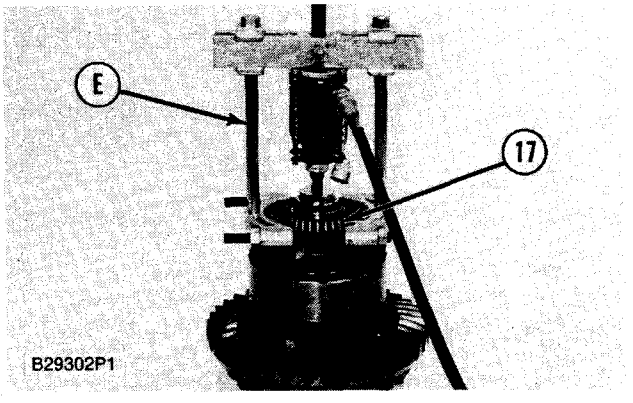
14. Remove the bolts and bearing caps (13) and (14) from the carrier assembly.



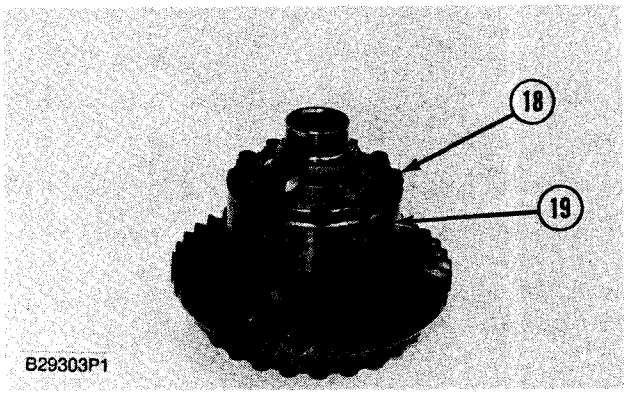
15. Slide a piece of pipe through the differential as shown. Fasten a hoist to the pipe. Remove the differ-

ential from the carrier assembly. The weight of the differential is 86 kg (190 lb.).

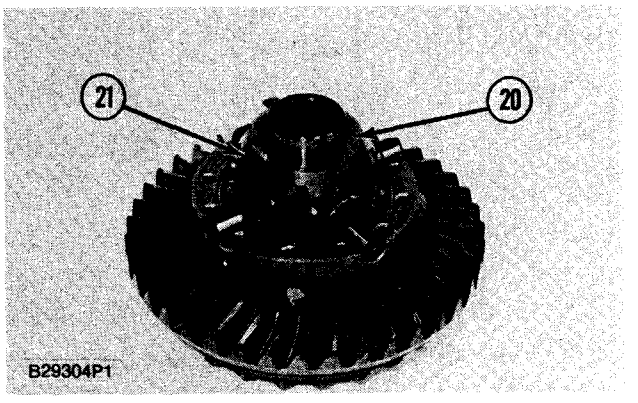
16. Remove rings (16) and bearing cups (15) from each end of the differential.



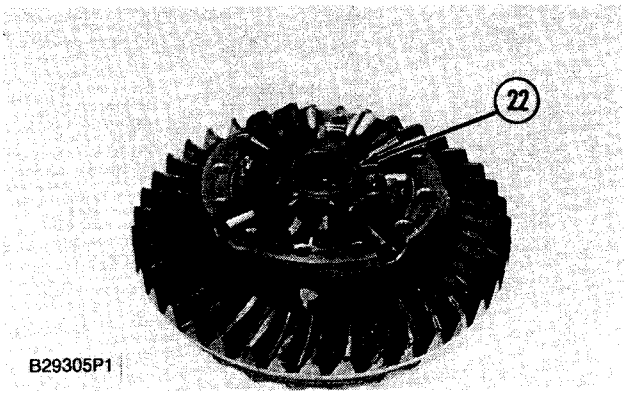
17. Use tooling (E) to remove bearing cone (17) from the differential.



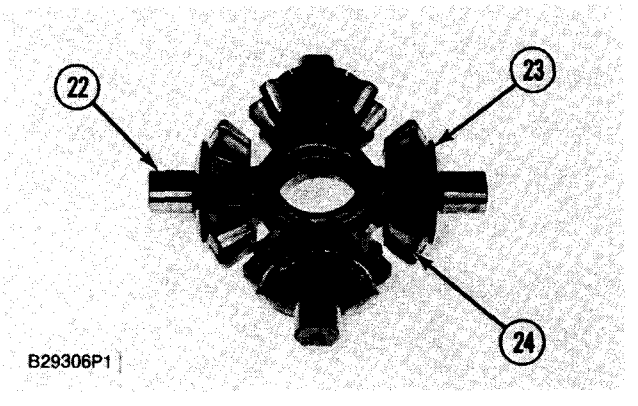
18. Put a mark on case (19) as to its location on the lower case for correct assembly. Remove bolts (18) and case (19) from the case and spider gears.



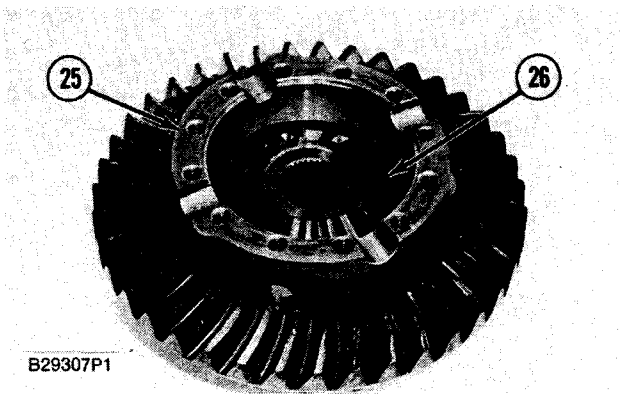
19. Remove washer (20) from gear (21). Remove gear (21) from the spider gears.



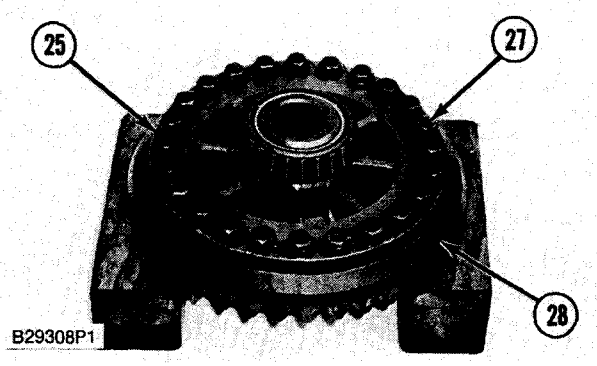
20. Remove spider (22) from the differential case.



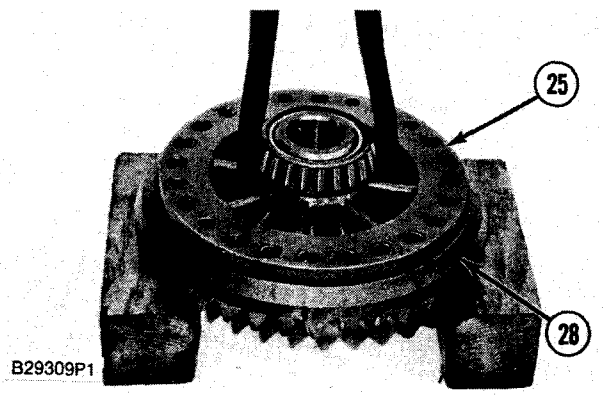
21. Remove washers (23) and gears (24) from spider (22).



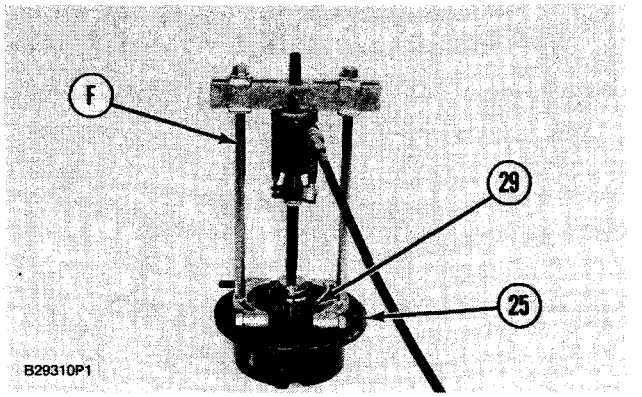
22. Remove gear (26) and the washer under it from case (25).



23. Remove the lockwire and bolts (27) that hold bevel gear (28) to case (25).



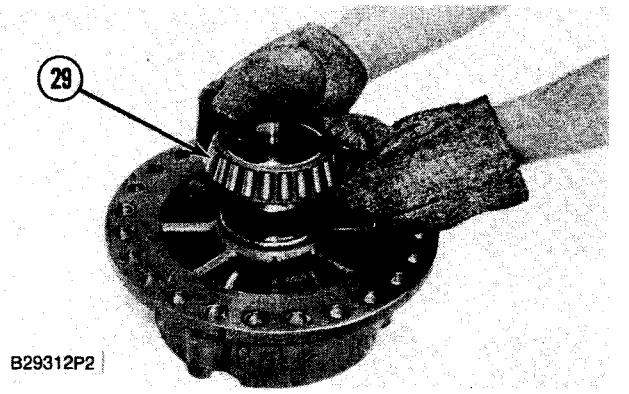
24. Fasten a hoist to case (25) and remove it from bevel gear (28). The weight of case (25) is 27 kg (60 lb.).



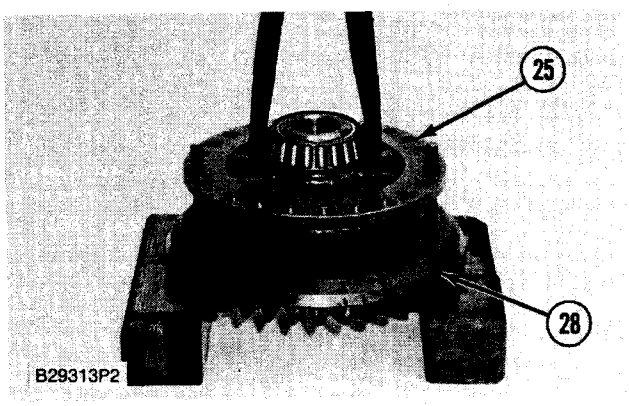
25. Use tooling (F) to remove bearing cone (29) from case (25).

Assemble Front And Rear Differentials 3258-016

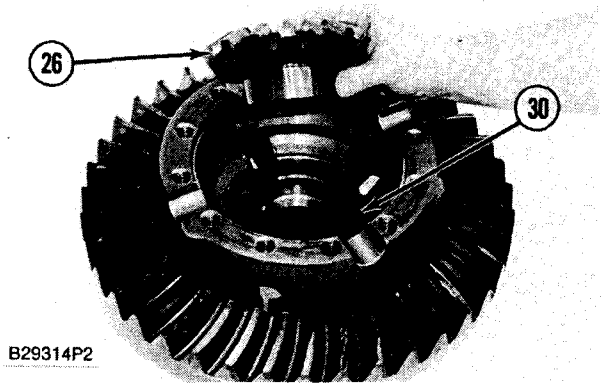
Tools Needed		A	C	G	H	J
1P2420	Transmission Repair Stand	1				
FT957	Adapter	1				
FT996	Positioning Group	1				
6V4070	Spanner Wrench		1			
5P9736	Link Bracket			2		
1P520	Driver Group				1	
8S2328	Dial Test Indicator Group					1



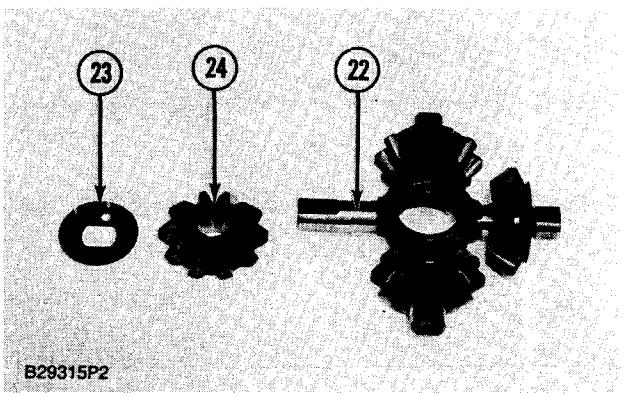
1. Heat the bearing to a maximum temperature of 135° C (275° F). Install bearing cone (29) on the differential case as shown.



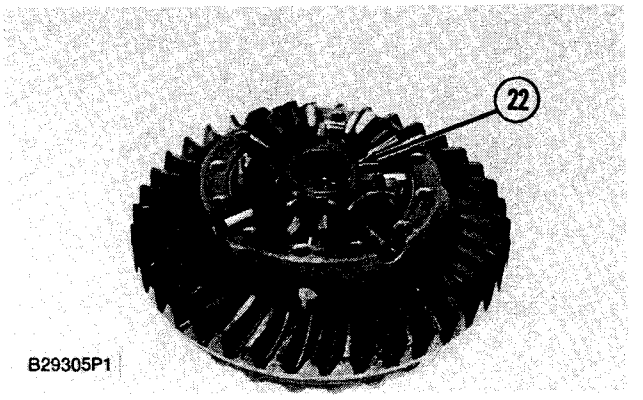
2. Install two 1/2" -20 NF guide pins in the bevel gear as shown. Fasten a hoist to case (25). Put case (25) in position in bevel gear (28). Install the bolts that hold it. Tighten the bolts to a torque of 135 ± 15 N•m (100 ± 11 lb.ft.). Install the lockwire on the bolts.



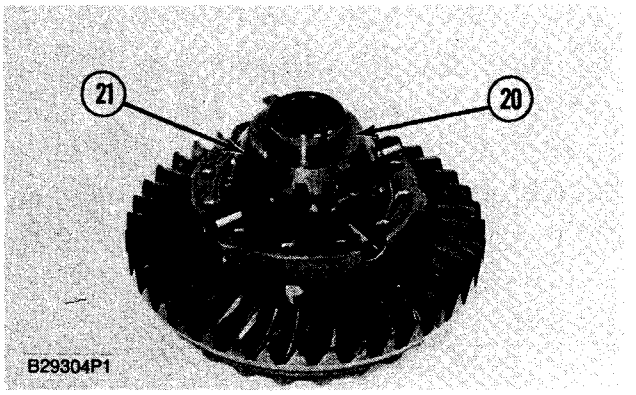
3. Install washer (30) and gear (26) in the case.



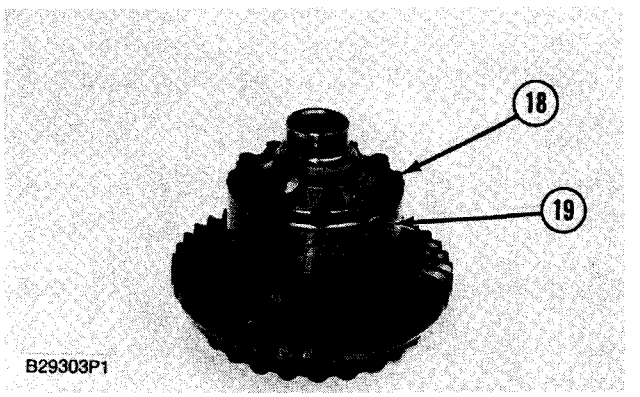
4. Install gears (24) and washers (23) on spider (22).



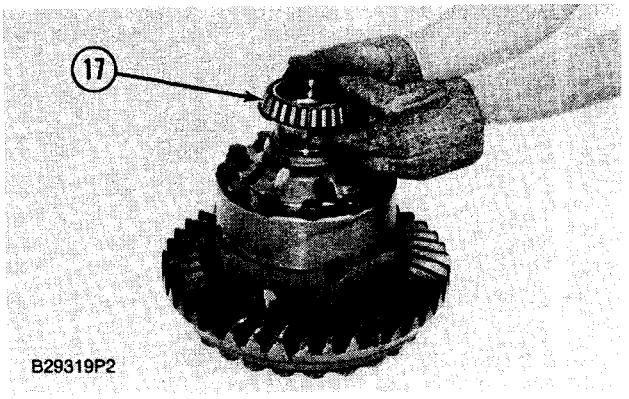
5. Install the gears and spider (22) in the case.



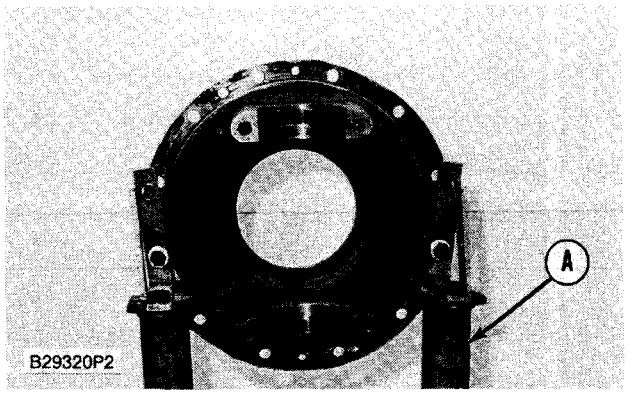
6. Install washer (20) on gear (21) and put the gear in position in the case.



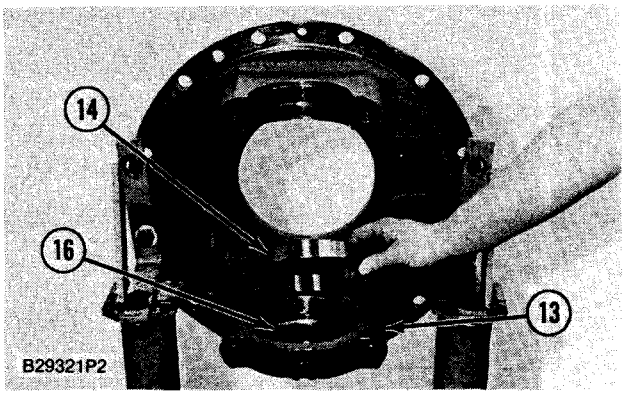
7. Install case (19) on the differential case. Make sure the marks on the cases are in alignment, and install bolts (18) that hold the cases together. Tighten the bolts to a torque of 135 ± 15 N•m (100 ± 11 lb.ft.).



8. Heat bearing cone (17) to a maximum temperature of 135° C (275° F). Install bearing cone (17) on the case.

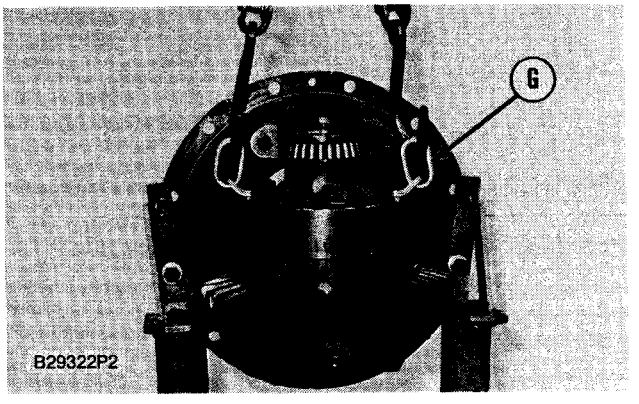


9. Put the carrier assembly in position on tooling (A) as shown.

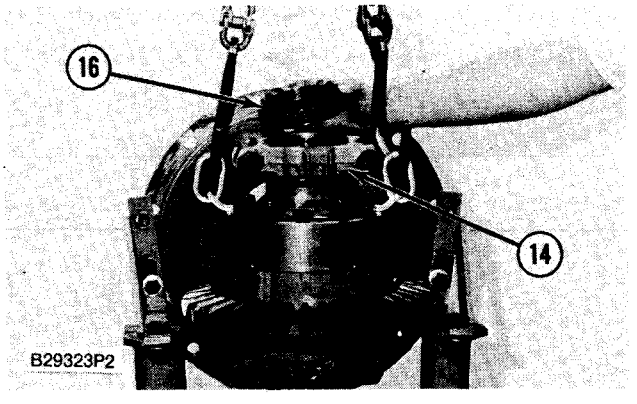


10. Install the larger bearing cap (13) on the carrier assembly. Make sure the threads in the bearing cap and carrier assembly are in alignment before the bolts are tightened.

