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DIFFERENTIAL & DRIVELINE

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DIFFERENTIAL & DRIVELINE - ELECTRICAL DIAGNOSTICS

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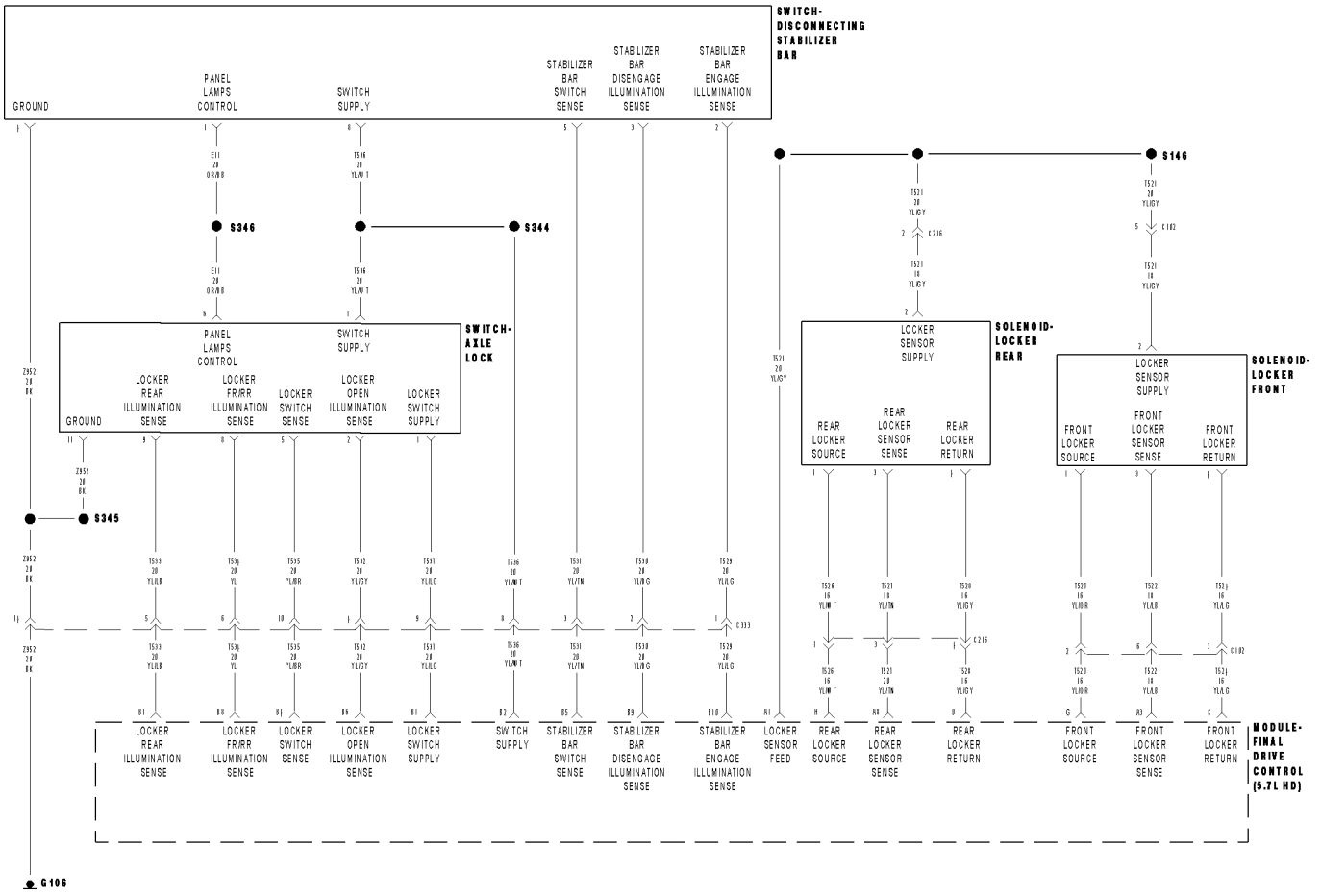
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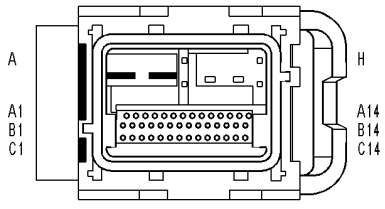
DIFFERENTIAL & DRIVELINE - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

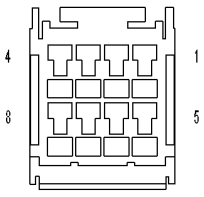
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C143A - DIFFERENTIAL/LOCKER SELECT SWITCH PERFORMANCE

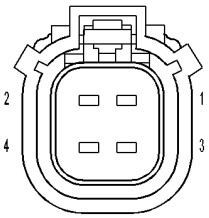




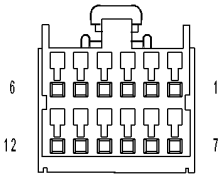
MODULE-FINAL DRIVE CONTROL (5.7L HD)



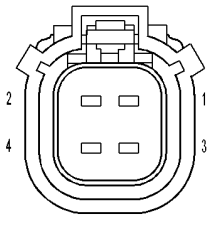
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C143A - DIFFERENTIAL/LOCKER SELECT SWITCH PERFORMANCE (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  During switch operation, the FDCM senses the Axle Locker Switch resistance is out of specification.

Possible Causes
SWITCH INTERMITTENT
ALXE LOCKER SWITCH
(T537) LOCKER SWITCH SUPPLY CIRCUIT
(T535) LOCKER SWITCH SENSE CIRCUIT OPEN/HIGH RESISTANCE
FDCM

1. DTC ACTIVE

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Turn the ignition on, engine not running

With the DRBIII®, read FDCM DTC(s).

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 5

---

2. AXLE LOCKER SWITCH OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Axle Locker Switch harness connector.

Remove the Axle Locker Switch.

Measure the resistance on the Axle Locker Switch between the Locker Switch Supply terminal and the Locker Switch Sense terminal.

The resistance must read as follows for each position of the switch.

- **UNLOCK: 5454 ohms +/- 5%**
- **RR: 1940 ohms +/- 5%**
- **FR/RR: 1075 ohms +/- 5%**

Does the ohmmeter read correctly for each position of the Axle Locker Switch

Yes >> Go To 3

No >> Replace the Axle Locker Switch.
Perform FDCM VERIFICATION TEST.

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C143A - DIFFERENTIAL/LOCKER SELECT SWITCH PERFORMANCE (CONTINUED)

3. (T535) LOCKER SWITCH SENSE CIRCUIT OPEN

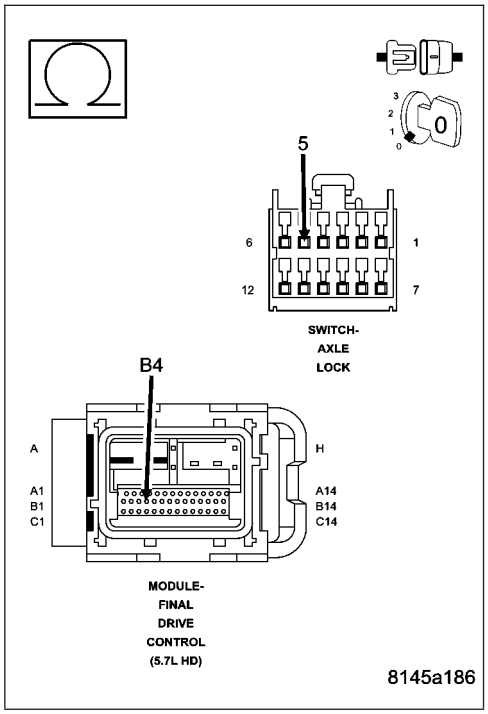
Disconnect the FDCM harness connector.

Measure the resistance of the (T535) Locker Switch Sense circuit between the Axle Locker Switch and the FDCM harness connector.

Is the resistance below 5.0 ohms?

Yes >> Go To 4

No >> Repair the open or high resistance in the (T535) Locker Switch Sense circuit.
Perform FDCM VERIFICATION TEST.



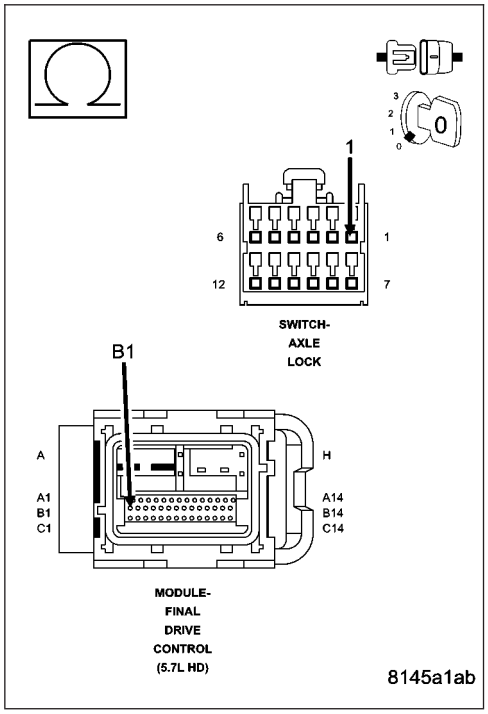
4. (537) LOCKER SWITCH SUPPLY CIRCUIT OPEN

Measure the resistance of the (T537) Locker Switch Supply circuit between the Axle Locker Switch and the FDCM harness connector.

Is the resistance below 5.0 ohms?

Yes >> Replace the FDCM in accordance with the Service Information
Perform FDCM VERIFICATION TEST.

No >> Repair the open or high resistance in the (T537) Locker Switch Supply circuit.
Perform FDCM VERIFICATION TEST.



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C143A - DIFFERENTIAL/LOCKER SELECT SWITCH PERFORMANCE (CONTINUED)

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

While monitoring the TRAC State on the DRBIII®, move the switch to each position. The DRBIII® display must match the position on the actual switch.

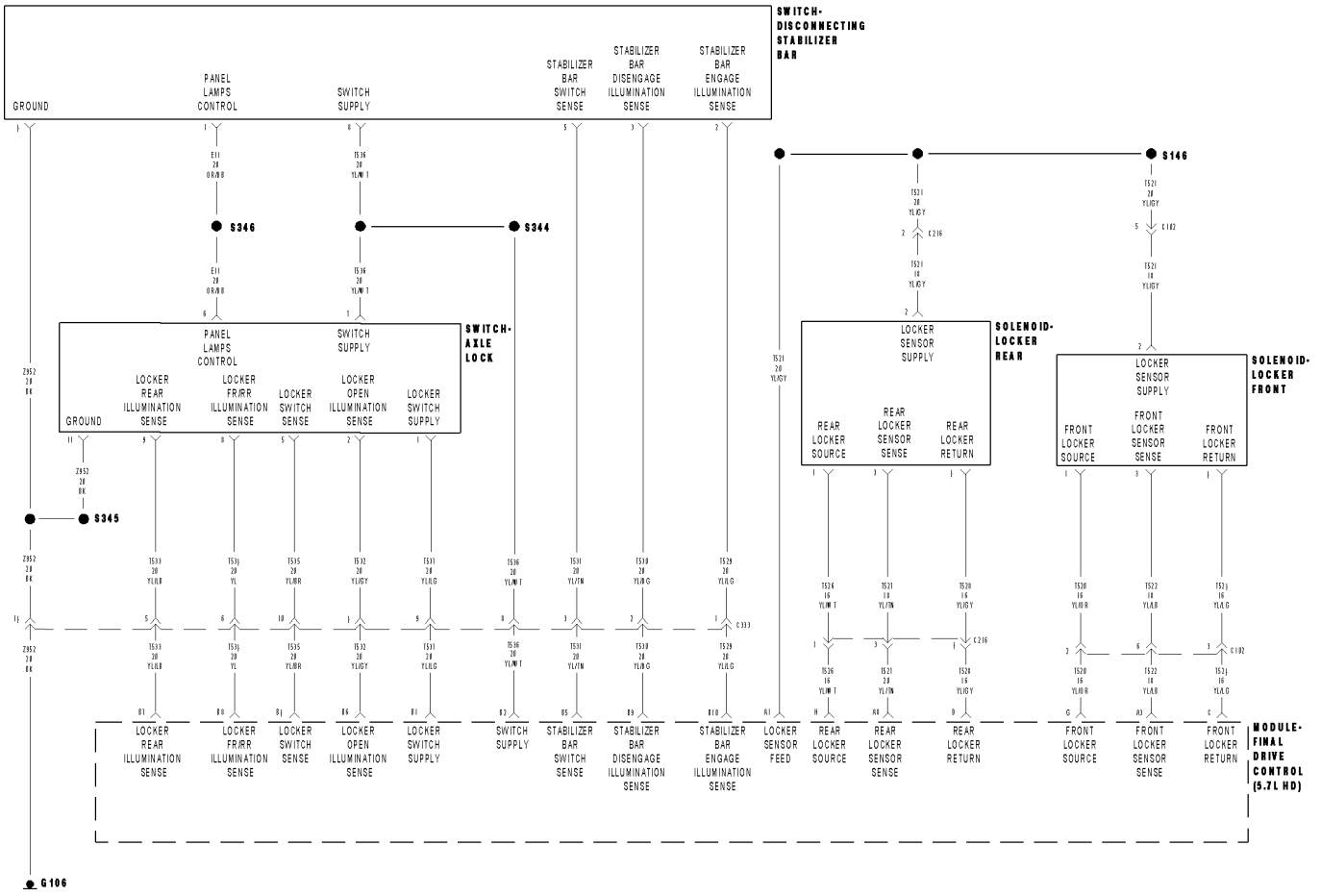
Were there any problems found?

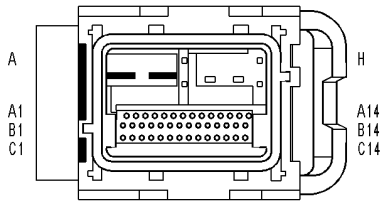
Yes >> Repair as necessary.
Perform TRANSFER CASE VERIFICATION TEST.

No >> Test Complete.

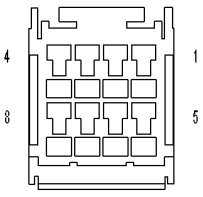
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C143B-DIFFERENTIAL/LOCKER SELECT SWITCH CIRCUIT LOW

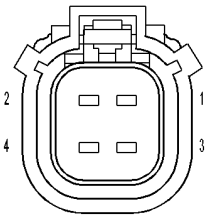




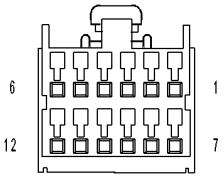
MODULE-FINAL DRIVE CONTROL (5.7L HD)



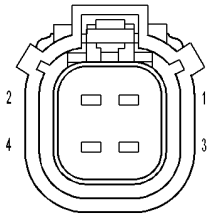
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C143B-DIFFERENTIAL/LOCKER SELECT SWITCH CIRCUIT LOW (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  During switch operation, the FDCM senses the Axle Locker Switch sense is below 0.25 volt.

Possible Causes
SWITCH INTERMITTENT
ALXE LOCKER SWITCH
(T537) LOCKER SWITCH SUPPLY CIRCUIT SHORTED TO GROUND
(T535) LOCKER SWITCH SENSE CIRCUIT SHORT TO GROUND
FDCM

1. DTC ACTIVE

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Turn the ignition on, engine not running

With the DRBIII®, read FDCM DTC(s).

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 5

---

2. AXLE LOCKER SWITCH OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Axle Locker Switch harness connector.

Remove the Axle Locker Switch.

Measure the resistance on the Axle Locker Switch between the Locker Switch Supply terminal and the Locker Switch Sense terminal.

The resistance must read as follows for each position of the switch.

- **UNLOCK: 5454 ohms +/- 5%**
- **RR: 1940 ohms +/- 5%**
- **FR/RR: 1075 ohms +/- 5%**

Does the ohmmeter read correctly for each position of the Axle Locker Switch

Yes >> Go To 3

No >> Replace the Axle Locker Switch.
Perform FDCM VERIFICATION TEST.

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C143B-DIFFERENTIAL/LOCKER SELECT SWITCH CIRCUIT LOW (CONTINUED)

3. (T535) LOCKER SWITCH SENSE CIRCUIT SHORTED TO GROUND

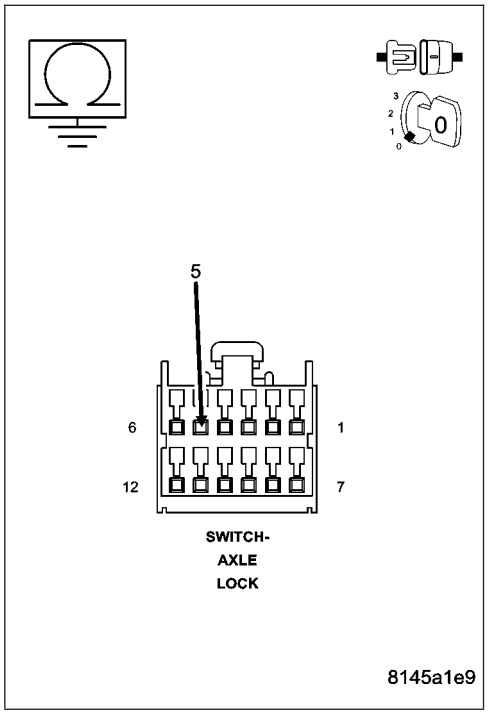
Disconnect the FDCM harness connector.

Measure the resistance of the (T535) Locker Switch Sense circuit in the Axle Locker Switch harness connector to ground.

Is the resistance below 100 ohms?

Yes >> Repair the short to ground in the (T535) Locker Switch Sense circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4



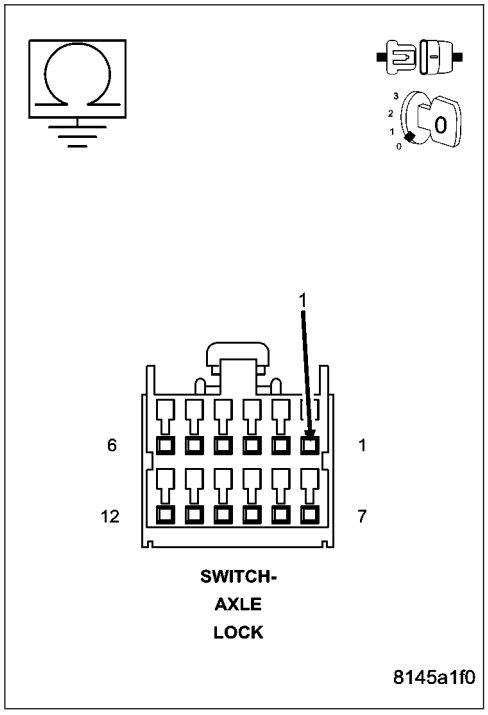
4. (T537) LOCKER SWITCH SUPPLY CIRCUIT SHORT TO GROUND

Measure the resistance of the (T537) Locker Switch Supply circuit in the Axle Locker Switch harness connector to ground.

Is the resistance below 100 ohms?

Yes >> Repair the short to ground in the (T537) Locker Switch Supply circuit.
Perform FDCM VERIFICATION TEST.

No >> Replace the FDCM in accordance with the Service Information
Perform FDCM VERIFICATION TEST.



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C143B-DIFFERENTIAL/LOCKER SELECT SWITCH CIRCUIT LOW (CONTINUED)

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

While monitoring the TRAC State on the DRBIII®, move the switch to each position. The DRBIII® display must match the position on the actual switch.

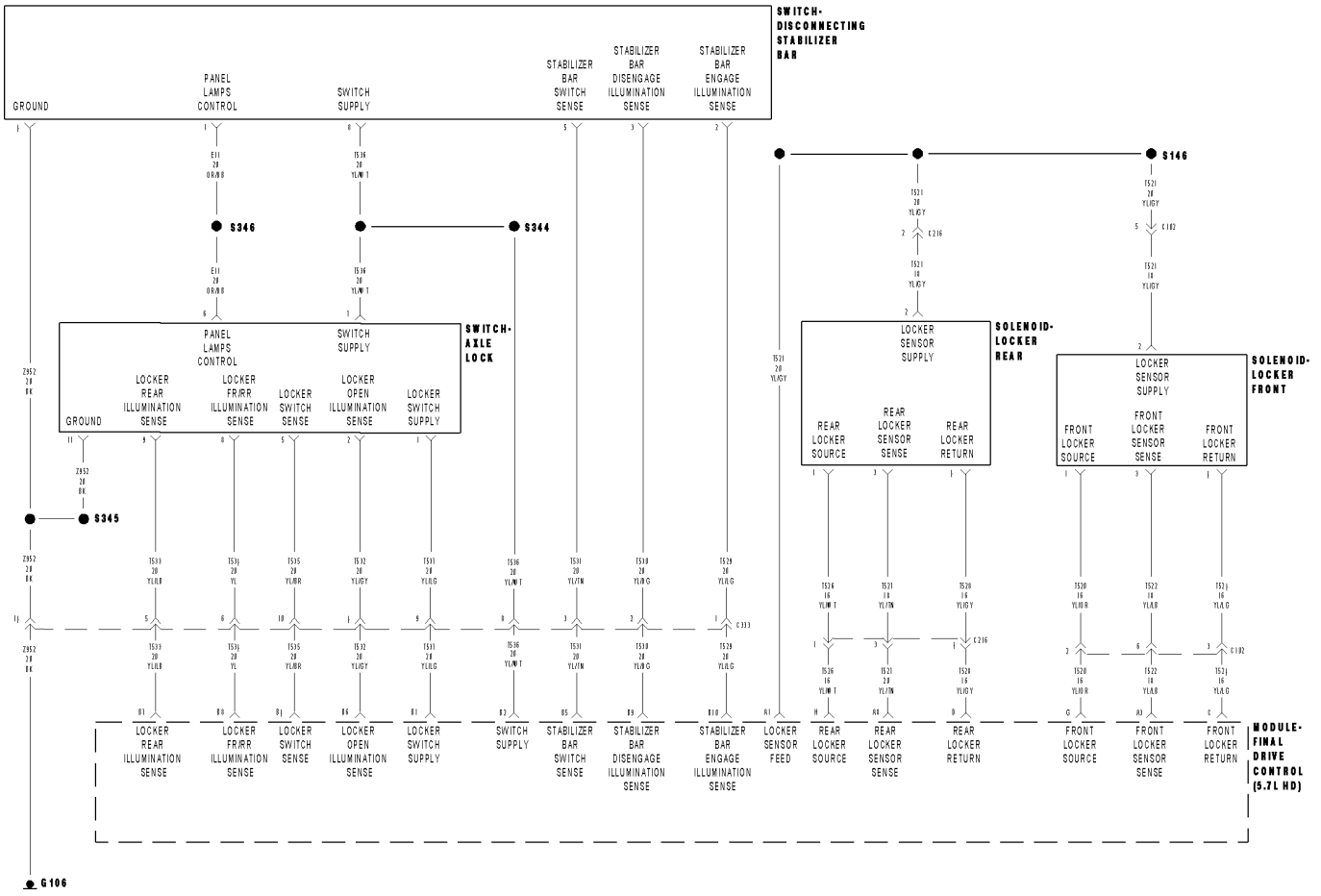
Were there any problems found?

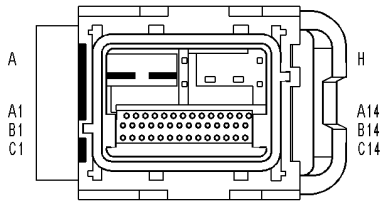
Yes >> Repair as necessary.
Perform TRANSFER CASE VERIFICATION TEST.

No >> Test Complete.

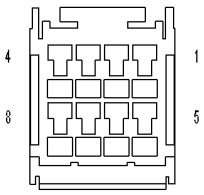
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C143C-DIFFERENTIAL/LOCKER SELECT SWITCH CIRCUIT HIGH

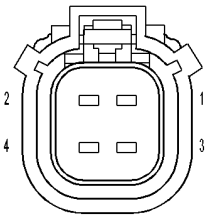




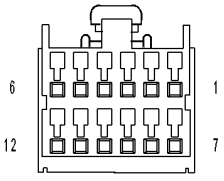
MODULE-FINAL DRIVE CONTROL (5.7L HD)



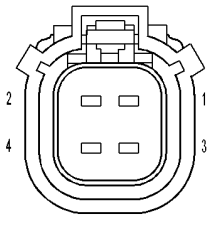
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C143C-DIFFERENTIAL/LOCKER SELECT SWITCH CIRCUIT HIGH (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  During switch operation, the FDCM senses the Axle Locker Switch Sense circuit is above 4.5 volts.