11. Install adjustment nut (16) and bearing cup (14) as shown.

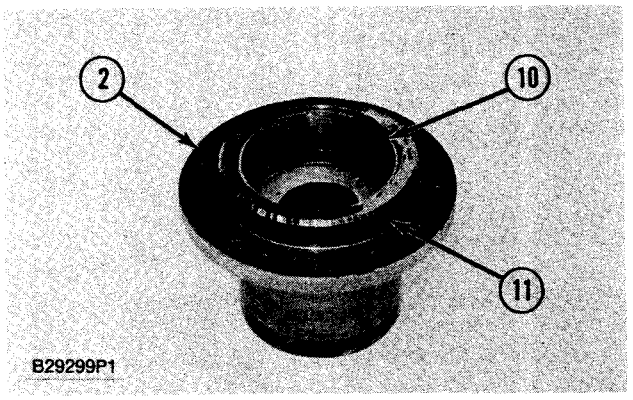


12. Fasten a hoist to the differential with tooling (B). Put the differential in position in the carrier assembly as shown.



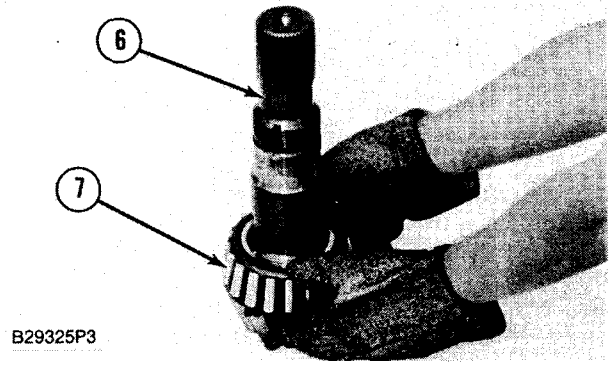
13. Install smaller bearing cap (14) on the carrier assembly. Make sure the threads in cap and the carrier assembly are in alignment before the bolts are tightened.

14. Install the bearing cup and adjustment nut (16).

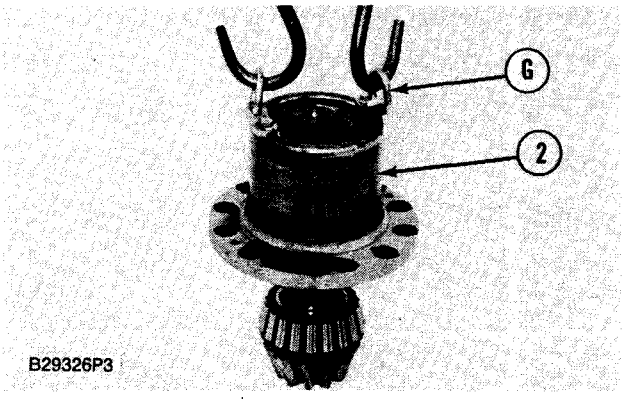


15. Lower the temperature of bearing cup (10) and install it in pinion housing (2).

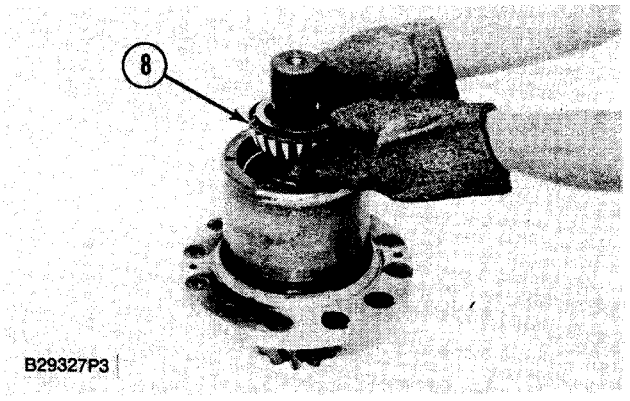
16. Install O-ring seal (11) on housing (2) and put clean oil on it.



17. Heat bearing cone (7) to a maximum temperature of 135° C (275° F). Install bearing (7) on pinion (6).

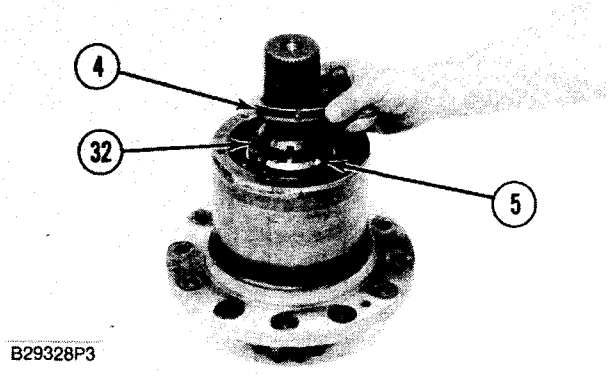


18. Fasten a hoist to housing (21) with tooling (G). Put housing (2) in position on the pinion and bearing.

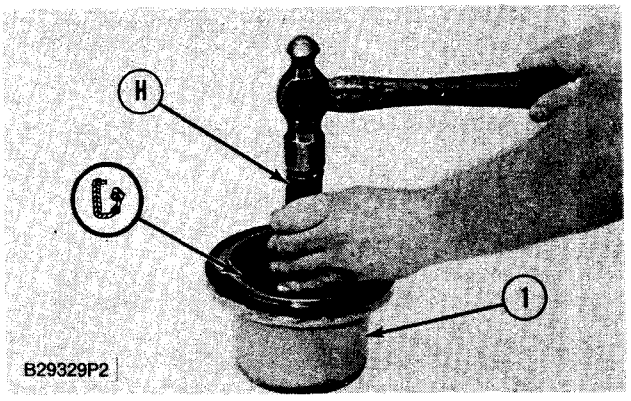


19. Heat bearing cone (8) to a maximum temperature of 135° C (275° F) and install it on the pinion shaft as shown.

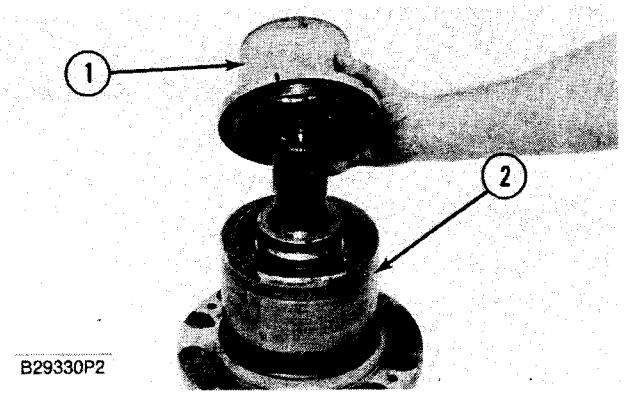
20. Install nut (16) on the pinion shaft. While the pinion is slowly turned, tighten nut (16) with tool (C) until the torque needed to turn the pinion is 2.0 ± 0.2 N•m (18 ± 2 lb.in.).



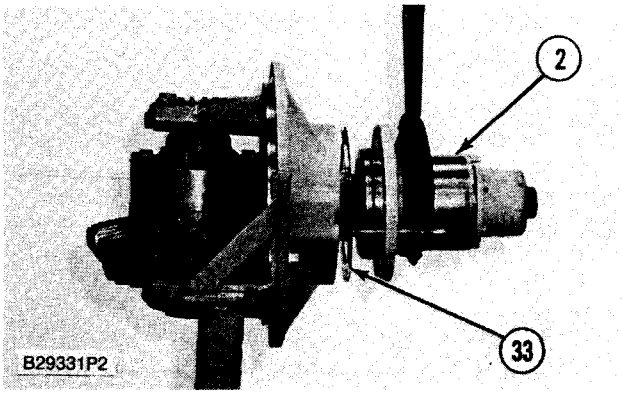
21. Put clean oil on lock (32) and install it on the pinion shaft. Install nut (4) with tool (C) on the pinion shaft. Bend the tab of the lock in the groove of nut (4). Check the torque needed to turn the pinion. The torque still must be 2.0 ± 0.2 N•m (18 ± 2 lb.in.). If the torque is not correct, lock (32) and nut (4) must be removed and an adjustment made to nut (5).



22. Use tool group (H) and install the seal in retainer (1). Make sure the lip of the seal is toward the inside of retainer (1) as shown. Put clean oil on the lip of the seal after installation.

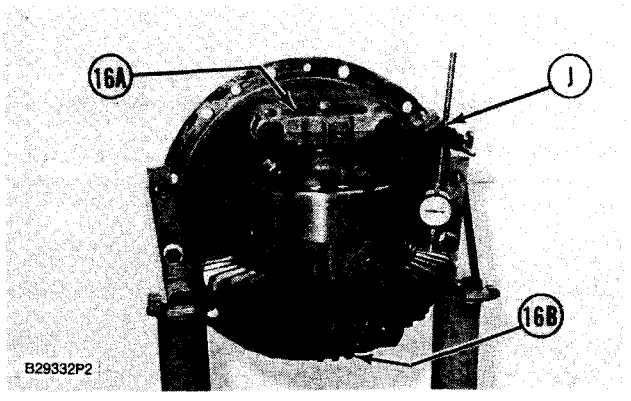


23. Install the gasket and retainer (1) on housing (2).



24. Install two 5/8" -11 NC guide bolts in the carrier assembly. Install shims (33) of the original thickness on the carrier assembly.

25. Fasten a hoist and put the pinion and housing (2) on the carrier assembly. Do not install the O-ring seal around housing (2) at this time. Install three bolts the same distance apart to hold housing (2) in the carrier assembly.



26. Make an adjustment of the differential bearing preload and the gear clearance (backlash) between the bevel gear and pinion as follows:

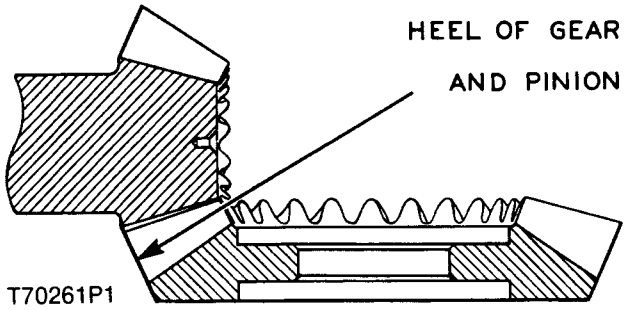
a. Tighten the adjustment nuts until there is a small amount of preload on the bearings.

b. Install tool group (J) on the bevel gear as shown to check the gear clearance (backlash) at four locations around the bevel gear 90° apart. Use the lowest indication on tool group (J) as the correct gear clearance (backlash) value. The correct gear clearance (backlash) is 0.20 to 0.43 mm (.008 to .017 in.).

c. If the gear clearance (backlash) is too much, loosen upper adjustment nut (16A), and tighten lower adjustment nut (16B) the same amount to change the gear clearance (backlash). If the gear clearance (backlash) is not enough, loosen lower adjustment nut (16B) and tighten upper adjustment nut (16A) the same amount to change the gear clearance (backlash).

d. Tighten upper adjustment nut (16A) until a torque of 4.0 ± 0.6 N•m (35 ± 5 lb.in.) is needed to turn the pinion shaft.

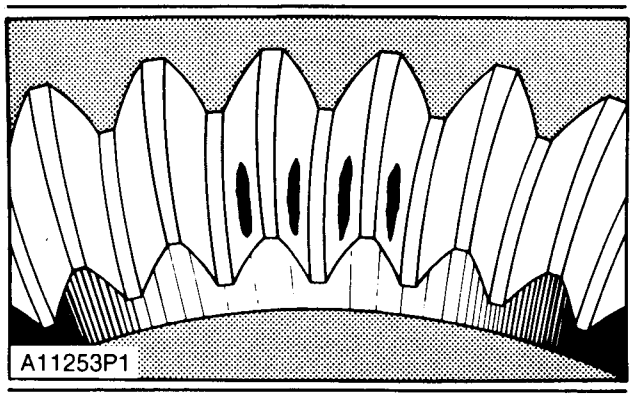
e. Check the gear clearance (backlash) again as in Steps b and c.



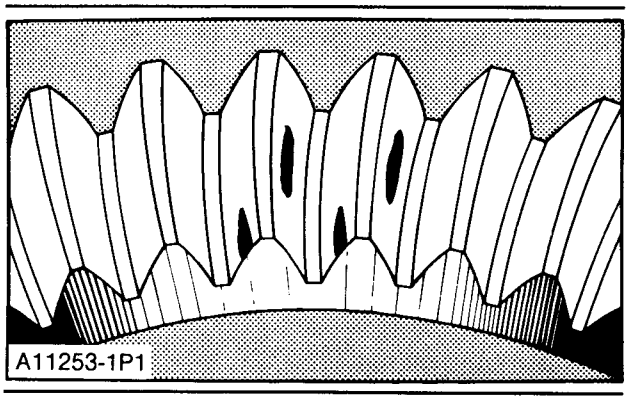
Alignment Of Bevel Gear And Pinion

27. Make a check of the tooth contact setting between the bevel gear and pinion after the gear clearance (backlash) and bearing preload adjustments have been made as follows:

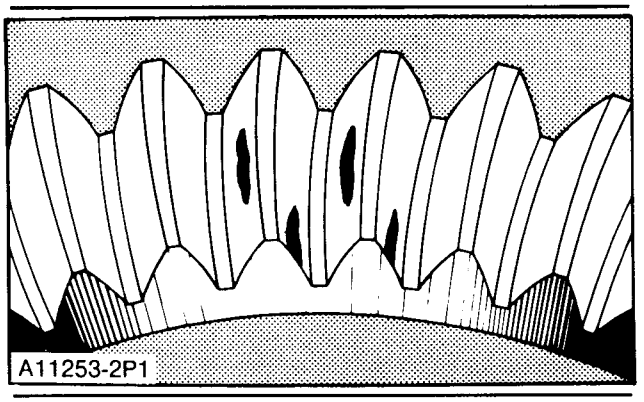
a. Put a small amount of Prussian blue, red lead or paint on the bevel gear teeth. Turn the pinion in both directions and check the marks made on the bevel gear teeth.



Correct Tooth Contact Setting



Short Toe Contact Setting



Short Heel Contact Setting

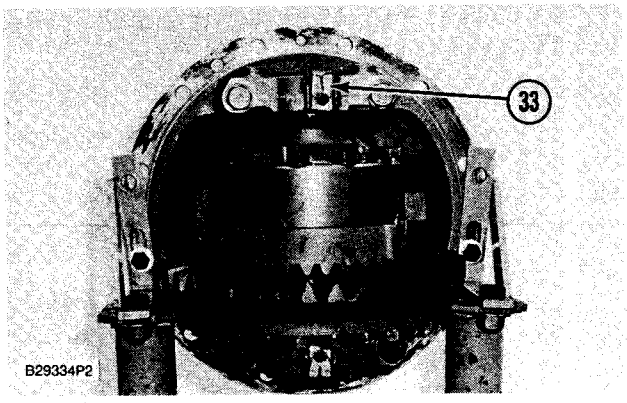
b. With no load, correct tooth contact setting will be as shown. The area of contact starts near the toe of the gear and goes 30% to 50% up the length of the tooth. With this setting, when a load is put on the gear, the load will be over the correct area of the teeth.

c. If bevel pinion shaft is too far away from bevel gear, short toe contact will be the result as shown. The teeth of pinion will be in contact with toe ends of convex faces (part that makes a curve toward the outside), and top edge of heel end of concave faces (part that makes a curve toward the inside). To correct this, remove shims from between pinion cage and carrier. After this is done, check gear clearance (backlash) and tooth contact again.

d. If bevel pinion shaft is too near to center of bevel gear, short heel contact will be the result as shown. The teeth of pinion will be in contact with toe ends of concave faces (part that makes a curve toward the inside) and the heel ends of convex faces (part that makes a curve toward the outside). To correct this, add shims between pinion cage and carrier. After this is done, check gear clearance (backlash) and tooth contact again.

NOTE: Several adjustments of both pinion and bevel gear can be needed before correct tooth contact and gear clearance (backlash) is made. Always remember that a change to gear clearance (backlash) will also change the tooth contact. Therefore, be sure gear clearance (backlash) is in correct adjustment before tooth contact is checked.

e. After correct gear clearance (backlash) and tooth contact is correct, remove extra Prussian blue, red lead or paint from bevel gear and pinion.



f. Install the O-ring seal between the pinion housing and carrier assembly. Remove the guide bolts and install the remainder of the bolts that hold the pinion housing in place. Tighten the bolts to a torque of 270 ± 25 N•m (200 ± 20 lb.ft.).

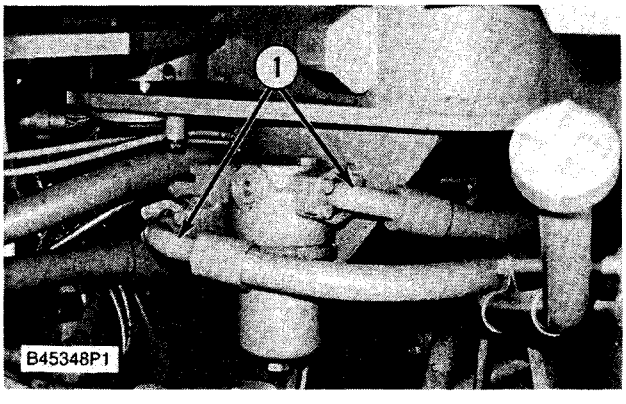
28. Install locks (33), the bolts and lockwire for each adjustment nut. Remove the differential and carrier assembly from tooling (A).

End By:

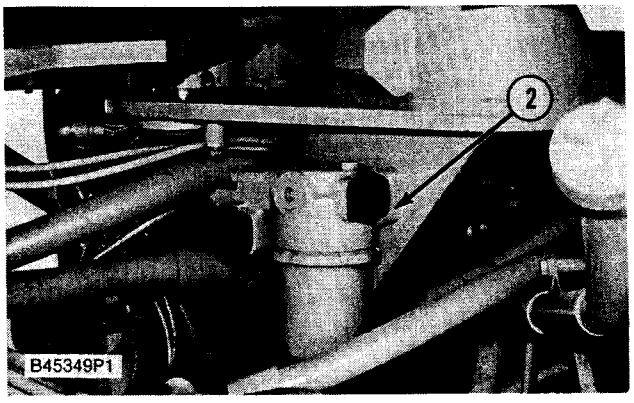
a. install front or rear differential

Transmission Oil Filter

Remove And Install Transmission Oil Filter 3179-010



1. Remove the bolts and disconnect oil lines (1) from the oil filter base.



2. Remove the bolts, oil filter base and housing (2) from the machine.

NOTE: If only housing and element are to be removed, see Lubrication And Maintenance Guide.

NOTE: The following steps are for the installation of the transmission oil filter.

3. Put oil filter base and housing (2) into position and install the bolts.

4. Put O-ring seals into position on the oil lines.

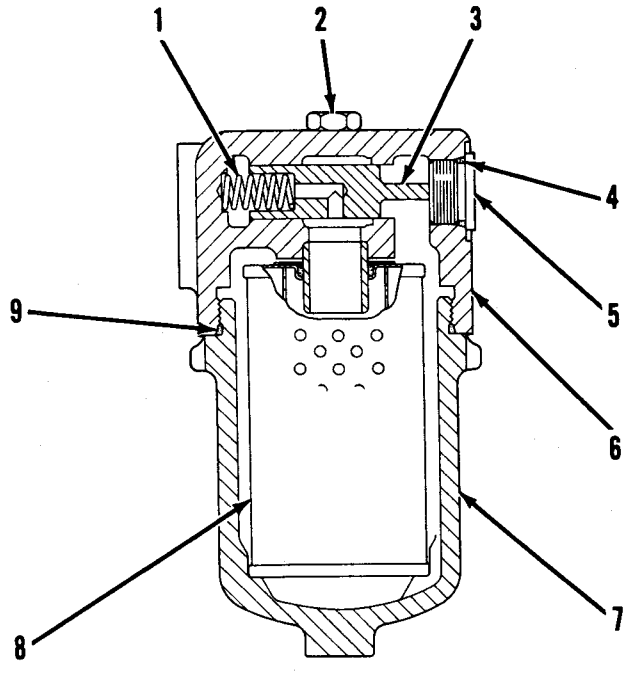
5. Connect oil lines (1) to oil filter base (2).

Disassemble And Assemble Transmission Oil Filter 3179-017

Start By:

a. remove transmission oil filter

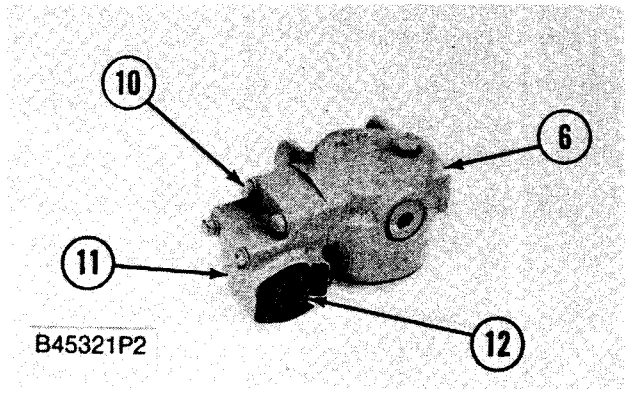
NOTE: Do not use an air wrench when the filter housing is removed.



C17604P1

1. Remove housing (7) from base assembly (6). Remove O-ring seal (9) from the housing.

2. Remove the filter element (8) from base assembly (6).



B45321P2

3. Remove bolts (10) and make a separation of adapter (11) from base assembly (6). Remove O-ring seal (12) from adapter (11).

4. Remove plug and seal (2) from the base assembly.

5. Remove plug (5), spool (3), and spring (1). Remove O-ring seal (4) from plug (5).

NOTE: The following steps are for the assembly of the transmission oil filter.

6. Check the condition of the O-ring seals. If any are worn or damaged, make a replacement with new parts.

7. Install O-ring seal (4) on plug (5). Install spring (1), spool (3), and plug (5) in base assembly (6).

8. Install plug and (2) in the base assembly.

9. Install O-ring seal (12) in adapter (11). Install adapter (11) on base assembly (6) with bolts (10).

NOTE: Do not use an air wrench to tighten housing (7).

10. Install filter element (8) on base assembly (6).

11. Install O-ring seal (9) on housing (7). Install housing (7) on base assembly (6).

End By:

a. install transmission oil filter

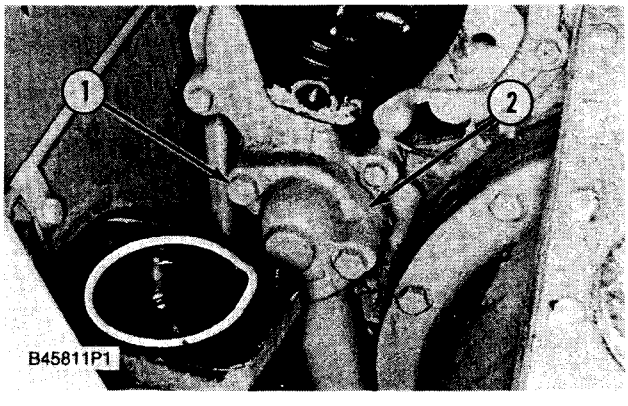
Transmission Oil Pump

Remove And Install Transmission Oil Pump 3153-010

Start By:

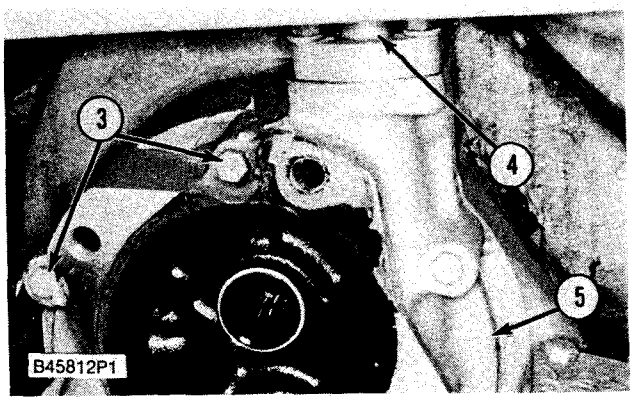
a. remove pilot and hydraulic pump*

*This operation is in the Vehicle Systems Disassembly And Assembly Manual.



B45811P1

1. Remove bolts (1) and disconnect tube assembly (2) from the pump.



2. Remove the bolts and disconnect tube assembly (4) from the pump.

3. Remove bolts (3) and remove transmission oil pump (5) from the torque converter housing.

NOTE: The following steps are for the installation of the transmission oil pump.

4. Make sure the O-ring seals are installed in the pump body and put clean power train oil on them.

5. Put transmission oil pump (5) in position and install bolts (3) that hold it.

6. Make sure the O-ring seal is installed in the end of tube assembly (4) and put clean power train oil on it. Connect tube assembly (4) to the pump.

7. Make sure the O-ring seal is installed in the end of tube assembly (2) and put clean power train oil on it. Connect tube assembly (2) to the pump.

End By:

a. install pilot and hydraulic pump*

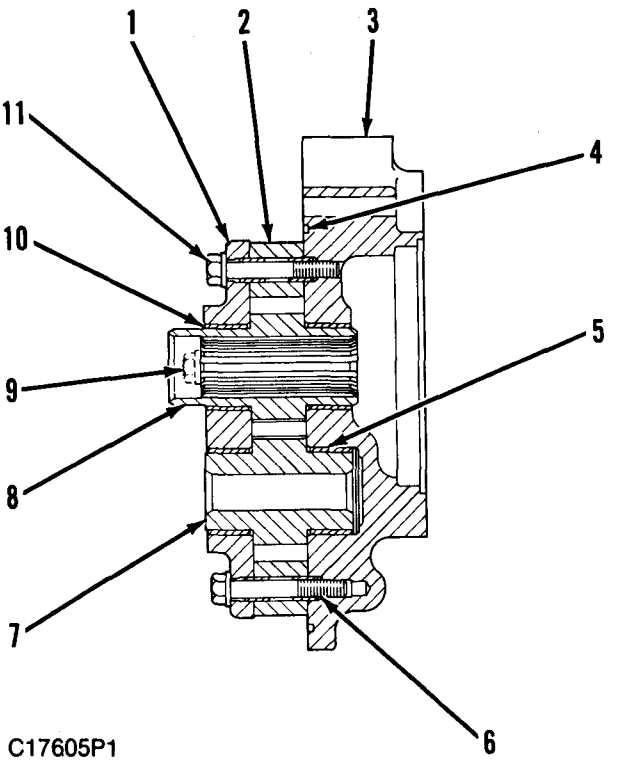
*This operation is in the Vehicle Systems Disassembly And Assembly Manual.

Disassemble And Assemble Transmission Oil Pump 3153-017

Tools Needed		A
1P510	Driver Group	1

Start By:

a. remove transmission oil pump



NOTE: Put marks on all parts for correct installation.

1. Remove O-ring seal (4) from manifold (3).

2. Remove bolts and washers (11) and (9), and make a separation of cover (1) from manifold (3).

3. If necessary, remove bearings (10) from cover (1). Remove gears (7) and (8) from manifold (3).

4. Remove body (2) from manifold (3). If necessary, remove four dowels (6) from the body.

5. If necessary, remove bearings (5) from manifold (3).

NOTE: The following steps are for the assembly of the transmission oil pump.

6. Use tool group (A) and a press to install bearings (5) in manifold (3). Install the bearings until they are 1.5 ± 0.5 mm (.059 ± .020 in.) below the surface of the manifold. Make sure the bearing joints are 30° ± 15° from the centerline toward the oil passage in the manifold.

7. Install four dowels (6) in body (2) until they extend 5.0 ± 0.5 mm (.197 ± .020 in.) above the surfaces of the body.

8. Install body (2) on manifold (3). Put clean oil on bearings (5), and install gears (7) and (8) in the manifold.

9. Use tool group (A) and a press to install bearings (10) in cover (1) until they are 1.5 ± 0.5 mm (.059 ± .020 in.) below the surface of the cover. Make sure the bearing joints are 30° ± 15° from the centerline toward the oil passage in the cover.

10. Put clean oil on bearings (10), and install cover (1) over the gears on body (2).

11. Install bolts and washers (9) and (11) to hold the pump together.

NOTE: The pump gears must turn freely by hand after bolts (9) and (11) are tightened.

12. Check the condition of O-ring seal (4). If the seal is worn or damaged, make a replacement with a new part. Install O-ring seal (4) on manifold (3).

End By:

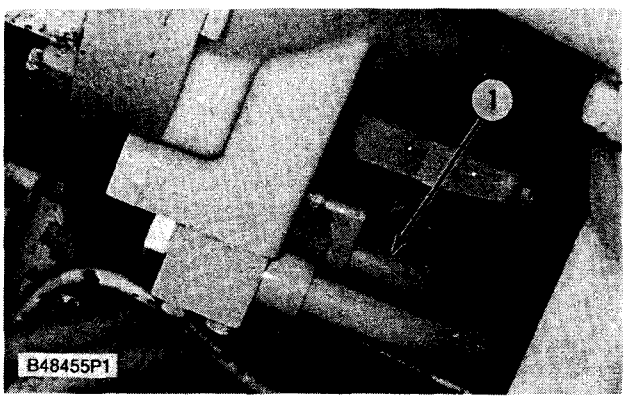
a. install transmission oil pump

Torque Converter Outlet Relief Valve

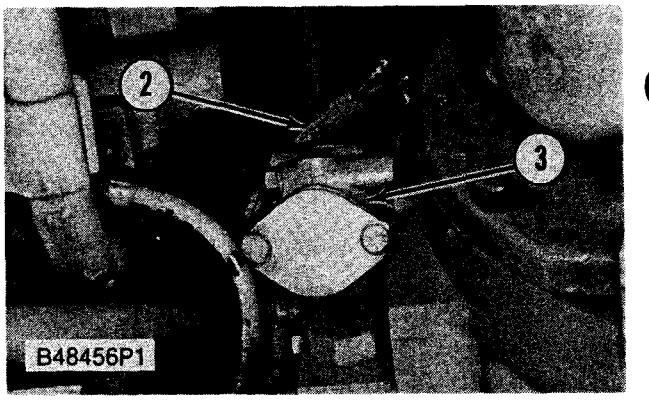
Remove And Install Torque Converter Outlet Relief Valve 3100-010

NOTE: The torque converter outlet relief valve is located on the left side of the torque converter when facing the front of the machine.

1. Drain the transmission oil.



2. Remove the bolts and disconnect tube assembly (1) from the outlet relief valve.



3. Remove the bolt and disconnect the clip that holds wire assembly (2) to outlet relief valve (3).

4. Remove the three bolts and remove outlet relief (3) from the torque converter.

NOTE: The following steps are for the installation of the torque converter outlet relief valve.

5. Install the O-ring seal on outlet relief valve (3).

6. Install outlet relief valve (3) on the torque converter.

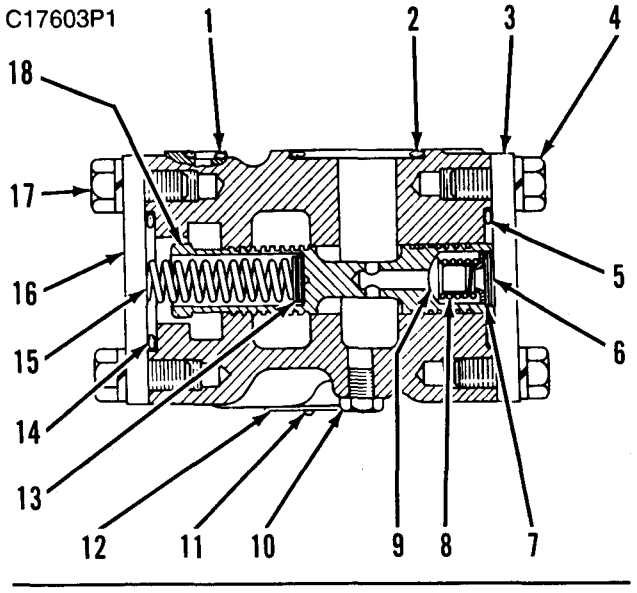
7. Install the bolt and connect the clip that holds wire assembly (2) to the outlet relief valve.

8. Install tube assembly (1) to the outlet relief valve.

Disassemble And Assemble Torque Converter Outlet Relief Valve 3100-017

Start By:

a. remove torque converter outlet relief valve



1. Remove O-ring seals (1) and (2) from the relief valve.

2. Remove bolts and washers (4), and remove cover (3). Remove O-ring seal (5) from the valve body.

3. Remove bolts and washers (17), and remove cover (16). Remove O-ring seal (14) from the valve body.

4. Remove spring (15), spacers (13), and valve spool (18). Remove ring (7), retainer (6), spring (8), and poppet (9).

5. Remove plug (10), screw (11), and plate (12) from the valve body.

NOTE: The following steps are for the assembly of the torque converter outlet relief valve.

6. Make sure all of the parts of the relief valve are clean and free of dirt and foreign material.

7. If any of the O-ring seals are worn or damaged, make a replacement with new parts. Put clean oil on all the parts at assembly.

8. Install plate (12), screw (11), and plug (10) on the valve body. (Install plug (10) without sealant)

9. Install poppet (9), spring (8), retainer (6), and ring (7) in valve spool (18). Make sure the shoulder on retainer (6) is toward spring (8) when it is installed.

10. Install valve spool (18), spacers (13), and spring (15) in the valve body.

NOTE: Spacers (13) are used to make an adjustment to the pressure needed to open the torque converter outlet relief valve. See Power Shift Transmission Testing And Adjusting for the correct pressure setting.

11. Install O-ring seal (14) in the valve body. Install cover (16) with bolts and washers (17).

12. Install O-ring seal (5) in the valve body. Install cover (3) with bolts and washers (4).

13. Install O-ring seals (1) and (2) in the relief valve.

End By:

a. install torque converter outlet relief valve

Engine And Transmission (Earlier)

Remove Engine And Transmission (Earlier) 1000 & 3000-011

Tools Needed		A	B	C
6V2156	Link Bracket	2		
	OTC 1790 Transmission Jack		1	
8S9906	Ratchet Puller			1

Start By:

a. remove rear drive shaft

b. remove center drive shaft

NOTE: It is not necessary to remove the transmission when just the engine is to be removed. See The Engine Disassembly And Assembly Module.

1. Remove the hood. The weight of the hood is approximately 52 kg (115 lb.).

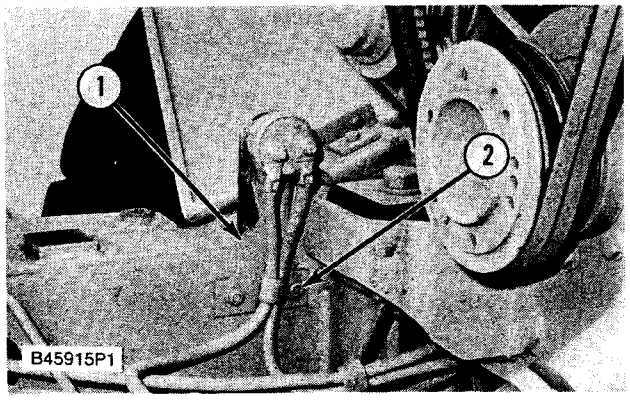
2. Remove the muffler.

3. Remove air cleaner housing. (This operation is in the Engine Disassembly And Assembly Manual).

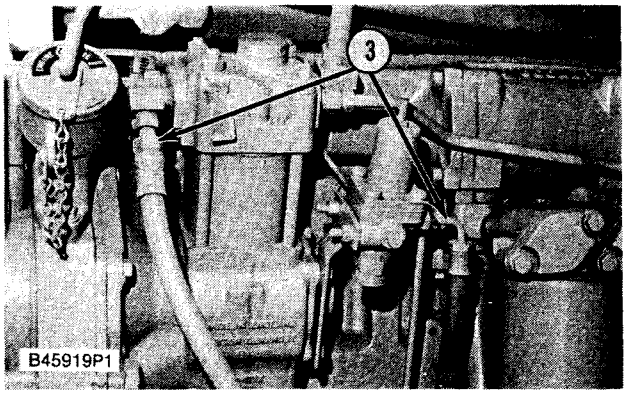
4. Remove radiator and guard. (This operation is in the Engine Disassembly And Assembly Manual).

⚠ WARNING

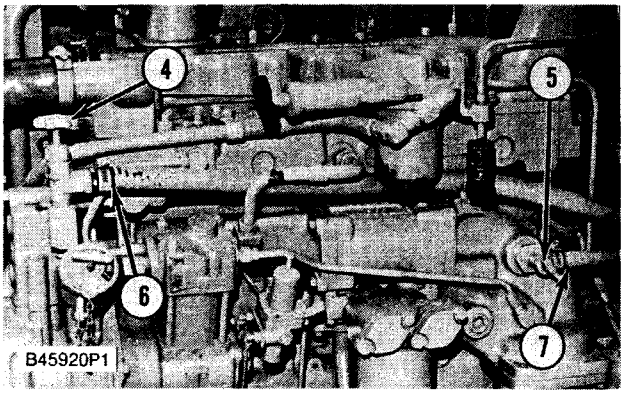
To prevent personal injury, release the pressure in the air reservoir before any lines are disconnected.



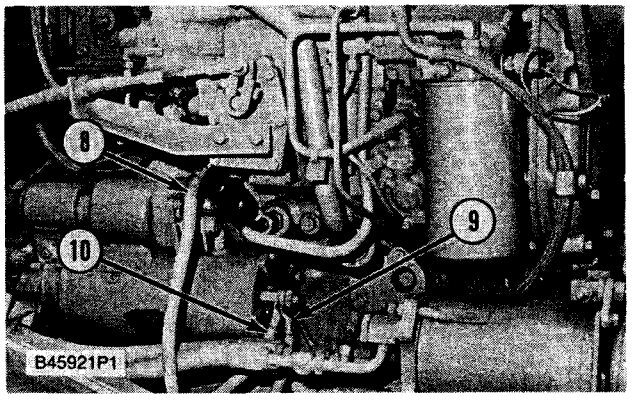
5. Remove nuts (2) and disconnect the disconnect switch (1) from the frame.



6. Disconnect air lines (3) from the engine.



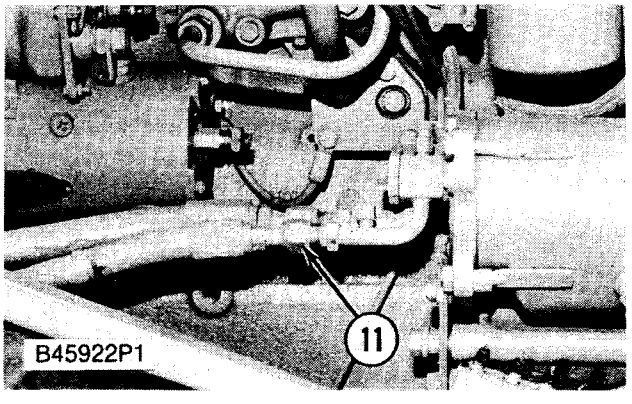
7. Turn valves (4) and (5) to the "CLOSED" position. Disconnect heater hoses (6) and (7) from the engine.



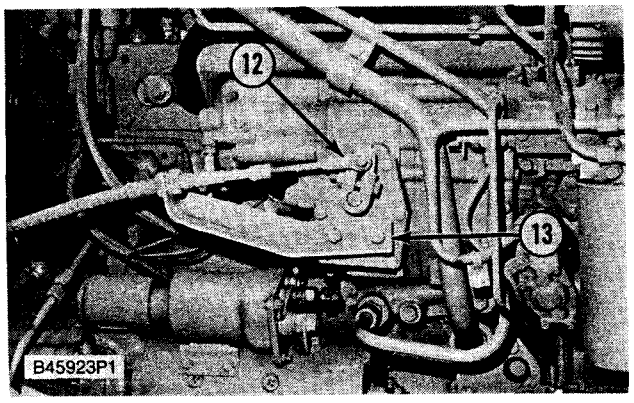
8. Put identification on wires (8), (9) and (10). Disconnect wires (8), (9) and (10) from the starter and the solenoid.

⚠ WARNING

Always wear goggles when the air conditioning system is opened. This system is charged with Freon-12 (CCL2F@-Dichlorodifluoromethane) which is not toxic or flammable. But, there is a reason for caution. When Freon-12 makes contact with a flame, lethal phosgene gas is made. INHALING FREON THROUGH A LIGHTED CIGARETTE CAN CAUSE VIOLENT ILLNESS. This system is under pressure at all times, engine running or not. HEAT MUST NEVER BE PUT ON A CHARGED SYSTEM. See AIR CONDITIONING AND HEATING SERVICE MANUAL, Form No. SENR3334, for more information on procedures and safety requirements on removal and installation of lines and refrigerant from the system.