Possible Causes
SWITCH INTERMITTENT
ALXE LOCKER SWITCH
(T535) LOCKER SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
(T537) LOCKER SWITCH SUPPLY CIRCUIT SHORTED TO (T535) LOCKER SWITCH SENSE CIRCUIT
(T535) LOCKER SWITCH SENSE CIRCUIT OPEN
FDCM

1. DTC ACTIVE

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Turn the ignition on, engine not running

With the DRBIII®, read FDCM DTC(s).

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

---

2. AXLE LOCKER SWITCH OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Axle Locker Switch harness connector.

Remove the Axle Locker Switch.

Measure the resistance on the Axle Locker Switch between the Locker Switch Supply terminal and the Locker Switch Sense terminal.

The resistance must read as follows for each position of the switch.

- **UNLOCK: 5454 ohms +/- 5%**
- **RR: 1940 ohms +/- 5%**
- **FR/RR: 1075 ohms +/- 5%**

Does the ohmmeter read correctly for each position of the Axle Locker Switch

Yes >> Go To 5

No >> Replace the Axle Locker Switch.
Perform FDCM VERIFICATION TEST.

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C143C-DIFFERENTIAL/LOCKER SELECT SWITCH CIRCUIT HIGH (CONTINUED)

3. (T535) LOCKER SWITCH SENSE CIRCUIT SHORTED TO VOLTAGE

Disconnect the FDCM harness connector.

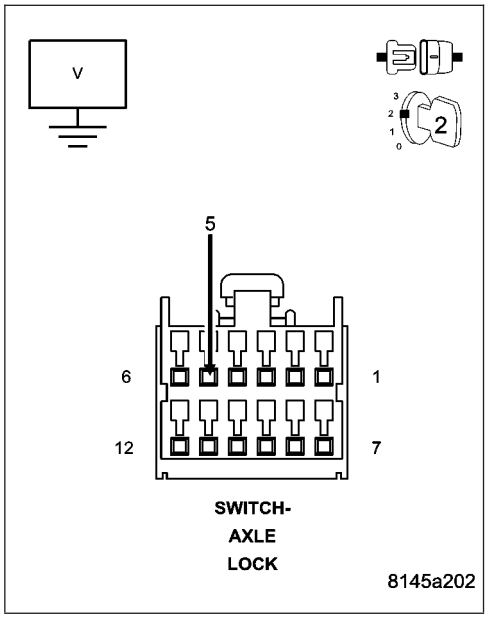
Turn the ignition on.

Measure the voltage of the (T535) Locker Switch Sense circuit in the Axle Locker Switch harness connector.

Does the voltmeter indicate voltage present?

Yes >> Repair the short to voltage in the (T535) Locker Switch Sense circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4



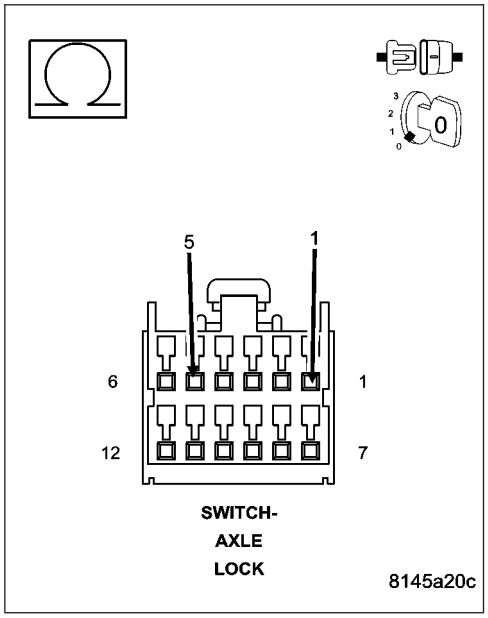
4. (T537) LOCKER SWITCH SUPPLY CIRCUIT SHORTED TO (T535) LOCKER SWITCH SENSE CIRCUIT

Measure the resistance between (T537) Locker Switch Supply circuit and the (T535) Locker Switch Sense circuit in the Axle Locker Switch harness connector.

Is the resistance below 5.0 ohms?

Yes >> Repair the short between (T537) Locker Switch Supply circuit and the (T535) Locker Switch Sense circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 5

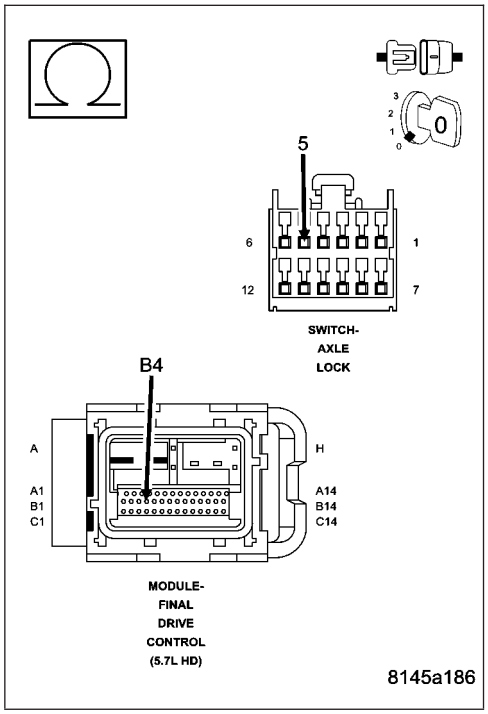


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C143C-DIFFERENTIAL/LOCKER SELECT SWITCH CIRCUIT HIGH (CONTINUED)

5. (T535) LOCKER SWITCH SENSE CIRCUIT OPEN

Measure the resistance of the (T535) Locker Switch Sense circuit between the Axle Locker Switch and the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Replace the FDCM in accordance with the Service Information.
Perform FDCM VERIFICATION TEST.

No >> Repair the open in the (T535) Locker Switch Sense circuit.
Perform FDCM VERIFICATION TEST.

---

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

While monitoring the TRAC State on the DRBIII®, move the switch to each position. The DRBIII® display must match the position on the actual switch.

Were there any problems found?

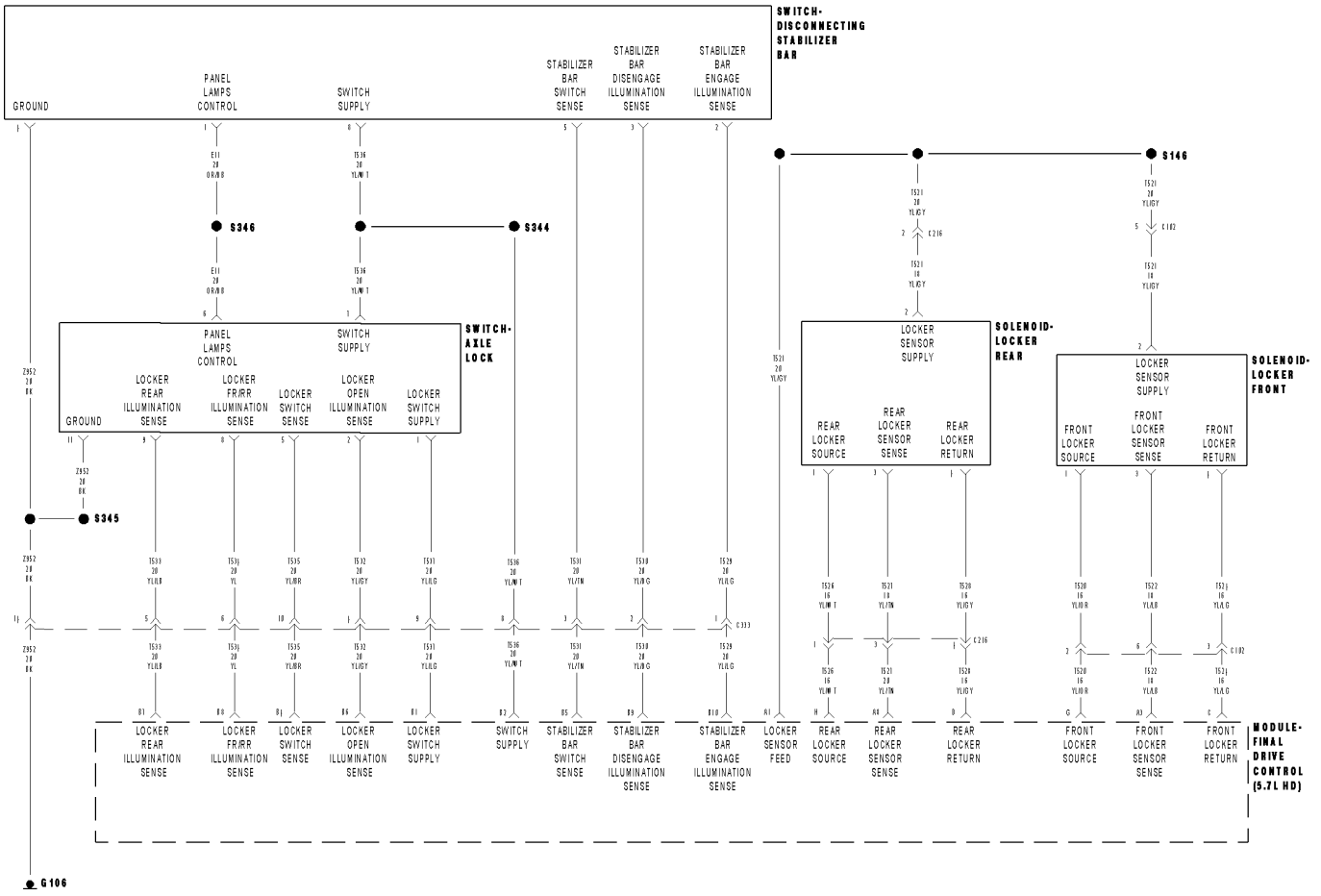
Yes >> Repair as necessary.
Perform TRANSFER CASE VERIFICATION TEST.

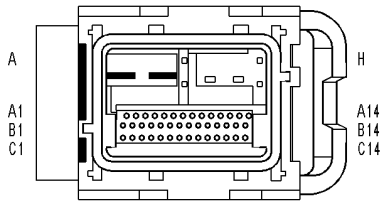
No >> Test Complete.

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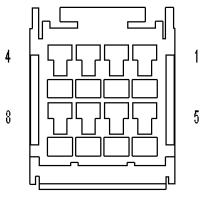
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C1418–FRONT DIFFERENTIAL CONTROL CIRCUIT HIGH

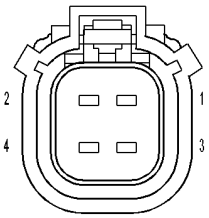




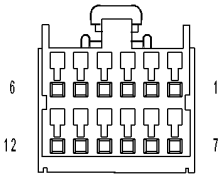
MODULE-FINAL DRIVE CONTROL (5.7L HD)



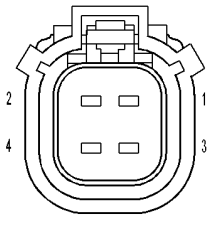
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C1418–FRONT DIFFERENTIAL CONTROL CIRCUIT HIGH (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects the Front Locker Source circuit is shorted high.

Possible Causes
FRONT LOCKER SOLENOID
(T520) FRONT LOCKER SOURCE CIRCUIT SHORTED TO BATTERY VOLTAGE
(T524) FRONT LOCKER RETURN CIRCUIT OPEN
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

---

2. FRONT LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Front Locker Solenoid harness connector.

Ignition on, engine not running.

Using a 12-volt test light, jump across from the (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit in the Front Locker harness connector.

With a DRBIII®, actuate the Front Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Front Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

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C1418–FRONT DIFFERENTIAL CONTROL CIRCUIT HIGH (CONTINUED)

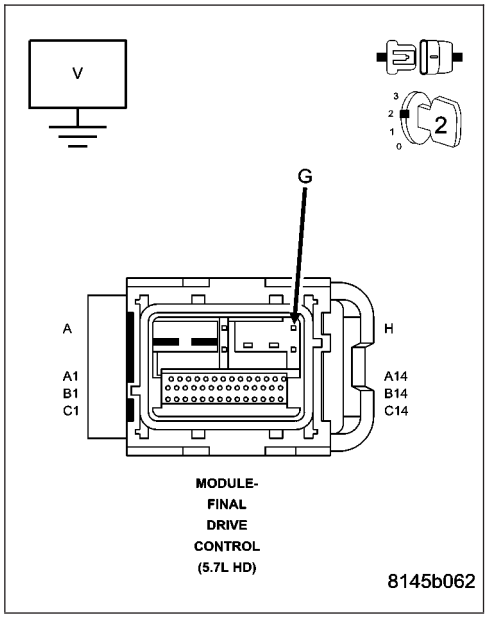
3. (T520) FRONT LOCKER SOURCE CIRCUIT SHORTED TO BATTERY VOLTAGE

Turn the ignition off.

Disconnect the FDCM harness connector.

Turn the ignition on.

Measure the voltage on the (T520) Front Locker Source circuit at the FDCM harness connector.



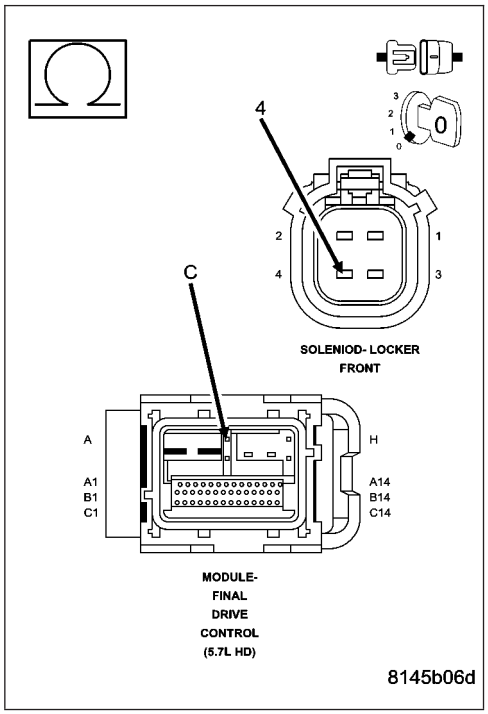
Does the voltmeter indicate voltage present?

Yes >> Repair the short to voltage in the (T520) Front Locker Source circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

4. (T524) FRONT LOCKER RETURN CIRCUIT OPEN

Measure the resistance of the (T524) Front Locker Return circuit form the in the Front Locker Solenoid harness connector and the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Go To 5

No >> Repair the open in the (T524) Front Locker Return circuit.
Perform FDCM VERIFICATION TEST

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C1418–FRONT DIFFERENTIAL CONTROL CIRCUIT HIGH (CONTINUED)

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

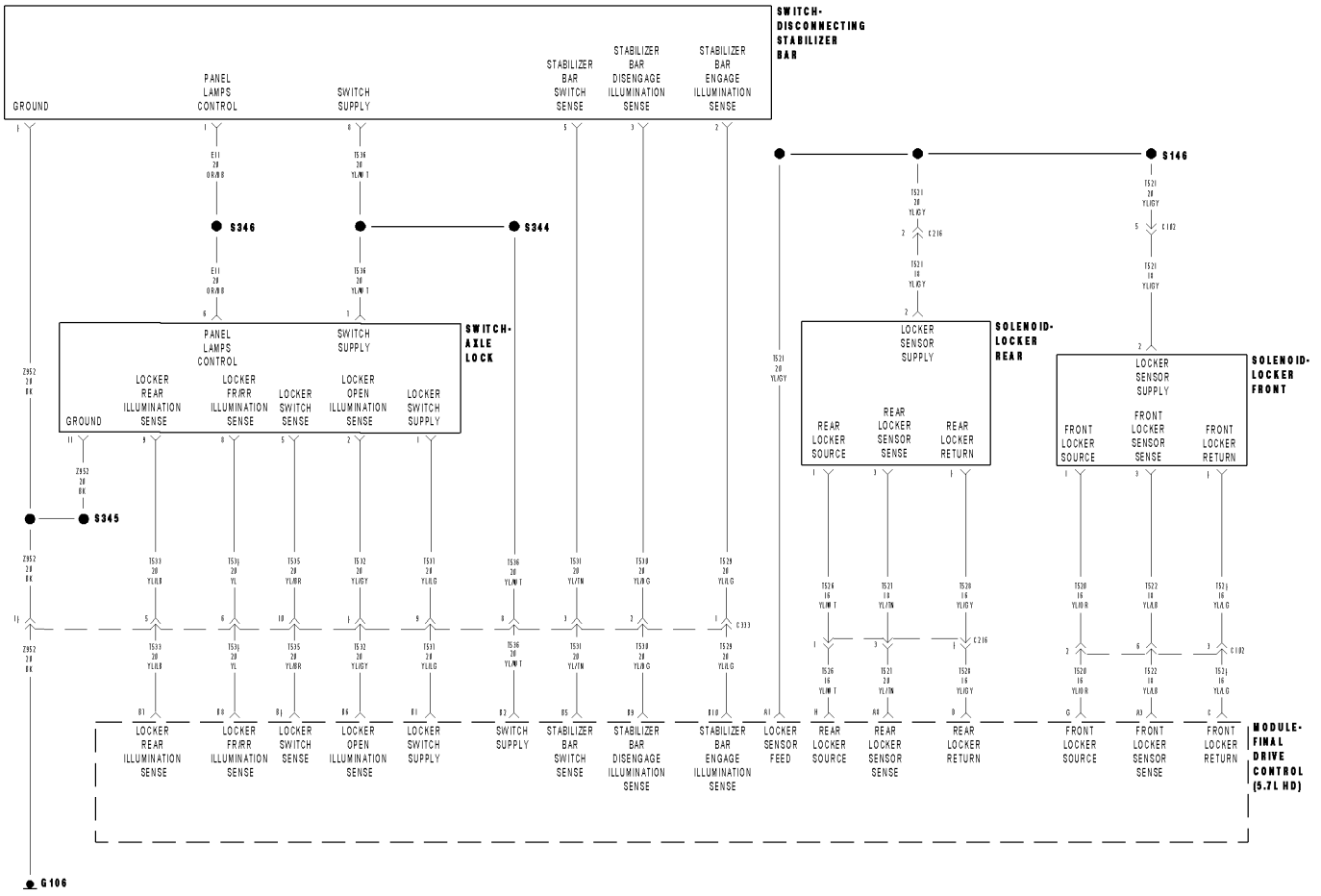
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

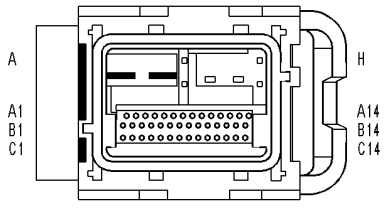
No >> Test Complete.

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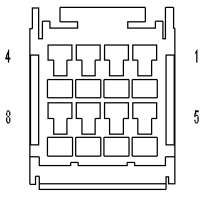
https://truckmanualshub.com/

C1419–FRONT DIFFERENTIAL CONTROL CIRCUIT OPEN

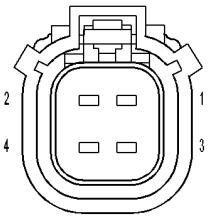




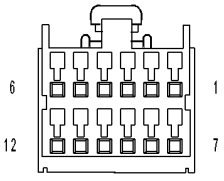
MODULE-FINAL DRIVE CONTROL (5.7L HD)



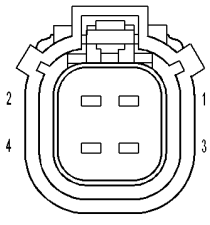
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C1419–FRONT DIFFERENTIAL CONTROL CIRCUIT OPEN (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects the Front Locker Source circuit is open.

Possible Causes
FRONT LOCKER SOLENOID
(T520) FRONT LOCKER SOURCE CIRCUIT OPEN
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 5

---

2. FRONT LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Front Locker Solenoid harness connector.

Ignition on, engine not running.

Using a 12-volt test light, jump across from the (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit in the Front Locker harness connector.

With a DRBIII®, actuate the Front Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Front Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

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C1419–FRONT DIFFERENTIAL CONTROL CIRCUIT OPEN (CONTINUED)

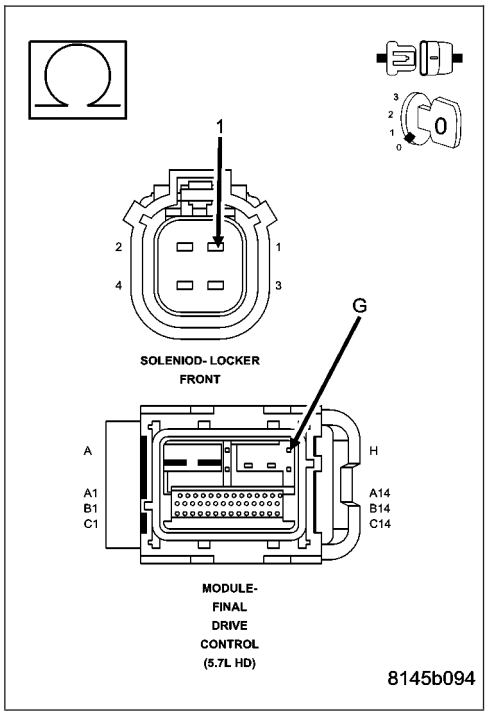
3. (T520) FRONT LOCKER SOURCE CIRCUIT OPEN

Turn the ignition off.

Disconnect the FDCM harness connector.

Turn the ignition on.

Measure the resistance of the (T520) Front Locker Source circuit from the FDCM harness connector and the Front Locker Solenoid harness connector.



Is the resistances below 5.0 ohms?

Yes >> Go To 4

No >> Repair the open in the Front Locker Source circuit.
Perform FDCM VERIFICATION TEST.

---

4. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

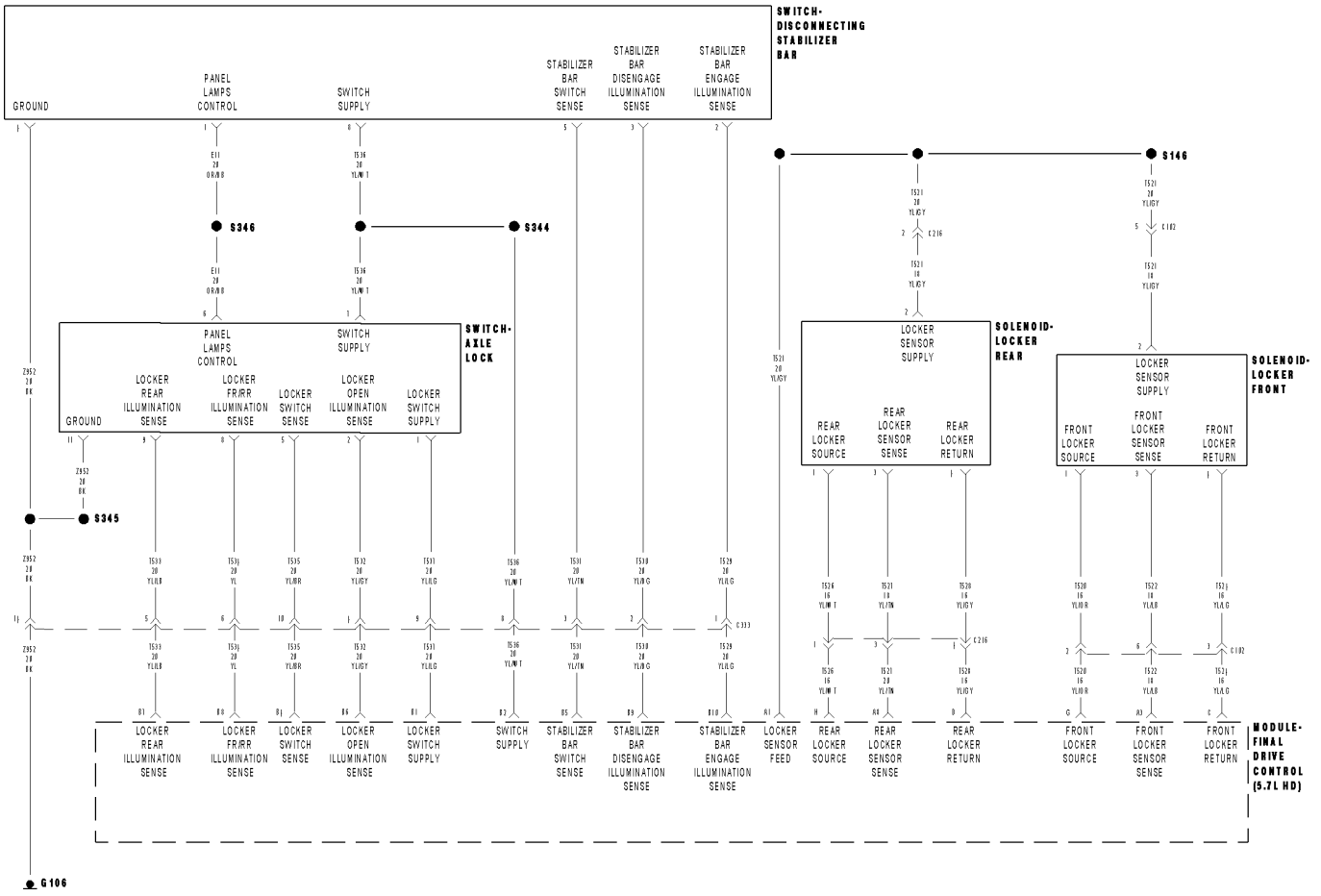
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

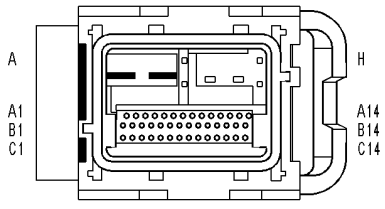
No >> Test Complete.

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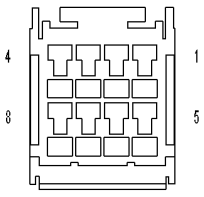
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C141E–REAR DIFFERENTIAL CONTROL CIRCUIT HIGH

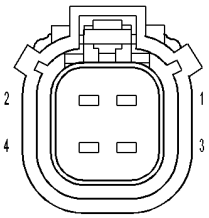




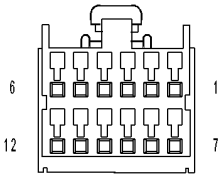
MODULE-FINAL DRIVE CONTROL (5.7L HD)



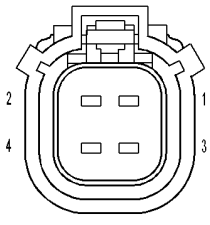
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C141E–REAR DIFFERENTIAL CONTROL CIRCUIT HIGH (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects the Rear Locker Source circuit is shorted high.

Possible Causes
REAR LOCKER SOLENOID
(T526) REAR LOCKER SOURCE CIRCUIT SHORTED TO BATTERY VOLTAGE
(T528) REAR LOCKER RETURN CIRCUIT OPEN
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

---

2. REAR LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Rear Locker Solenoid harness connector.

Ignition on, engine not running.

Using a 12-volt test light, jump across from the (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit in the Rear Locker harness connector.

With a DRBIII®, actuate the Rear Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Rear Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

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C141E–REAR DIFFERENTIAL CONTROL CIRCUIT HIGH (CONTINUED)

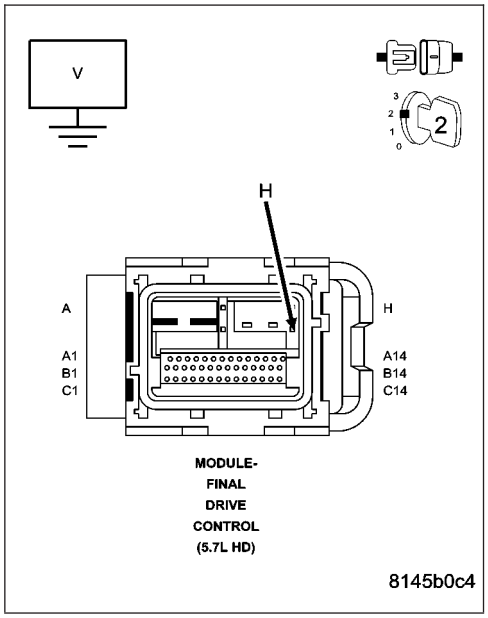
3. (T526) REAR LOCKER SOURCE CIRCUIT SHORTED TO BATTERY VOLTAGE

Turn the ignition off.

Disconnect the FDCM harness connector.

Turn the ignition on.

Measure the voltage on the (T526) Rear Locker Source circuit at the FDCM harness connector.



Does the voltmeter indicate voltage present?

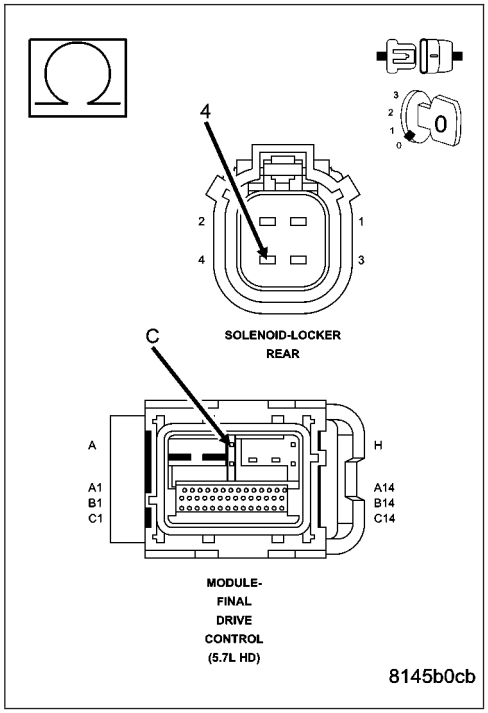
Yes >> Repair the short to voltage in the Rear Locker Source circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

---

4. (T528) REAR LOCKER RETURN CIRCUIT OPEN

Measure the resistance of the (T528) Rear Locker Return circuit form the in the Rear Locker Solenoid harness connector and the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Go To 5

No >> Repair the open in the (T528) Rear Locker Return circuit.
Perform FDCM VERIFICATION TEST

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C141E–REAR DIFFERENTIAL CONTROL CIRCUIT HIGH (CONTINUED)

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

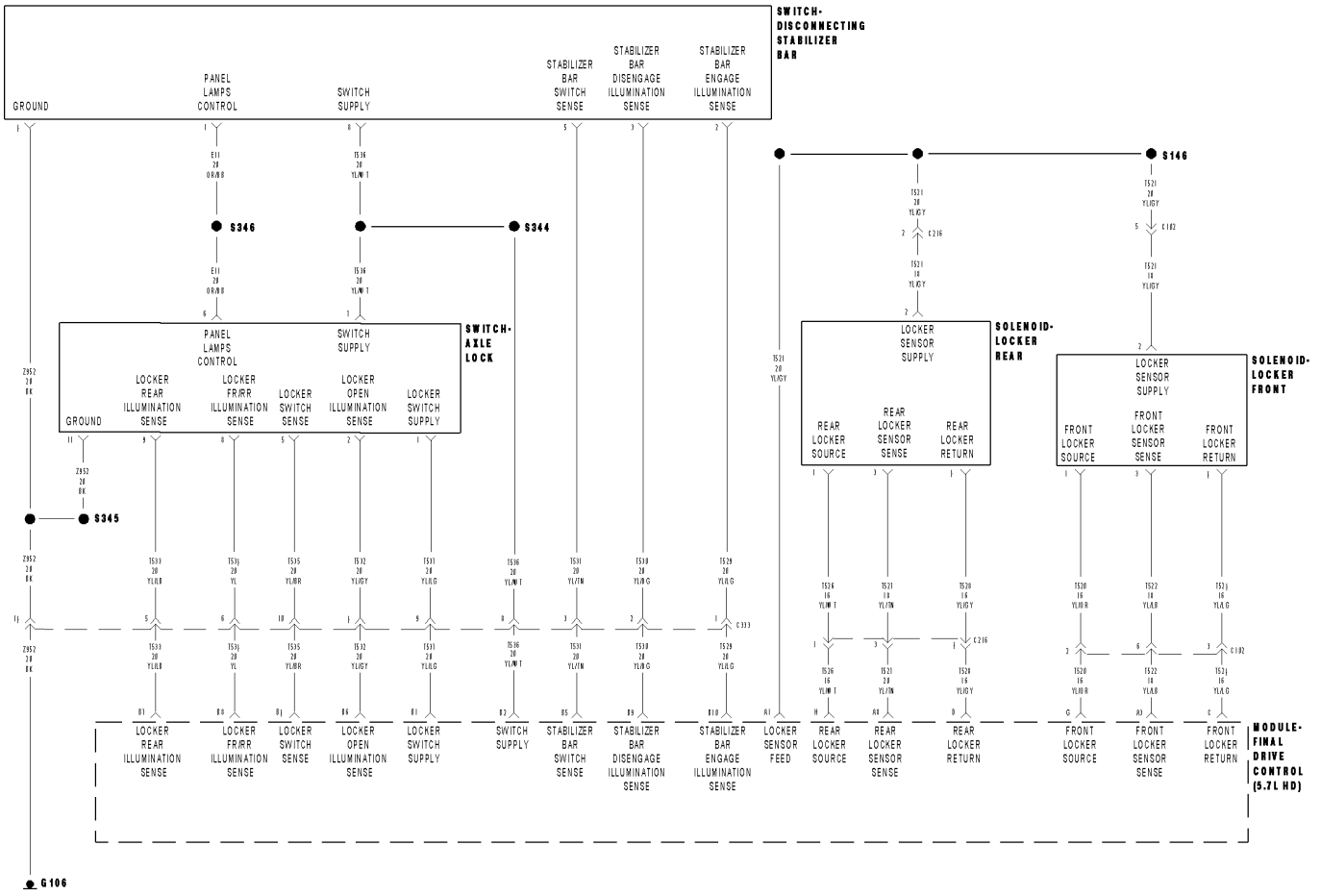
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

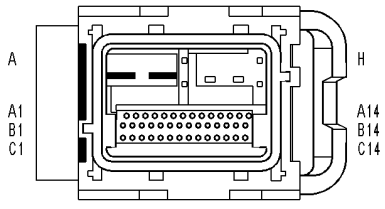
No >> Test Complete.

---

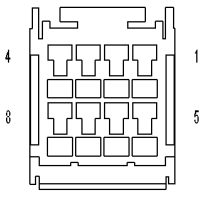
https://truckmanualshub.com/

C141F–REAR DIFFERENTIAL CONTROL CIRCUIT OPEN

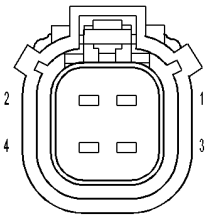




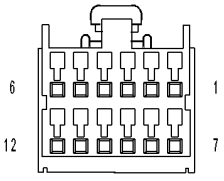
MODULE-FINAL DRIVE CONTROL (5.7L HD)



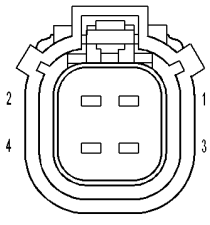
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C141F–REAR DIFFERENTIAL CONTROL CIRCUIT OPEN (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects the Rear Locker Source circuit is open.

Possible Causes
REAR LOCKER SOLENOID
(T526) REAR LOCKER SOURCE CIRCUIT OPEN
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 5

---

2. REAR LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Rear Locker Solenoid harness connector.

Ignition on, engine not running.

Using a 12-volt test light, jump across from the (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit in the Rear Locker harness connector.

With a DRBIII®, actuate the Rear Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Rear Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

---

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C141F–REAR DIFFERENTIAL CONTROL CIRCUIT OPEN (CONTINUED)

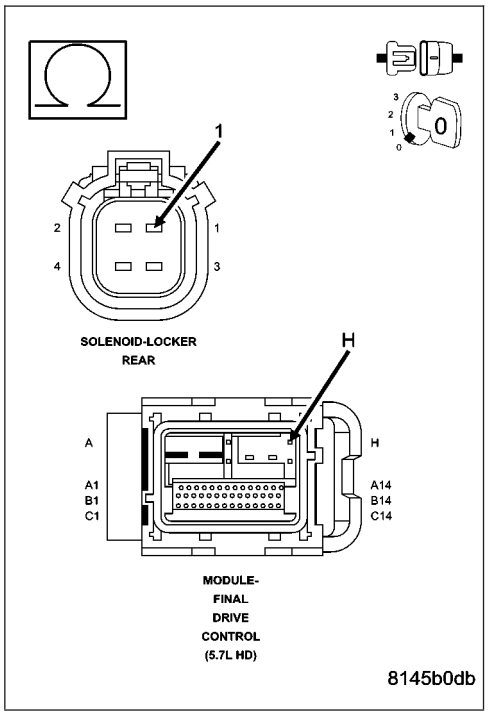
3. (T526) REAR LOCKER SOURCE CIRCUIT OPEN

Turn the ignition off.

Disconnect the FDCM harness connector.

Turn the ignition on.

Measure the resistance of the (T526) Rear Locker Source circuit from the FDCM harness connector and the Rear Locker Solenoid harness connector.



Is the resistances below 5.0 ohms?

Yes >> Go To 4

No >> Repair the open in the Rear Locker Source circuit.
Perform FDCM VERIFICATION TEST.

---

4. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

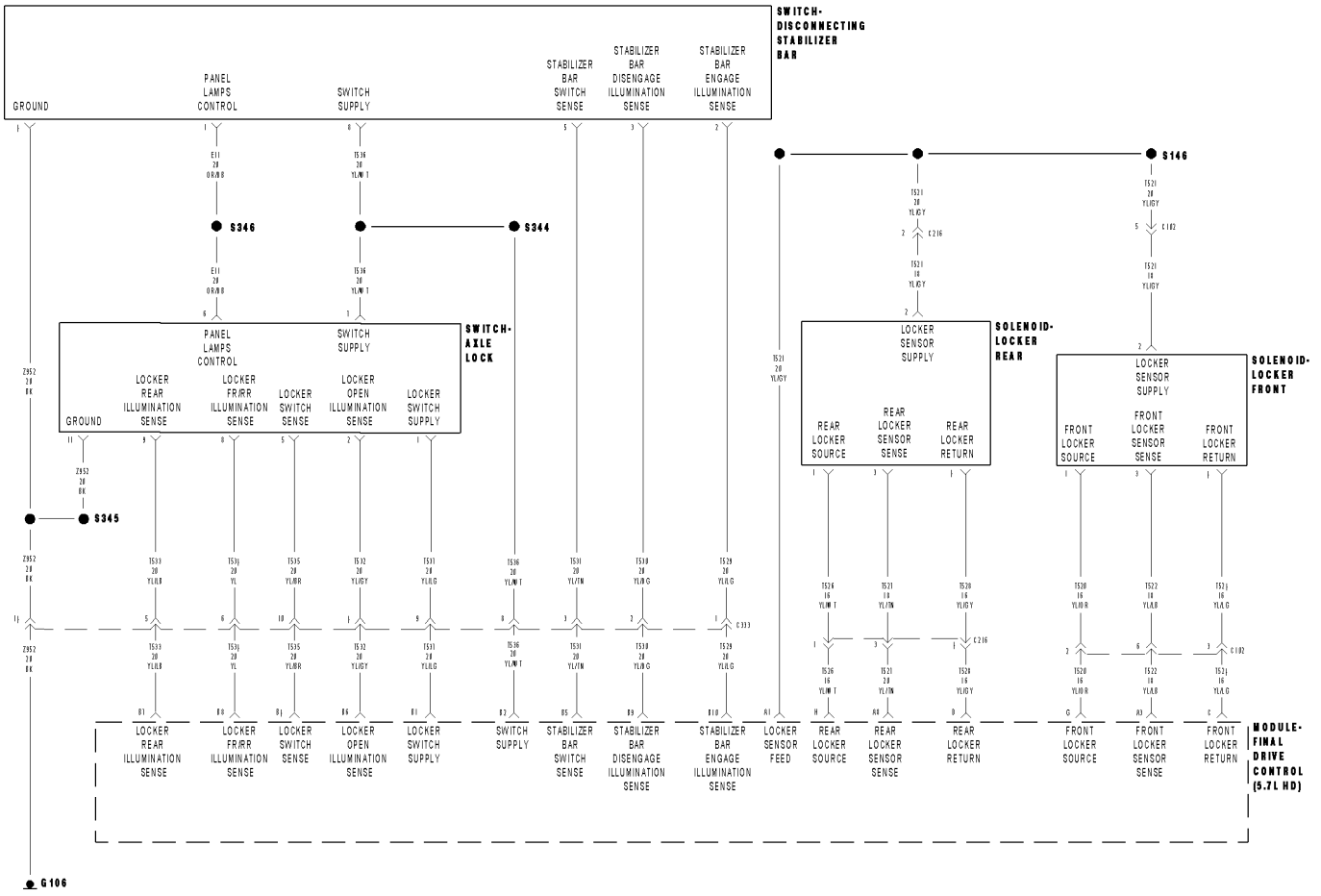
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

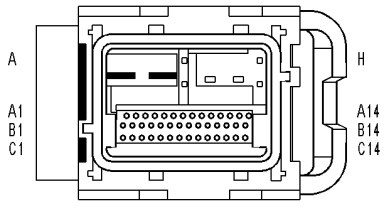
No >> Test Complete.

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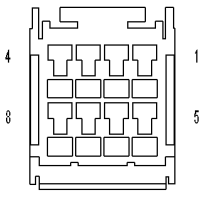
https://truckmanualshub.com/

C1446-FRONT DIFFERENTIAL RETURN CIRCUIT LOW

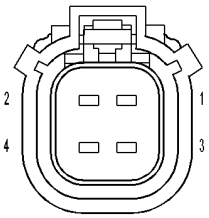




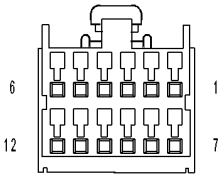
MODULE-FINAL DRIVE CONTROL (5.7L HD)



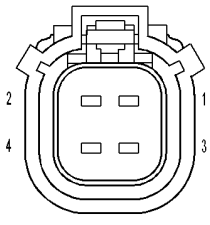
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C1446-FRONT DIFFERENTIAL RETURN CIRCUIT LOW (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects the Front Locker Source circuit is shorted low.

Possible Causes
FRONT LOCKER SOLENOID
(T526) FRONT LOCKER RETURN CIRCUIT SHORTED TO GROUND
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 5

---

2. FRONT LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Front Locker Solenoid harness connector.

Ignition on, engine not running.

Using a 12-volt test light, jump across from the (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit in the Front Locker harness connector.

With a DRBIII®, actuate the Front Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Front Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

---

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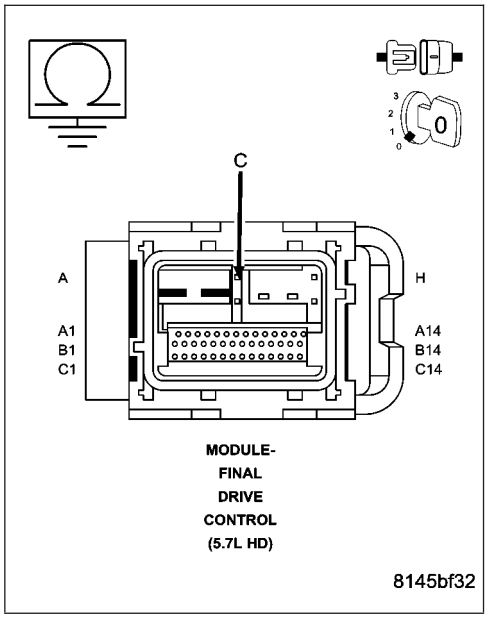
C1446-FRONT DIFFERENTIAL RETURN CIRCUIT LOW (CONTINUED)

3. (T524) FRONT LOCKER RETURN CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T524) Front Locker Return circuit in the FDCM harness connector to ground.



Is the resistance below 100 ohms?

Yes >> Repair the short to ground in (T524) Front Locker Return circuit.
Perform FDCM VERIFICATION TEST

No >> Go To 4

---

4. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

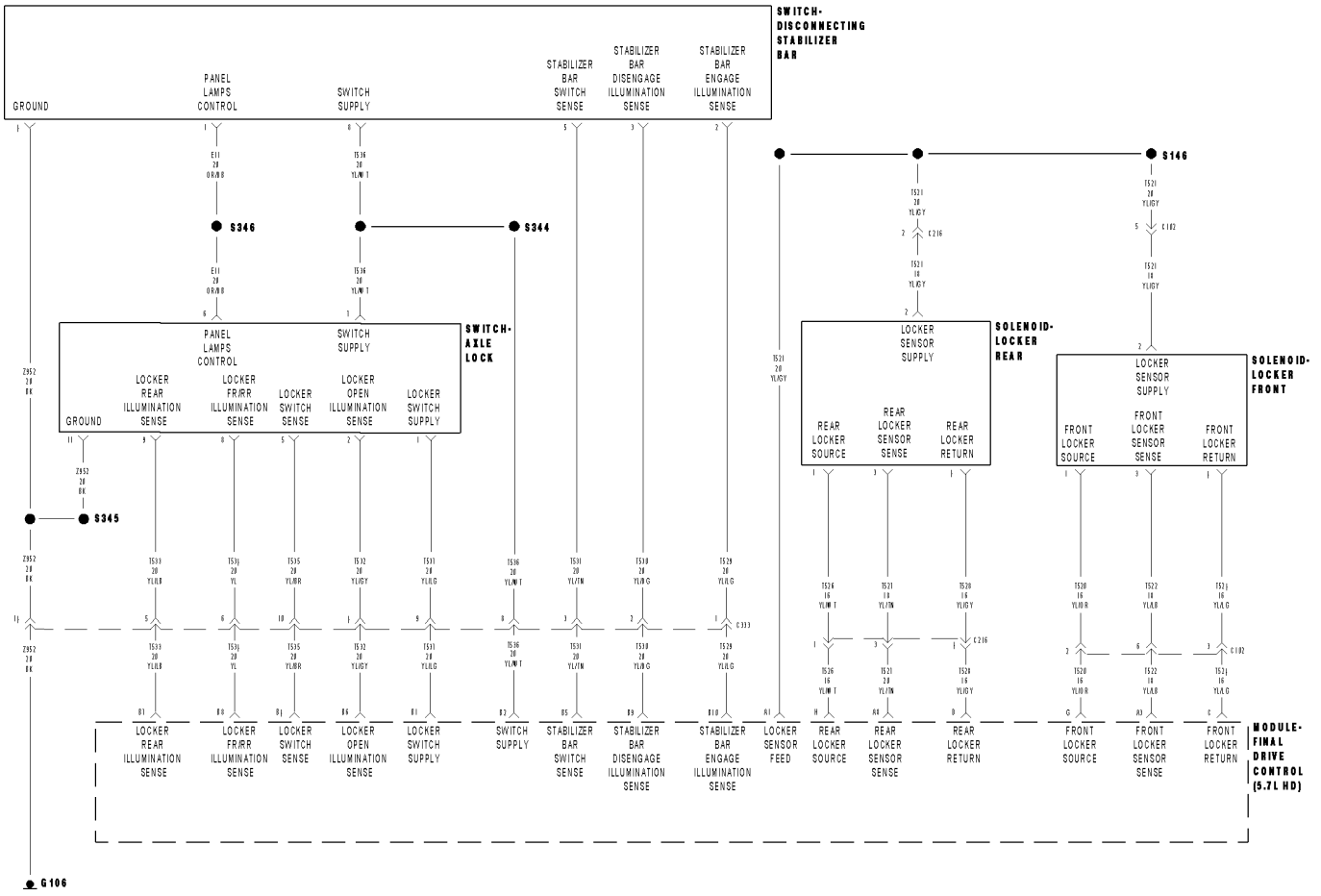
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

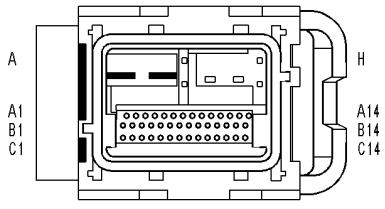
No >> Test Complete.