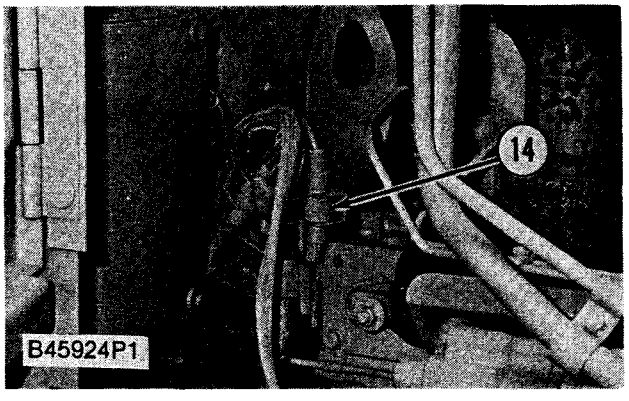


9. Disconnect air conditioning lines (11) from the air conditioning compressor.

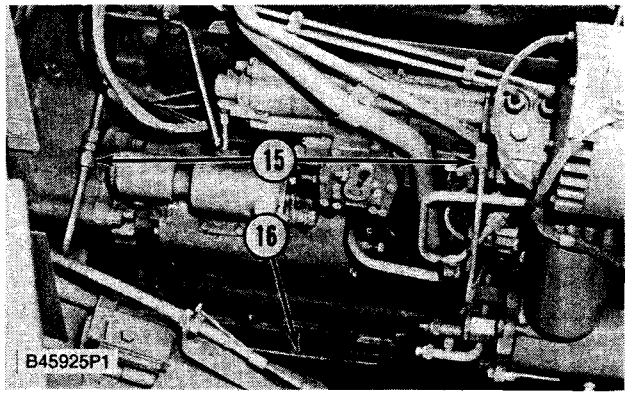


10. Disconnect governor control cable (12) from the governor.

11. Remove the bolts and disconnect bracket (13) from the engine.

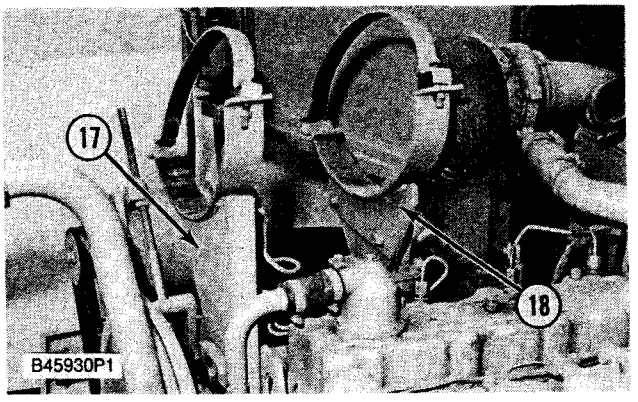


12. Put identification on wire harnesses (14) and disconnect them at the rear of the machine.

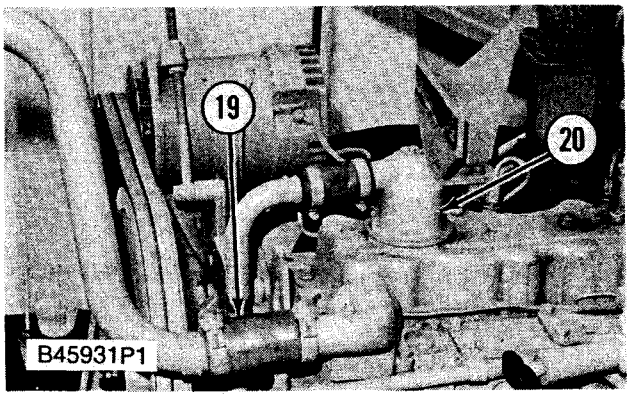


13. Disconnect fuel lines (15) from the fuel injection pump housing and the rear of the engine.

14. Disconnect clips (16) that hold the fuel line to the oil pan.

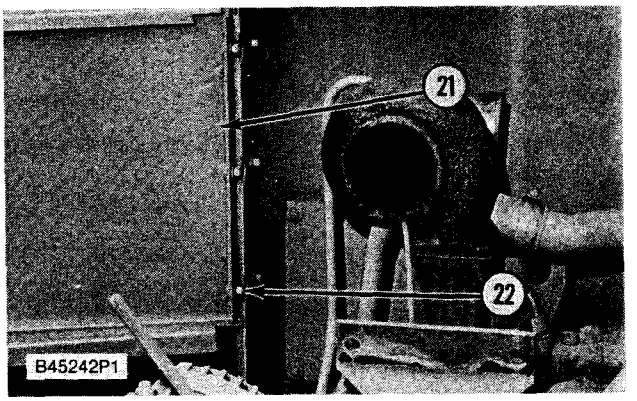


15. Remove the nuts and bolts and remove muffler brackets (17) and (18) from the engine.

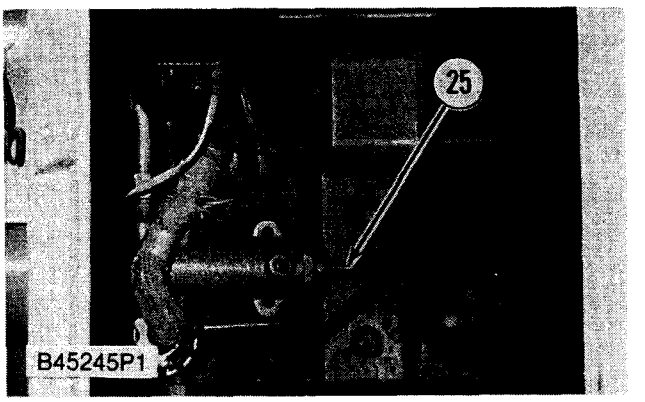


16. Remove the bolt and disconnect clip (19) that holds the breather tube to the engine.

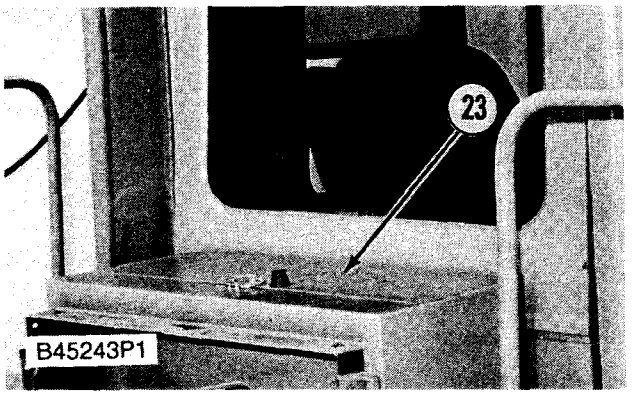
17. Remove the bolt and remove breather assembly (20) from the valve cover.



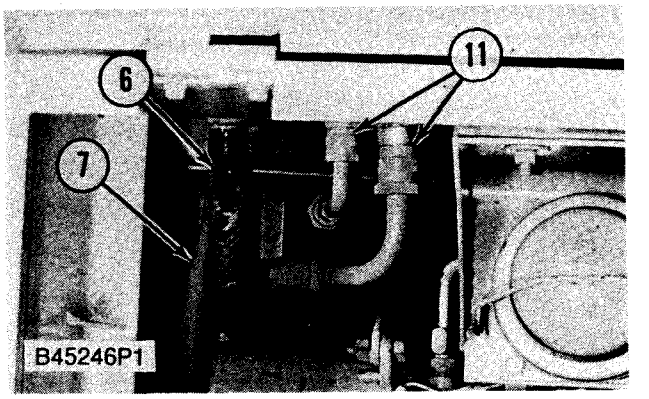
18. Remove nuts (22) and upper access door (21) from both sides of the machine.



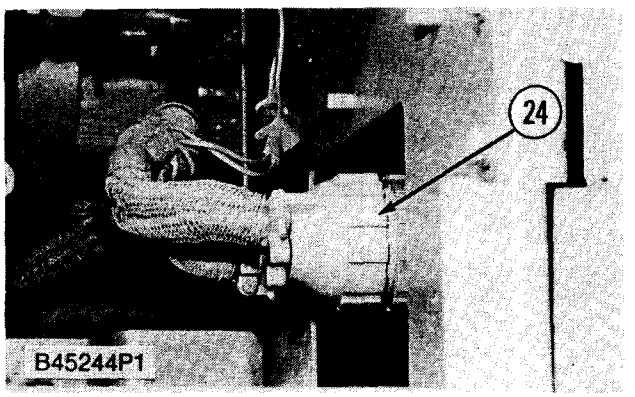
21. Disconnect two air lines (25) from each air/hydraulic cylinder.



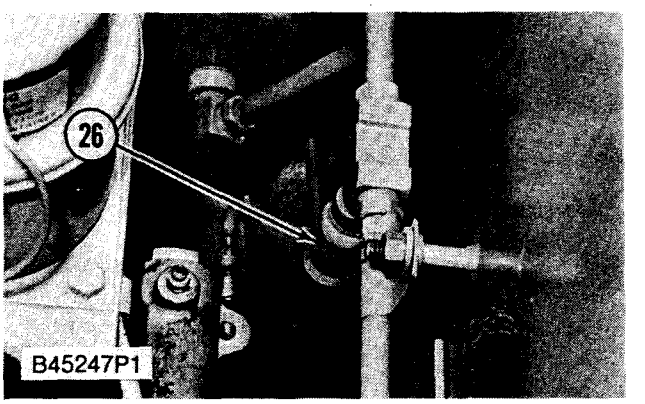
19. Open access door (23) behind the cab.



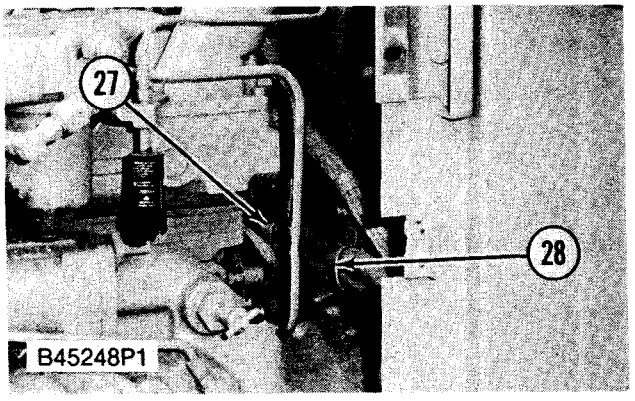
22. Disconnect heater hoses (6) and (7) and air conditioning lines (11) from behind the cab.



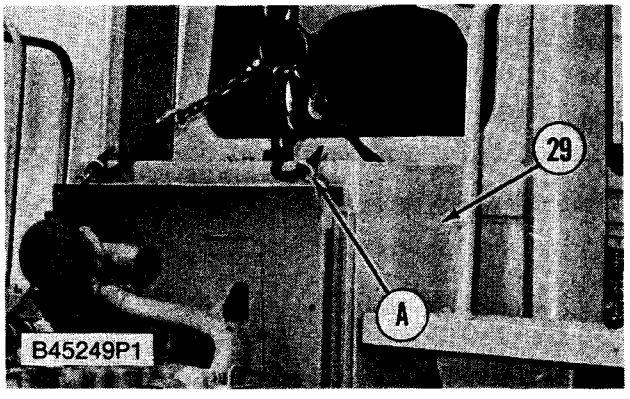
20. Disconnect wire harnesses (24) from behind the cab.



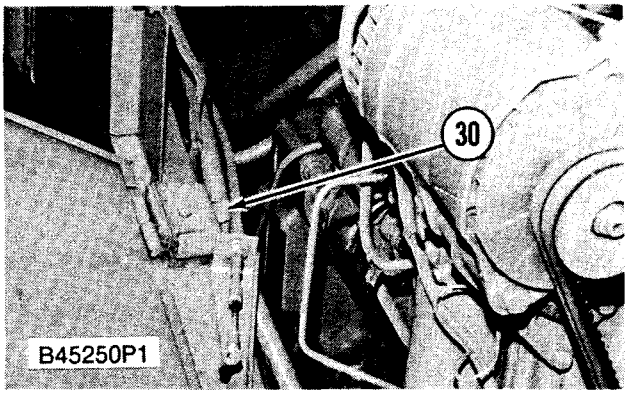
23. Disconnect air line (26) from the tee fitting.



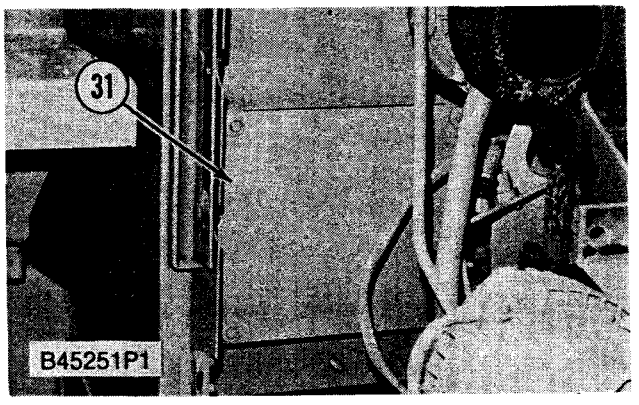
24. Remove the nuts and disconnect clips (27) and (28) that hold the heater hoses to the firewall.



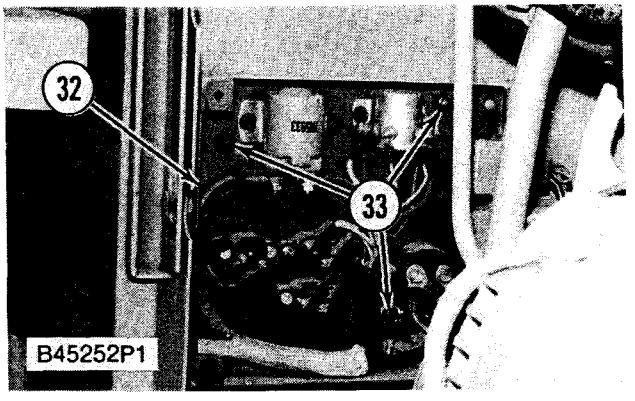
25. Fasten tooling (A) and a hoist to firewall (29) as shown.



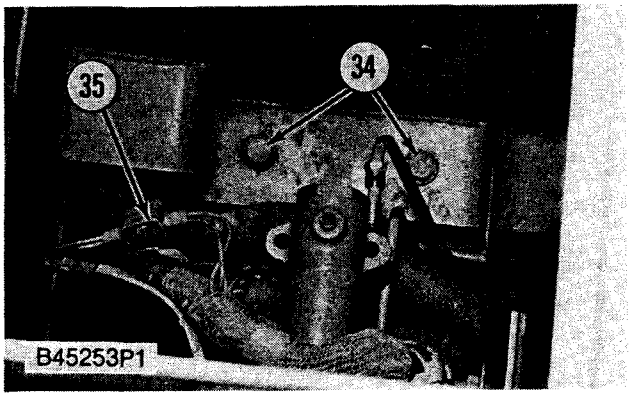
26. Disconnect three clips (30) that hold the hose and wire harnesses to the frame.



27. Remove the bolts and cover (31) from the electrical box.

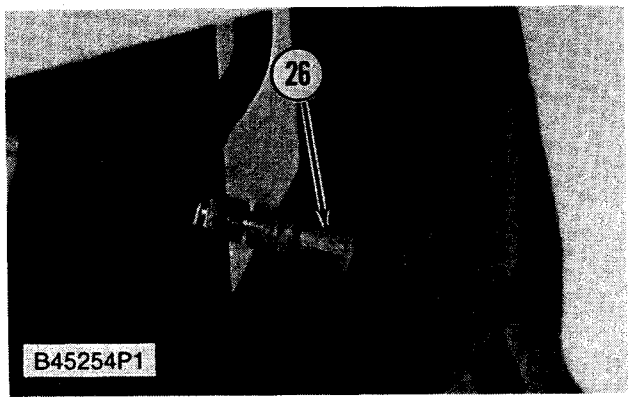


28. Remove nuts (33) and disconnect electrical box (32) from the firewall.

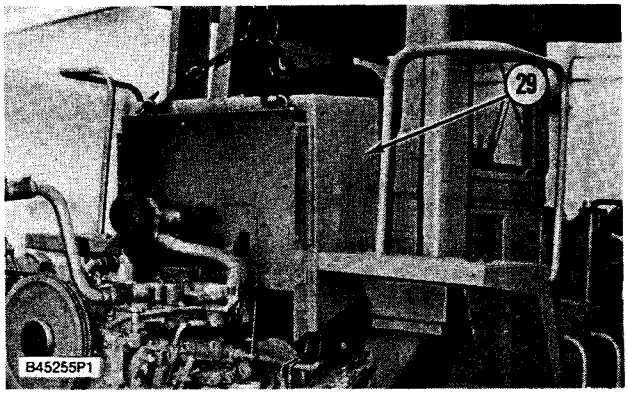


29. Disconnect wire harness (35) (right side only).

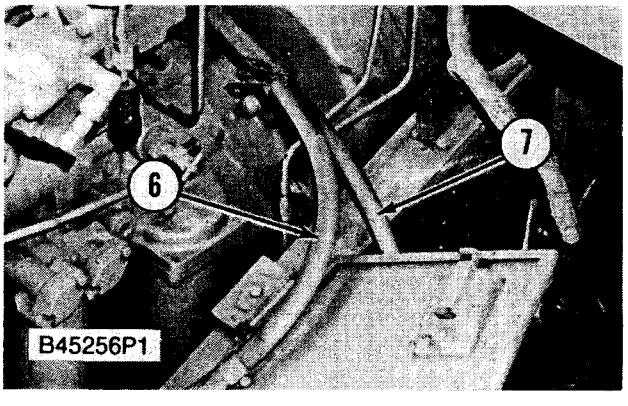
30. Remove two bolts (34) from each side of the firewall.



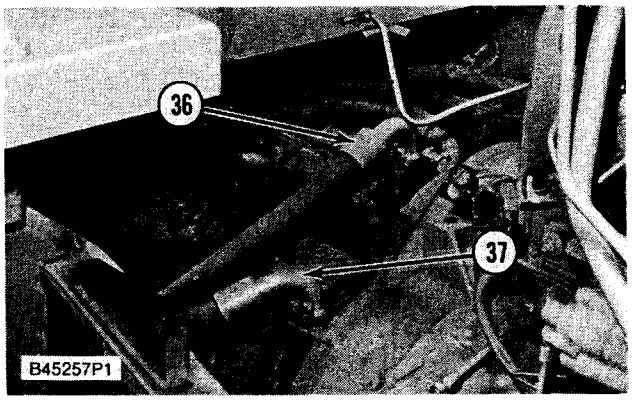
31. Lift the firewall a small amount and remove air hose (26) from the firewall.



32. Make sure all hoses, wires and clips are disconnected and remove firewall (29) from the machine. The weight of the firewall is approximately 109 kg (240 lb.).

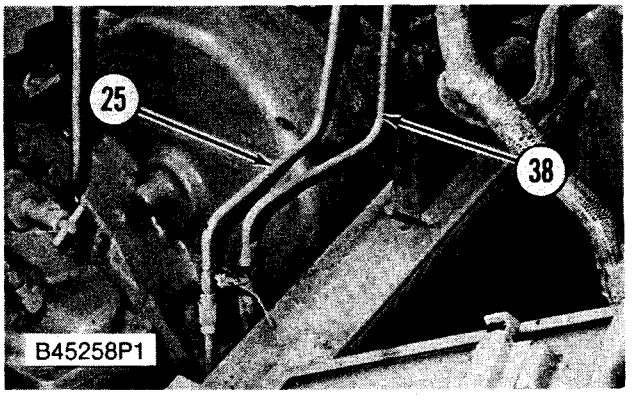


33. Remove heater hoses (6) and (7) from the machine.

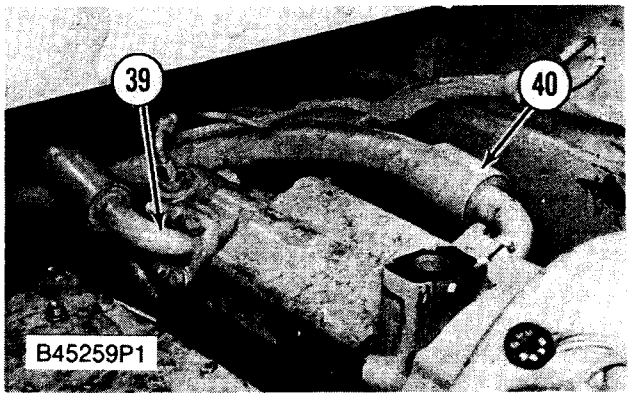


34. Remove the bolts and disconnect hose assembly (36) from the transmission pump.

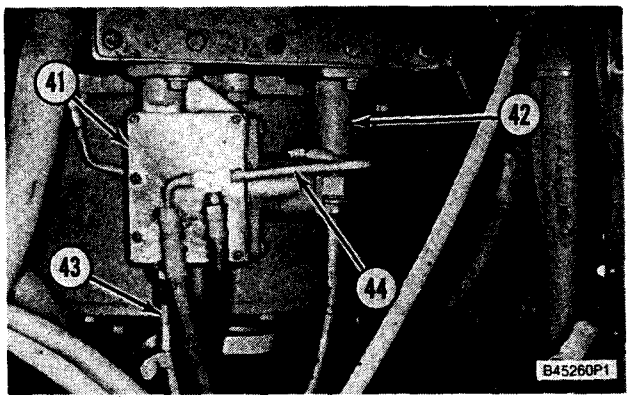
35. Remove the bolts and disconnect hose assembly (37) from the transmission.