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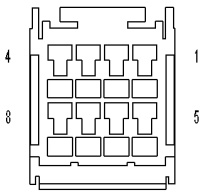
https://truckmanualshub.com/

C1447-FRONT DIFFERENTIAL RETURN CIRCUIT HIGH

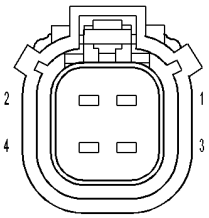




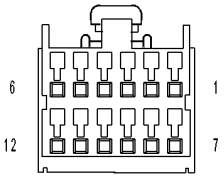
MODULE-FINAL DRIVE CONTROL (5.7L HD)



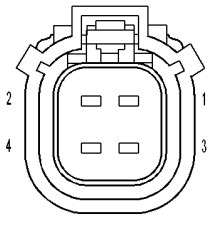
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C1447-FRONT DIFFERENTIAL RETURN CIRCUIT HIGH (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects the Front Locker Source circuit is shorted low.

Possible Causes
FRONT LOCKER SOLENOID
(T520) FRONT LOCKER SOURCE CIRCUIT SHORTED TO GROUND
(T524) FRONT LOCKER RETURN CIRCUIT SHORTED TO (T520) FRONT LOCKER SOURCE CIRCUIT
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

---

2. FRONT LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Front Locker Solenoid harness connector.

Ignition on, engine not running.

Using a 12-volt test light, jump across from the (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit in the Front Locker harness connector.

With a DRBIII®, actuate the Front Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Front Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

---

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C1447-FRONT DIFFERENTIAL RETURN CIRCUIT HIGH (CONTINUED)

3. (T524) FRONT LOCKER RETURN CIRCUIT SHORTED TO BATTERY VOLTAGE

Turn the ignition off.

Disconnect the FDCM harness connector.

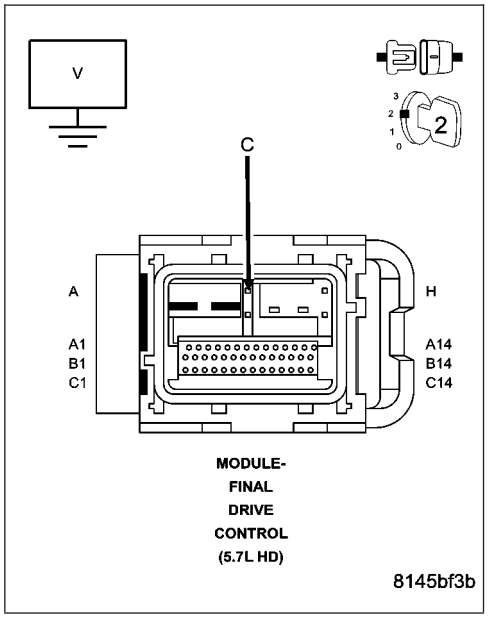
Turn the ignition on.

Measure the voltage of the (T524) Front Locker Return circuit at the FDCM harness connector.

Does the voltmeter indicate voltage present?

Yes >> Repair the short to voltage in the (T524) Front Locker Return circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4



4. (T524) FRONT LOCKER RETURN CIRCUIT SHORTED TO (T520) FRONT LOCKER SOURCE CIRCUIT

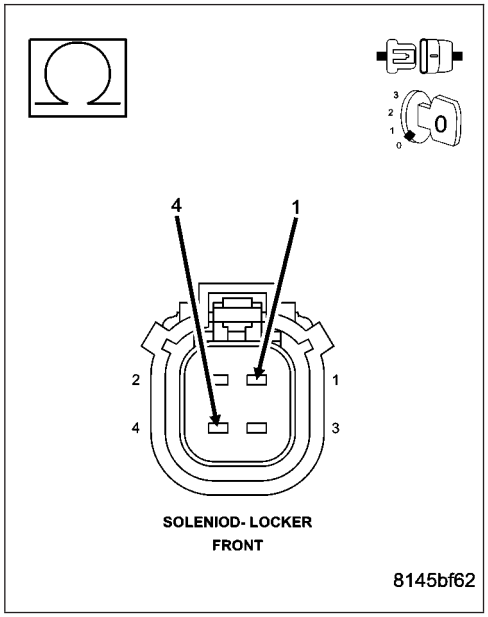
Turn the ignition off.

Measure the resistance between the (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit in the Front Locker Solenoid harness connector.

Is the resistance below 100 ohms?

Yes >> Repair the short between (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit.
Perform FDCM VERIFICATION TEST

No >> Go To 5



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C1447-FRONT DIFFERENTIAL RETURN CIRCUIT HIGH (CONTINUED)

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

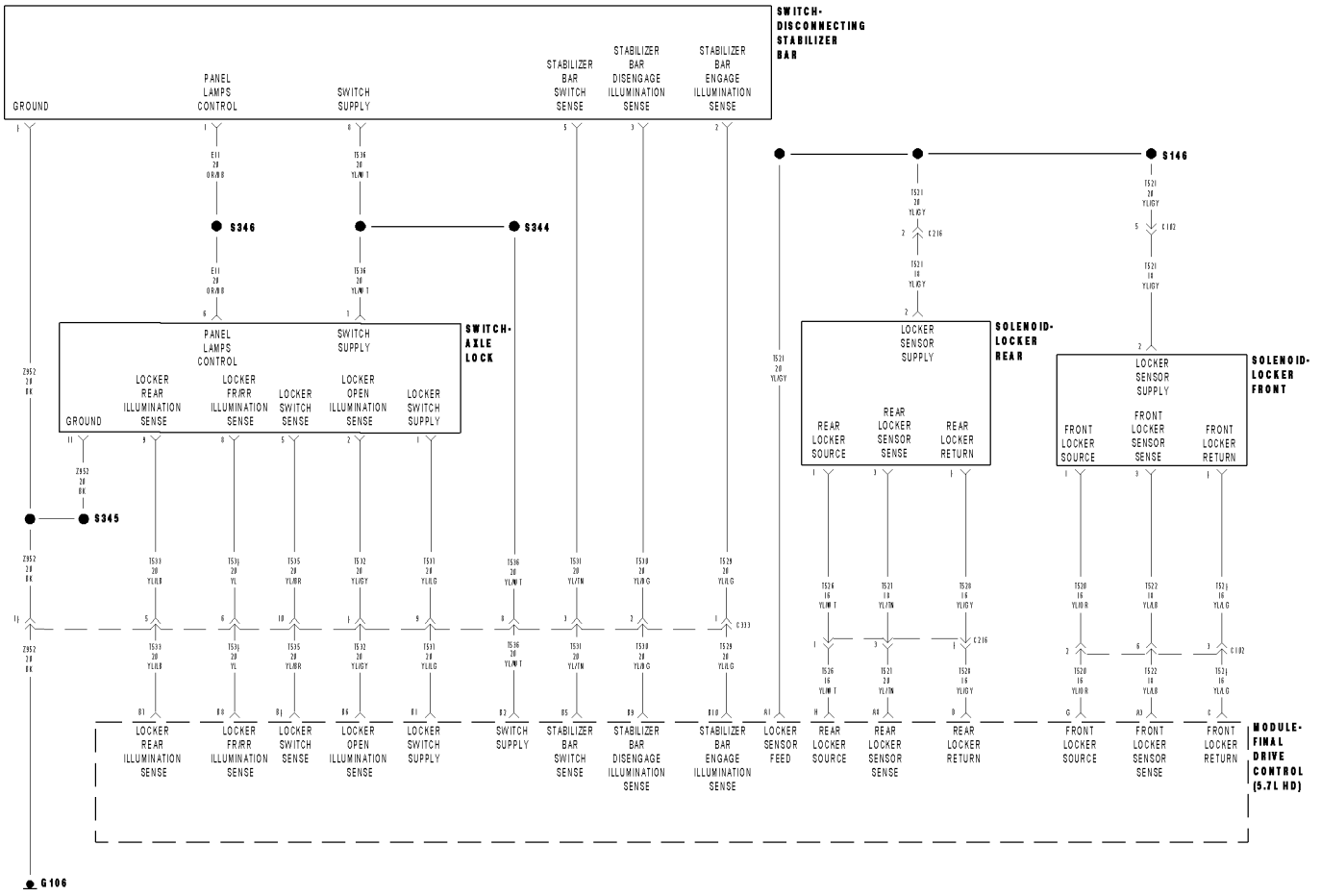
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

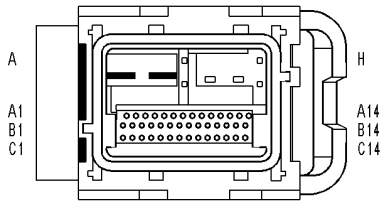
No >> Test Complete.

---

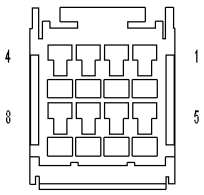
https://truckmanualshub.com/

C144A-REAR DIFFERENTIAL RETURN CIRCUIT LOW

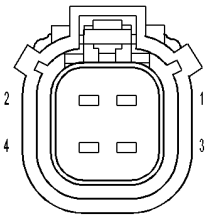




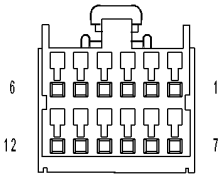
MODULE-
FINAL
DRIVE
CONTROL
(5.7L HD)



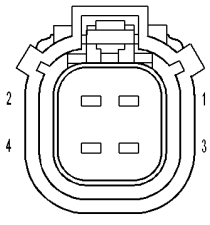
SWITCH-
DISCONNECTING
STABILZER BAR



SOLENOID-LOCKER
REAR



SWITCH-
AXLE
LOCK



SOLENIOD- LOCKER
FRONT

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C144A-REAR DIFFERENTIAL RETURN CIRCUIT LOW (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the RR or FR/RR position.
- **Set Condition:**
  The FDCM detects the Rear Locker Source circuit is shorted low.

Possible Causes
REAR LOCKER SOLENOID
(T528) REAR LOCKER RETURN CIRCUIT SHORTED TO GROUND
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 5

---

2. REAR LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Turn the ignition off.

Disconnect the Rear Locker Solenoid harness connector.

Ignition on, engine not running.

Using a 12-volt test light, jump across from the (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit in the Rear Locker harness connector.

With a DRBIII®, actuate the Rear Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Rear Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

---

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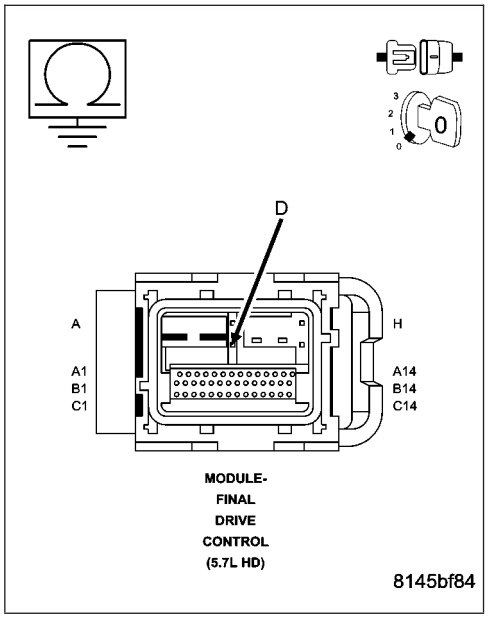
C144A-REAR DIFFERENTIAL RETURN CIRCUIT LOW (CONTINUED)

3. (T528) REAR LOCKER RETURN CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T528) Rear Locker Return circuit in the FDCM harness connector to ground.



Is the resistance below 100 ohms?

Yes >> Repair the short to ground in (T528) Rear Locker Return circuit.
Perform FDCM VERIFICATION TEST

No >> Go To 4

---

4. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

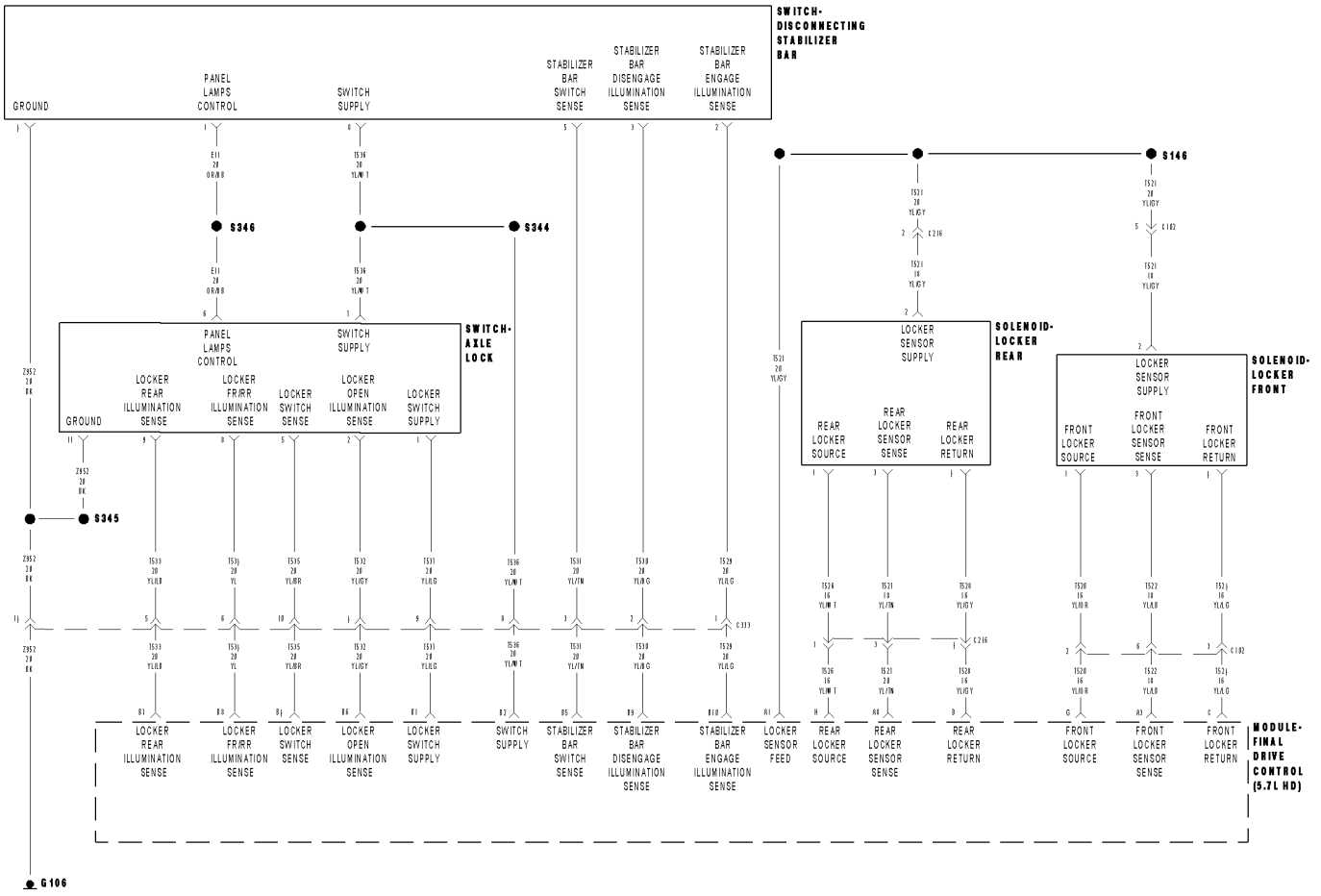
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

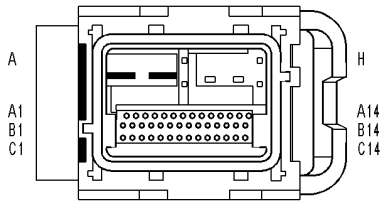
No >> Test Complete.

---

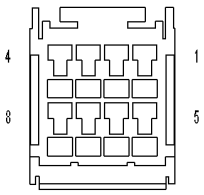
https://truckmanualshub.com/

C144B-REAR DIFFERENTIAL RETURN CIRCUIT HIGH

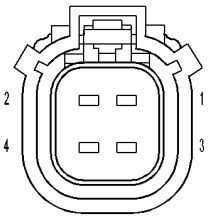




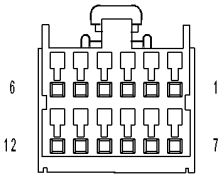
MODULE-FINAL DRIVE CONTROL (5.7L HD)



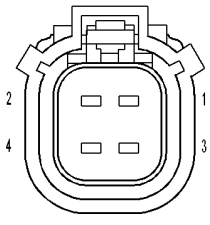
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C144B-REAR DIFFERENTIAL RETURN CIRCUIT HIGH (CONTINUED)
For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the RR or FR/RR position.
- **Set Condition:**
  The FDCM detects the Rear Locker Source circuit is shorted low.

Possible Causes
REAR LOCKER SOLENOID
(T526) REAR LOCKER SOURCE CIRCUIT SHORTED TO GROUND
(T528) REAR LOCKER RETURN CIRCUIT SHORTED TO (T526) REAR LOCKER SOURCE CIRCUIT
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.
Ignition on, engine not running.
With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2
No >> Go To 6

---

2. REAR LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.
Turn the ignition off.
Disconnect the Rear Locker Solenoid harness connector.
Ignition on, engine not running.
Using a 12-volt test light, jump across from the (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit in the Rear Locker harness connector.
With a DRBIII®, actuate the Rear Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Rear Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.
No >> Go To 3

---

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C144B-REAR DIFFERENTIAL RETURN CIRCUIT HIGH (CONTINUED)

3. (T528) REAR LOCKER RETURN CIRCUIT SHORTED TO BATTERY VOLTAGE

Turn the ignition off.

Disconnect the FDCM harness connector.

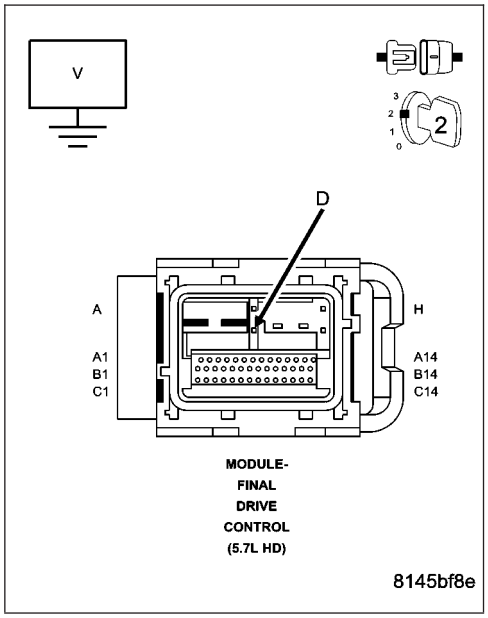
Turn the ignition on.

Measure the voltage of the (T528) Rear Locker Return circuit at the FDCM harness connector.

Does the voltmeter indicate voltage present?

Yes >> Repair the short to voltage in the (T528) Rear Locker Return circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4



4. (T528) REAR LOCKER RETURN CIRCUIT SHORTED TO (T526) REAR LOCKER SOURCE CIRCUIT

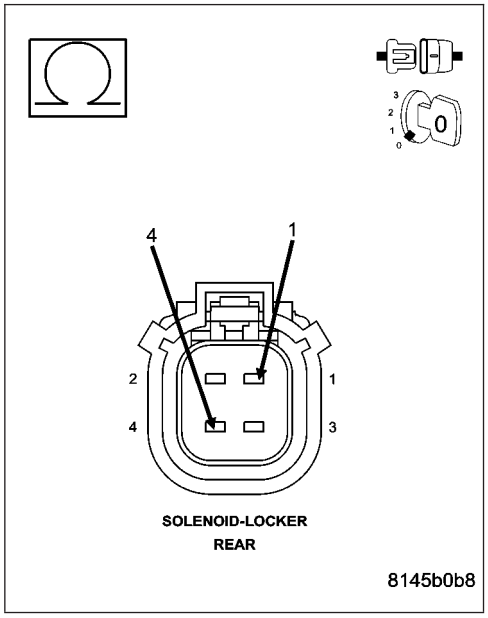
Turn the ignition off.

Measure the resistance between the (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit in the Rear Locker Solenoid harness connector.

Is the resistance below 100 ohms?

Yes >> Repair the short between (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit.
Perform FDCM VERIFICATION TEST

No >> Go To 5



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C144B-REAR DIFFERENTIAL RETURN CIRCUIT HIGH (CONTINUED)

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

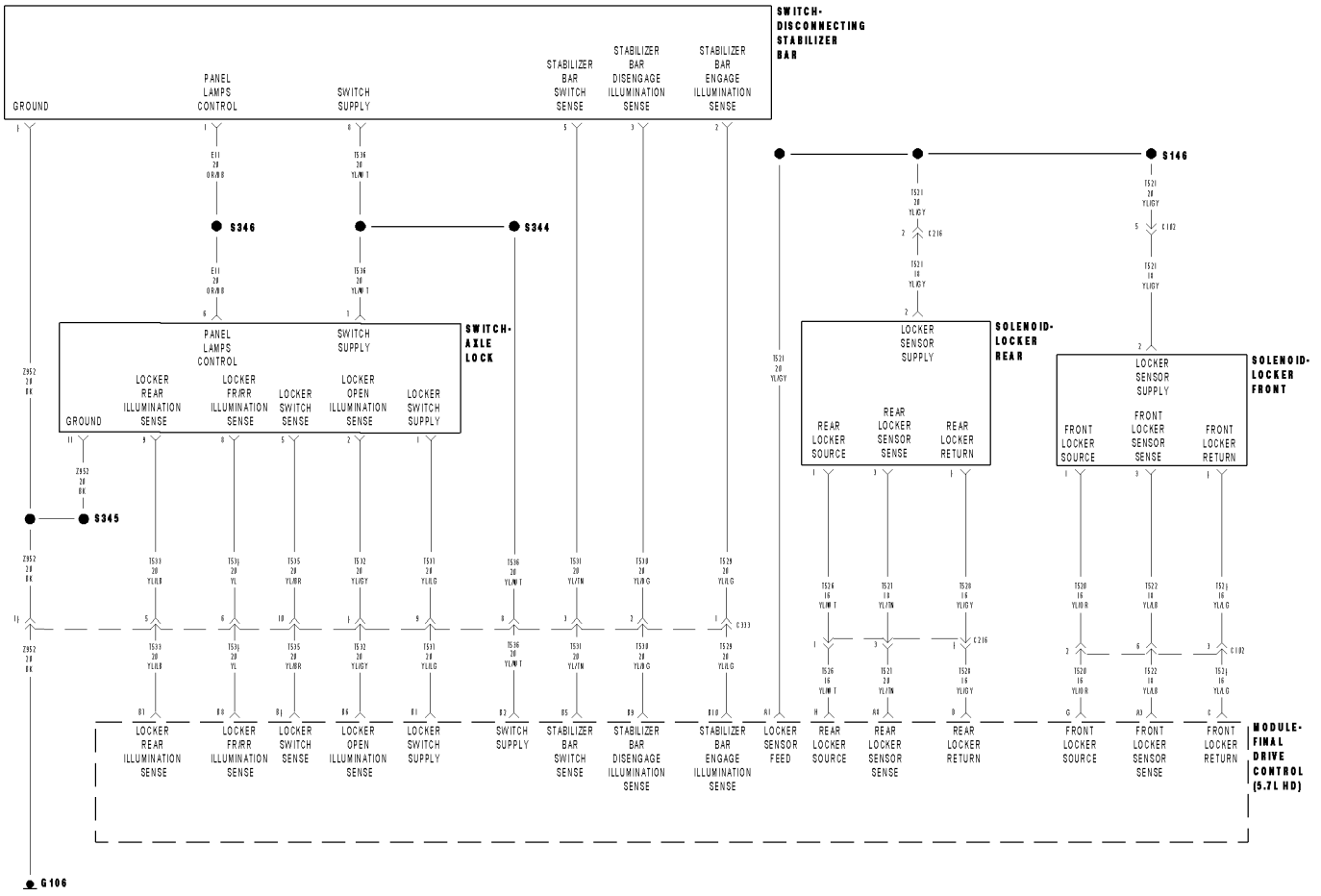
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

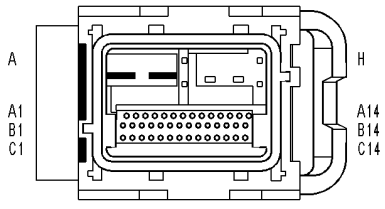
No >> Test Complete.