36. Remove air lines (25) and (38) from the machine.



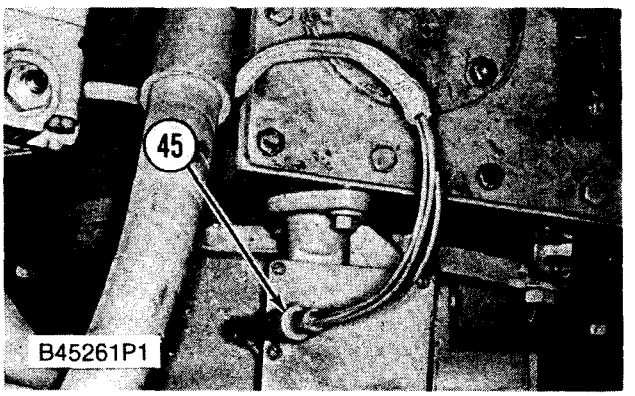
37. Remove the bolts and disconnect hose assemblies (39) and (40) from the pilot and hydraulic pump.



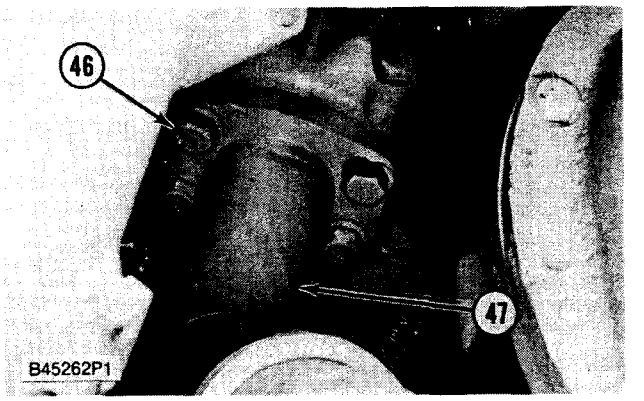
38. Remove the screws and cover (41) from the transmission neutralizer and disconnect cable (43). See Remove Transmission Neutralizer in the Vehicle Systems Disassembly And Assembly Section.

39. Disconnect tube (44) from the transmission neutralizer.

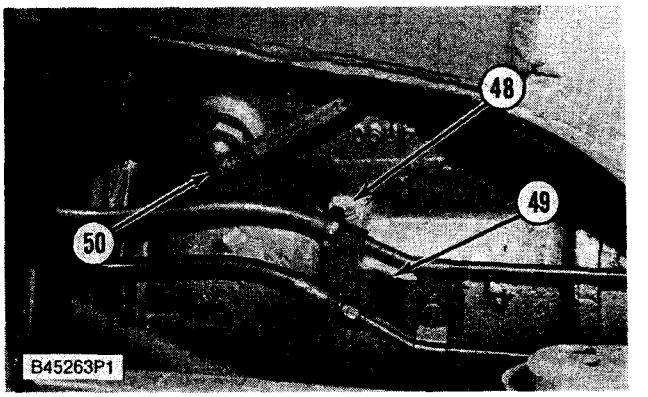
40. Remove the bolts and disconnect transmission selector (42) from the transmission hydraulic control by removal of the notch from the slot.



41. Disconnect wire harness (45).

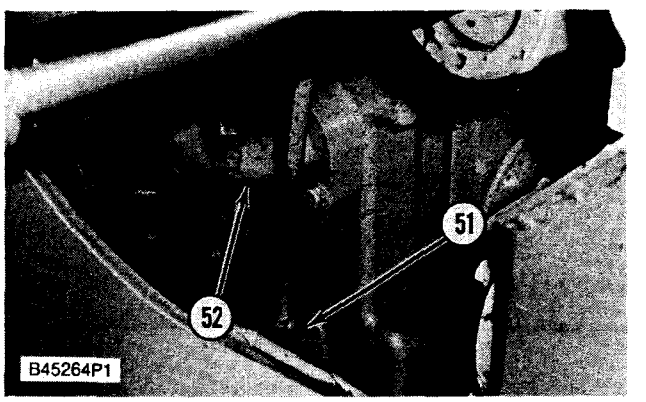


42. Remove bolts (46) and loosen the clamp on tube assembly (47). Remove tube assembly (47) from the bottom of the hydraulic pump.

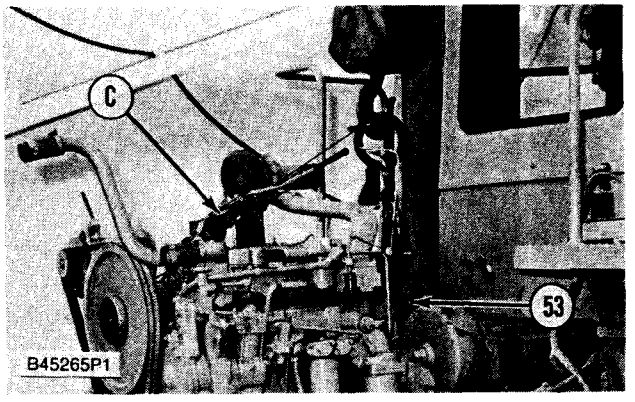


43. Disconnect air line (50) from the transmission.

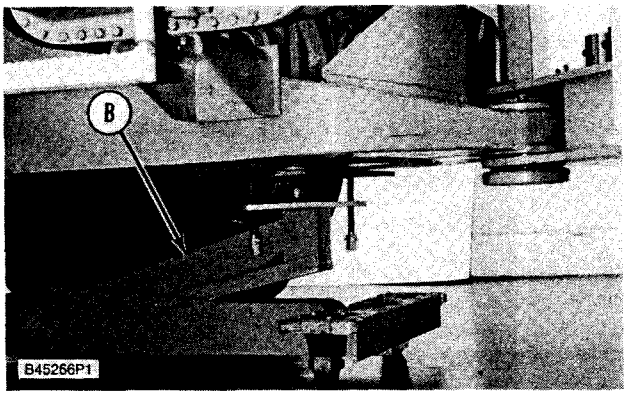
44. Remove bolt (48) and disconnect fuel line bracket (49) from the side of the transmission.



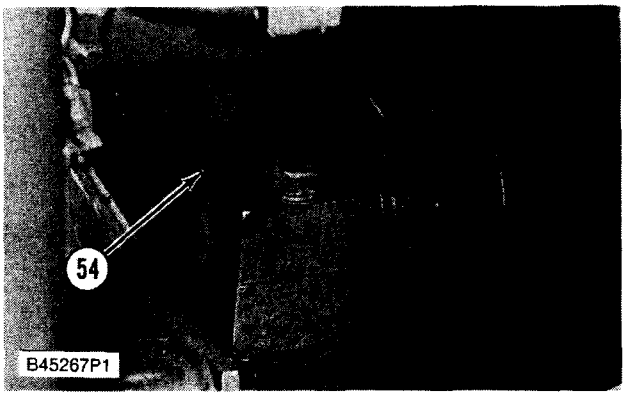
45. Remove the bolts and disconnect oil filler tube (52) and dipstick tube (51) from the transfer case.



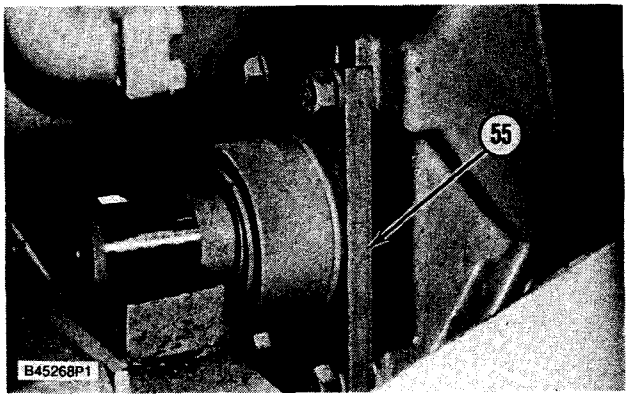
46. Install a 3/4" -10 NC eyebolt (53) to the transmission, tool (C) to the lifting bracket and a hoist to the engine and transmission as shown.



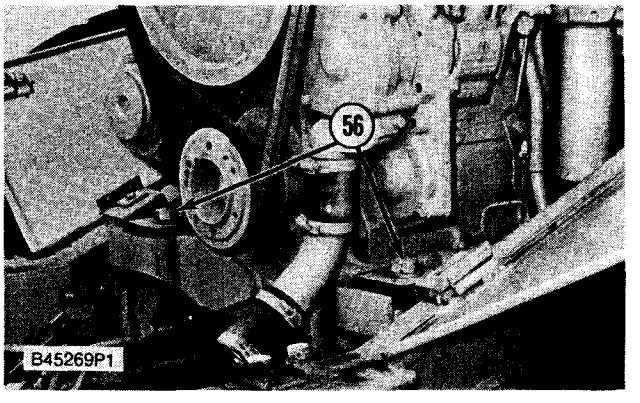
47. Put tool (B) in position under the transmission as shown when the support brackets are removed.



48. Remove the bolts and remove caps (54) from each side of the transmission.



49. Remove the bolts and remove support brackets (55) from each side of the transmission.

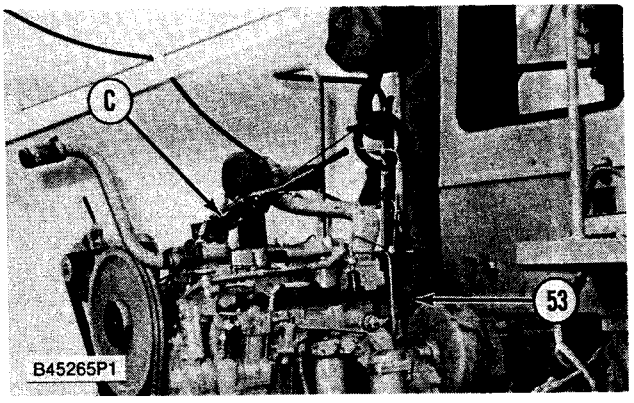


50. Remove bolts (56), the nuts and the washers from the front engine mounts.

51. Lift up slightly on the engine and transmission and remove them as a unit. The weight of the engine and transmission is approximately 1693 kg (3750 lb.).

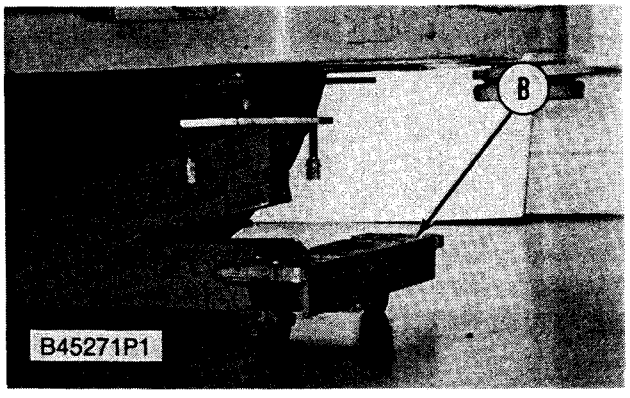
Install Engine And Transmission (Earlier) 1000 & 3000-012

Tools Needed		A	B	C
8S9906	Ratchet Puller			1
	OTC 1790 Transmission Jack		1	
6V2156	Link Bracket	2		

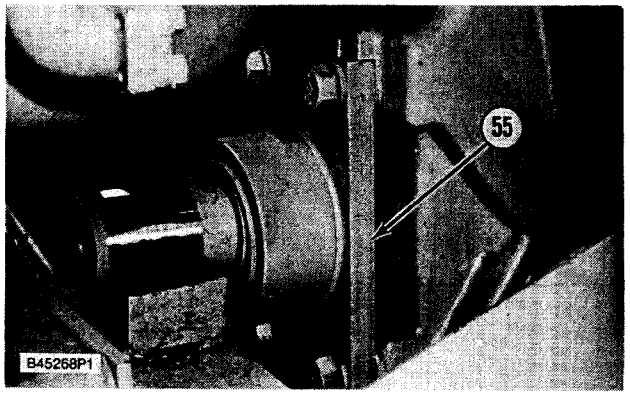


1. Install a 3/4" -10 NC eyebolt (53) on the transmission and fasten tool (C) to the front of the engine with a hoist as shown.

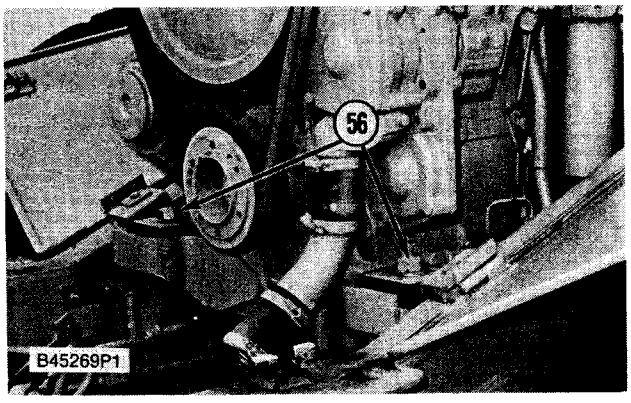
2. Put the engine and transmission in position on the machine.



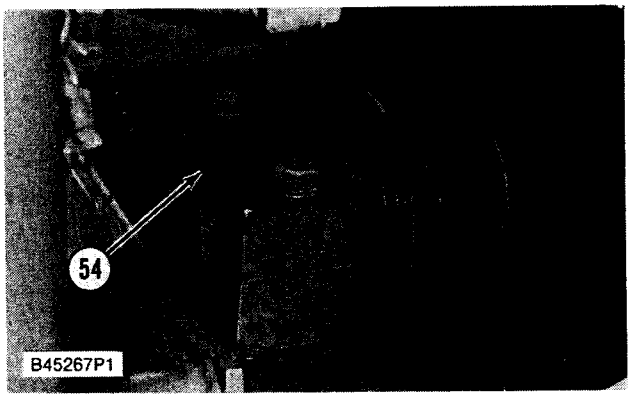
3. Put tool (B) in position under the transmission when the transmission support bracket is installed.



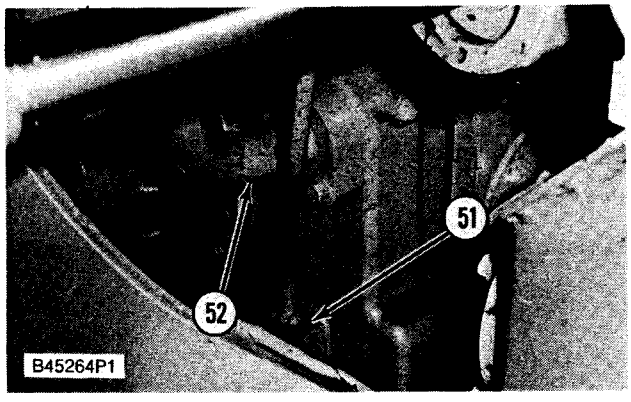
4. Install support brackets (55) to both sides of the transmission.



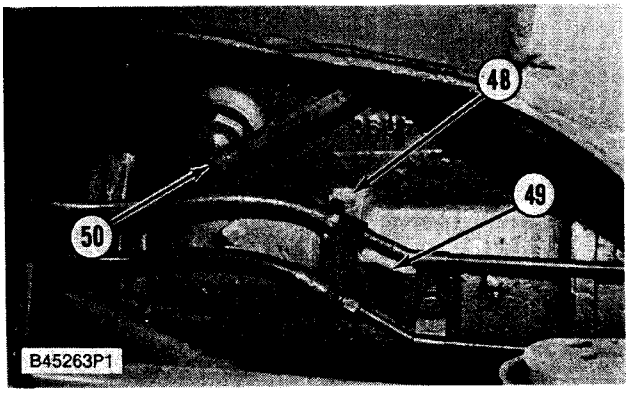
5. Install bolts (56), the nuts and washers to both sides of the engine.



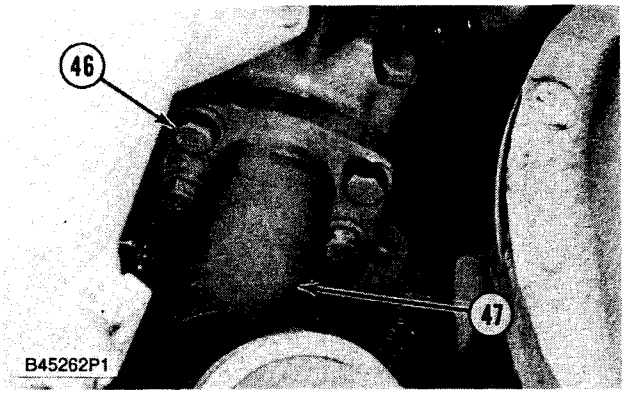
6. Install caps (54) that hold the transmission support brackets to both sides of the transmission.



7. Make sure the seal is in place on filler (52) and the gasket is in place on dipstick tube (51) and connect them to the transfer gear case.

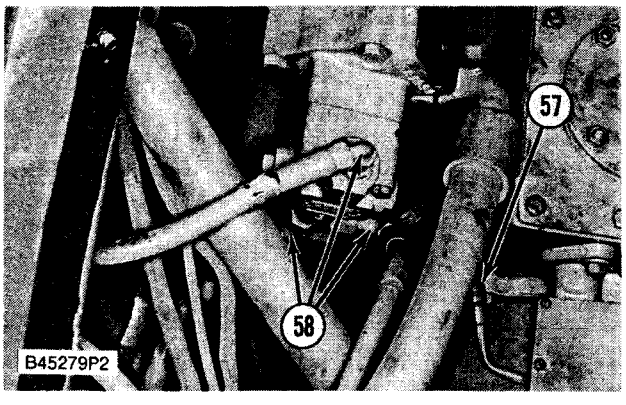


8. Connect air line (50) and fuel line bracket (49) to the side of the transmission housing with bolts (48).



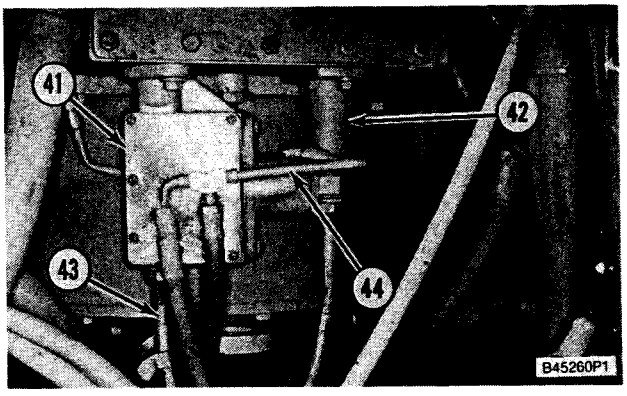
9. Install tube assembly (47) with bolts (46) on the hose and tighten the clamp.

10. Make sure O-ring seal is in place and connect tube assembly (47) to the bottom of the hydraulic pump.



11. Connect wire harness (57).

12. Connect hose assemblies (58) to the hydraulic pilot pump.



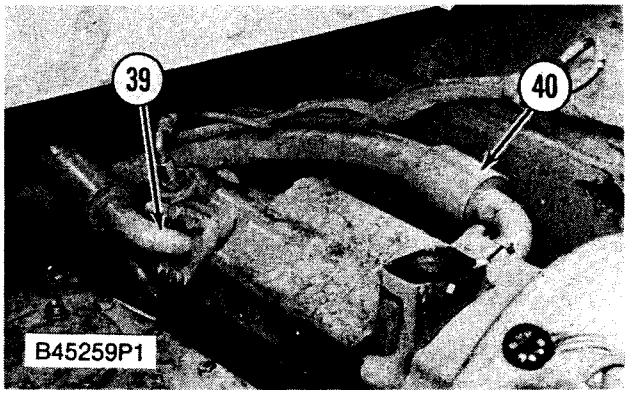
13. Connect cable assembly (43) to the cam in the transmission neutralizer. See Install Transmission Neutralizer in the Vehicle Systems Disassembly And Assembly Section.

14. Put the gasket and cover (41) in place.

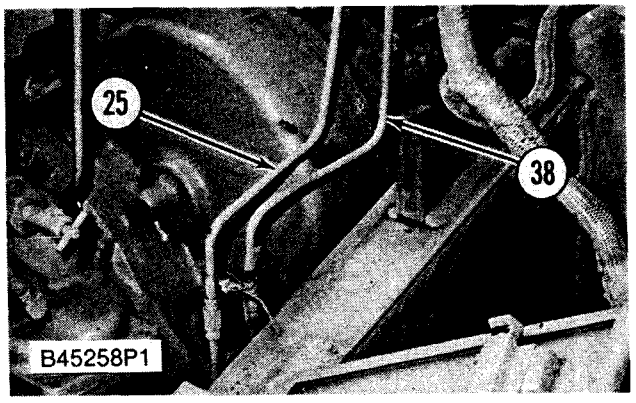
15. Make an adjustment to the transmission neutralizer control group. See Power Shift Transmission, Testing And Adjusting.

16. Install the notch on the opening (slot) in the transmission hydraulic control valve. Connect transmission selector control (42) to the transmission hydraulic control valve.

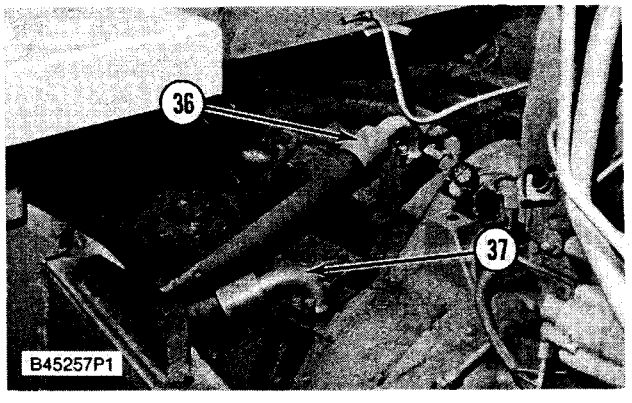
17. Connect tube assembly (44) to the transmission neutralizer.



18. Connect hose assemblies (39) and (40) to the hydraulic pump.

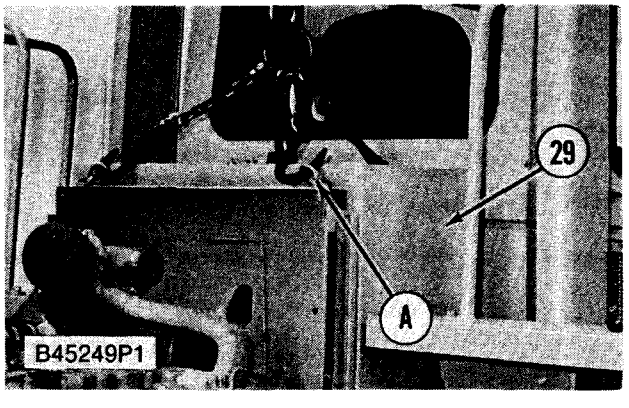


19. Install brake lines (25) and (38) on the machine.

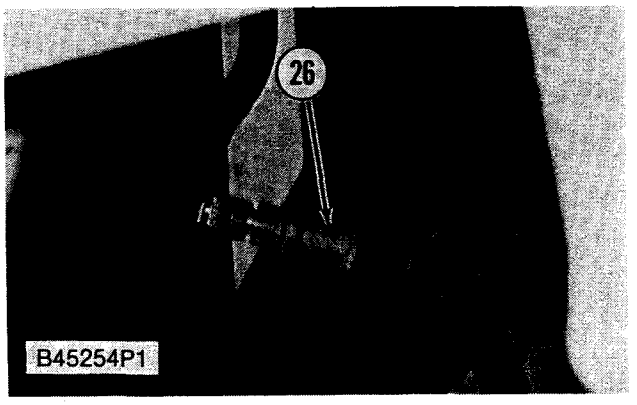


20. Connect hose (36) to the transmission oil pump.

21. Connect hose (37) to the transmission.

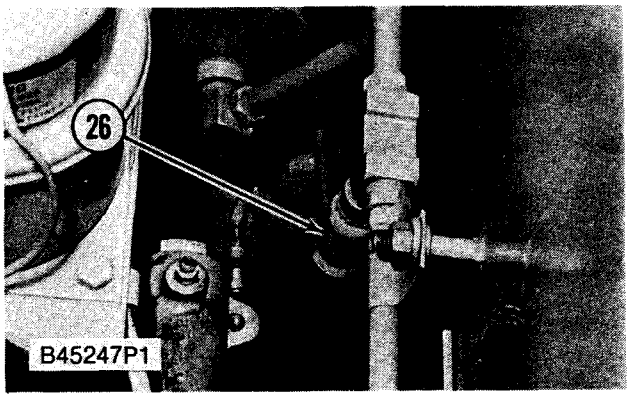


22. Fasten tooling (A) and a hoist to firewall (29) and install it on the machine.

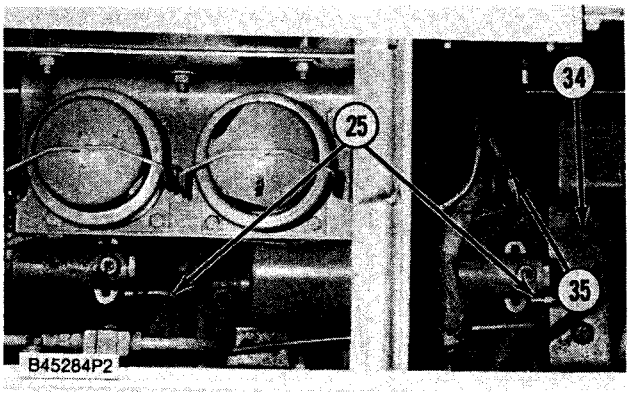


23. Lift the firewall a small amount and install air hose (26) in the back as shown.

24. Lower the firewall on the machine.



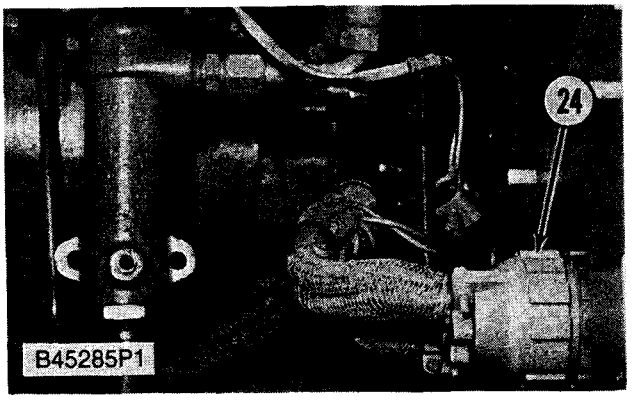
25. Connect air line (26) to the tee fitting.



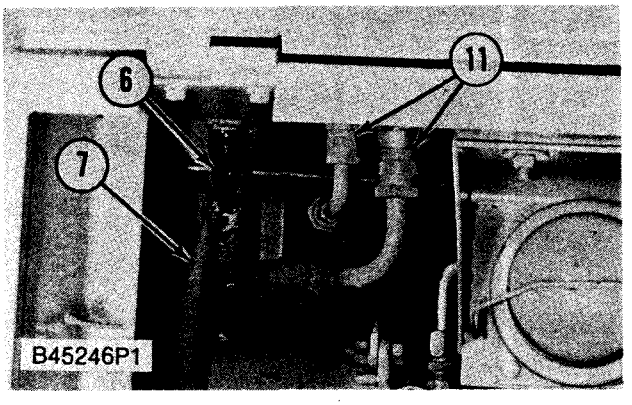
26. Install two bolts (34) to both sides of the firewall to hold it in place.

27. Connect brake lines (25) to the air/hydraulic cylinders.

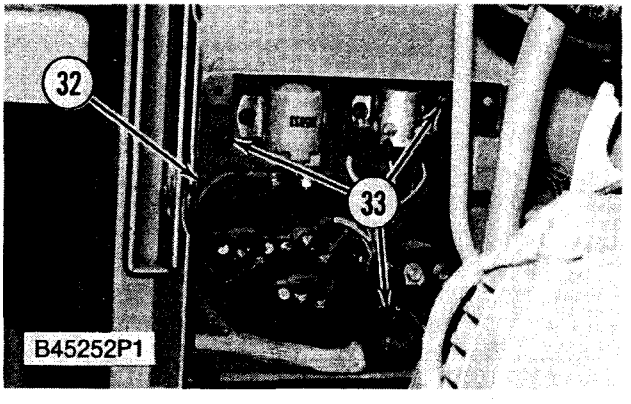
28. Connect wire harness (35) (right side only).



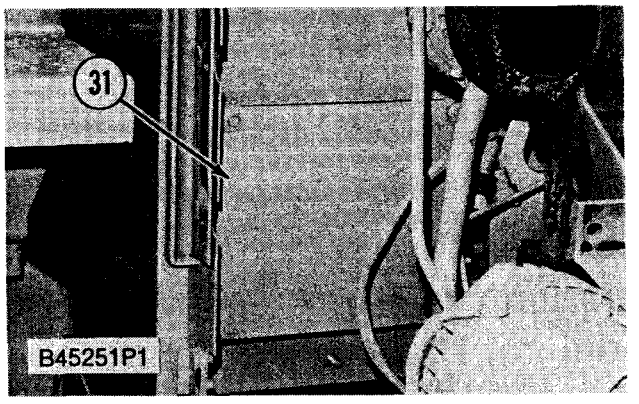
29. Connect wire harness (24) to the back of the cab.



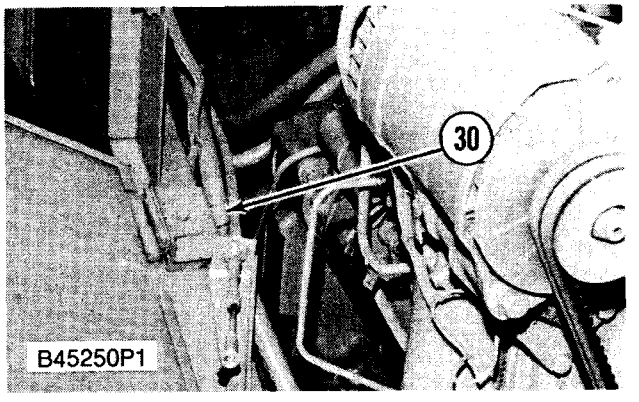
30. Connect heater hoses (6) and (7) and air conditioning lines (11) to the back of the cab.



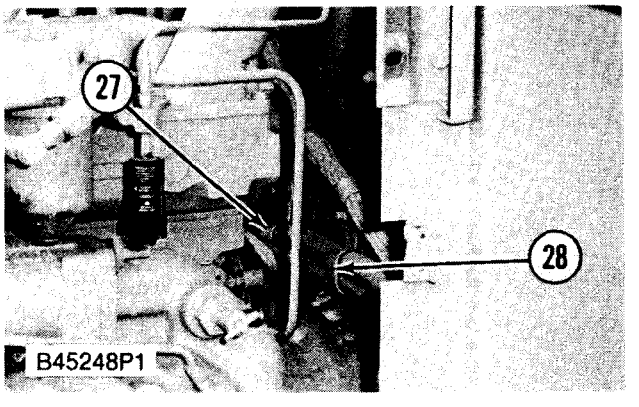
31. Connect electrical box (32) to the back of the firewall with nuts (33) that hold it.



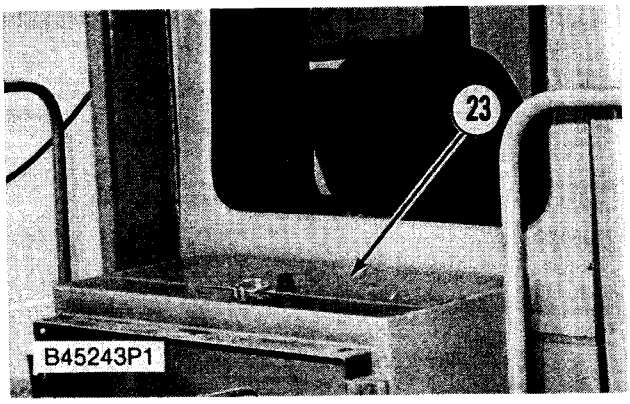
32. Install cover (31) to the electrical box.



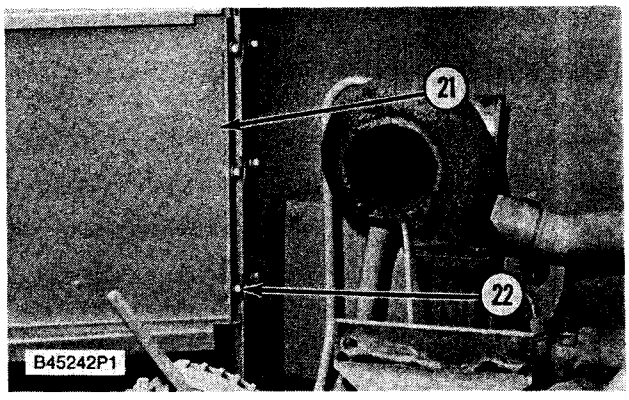
33. Connect hose and wire harness to the side of the frame with clips (30).



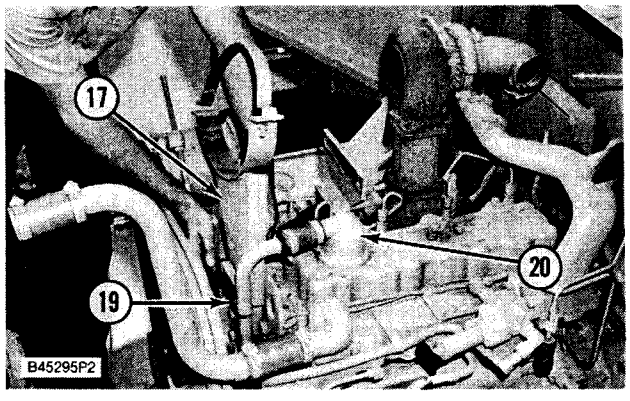
34. Connect clips (27) and (28) that hold the heater hoses to the firewall.



35. Close access door (23) in the back of the cab.



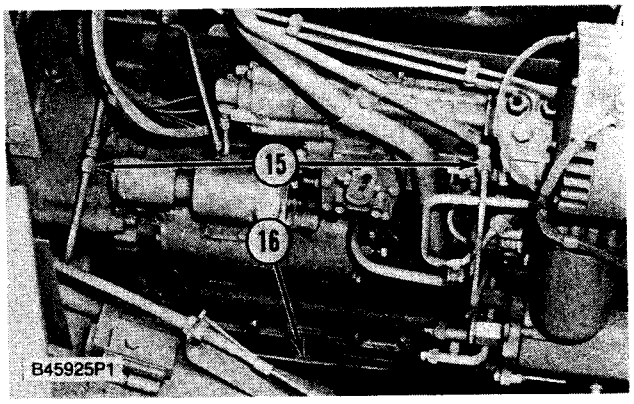
36. Install access door (21) to both sides of the machine with nuts (22).



37. Install muffler brackets (17) on the engine.

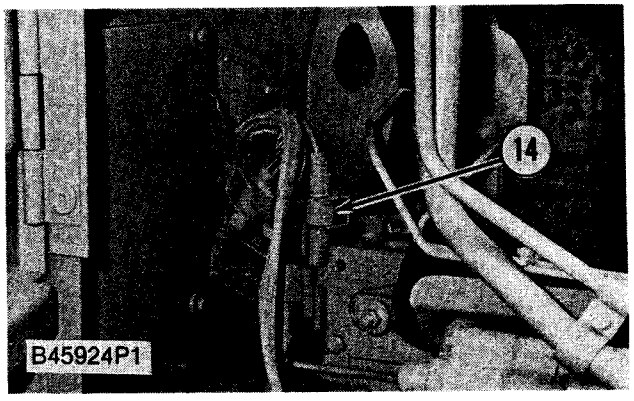
38. Install breather assembly (20) on the valve cover and tighten the bolt to a torque of 14 ± 3 N•m (10 ± 2 lb.ft.).

39. Connect clip (19) to the engine that holds the breather tube in place.

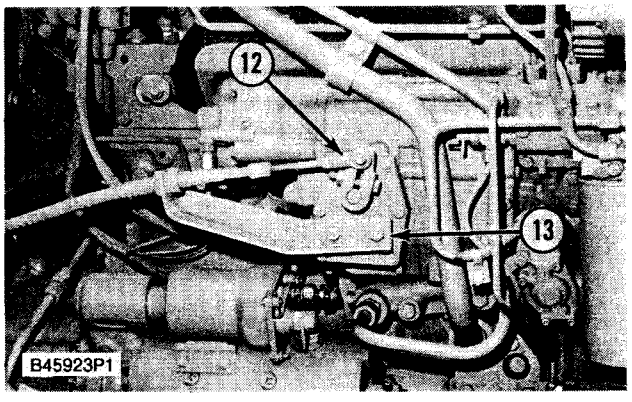


40. Connect fuel lines (15) at the rear of the engine.

41. Connect clip (16) that holds the fuel line at the oil pan.

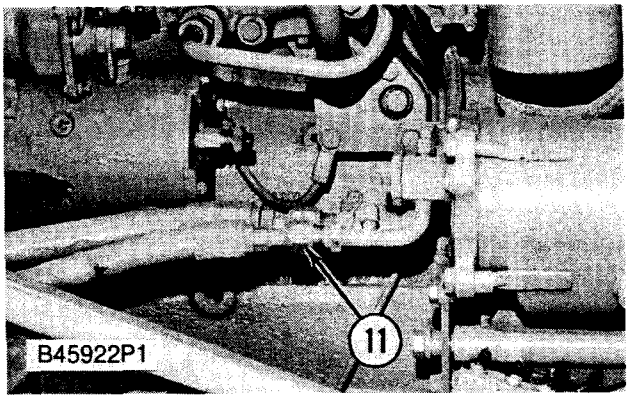


42. Connect wire harnesses (14) at the rear of the engine.



43. Connect bracket (13) to the governor housing.

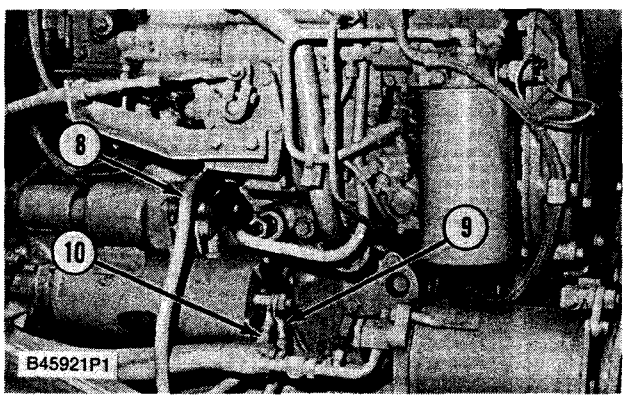
44. Connect governor control linkage (12) to the lever on the governor.



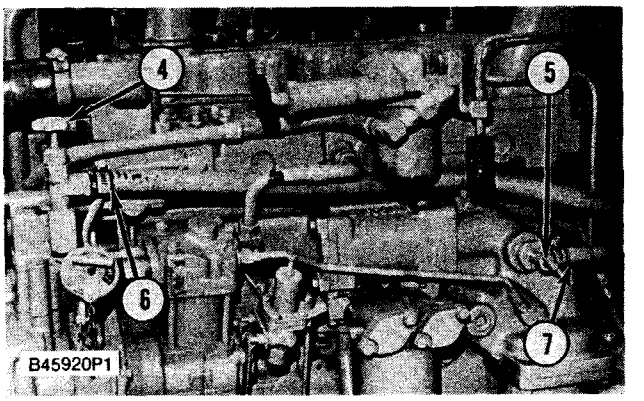
45. Connect air conditioning lines (11) to the air conditioning compressor.

⚠ WARNING

Always wear goggles when the air conditioning system is opened. This system is charged with Freon-12 (CCL2F2-Dichlorodifluoromethane) which is not toxic or flammable. But, there is a reason for caution. When Freon-12 makes contact with a flame, lethal phosgene gas is made. INHALING FREON THROUGH A LIGHTED CIGARETTE CAN CAUSE VIOLENT ILLNESS. This system is under pressure at all times, engine running or not. HEAT MUST NEVER BE PUT ON A CHARGED SYSTEM. See AIR CONDITIONING AND HEATING SERVICE MANUAL, Form No. SENR3334, for more information on procedures and safety requirements on removal and installation of lines and refrigerant from the system.