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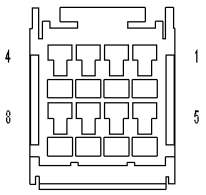
https://truckmanualshub.com/

C144E-FRONT DIFFERENTIAL POSITION SENSOR PERFORMANCE

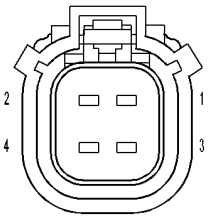




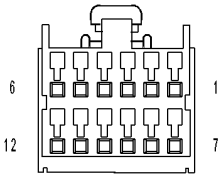
MODULE-FINAL DRIVE CONTROL (5.7L HD)



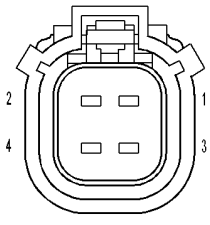
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C144E-FRONT DIFFERENTIAL POSITION SENSOR PERFORMANCE (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects that the Front Differential Position Sensor is in an unexpected state.

Possible Causes
(T522) FRONT DIFFERENTIAL POSITION SENSOR (WIRING, CONNECTOR AND/OR TERMINAL CONDITION)
FRONT DIFFERENTIAL POSITION SENSOR
(T522) FRONT LOCKER SENSOR SENSE OPEN
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

---

2. FRONT DIFFERENTIAL POSITION SENSOR WIRING

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Using the DRBIII®, actuate the Front Locker Solenoid.

Monitor the Front Differential Position Sensor State.

Wiggle the related wiring harness from the FDCM to the Front Locker Solenoid connector at the axle.

With a DRBIII®, actuate the Front Locker Solenoid.

Does the state on the DRBIII® change while wiggling the wiring harness?

Yes >> Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Check the Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. Repair as necessary.

Perform FDCM VERIFICATION TEST.

No >> Go To 3

---

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C144E-FRONT DIFFERENTIAL POSITION SENSOR PERFORMANCE (CONTINUED)

3. FRONT DIFFERENTIAL POSITION SENSOR OPERATION

Turn the ignition off.

Disconnect the Front Locker Solenoid harness connector.

Ignition on, engine not running.

Using a jumper wire, jumper across from the (T522) Front Locker Sensor Sense circuit and the (T521) Locker Sensor Supply circuit in the Front Locker Solenoid harness connector.

While monitoring the sensor state on the DRBIII®, tap the jumper wire on and off the (T522) Front Locker Sensor Sense circuit terminal. Hold the jumper wire on and off the terminal for a minimum of 3 seconds.

Does the state change on the DRBIII® while tapping the terminal?

Yes >> Replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

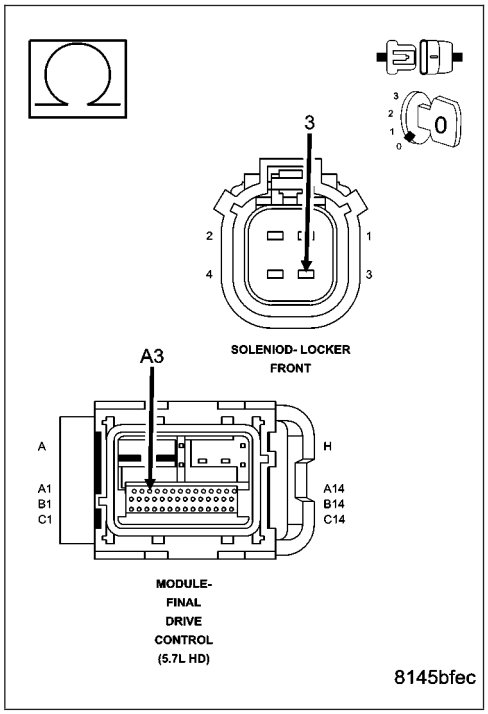
---

4. (T522) FRONT LOCKER SENSOR SENSE CIRCUIT OPEN

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T522) Front Locker Sensor Sense circuit between the Front Locker Solenoid harness connector and the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Go To 5

No >> Repair the open in the Front Locker Sensor Sense circuit.
Perform FDCM VERIFICATION TEST.

---

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

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C144E-FRONT DIFFERENTIAL POSITION SENSOR PERFORMANCE (CONTINUED)

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

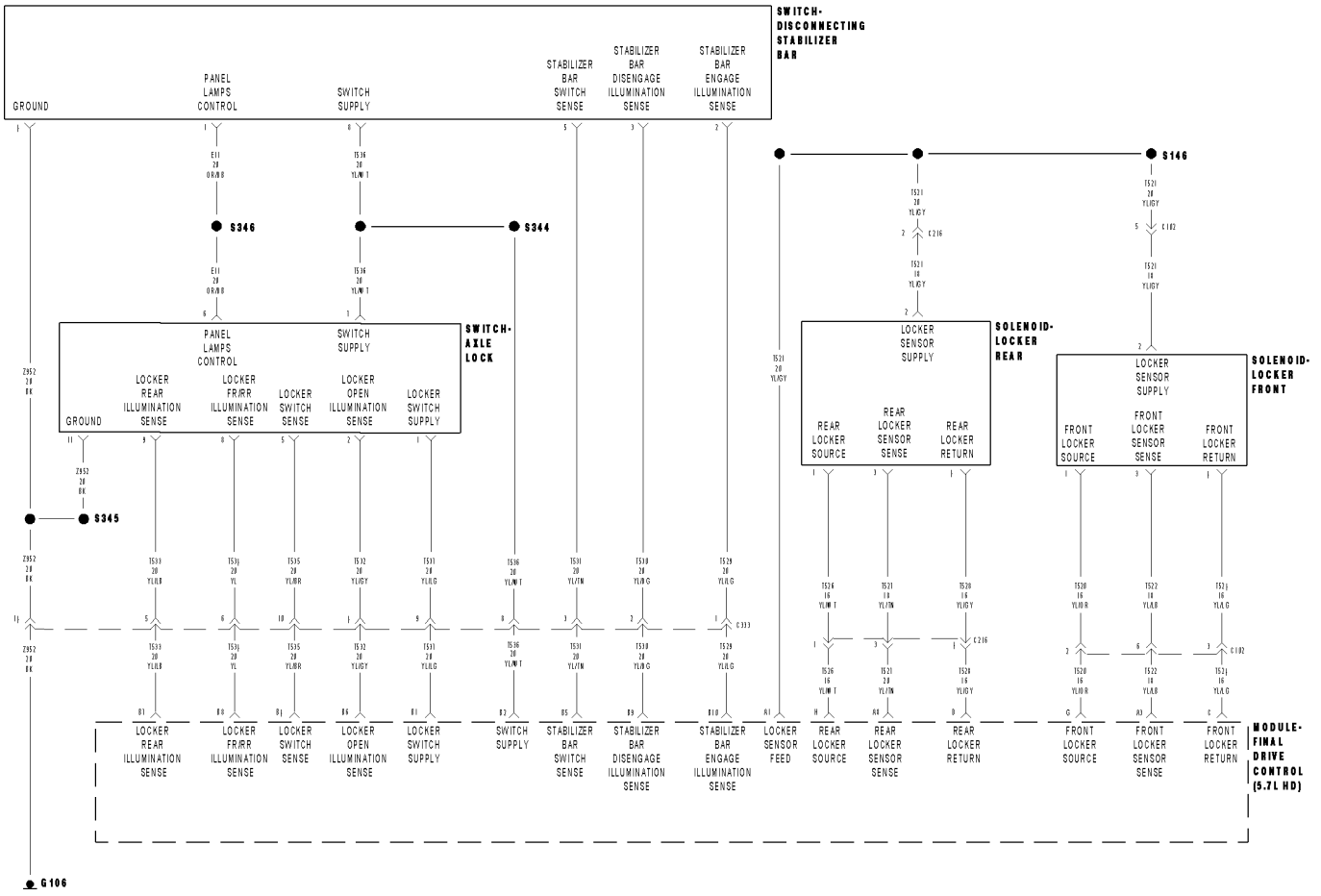
Were there any problems found?

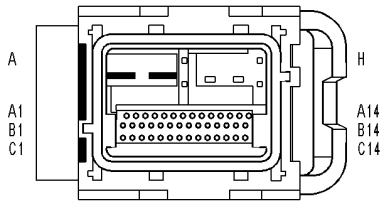
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

No >> Test Complete.

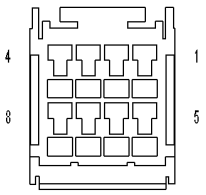
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C1450-FRONT DIFFERENTIAL POSITION SENSOR CIRCUIT HIGH

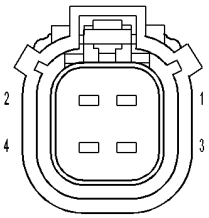




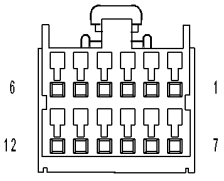
MODULE-FINAL DRIVE CONTROL (5.7L HD)



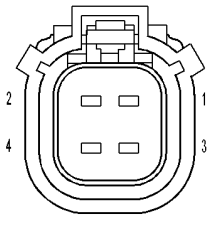
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C1450-FRONT DIFFERENTIAL POSITION SENSOR CIRCUIT HIGH (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects that the Front Differential Position Sensor is shorted to voltage.

Possible Causes
(T522) FRONT LOCKER SENSOR SENSE SHORTED TO BATTERY VOLTAGE
FRONT DIFFERENTIAL POSITION SENSOR
(T522) FRONT LOCKER SENSOR SENSE OPEN
(T522) FRONT LOCKER SENSOR SENSE SHORTED TO (T521) LOCKER SENSOR SUPPLY
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 7

---

2. (T522) FRONT LOCKER SENSOR SENSE SHORTED TO BATTERY VOLTAGE

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

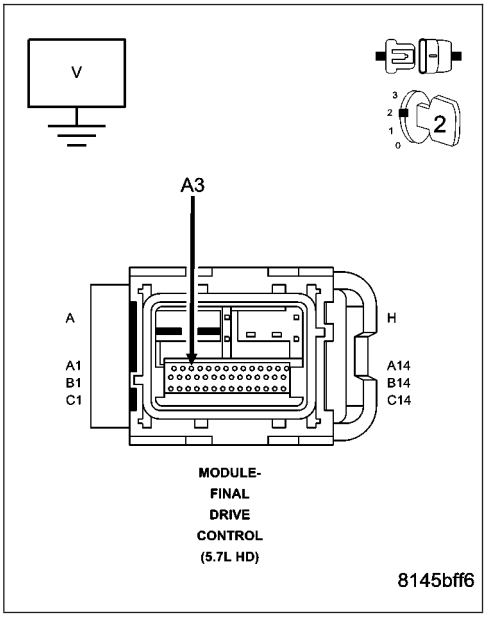
Turn the ignition off.

Disconnect the Front Locker Solenoid harness connector.

Disconnect the FDCM harness connector.

Turn the ignition on.

Measure the voltage on the (T522) Front Locker Sensor Sense circuit in the FDCM harness connector.



Does the voltmeter indicate voltage present?

Yes >> Repair the short to voltage in the (T522) Front Locker Sensor Sense circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

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C1450-FRONT DIFFERENTIAL POSITION SENSOR CIRCUIT HIGH (CONTINUED)

3. FRONT DIFFERENTIAL POSITION SENSOR OPERATION

Turn the ignition off.

Connect the FDCM harness connector.

Ignition on, engine not running.

Using a jumper wire, jumper across from the (T522) Front Locker Sensor Sense circuit and the (T521) Locker Sensor Supply circuit in the Front Locker Solenoid harness connector.

While monitoring the sensor state on the DRBIII®, tap the jumper wire on and off the (T522) Front Locker Sensor Sense circuit terminal. Hold the jumper wire on and off the terminal for a minimum of 3 seconds.

Does the state change on the DRBIII® while tapping the terminal?

Yes >> Replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

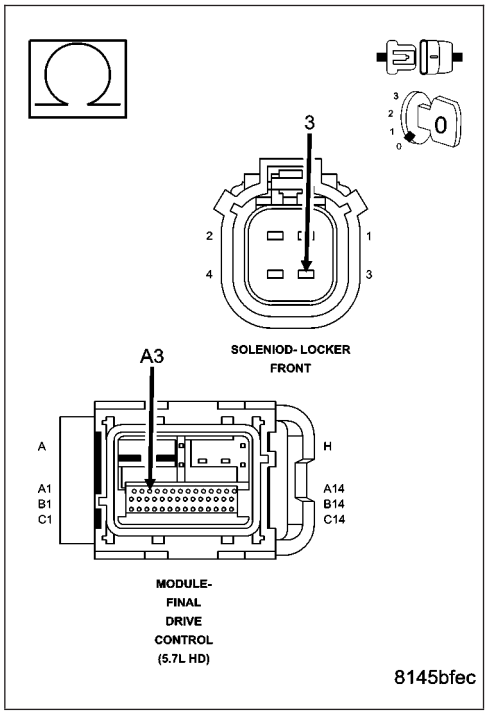
---

4. (T522) FRONT LOCKER SENSOR SENSE CIRCUIT OPEN

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T522) Front Locker Sensor Sense circuit between the Front Locker Solenoid harness connector and the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Go To 5

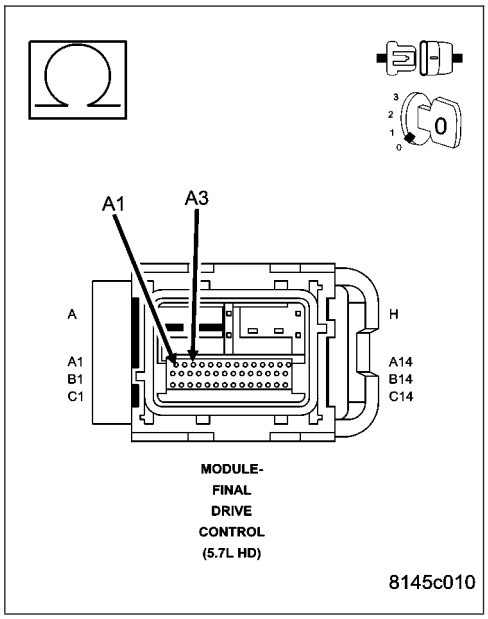
No >> Repair the open in the (T522) Front Locker Sensor Sense circuit.
Perform FDCM VERIFICATION TEST.

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C1450-FRONT DIFFERENTIAL POSITION SENSOR CIRCUIT HIGH (CONTINUED)

5. (T522) FRONT LOCKER SENSOR SENSE CIRCUIT SHORTED TO (T521) LOCKER SENSOR SUPPLY

Measure the resistance between the (T522) Front Locker Sensor Sense circuit and the (T521) Locker Sensor Supply circuit in the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Repair the short between the Front Locker Sensor Sense circuit and the (T521) Locker Supply Sensor circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 6

---

6. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

7. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

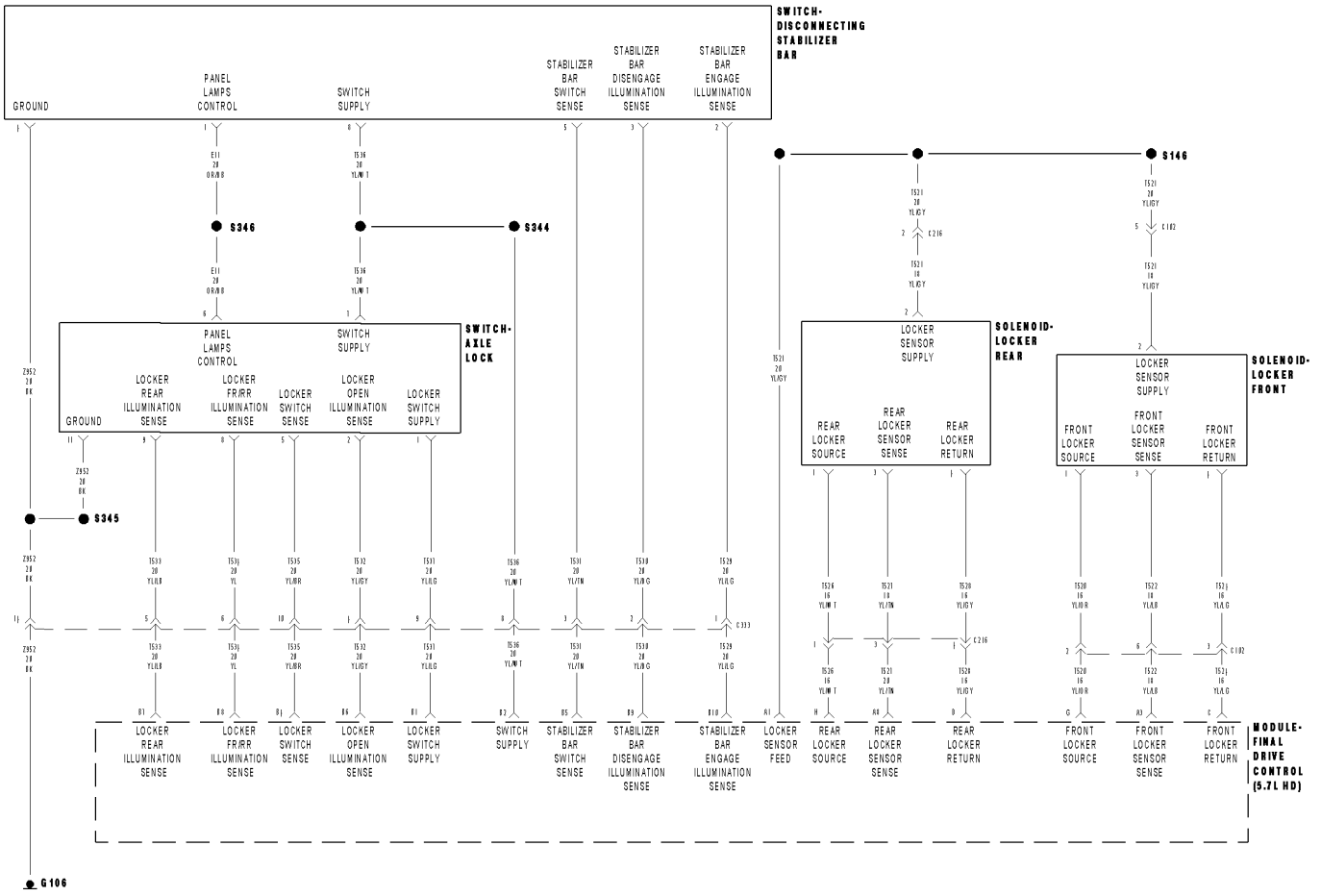
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

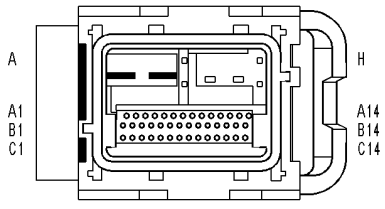
No >> Test Complete.

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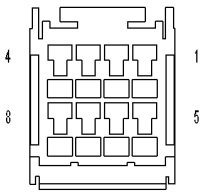
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C144F-FRONT DIFFERENTIAL POSITION SENSOR LOW

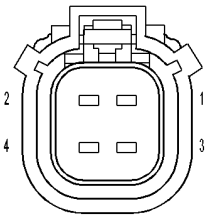




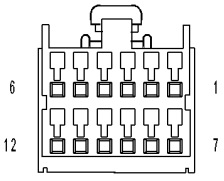
MODULE-FINAL DRIVE CONTROL (5.7L HD)



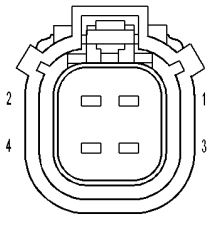
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C144F-FRONT DIFFERENTIAL POSITION SENSOR LOW (CONTINUED)
For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects that the Front Differential Position Sensor is short low.

Possible Causes
FRONT DIFFERENTIAL POSITION SENSOR
(T522) FRONT LOCKER SENSOR SENSE SHORTED TO GROUND
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.
Ignition on, engine not running.
With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2
No >> Go To 5

---

2. FRONT DIFFERENTIAL POSITION SENSOR OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.
Using the DRBIII®, ignition on, monitor the Front Locker Sensor state.
Disconnect the Front Locker Solenoid harness connector.

Does the state change on the DRBIII® from Locked to Unlocked?

Yes >> Replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.
No >> Go To 3

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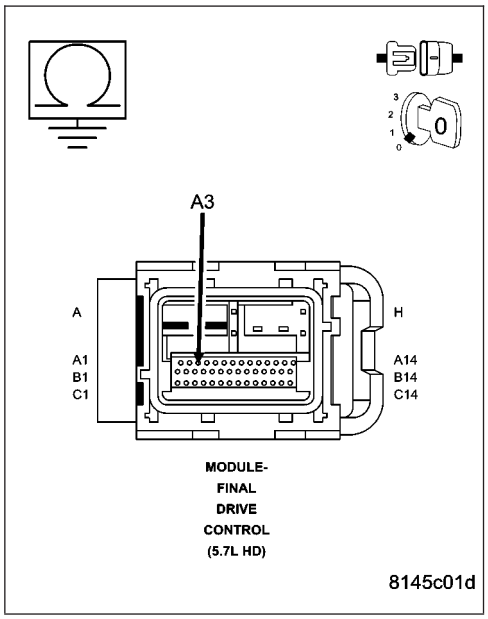
C144F-FRONT DIFFERENTIAL POSITION SENSOR LOW (CONTINUED)

3. (T522) FRONT LOCKER SENSOR SENSE CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T522) Front Locker Sensor Sense circuit in the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Repair the short to ground in the (T522) Front Locker Sensor Sense circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

---

4. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

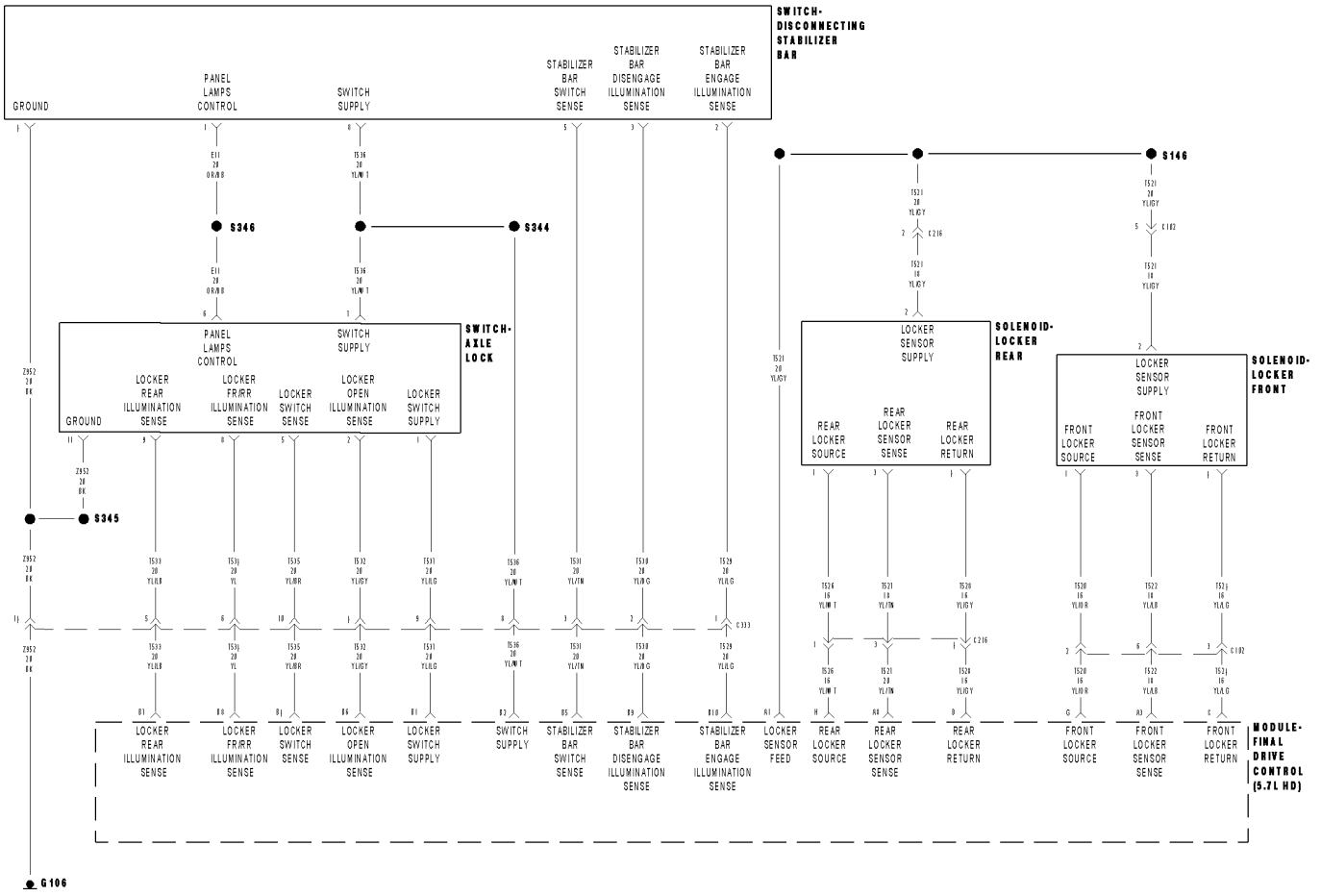
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

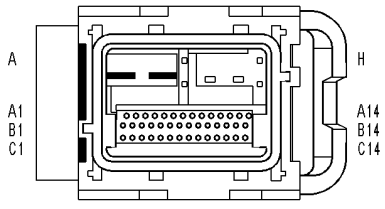
No >> Test Complete.