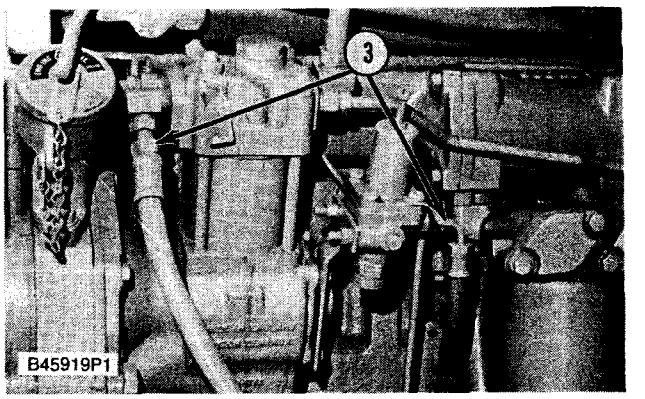


46. Connect wires (8) to the solenoid and wires (9) and (10) to the starter.

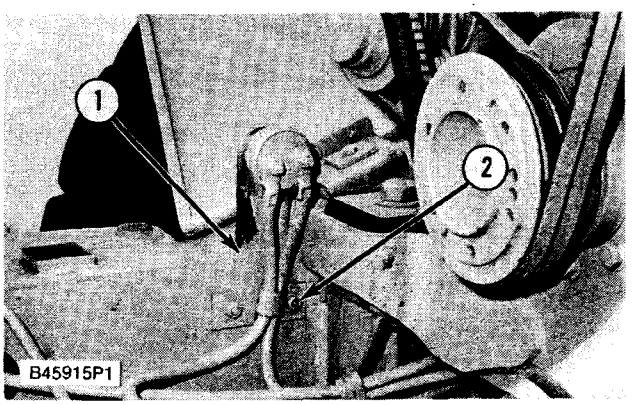


47. Connect heater hoses (6) and (7) to valves (4) and (5).

48. Turn valves (4) and (5) to the "OPEN" position.



49. Connect air lines (3) to the engine as shown.



50. Connect engine disconnect switch (1) to the frame with nuts (2).

51. Install radiator and guard. (This operation is in the Engine Disassembly And Assembly Section).

52. Install air cleaner housing. (This operation is in the Engine Disassembly And Assembly Section).

53. Install the muffler.

54. Install the hood.

End By:

a. install center drive shaft

b. install rear drive shaft

Engine And Transmission (Later)

Remove Engine And Transmission (Later) 1000 & 3000-011

	Tools Needed	A	B	C
6V2157	Link Bracket	2		
	OTC 1790 Transmission Jack		1	
9S9101	Sling Assembly			1

1. Remove the hood. The weight of the hood is approximately 52 kg (115 lb.).

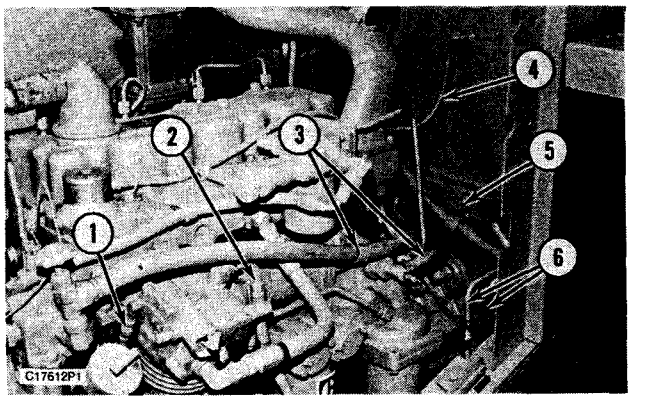
2. Remove the muffler.

3. Remove air cleaner housing (this operation is in the Engine Disassembly And Assembly Manual).

4. Remove radiator and guard (this operation is in the Engine Disassembly And Assembly Manual).

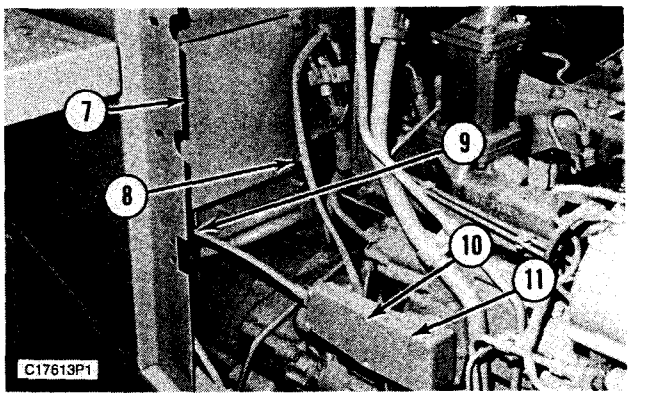
5. Remove rear drive shaft. See the topic, Remove Rear Drive Shaft.

6. Remove center drive shaft. See the topic, Remove Center Drive Shaft.



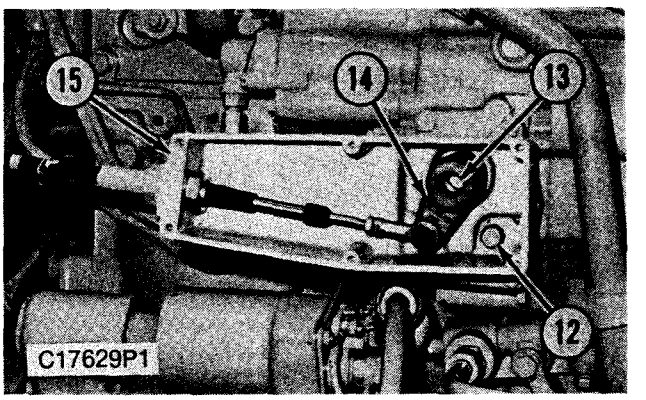
7. Remove air lines (1) and (2). Remove clamps and heater hoses (3).

8. Remove ether line (4). Remove clamp and bolt (5). Remove two brake lines (6).

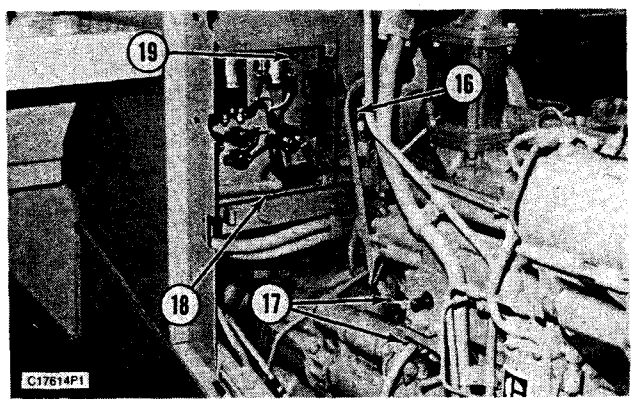


9. Remove bolts (8), and remove electrical cover (7).

10. Detach line (9) from the firewall. Remove bolts (10), and remove cover (11) from the side of the governor.

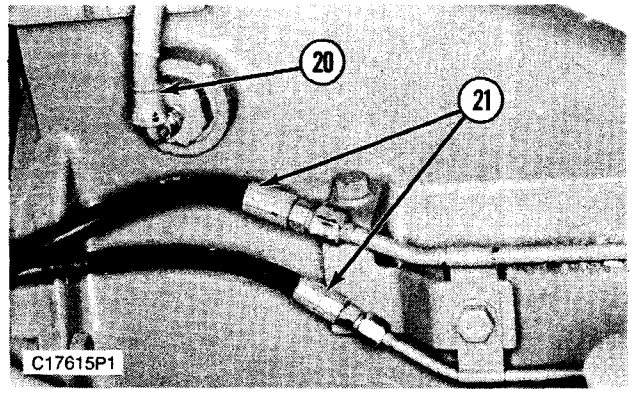


11. Make an identification of the position of lever (14) and shaft (13). Remove two bolts (12), and remove lever (14) with housing (15).

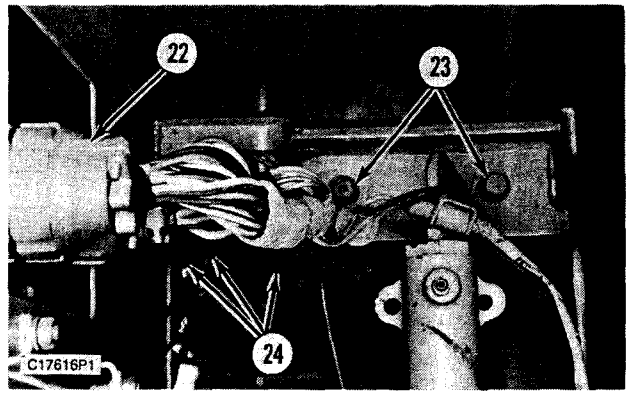


12. Disconnect wiring harness (16). Label and disconnect wires (17) from the electric starter.

13. Remove nuts and washers (19), and remove electrical box (18) from the firewall.

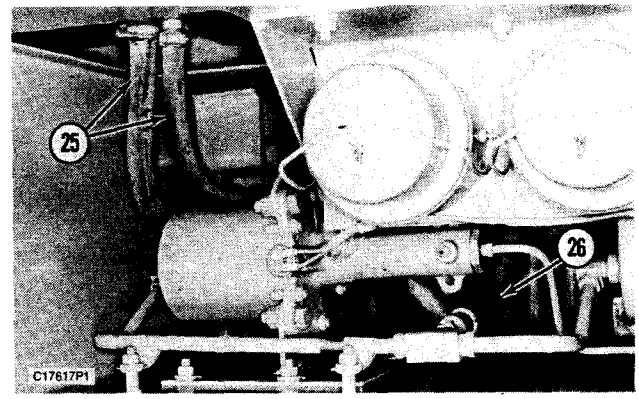


14. Remove line (20) from the transmission case. Disconnect fuel lines (21).

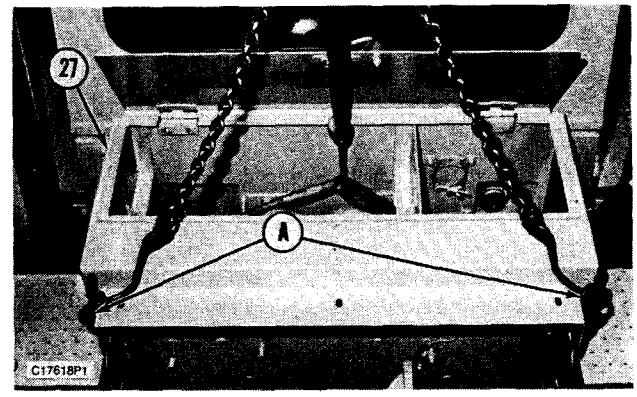


15. Disconnect wire harness (22) from the cab. Disconnect three electrical wires (24).

16. Remove two bolts (23) from each side of the firewall.

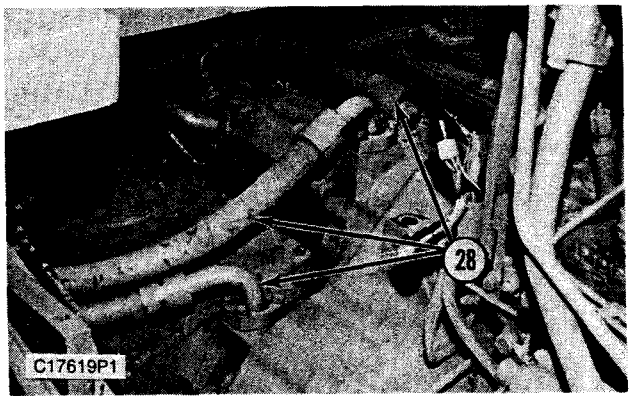


17. Disconnect two heater hoses (25). Remove air line (26) and push it through the hole in the firewall. Remove the rear light wiring harness from the vehicle frame (not shown).

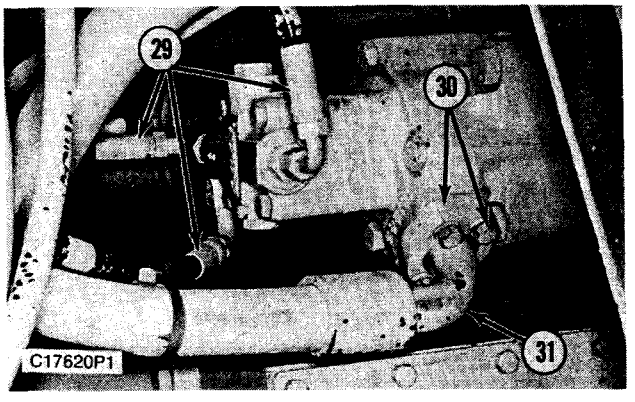


18. Install tooling (A) on firewall (27). Attach a nylon strap and hoist to the front of the firewall. Attach the hoist to tooling (A).

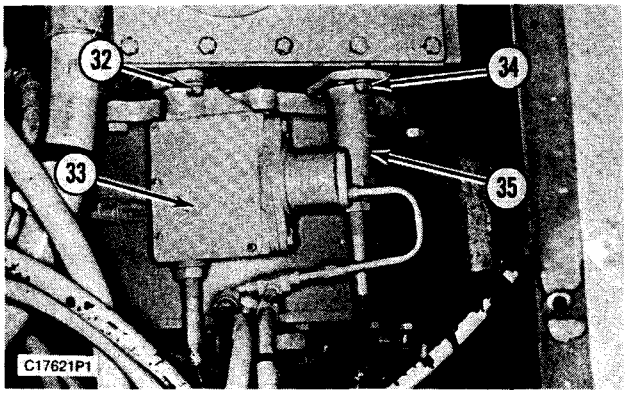
19. Remove firewall (27). The weight of the firewall is approximately 116 kg (255 lb.). Remove tooling (A) and the nylon strap from the firewall.



20. Remove three hoses (28).

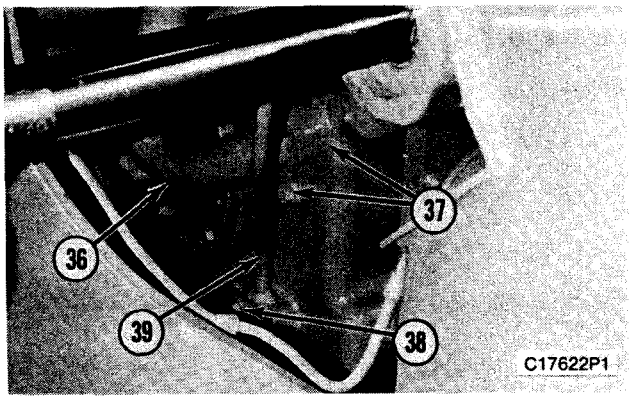


21. Remove three hoses (29) through the cab floor. Remove bolts and flanges (30). Remove hose (31) through the cab floor.



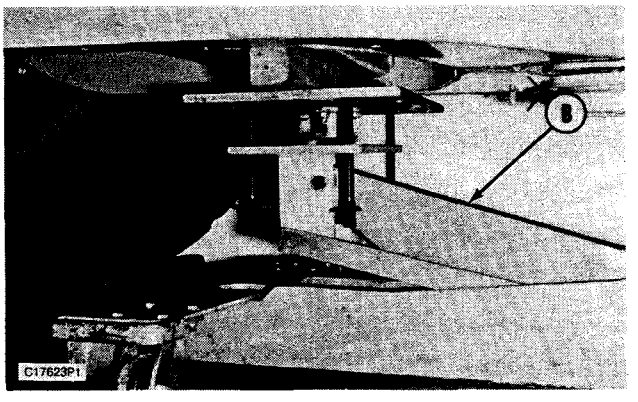
22. Remove bolts and washers (32), and remove transmission neutralizer (33).

23. Remove bolts and washers (34), and remove bracket assembly (35).

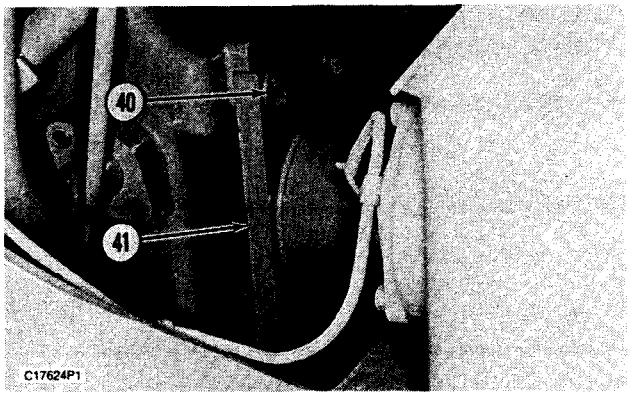


24. Remove bolts and flange (37), and remove tube (36).

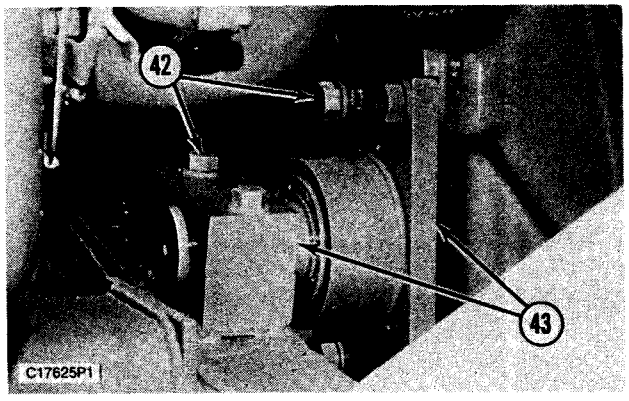
25. Remove bolts (38), and remove tube (39).



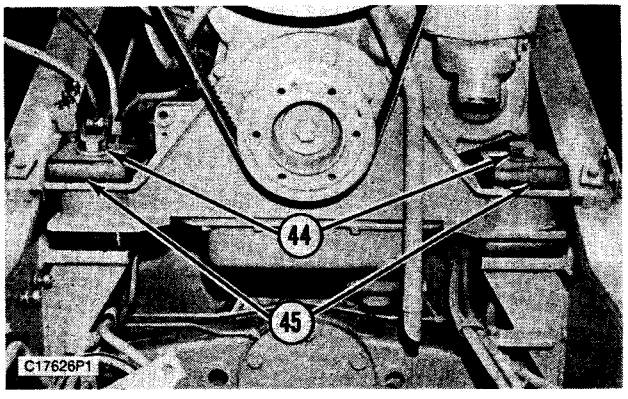
26. Position tool (B) with correct blocking under the transmission.



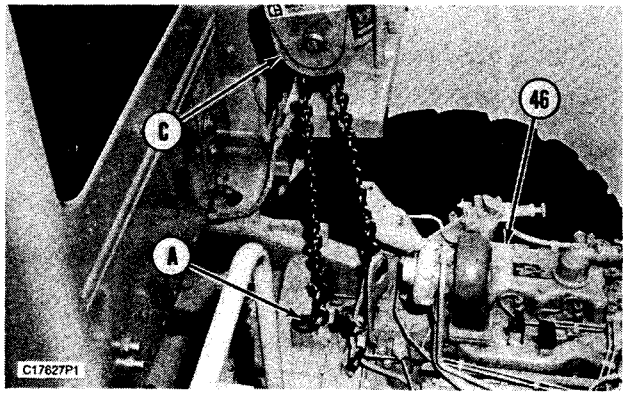
27. Remove six bolts (40), and remove support assembly (41) from the right side of the transfer case.



28. Remove six bolts (42), and remove support assembly (43) from the left side of the transfer case.



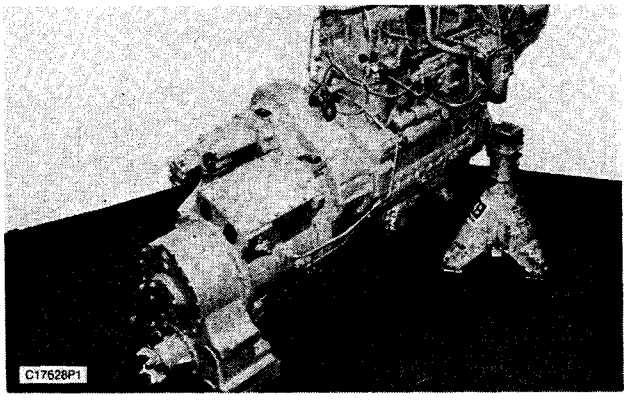
29. Remove two bolts and washers (44). Remove two mount assemblies (45).



30. Install one 6V2157 Link Bracket of tooling (A) as shown. Fasten tool (C) to a hoist.

31. Attach tool (C) to tooling (A) and the lift bracket on the engine as shown.

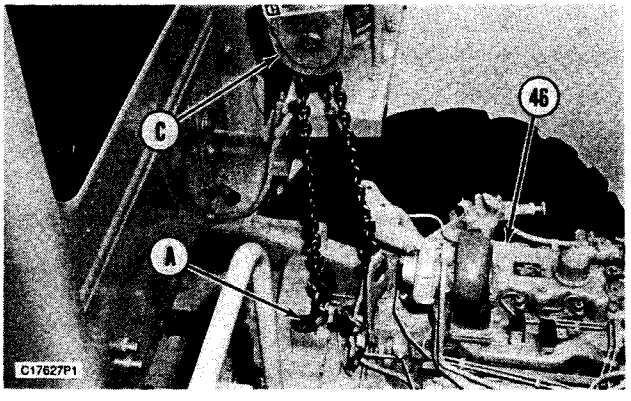
32. Remove engine and transmission (46). The weight of the engine and transmission is approximately 1708 kg (3780 lb.).



33. Position and lower the engine and transmission on adequate blocking.

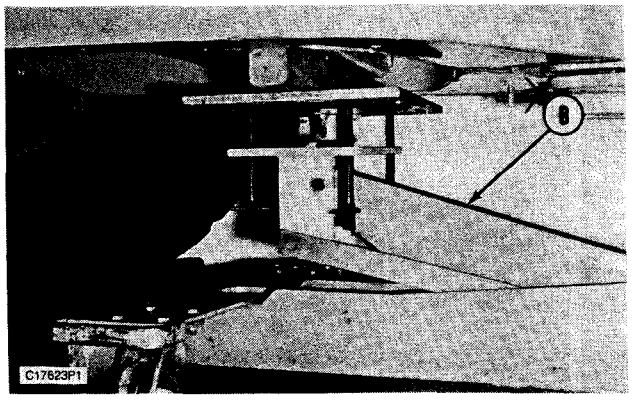
Install Engine And Transmission (Later) 1000 & 3000-012

	Tools Needed	A	B	C
6V2157	Link Bracket	2		
	OTC 1790 Transmission Jack		1	
9S9101	Sling Assembly			1

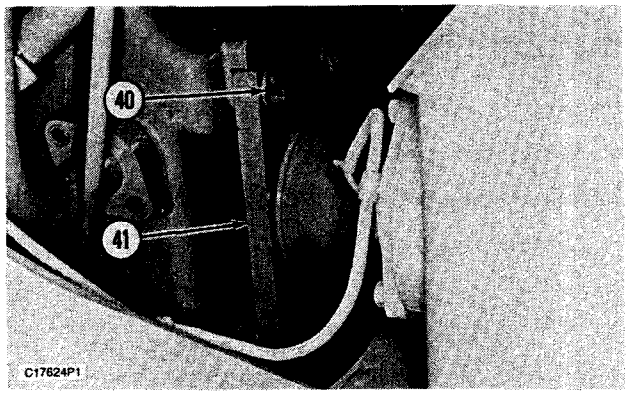


1. Install one 6V2157 Link Bracket of tooling (A) to the transfer case. Fasten tool (C) to a hoist.

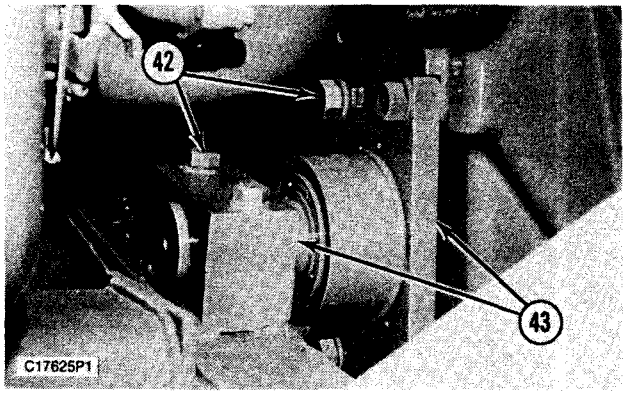
2. Attach tool (C) to tooling (A) and the lift bracket on the engine. Position engine and transmission (46) in the wheel loader frame.



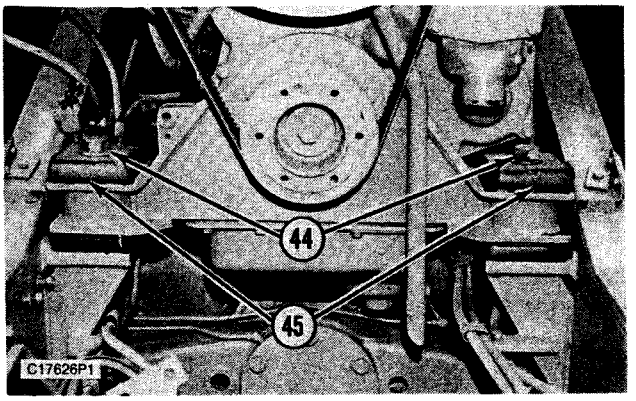
3. Position tool (B) with correct blocking under the transmission to install the support assemblies.



4. Position support assembly (41), and install six bolts (40) on the right side of the transfer case.

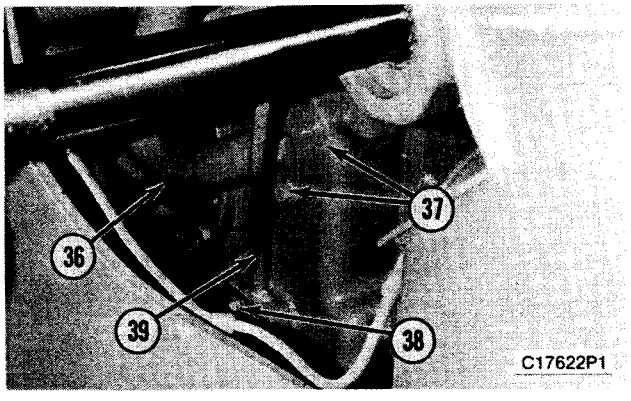


5. Position support assembly (43), and install six bolts (42) on the left side of the transfer case.



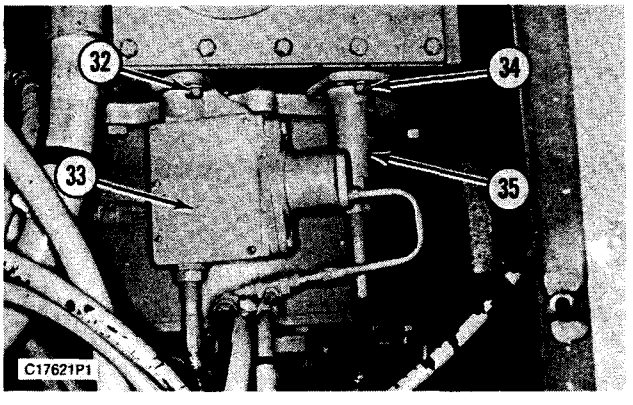
6. Position two front mount assemblies (45), and install bolts and washers (44).

7. Remove tool (B), tool (C) and tooling (A) from the wheel loader.



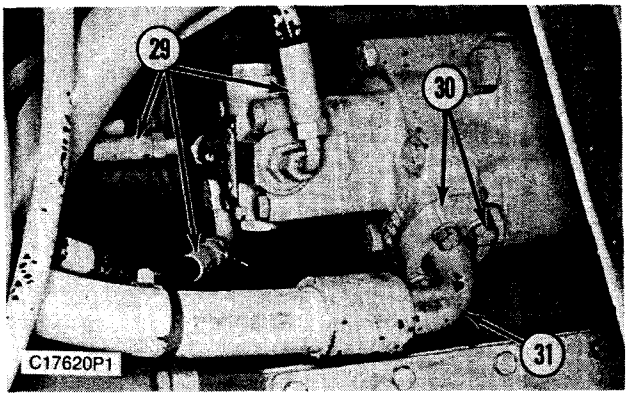
8. Position tube (39), and install bolts (38).

9. Position tube (36), and install flange and bolts (37).

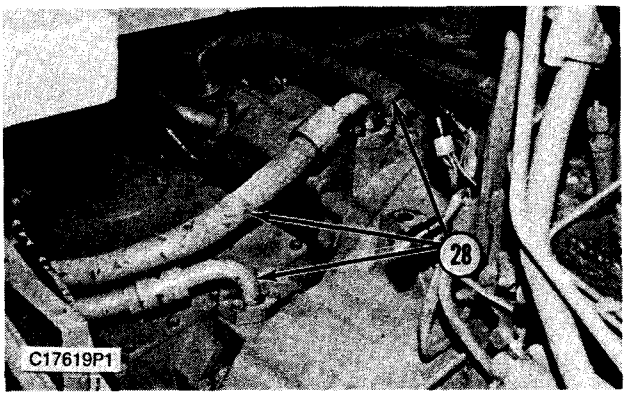


10. Position bracket assembly (35). Make sure the spool fork from the transmission hydraulic control valves is engaged with the cable assembly pin in bracket assembly (35). Install bolts (34).

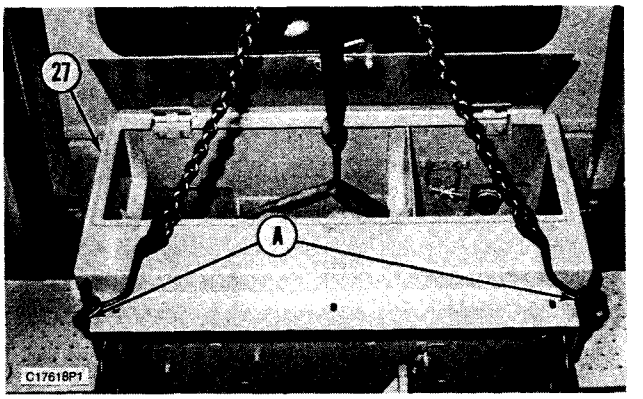
11. Position neutralizer (33). Make sure the spool fork from the transmission hydraulic control valves is engaged with the cable assembly pin in the transmission neutralizer (33). Install bolts (32).



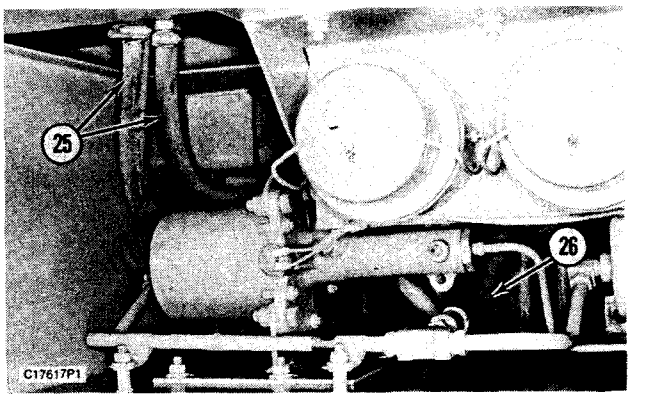
12. Pull hose (31) through the cab floor, and install it with flanges and bolts (30). Pull three hoses (29) through the cab floor, and install the three hoses as shown.



13. Position and install three hoses (28) as shown.

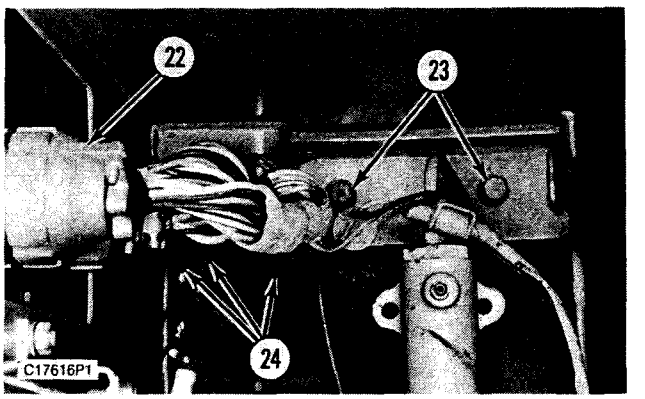


14. Install tooling (A) to the firewall and a nylon strap to the front of firewall (27). Attach a hoist to tooling (A) and the nylon strap, and position the firewall as shown.



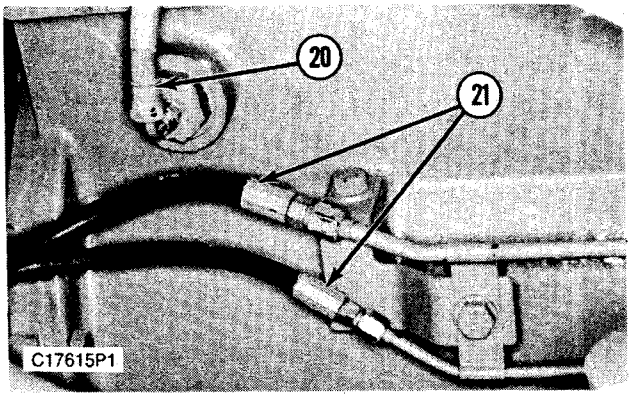
15. Install the rear light wiring harness to the vehicle frame (not shown).

16. Pull air line (26) through the hole in the firewall and install it. Connect two heater hoses (25).

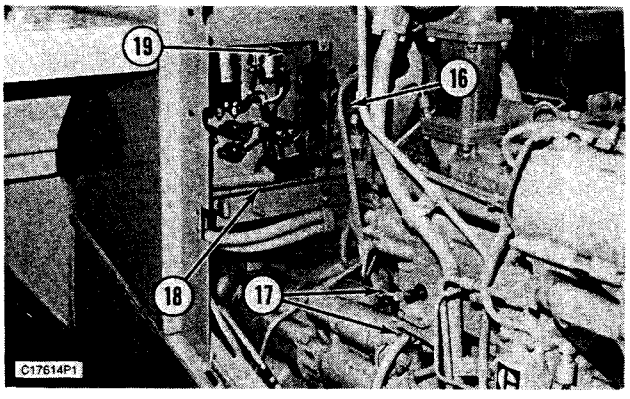


17. Install two bolts (23) on each side of the firewall.

18. Connect three electrical wires (24). Connect wire harness (22) to the cab. Remove tooling (A) and the nylon strap from the firewall.

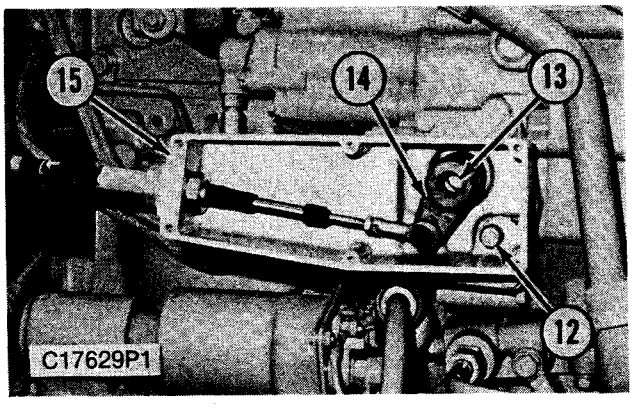


19. Connect fuel lines (21). Install line (20) to the transmission case.

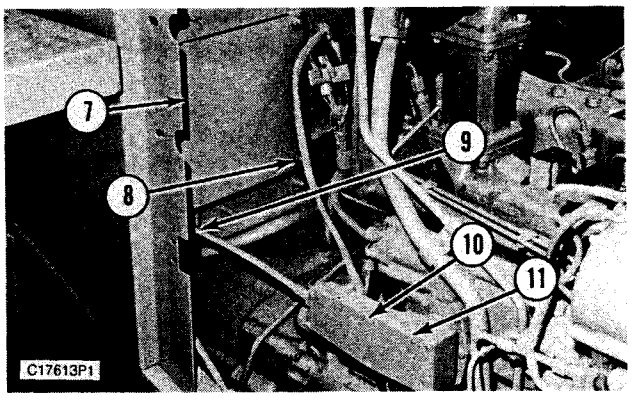


20. Position electrical box (18) on the firewall, and install nuts and washers (19).

21. Connect wires (17) to the electric starter, according to the labels. Connect wiring harness (16).

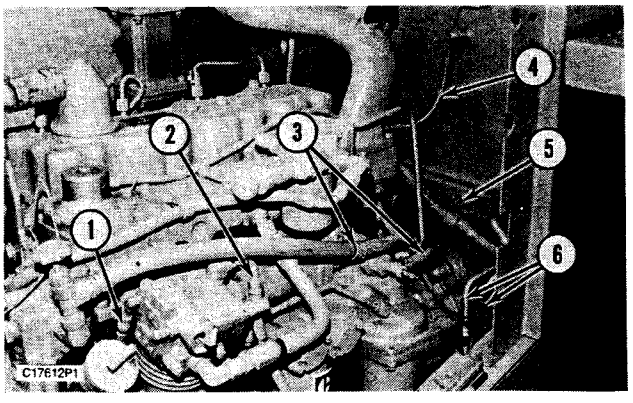


22. Install lever (14) on shaft (13) with housing (15). Install two bolts (12) that hold the housing.



23. Position cover (11), and install bolts (10). Attach line (9) to the firewall.

24. Position electrical cover (7), and install bolts (8).



25. Install two brake lines (6). Install clamp and bolt (5). Install ether line (4).

26. Install clamps and heater hoses (3). Install air lines (1) and (2).

27. Install center drive shaft. See the topic, Install Center Drive Shaft.

28. Install rear drive shaft. See the topic, Install Rear Drive Shaft.

29. Install radiator and guard (this operation is in the Engine Disassembly And Assembly Manual).

30. Install air cleaner housing (this operation is in the Engine Disassembly And Assembly Manual).

31. Install the muffler.

32. Install the hood.

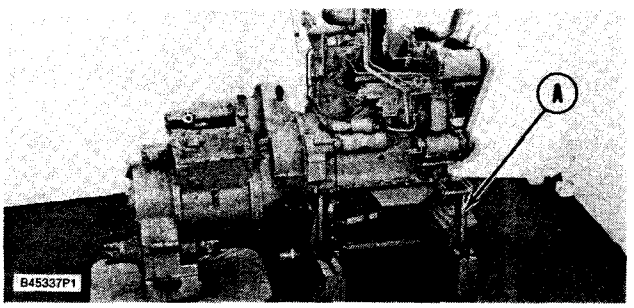
Separation Of Torque Converter And Transmission From Engine

Separation And Connection Of Torque Converter And Transmission From Engine 3101 & 1000-029

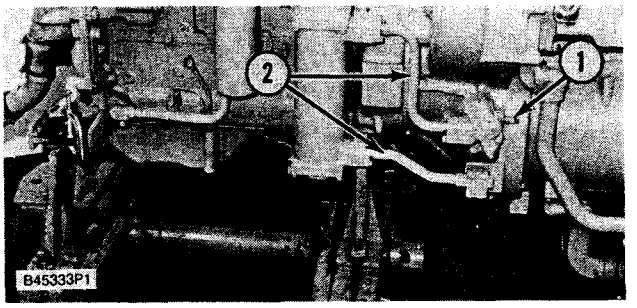
Tools Needed		A	B
9S8500	Engine Stand	1	
6V3145	Load Leveler		1

Start By:

a. remove engine, torque converter, transmission and transfer gears.

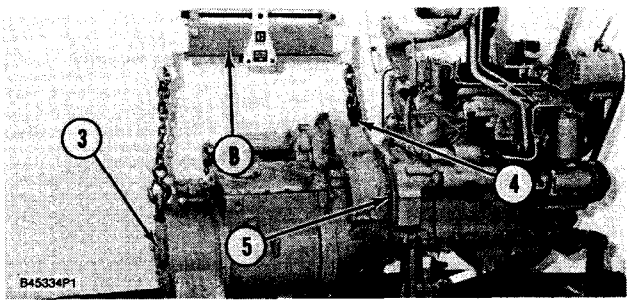


1. Put the engine, torque converter and transmission in position on tool (A) as shown.



2. Disconnect the wire from sending unit (1).

3. Remove tube assemblies (2) that connect the transmission oil cooler to the torque converter and the transfer gear case.



4. Install 3/4" -10 NC eyebolt (4) in the housing as shown.

5. Put tool (B) in position on transmission and torque converter.

6. Remove bolts (5) and make a separation of transmission and torque converter (3) from the engine. The weight of the transmission and torque converter is approximately 743 kg (1650 lb.).

NOTE: The following steps are for the connection of the torque converter and transmission to the engine.

7. Install a 3/4" -10 eyebolt (4) and put tool (B) in position on transmission and torque converter housing (3).

8. Install the O-ring seal on the transmission case.

9. Make an alignment of the flywheel and the torque connection of transmission and torque converter (3) to the engine. Install the bolts.

10. Connect the wire to sending unit (1).

11. Make sure the O-ring seals are in position on tube assemblies (2).

12. Install tube assemblies (2).