---

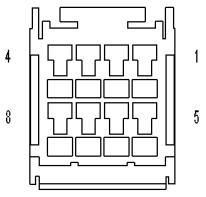
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C1452-REAR DIFFERENTIAL POSITION SENSOR PERFORMANCE

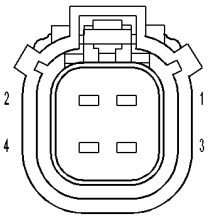




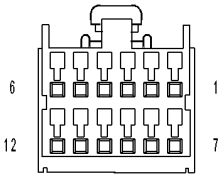
MODULE-FINAL DRIVE CONTROL (5.7L HD)



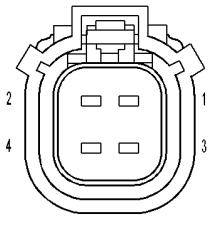
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C1452-REAR DIFFERENTIAL POSITION SENSOR PERFORMANCE (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The ignition on. Axle Locker Switch in the RR or FR/RR position.
- **Set Condition:**
  The FDCM detects that the Rear Differential Position Sensor is in an unexpected state.

Possible Causes
REAR DIFFERENTIAL POSITION SENSOR (WIRING, CONNECTOR AND/OR TERMINAL CONDITION)
REAR DIFFERENTIAL POSITION SENSOR
REAR LOCKER SENSOR SENSE OPEN
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

---

2. REAR DIFFERENTIAL POSITION SENSOR WIRING

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Using the DRBIII®, actuate the Rear Locker Solenoid.

Monitor the Rear Differential Position Sensor State.

Wiggle the related wiring harness from the FDCM to the Rear Locker Solenoid connector at the axle.

With a DRBIII®, actuate the Rear Locker Solenoid.

Does the state on the DRBIII® change while wiggling the wiring harness?

Yes >> Using the schematics as a guide, inspect the wiring and connectors specific to this circuit. Check the Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. Repair as necessary.

Perform FDCM VERIFICATION TEST.

No >> Go To 3

---

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C1452-REAR DIFFERENTIAL POSITION SENSOR PERFORMANCE (CONTINUED)

3. REAR DIFFERENTIAL POSITION SENSOR OPERATION

Turn the ignition off.

Disconnect the Rear Locker Solenoid harness connector.

Ignition on, engine not running.

Using a jumper wire, jumper across from the (T527) Rear Locker Sensor Sense circuit and the (T521) Locker Sensor Supply circuit in the Rear Locker Solenoid harness connector.

While monitoring the sensor state on the DRBIII®, tap the jumper wire on and off the (T527) Rear Locker Sensor Sense circuit terminal. Hold the jumper wire on and off the terminal for a minimum of 3 seconds.

Does the state change on the DRBIII® while tapping the terminal?

Yes >> Replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

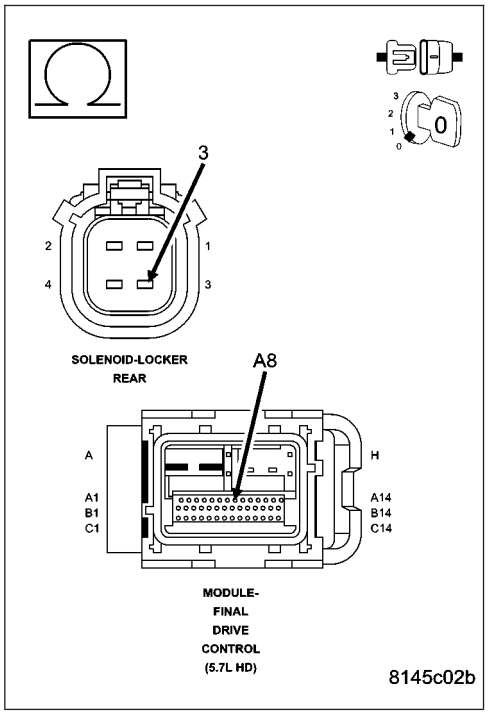
---

4. (T527) REAR LOCKER SENSOR SENSE CIRCUIT OPEN

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T527) Rear Locker Sensor Sense circuit between the Rear Locker Solenoid harness connector and the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Go To 5

No >> Repair the open in the Rear Locker Sensor Sense circuit.
Perform FDCM VERIFICATION TEST.

---

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

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C1452-REAR DIFFERENTIAL POSITION SENSOR PERFORMANCE (CONTINUED)

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

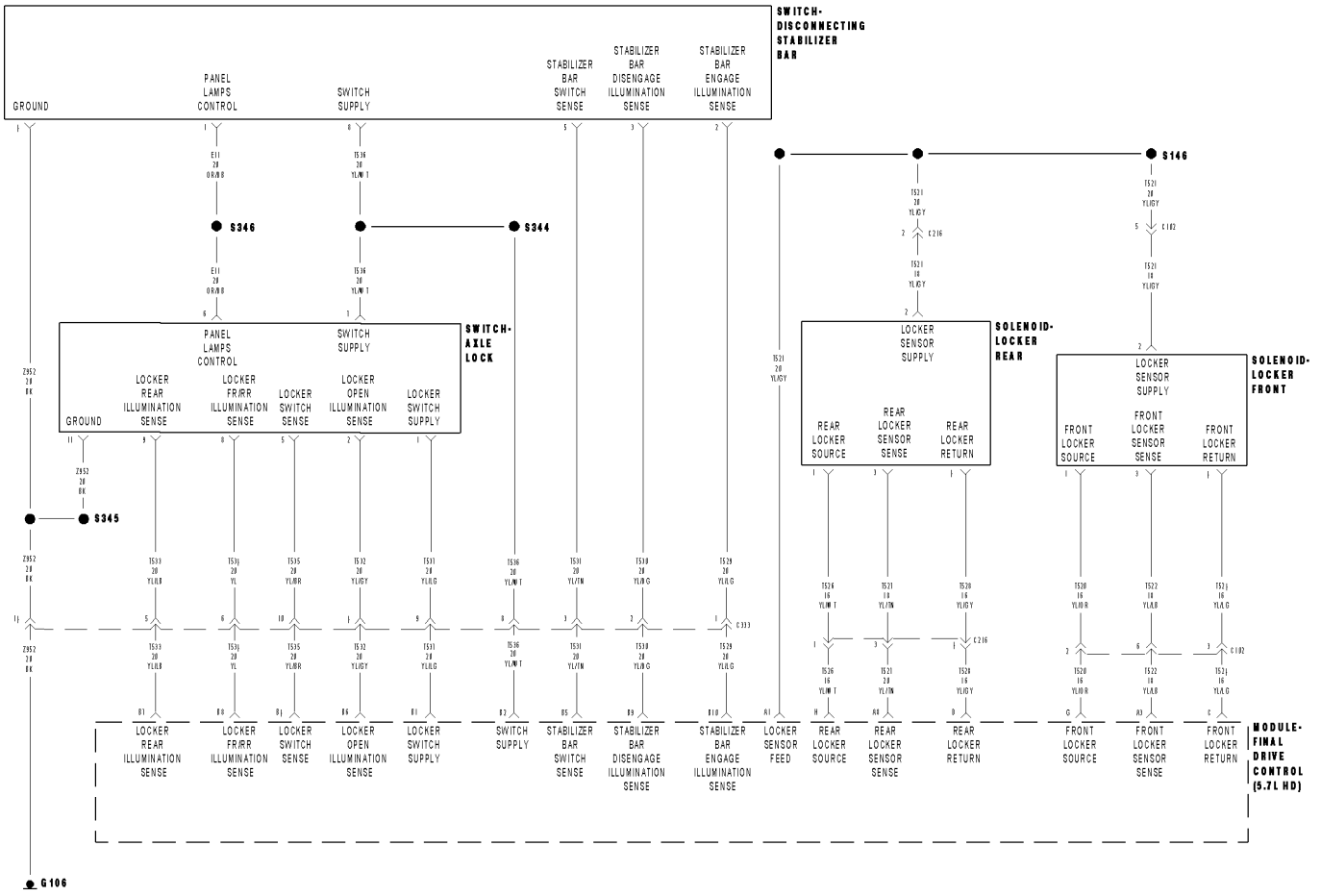
Were there any problems found?

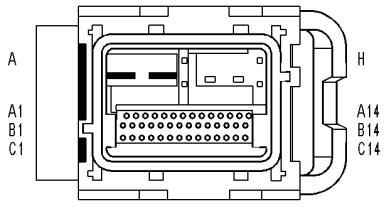
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

No >> Test Complete.

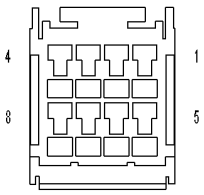
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C1453-REAR DIFFERENTIAL POSITION SENSOR LOW

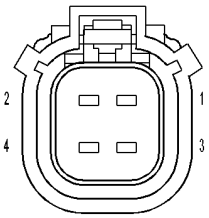




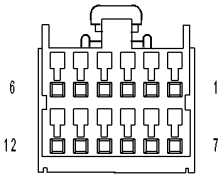
MODULE-FINAL DRIVE CONTROL (5.7L HD)



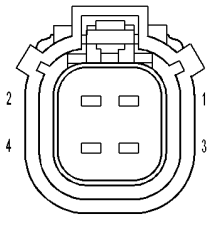
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C1453-REAR DIFFERENTIAL POSITION SENSOR LOW (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The ignition on. Axle Locker Switch in the FR/RR position.
- **Set Condition:**
  The FDCM detects that the Rear Differential Position Sensor is short low.

Possible Causes
FRONT DIFFERENTIAL POSITION SENSOR
(522) FRONT LOCKER SENSOR SENSE SHORTED TO GROUND
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 5

---

2. REAR DIFFERENTIAL POSITION SENSOR OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

Using the DRBIII®, ignition on, monitor the Rear Locker Sensor state.

Disconnect the Rear Locker Solenoid harness connector.

Does the state change on the DRBIII® from Locked to Unlocked?

Yes >> Replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

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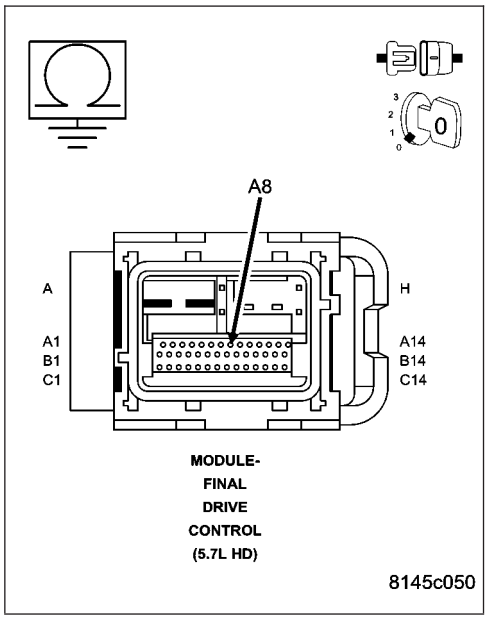
C1453-REAR DIFFERENTIAL POSITION SENSOR LOW (CONTINUED)

3. (T527) REAR LOCKER SENSOR SENSE CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T527) Rear Locker Sensor Sense circuit in the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Repair the short to ground in the Rear Locker Sensor Sense circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

---

4. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

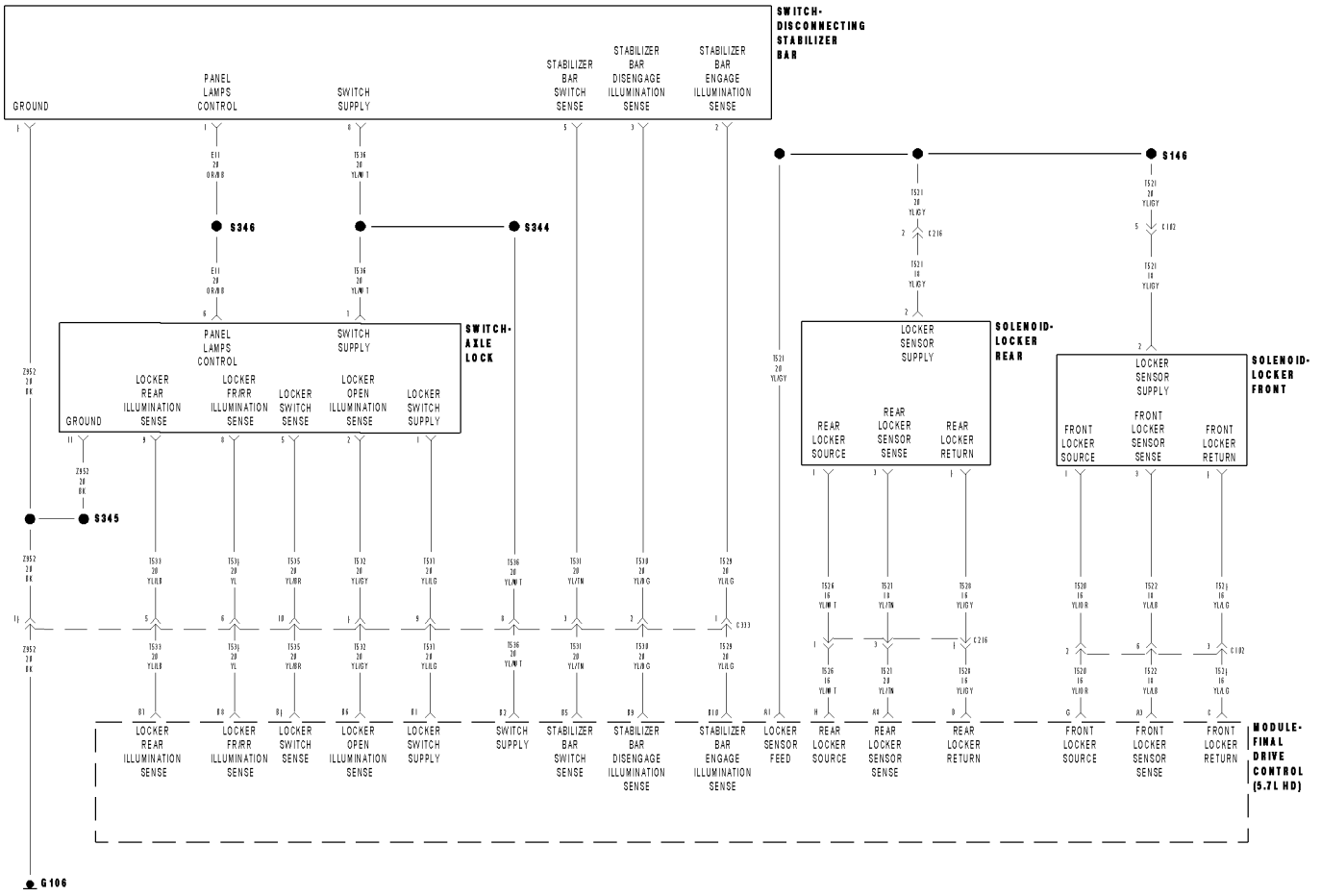
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

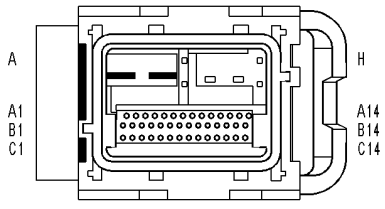
No >> Test Complete.

---

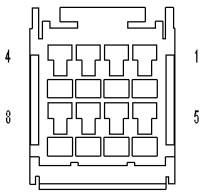
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C1454-REAR DIFFERENTIAL POSITION SENSOR CIRCUIT HIGH

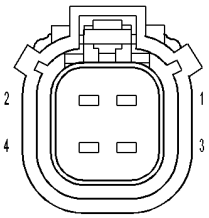




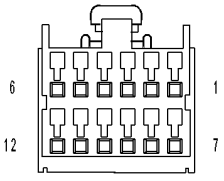
MODULE-FINAL DRIVE CONTROL (5.7L HD)



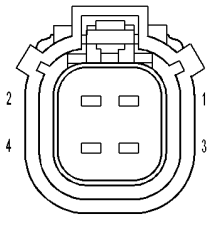
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C1454-REAR DIFFERENTIAL POSITION SENSOR CIRCUIT HIGH (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The ignition on. Axle Locker Switch in the RR or FR/RR position.
- **Set Condition:**
  The FDCM detects that the Rear Differential Position Sensor is shorted to voltage.

Possible Causes
(T527) REAR LOCKER SENSOR SENSE SHORTED TO BATTERY VOLTAGE
REAR DIFFERENTIAL POSITION SENSOR
(T527) REAR LOCKER SENSOR SENSE OPEN
(T527) REAR LOCKER SENSOR SENSE SHORTED TO (T521) LOCKER SENSOR SUPPLY
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Ignition on, engine not running.

With the DRBIII®, read DTCs.

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 7

---

2. (T527) REAR LOCKER SENSOR SENSE SHORTED TO BATTERY VOLTAGE

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

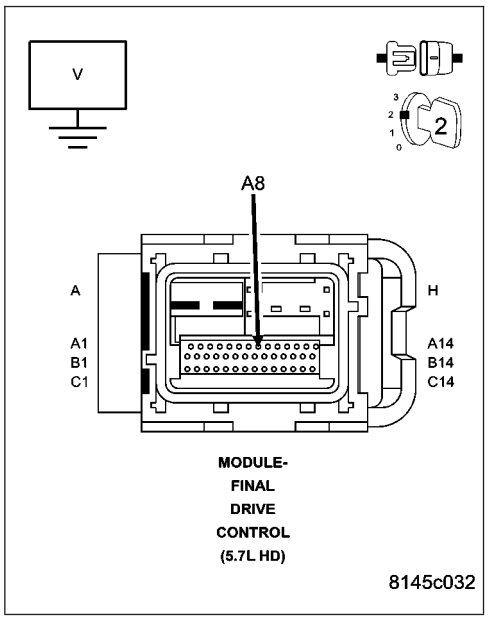
Turn the ignition off.

Disconnect the Rear Locker Solenoid harness connector.

Disconnect the FDCM harness connector.

Turn the ignition on.

Measure the voltage on the (T527) Rear Locker Sensor Sense circuit in the FDCM harness connector.



Does the voltmeter indicate voltage present?

Yes >> Repair the short to voltage in the (T527) Rear Locker Sensor Sense circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

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C1454-REAR DIFFERENTIAL POSITION SENSOR CIRCUIT HIGH (CONTINUED)

3. REAR DIFFERENTIAL POSITION SENSOR OPERATION

Turn the ignition off.

Connect the FDCM harness connector.

Ignition on, engine not running.

Using a jumper wire, jumper across from the (T527) Rear Locker Sensor Sense circuit and the (T521) Locker Sensor Supply circuit in the Rear Locker Solenoid harness connector.

While monitoring the sensor state on the DRBIII®, tap the jumper wire on and off the (T527) Rear Locker Sensor Sense circuit terminal. Hold the jumper wire on and off the terminal for a minimum of 3 seconds.

Does the state change on the DRBIII® while tapping the terminal?

Yes >> Replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

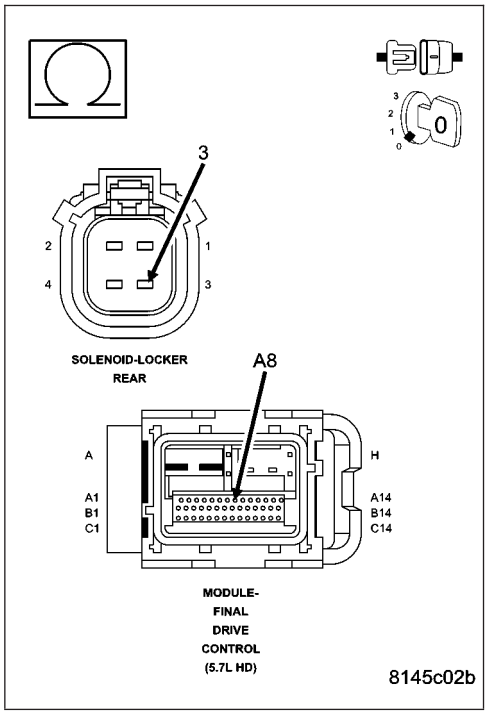
---

4. (T527) REAR LOCKER SENSOR SENSE CIRCUIT OPEN

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T527) Rear Locker Sensor Sense circuit between the Rear Locker Solenoid harness connector and the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Go To 5

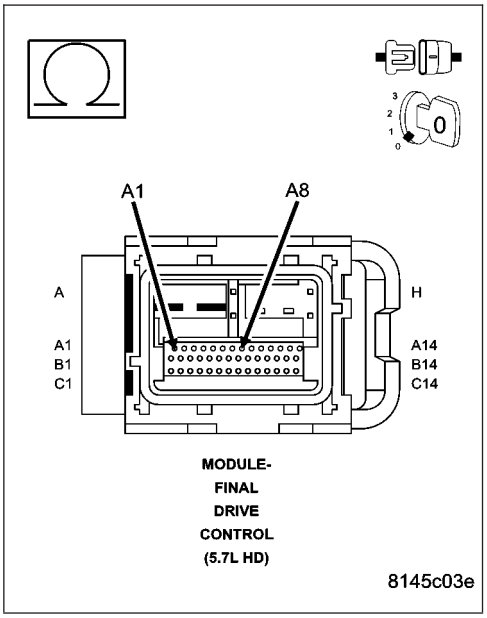
No >> Repair the open in the Rear Locker Sensor Sense circuit.
Perform FDCM VERIFICATION TEST.

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C1454-REAR DIFFERENTIAL POSITION SENSOR CIRCUIT HIGH (CONTINUED)

5. (T527) REAR LOCKER SENSOR SENSE CIRCUIT SHORTED TO (T521) LOCKER SENSOR SUPPLY

Measure the resistance between the (T527) Rear Locker Sensor Sense circuit and the (T521) Locker Sensor Supply circuit in the FDCM harness connector.



Is the resistance below 5.0 ohms?

Yes >> Repair the short between the (T527) Rear Locker Sensor Sense circuit and the Locker Supply Sensor circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 6

---

6. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

7. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

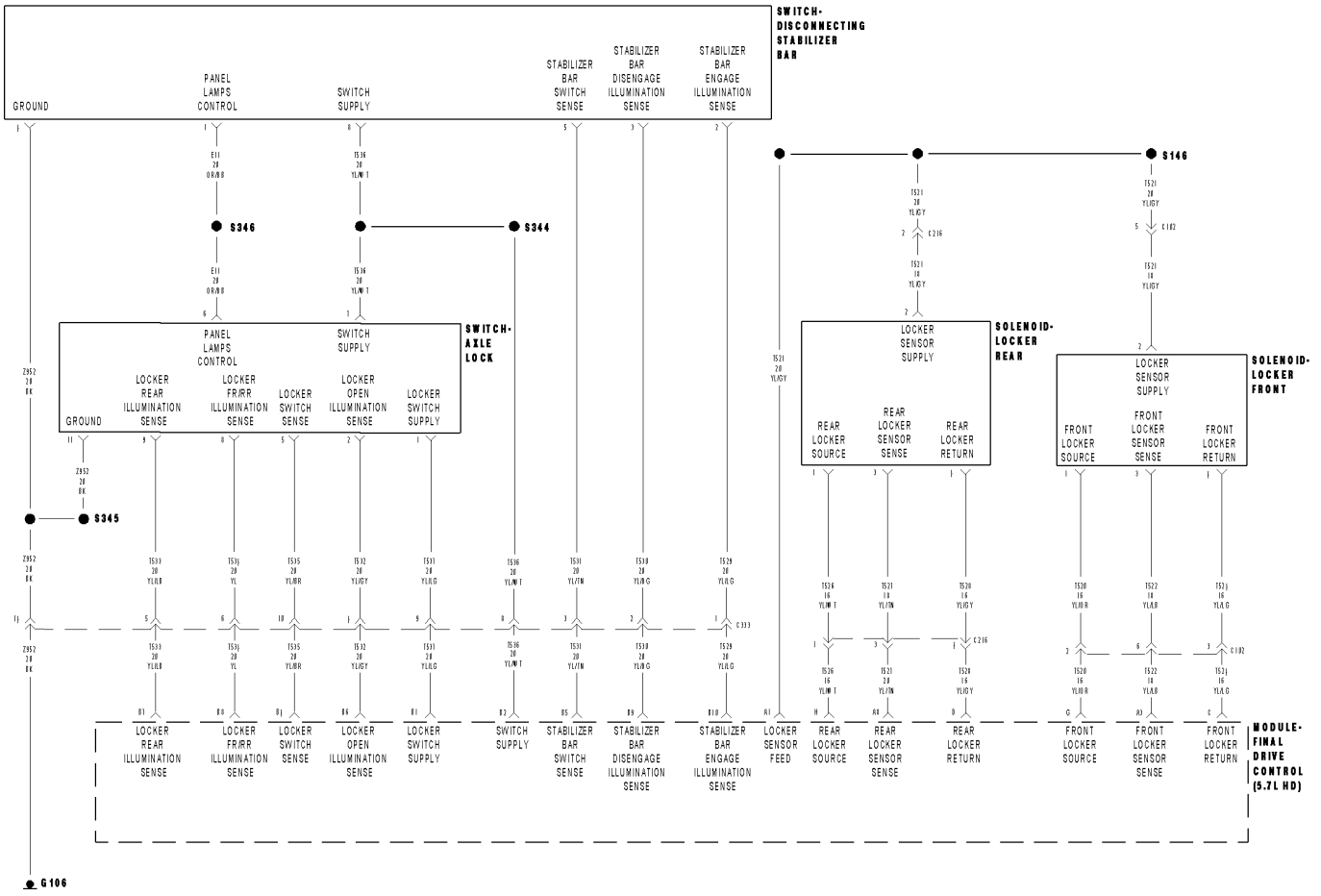
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

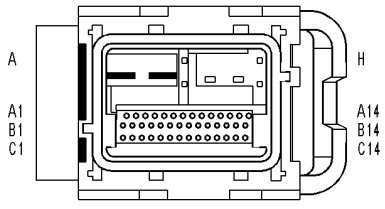
No >> Test Complete.

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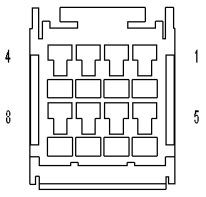
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C2111- DIFFERENTIAL POSITION SENSOR SUPPLY VOLTAGE CIRCUIT LOW

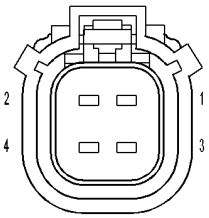




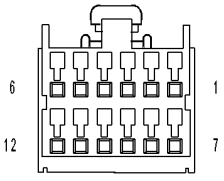
MODULE-FINAL DRIVE CONTROL (5.7L HD)



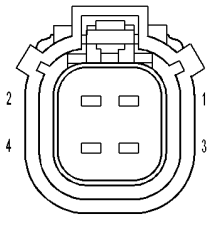
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C2111- DIFFERENTIAL POSITION SENSOR SUPPLY VOLTAGE CIRCUIT LOW (CONTINUED)
For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  The FDCM recognizes the Locker Sensor Supply circuit voltage is too low.

Possible Causes
FRONT DIFFERENTIAL POSITION SENSOR
REAR DIFFERENTIAL POSITION SENSOR
(T521) LOCKER SENSOR SUPPLY CIRCUIT SHORTED TO GROUND
FDCM

Diagnostic Test

1. ACTIVE DTC

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.
Ignition on, engine not running.
With a DRBIII®, read DTCs.

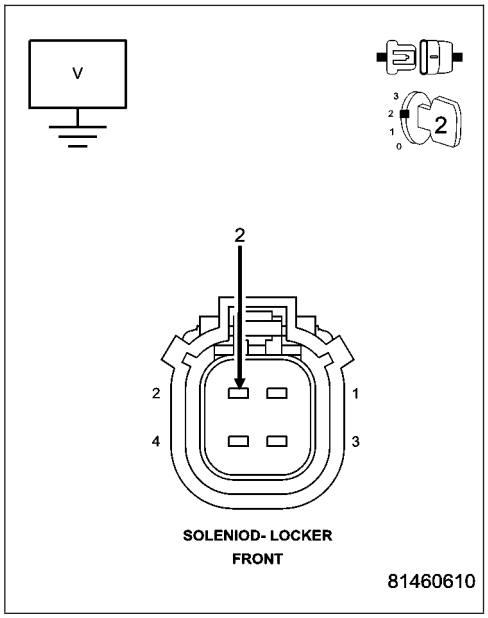
Is the DTC active at this time?

Yes >> Go To 2
No >> Go To 6

---

2. FRONT DIFFERENTIAL POSITION SENSOR

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.
Turn the ignition off.
Disconnect the Front Locker Solenoid harness connector.
Turn the ignition on.
Measure the voltage of the (T521) Locker Sensor Supply circuit in the Front Locker Solenoid harness connector.



Is the voltage between 4.5 and 5.0 volts?

Yes >> Replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.
No >> Go To 3

---

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C2111- DIFFERENTIAL POSITION SENSOR SUPPLY VOLTAGE CIRCUIT LOW (CONTINUED)

3. REAR DIFFERENTIAL POSITION SENSOR

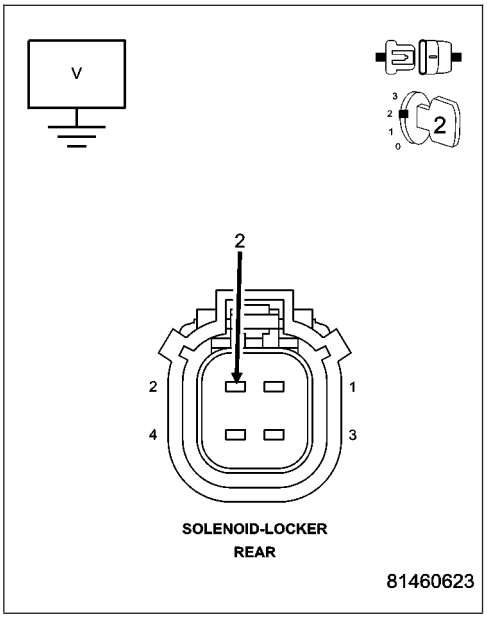
With the voltmeter still connected to the (T521) Locker Sensor Supply circuit in the Front Locker Solenoid harness connector.

While monitoring the voltmeter, disconnect the Rear Locker Solenoid harness connector.

Is the voltage between 4.5 and 5.0 volts?

Yes >> Replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 4



4. (T521) LOCKER SENSOR SUPPLY CIRCUIT SHORTED TO GROUND

Turn the ignition off.

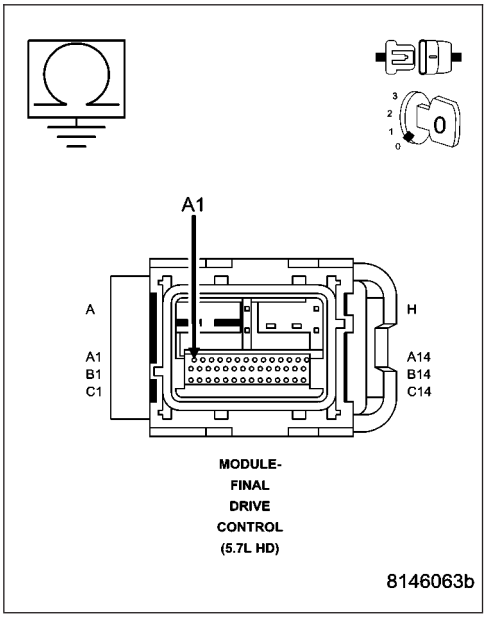
Disconnect the FDCM harness connector.

Measure the resistance of the (T521) Locker Sensor Supply circuit at the FDCM harness connector.

Is the resistance below 100 ohms?

Yes >> Repair the short to ground in the (T521) Locker Sensor Supply circuit shorted to ground.
Perform FDCM VERIFICATION TEST.

No >> Go To 5



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C2111- DIFFERENTIAL POSITION SENSOR SUPPLY VOLTAGE CIRCUIT LOW (CONTINUED)

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

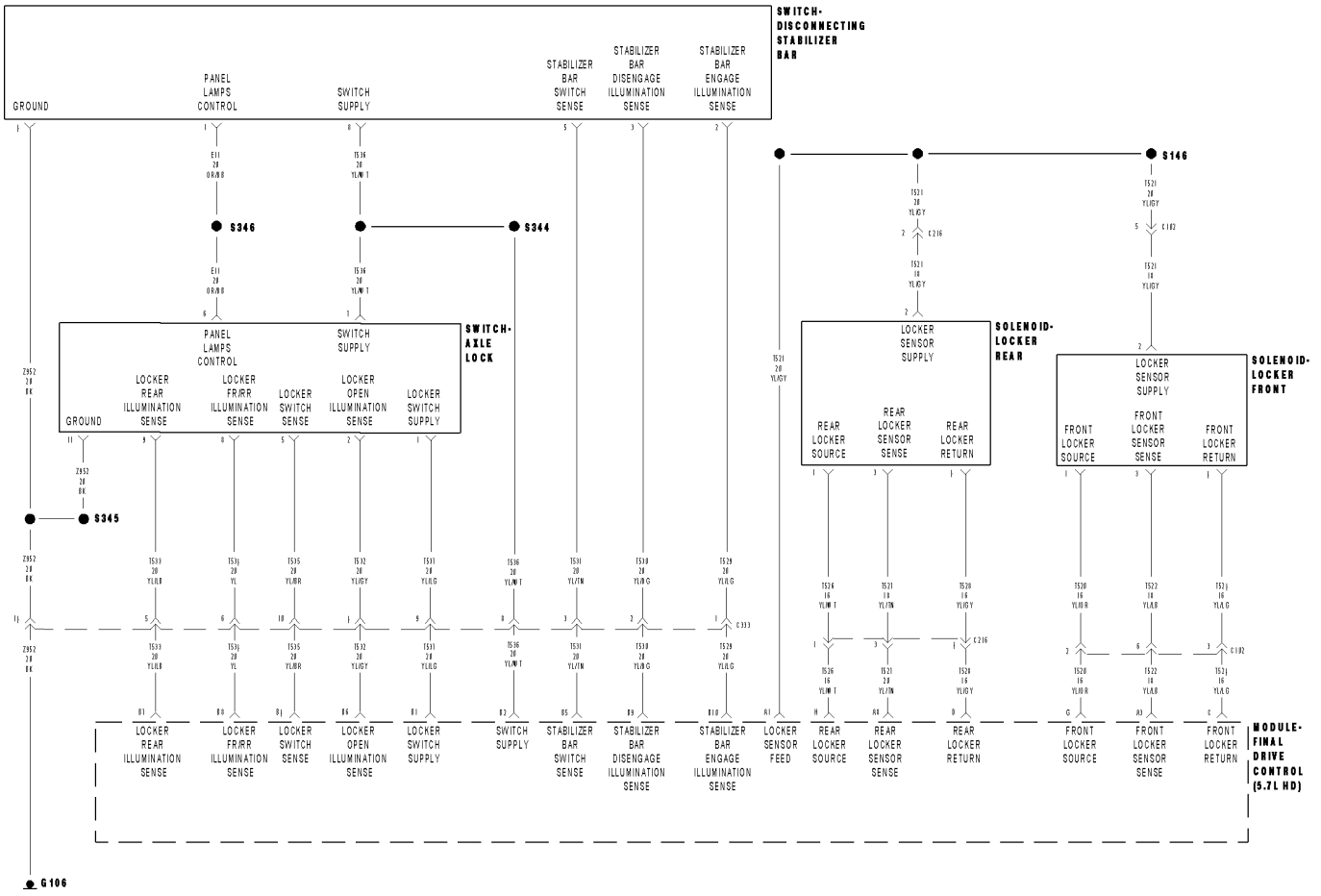
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

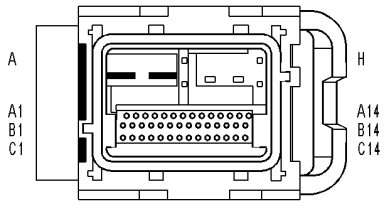
No >> Test Complete.

---

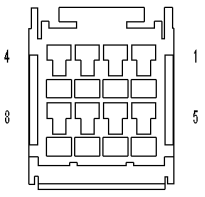
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C2112-DIFFERENTIAL POSITION SENSOR SUPPLY VOLTAGE CIRCUIT HIGH

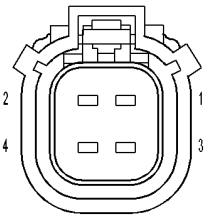




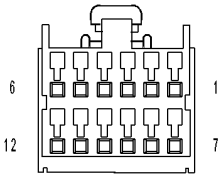
MODULE-FINAL DRIVE CONTROL (5.7L HD)



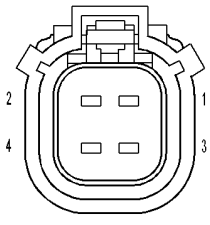
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C2112-DIFFERENTIAL POSITION SENSOR SUPPLY VOLTAGE CIRCUIT HIGH (CONTINUED)
For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  The FDCM recognizes the Locker Sensor Supply circuit voltage is too high.

Possible Causes
FRONT DIFFERENTIAL POSITION SENSOR
REAR DIFFERENTIAL POSITION SENSOR
(T521) LOCKER SENSOR SUPPLY CIRCUIT SHORTED TO VOLTAGE
FDCM

Diagnostic Test

1. ACTIVE DTC

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.
Ignition on, engine not running.
With a DRBIII®, read DTCs.

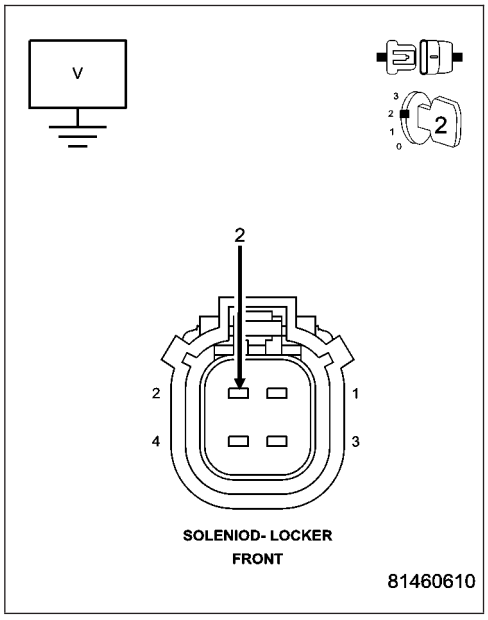
Is the DTC active at this time?

Yes >> Go To 2
No >> Go To 6

---

2. FRONT DIFFERENTIAL POSITION SENSOR

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.
Turn the ignition off.
Disconnect the Front Locker Solenoid harness connector.
Turn the ignition on.
Measure the voltage of the (T521) Locker Sensor Supply circuit in the Front Locker Solenoid harness connector.



Is the voltage above 4.5 volts?

Yes >> Replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.
No >> Go To 3

---

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C2112-DIFFERENTIAL POSITION SENSOR SUPPLY VOLTAGE CIRCUIT HIGH (CONTINUED)

3. REAR DIFFERENTIAL POSITION SENSOR

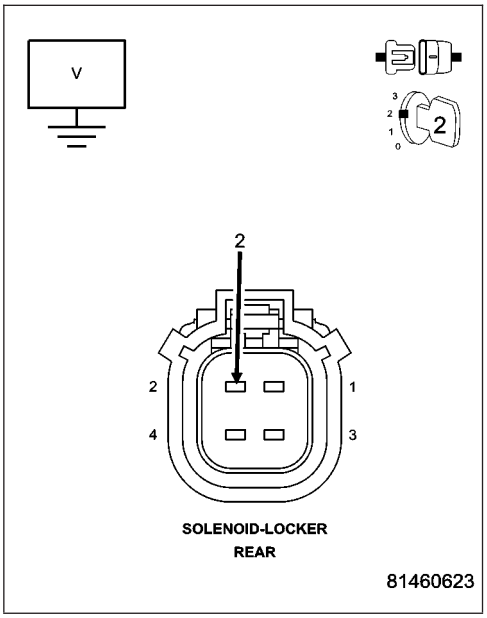
With the voltmeter still connected to the (T521) Locker Sensor Supply circuit in the Front Locker Solenoid harness connector.

While monitoring the voltmeter, disconnect the Rear Locker Solenoid harness connector.

Is the voltage above 4.5 volts?

Yes >> Replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 4



4. (T521) LOCKER SENSOR SUPPLY CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the FDCM harness connector.

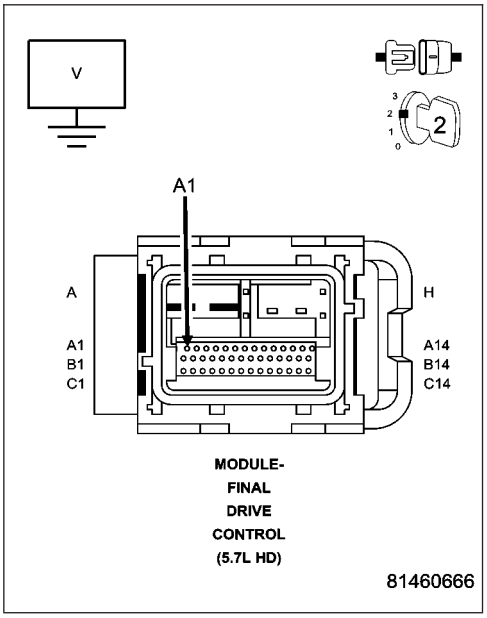
Turn the ignition on.

Measure the voltage of the (T521) Locker Sensor Supply circuit at the FDCM harness connector.

Does the voltameter indicate voltage present?

Yes >> Repair the short to voltage in the (T521) Locker Sensor Supply circuit shorted to ground.
Perform FDCM VERIFICATION TEST.

No >> Go To 5



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C2112-DIFFERENTIAL POSITION SENSOR SUPPLY VOLTAGE CIRCUIT HIGH (CONTINUED)

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

---

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

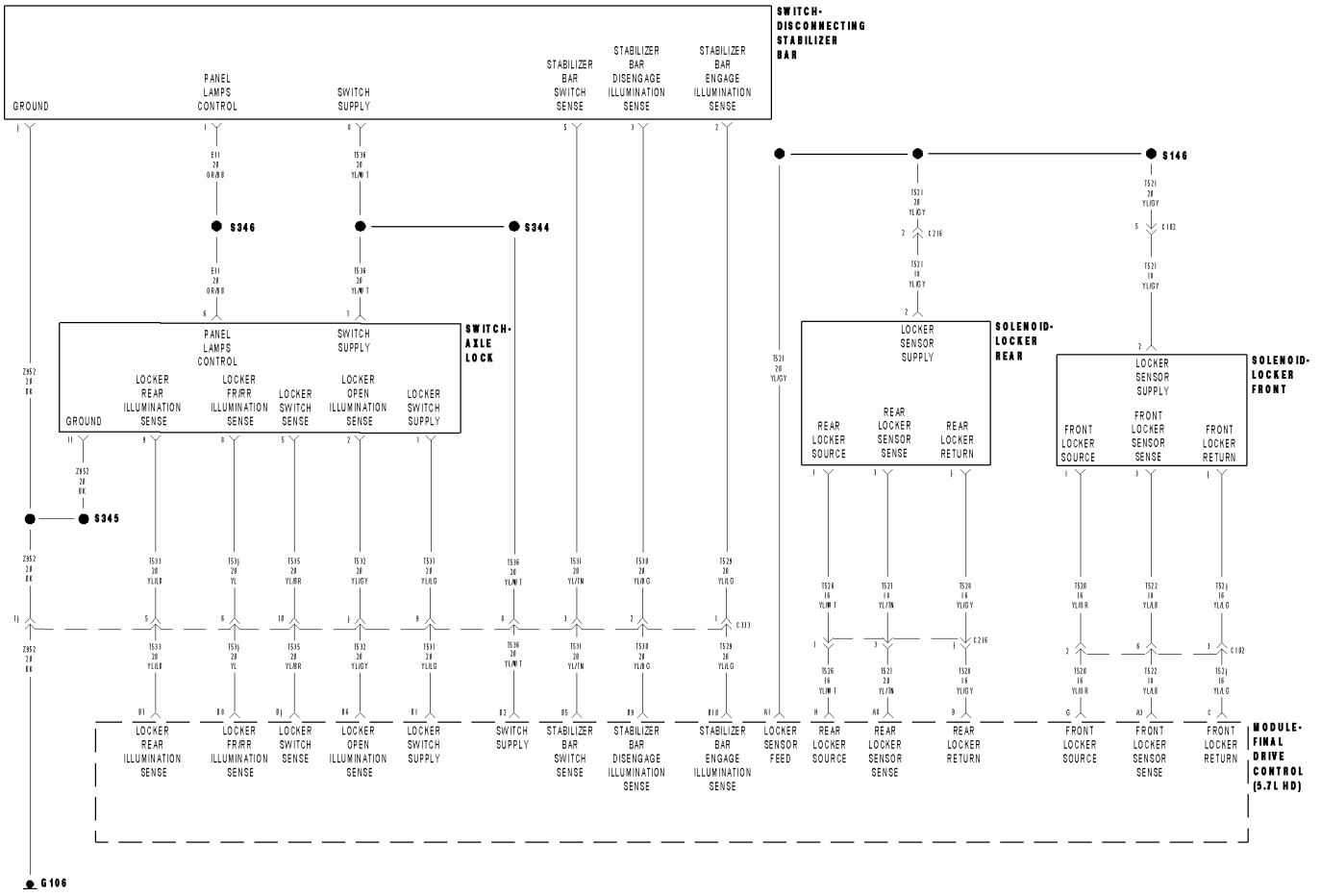
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

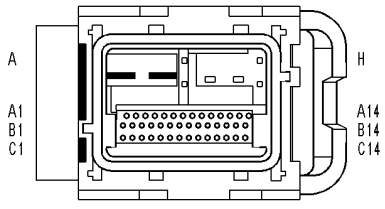
No >> Test Complete.

---

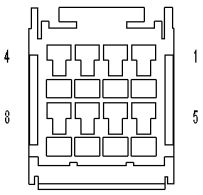
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C230F-LOCKER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT PREFORMANCE

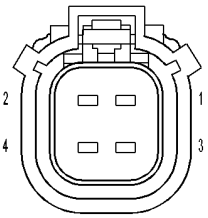




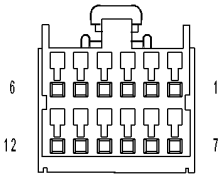
MODULE-FINAL DRIVE CONTROL (5.7L HD)



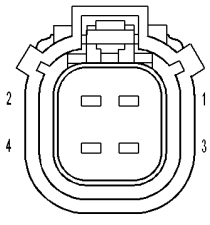
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C230F-LOCKER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT PREFORMANCE (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  The FDCM sense an incorrect voltage on the Switch Supply circuit other than 12 volts.

Possible Causes
DISCONNECTING STABILIZER SWITCH
ALXE LOCKER SWITCH
(T536) SWITCH SUPPLY CIRCUIT OPEN/HIGH RESISTANCE
(T532,T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT OPEN/HIGH RESISTANCE
FDCM

1. DTC ACTIVE

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Turn the ignition on, engine not running

With the DRBIII®, read FDCM DTC(s).

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

---

2. AXLE LOCKER SWITCH OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

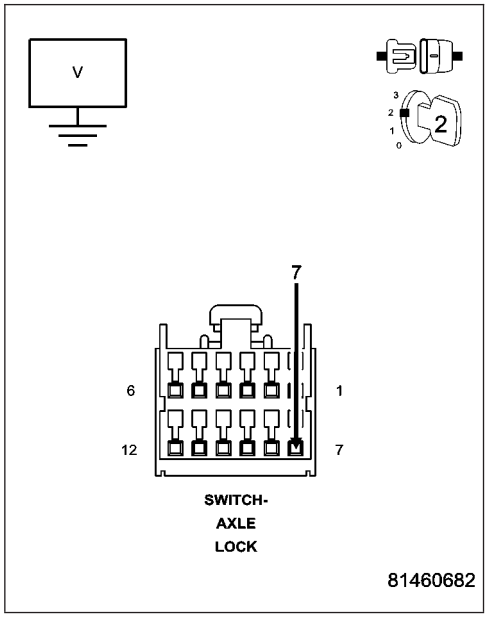
NOTE: If set along with this DTC, diagnose any Stabilizer Select Switch DTC(s) first before continuing.

Turn the ignition off.

Disconnect the Axle Locker Switch harness connector.

Turn the ignition on.

Measure the voltage on the (T536) Switch Supply circuit in the Axle Locker Switch harness connector.



Is the voltage 12 volts?

Yes >> Go To 4

No >> Go To 3

---

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C230F-LOCKER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT PREFORMANCE (CONTINUED)

3. DISCONNECTING STABILIZER SWITCH

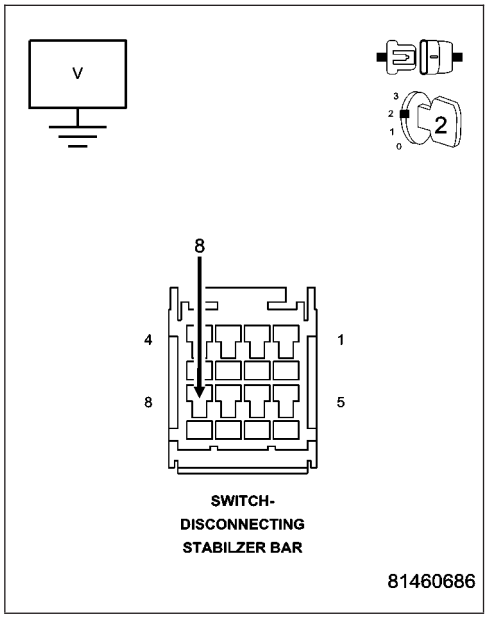
With the voltmeter still on the Switch Supply terminal in the Axle Locker Switch, disconnect the Disconnecting Stabilizer Switch.

Monitor the voltage on the voltmeter.

Is the voltage 12 volts?

Yes >> Replace the Disconnecting Stabilizer Bar Switch
Perform FDCM VERIFICATION TEST.

No >> Repair the open or high resistance in the (T536) Switch Supply circuit.
Perform FDCM VERIFICATION TEST.



---

4. AXLE LOCKER SWITCH

Using a test light connected to battery voltage, probe the (T532) Locker Open Illumination Sense circuit in the Axle Locker Switch harness connector.

With the DRBIII®, select System Test and actuate the Locker Open Illumination LED. Select the blinking option.

NOTE: Repeat the above test for the (T533) Locker Rear Illumination Sense circuit terminal and (T534) Locker FR/RR Illumination Sense circuit one at a time.

Does the test light illuminate and flash on and off at each circuit?

Yes >> Replace the Axle Locker Switch.
Perform FDCM VERIFICATION TEST.

No >> Go to 5

---

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C230F-LOCKER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT PREFORMANCE (CONTINUED)

5. (T532, T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT OPEN/HIGH RESISTANCE

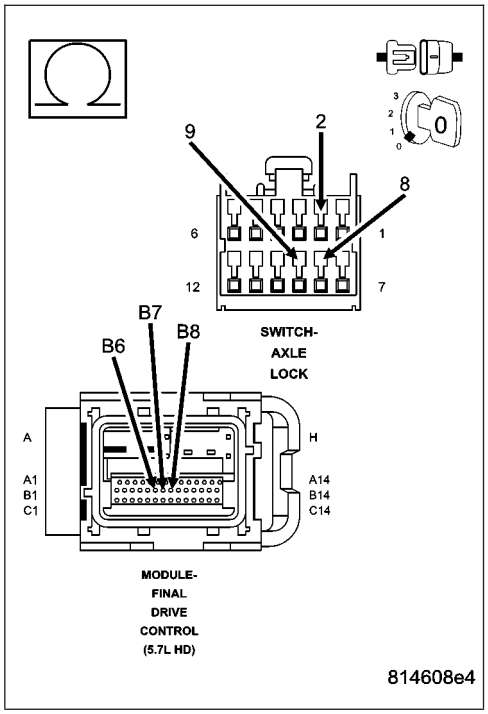
Measure the resistance of each of the following circuits between the FDCM harness connector and the Axle Locker Switch harness connector.

- (T532) Locker Open Illumination Sense circuit
- (T533) Locker Rear Illumination Sense circuit
- (T534) Locker FR/RR Illumination Sense circuit

Does the ohmmeter indicate each measurement below 5.0 ohms?

Yes >> Replace the FDCM in accordance with the Service Information.
Perform FDCM VERIFICATION TEST.

No >> Repair the open or high resistance in the Illumination Sense circuit that indicated the incorrect resistance reading.
Perform FDCM VERIFICATION TEST.



6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

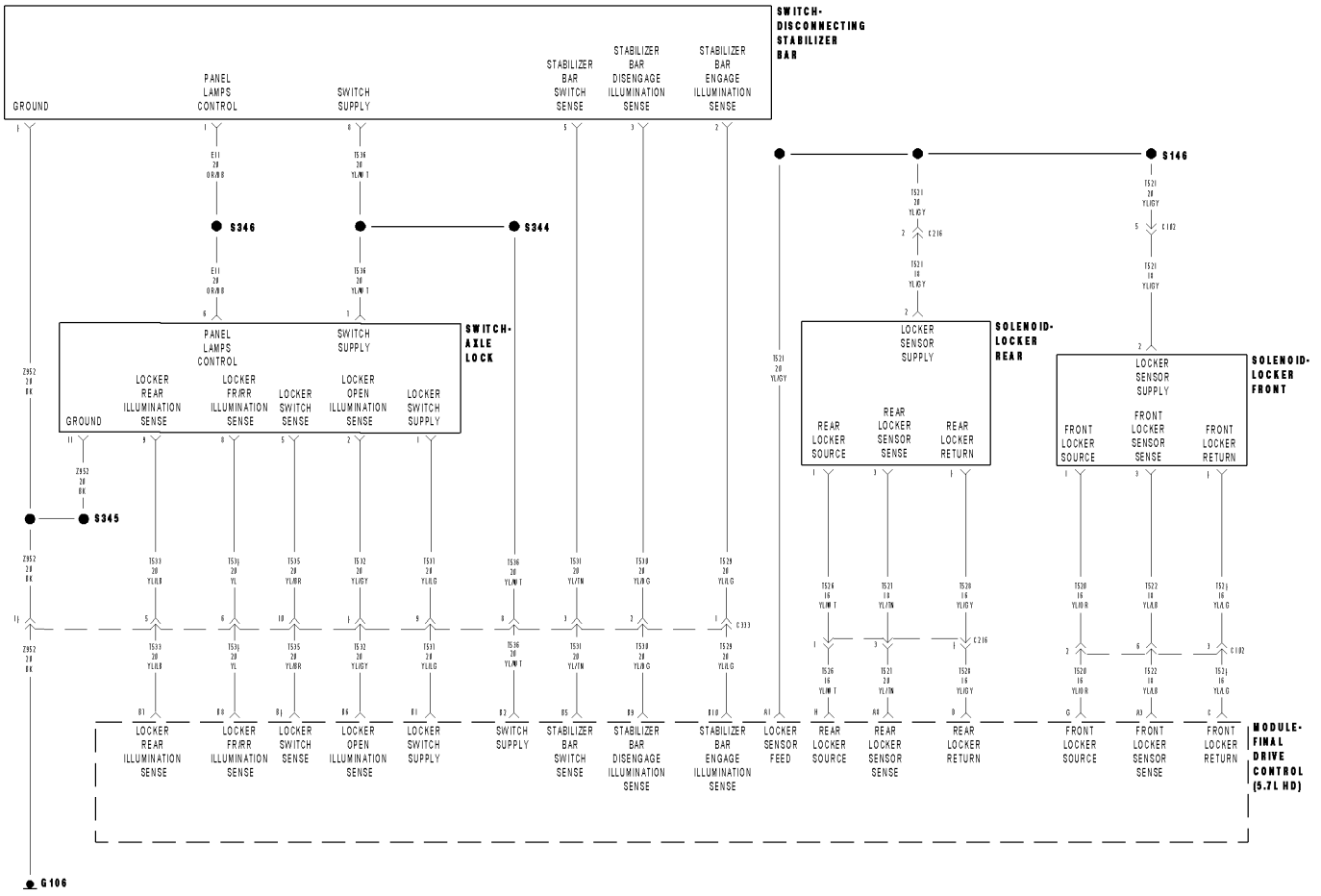
Were there any problems found?

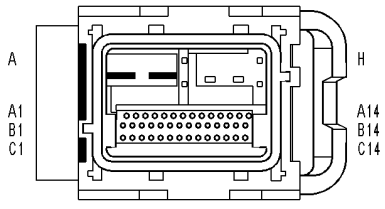
Yes >> Repair as necessary.
Perform TRANSFER CASE VERIFICATION TEST.

No >> Test Complete.

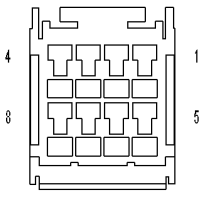
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C2310-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT LOW

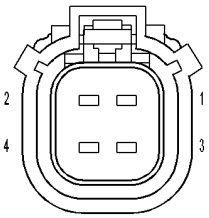




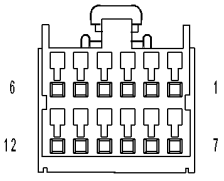
MODULE-FINAL DRIVE CONTROL (5.7L HD)



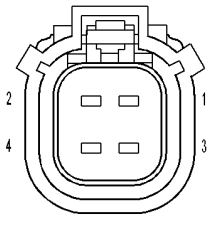
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C2310-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT LOW (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  The FDCM sense an the voltage on the Switch Supply circuit is low.

Possible Causes
DISCONNECTING STABILIZER SWITCH
ALXE LOCKER SWITCH
(T536) SWITCH SUPPLY CIRCUIT SHORTED TO GROUND
(T532,T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT SHORTED TO GROUND
FDCM

1. DTC ACTIVE

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Turn the ignition on, engine not running

With the DRBIII®, read FDCM DTC(s).

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

---

2. AXLE LOCKER SWITCH OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

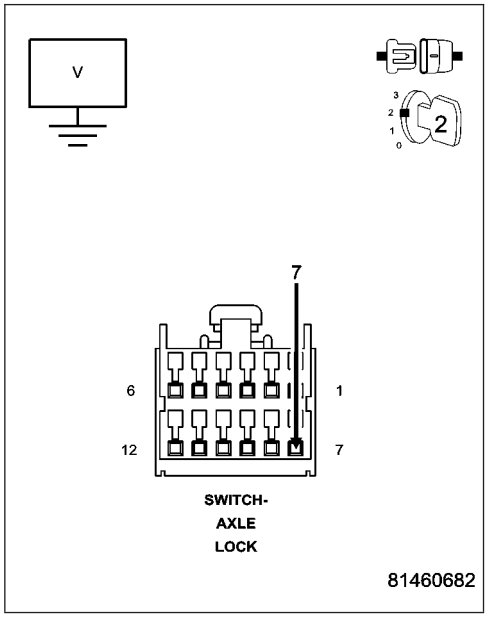
NOTE: If set along with this DTC, diagnostic any Stabilizer Select Switch DTC(s) first before continuing.

Turn the ignition off.

Disconnect the Axle Locker Switch harness connector.

Turn the ignition on.

Measure the voltage on the (T536) Switch Supply circuit in the Axle Locker Switch harness connector.



Is the voltage 12 volts?

Yes >> Go To 4

No >> Go To 3

---

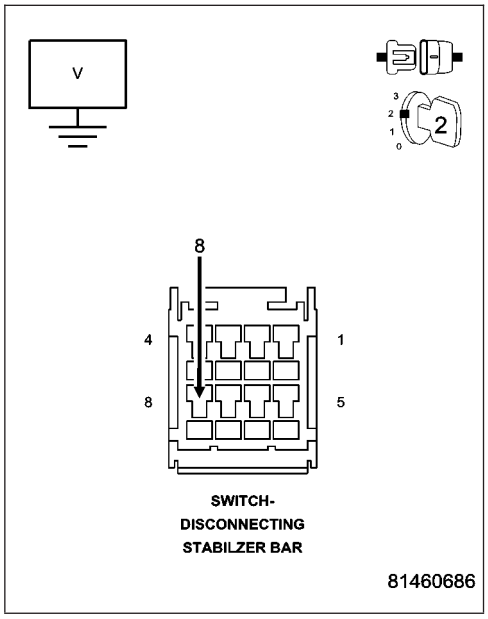
https://truckmanualshub.com/

C2310-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT LOW (CONTINUED)

3. DISCONNECTING STABILIZER SWITCH

With the voltmeter still on the Switch Supply terminal in the Axle Locker Switch, disconnect the Disconnecting Stabilizer Switch.

Monitor the voltage on the voltmeter.



Is the voltage 12 volts?

Yes >> Replace the Disconnecting Stabilizer Bar Switch
Perform FDCM VERIFICATION TEST.

No >> Repair the short to ground in the (T536) Switch Supply circuit.
Perform FDCM VERIFICATION TEST.

---

4. AXLE LOCKER SWITCH

Using a test light connected to battery voltage, probe the (T532) Locker Open Illumination Sense circuit in the Axle Locker Switch harness connector.

With the DRBIII®, select System Test and actuate the Locker Open Illumination LED. Select the blinking option.

NOTE: Repeat the above test for the (T533) Locker Rear Illumination Sense circuit terminal and (T534) Locker FR/RR Illumination Sense circuit one at a time.

Does the test light illuminate and flash on and off at each circuit?

Yes >> Go to 5

No >> Replace the Axle Locker Switch.
Perform FDCM VERIFICATION TEST.

---

5. (T532, T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT SHORTED TO GROUND

Disconnect the Axle Locker Switch harness connector.

Measure the resistance of each of the following circuit at the FDCM harness connector to ground.

- (T532) Locker Open Illumination Sense circuit
- (T533) Locker Rear Illumination Sense circuit
- (T534) Locker FR/RR Illumination Sense circuit

Does the ohmmeter read below 100 ohms for any of the above circuit checks?

Yes >> Repair the short to ground in the Illumination Sense circuit that indicated the resistance reading below 100 ohms.
Perform FDCM VERIFICATION TEST.

No >> Replace the FDCM in accordance with the Service Information.Perform FDCM VERIFICATION TEST.

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C2310-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT LOW (CONTINUED)

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

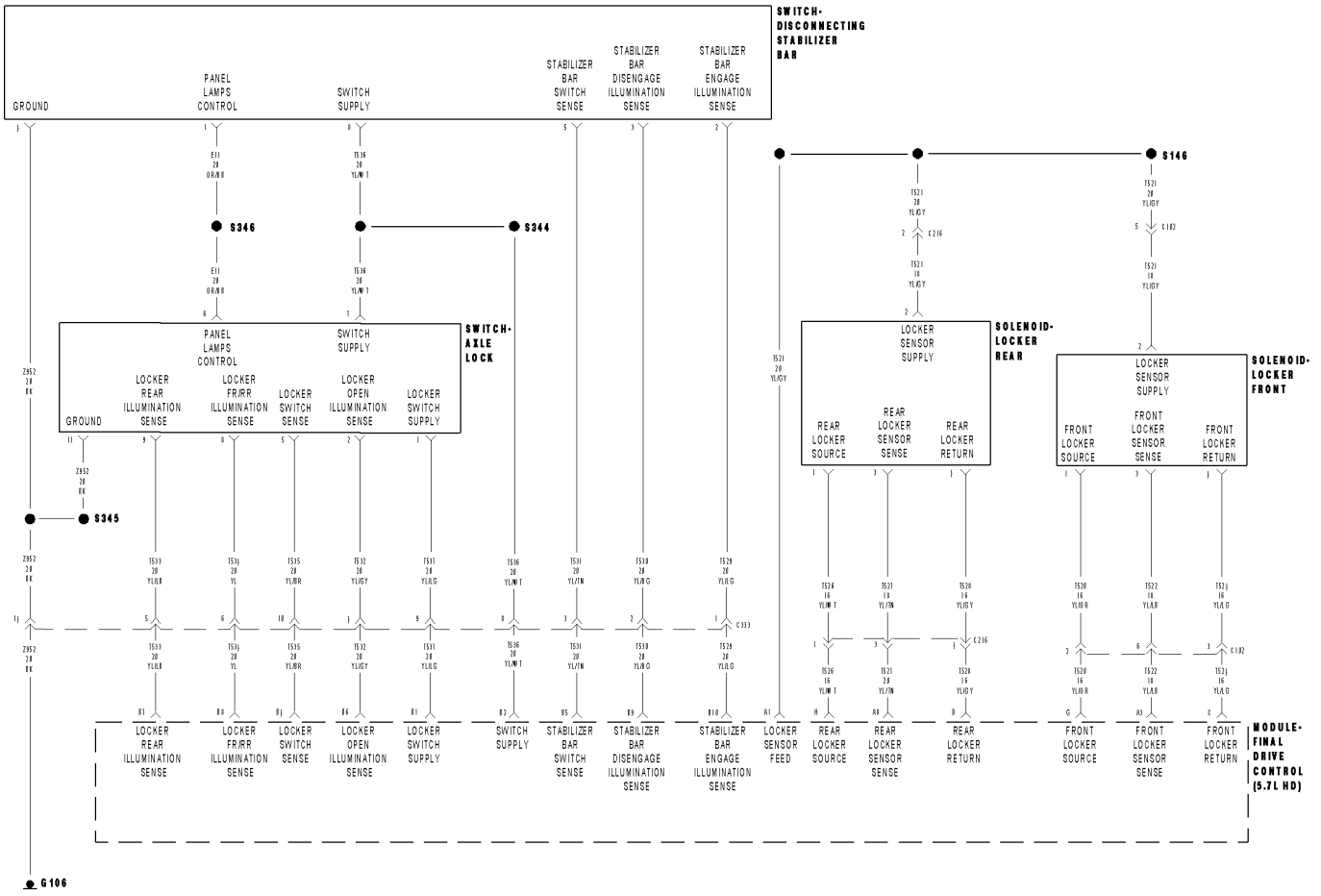
Were there any problems found?

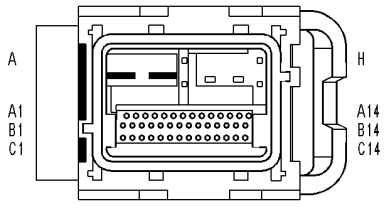
Yes >> Repair as necessary.
Perform TRANSFER CASE VERIFICATION TEST.

No >> Test Complete.

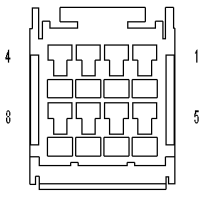
https://truckmanualshub.com/

C2311-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT HIGH

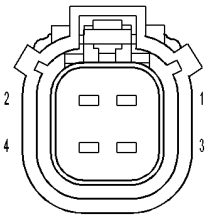




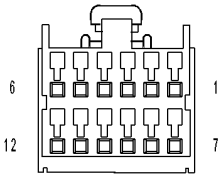
MODULE-FINAL DRIVE CONTROL (5.7L HD)



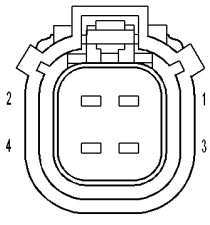
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C2311-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT HIGH (CONTINUED)
For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  The FDCM sense an the voltage on the Switch Supply circuit is high.

Possible Causes
DISCONNECTING STABILIZER SWITCH
ALXE LOCKER SWITCH
(T536) SWITCH SUPPLY CIRCUIT SHORTED TO VOLTAGE
T536) SWITCH SUPPLY CIRCUIT OPEN
(T532,T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT SHORTED TO VOLTAGE
(T532,T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT OPEN
FDCM

1. DTC ACTIVE

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

NOTE: If set along with this DTC, diagnose any Stabilizer Select Switch DTC(s) first before continuing.
Turn the ignition on, engine not running
With the DRBIII®, read FDCM DTC(s).

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 9

---

2. AXLE LOCKER SWITCH

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.
Turn the ignition off.
Disconnect the Axle Locker Switch harness connector.
Turn the ignition on.
Using a test light connected to battery voltage, probe the (T532) Locker Open Illumination Sense circuit in the Axle Locker Switch harness connector.
With the DRBIII®, select System Test and actuate the Locker Open Illumination LED. Select the blinking option.

NOTE: Repeat the above test for the (T533) Locker Rear Illumination Sense circuit and (T534) Locker FR/RR Illumination Sense circuit one at a time.

Does the test light illuminate and flash on and off at each circuit?

Yes >> Replace the Axle Locker Switch.
Perform FDCM VERIFICATION TEST.

No >> Go to 3

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C2311-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT HIGH (CONTINUED)

3. (T536) SWITCH SUPPLY CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Axle Locker Switch harness connector.

Disconnect the Disconnecting Stabilizer Bar Switch harness connector

Disconnect the FDCM harness connector.

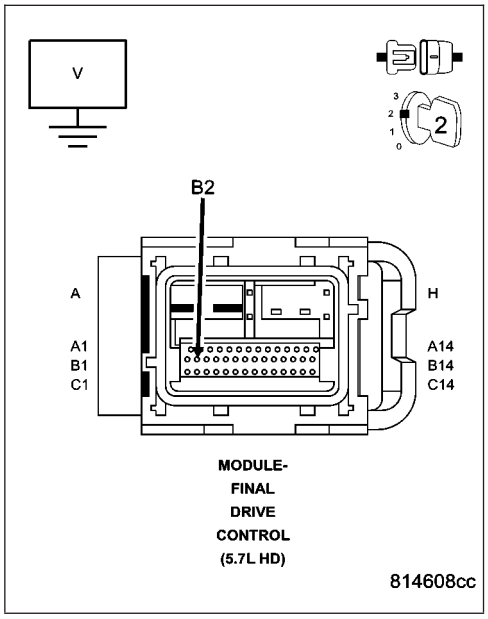
Turn the ignition on.

Measure the voltage on the (T536) Switch Supply circuit in the Axle Locker Switch harness connector.

Does the voltmeter indicate voltage present?

Yes >> Repair the short to voltage in the Switch Supply circuit.

No >> Go To 4



4. (t536) SWITCH SUPPLY CIRCUIT OPEN FROM THE AXLE LOCKER SWITCH AND THE FDCM

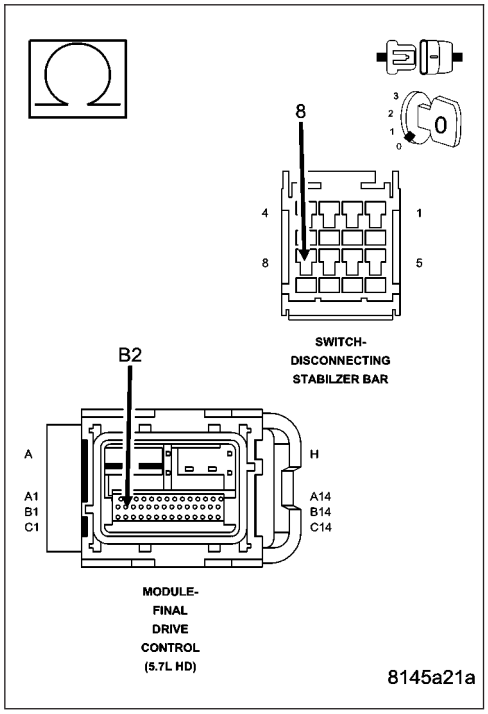
Turn the ignition off.

Measure the resistance of the (T536) Switch Supply circuit between the Axle Locker Switch harness connector and the FDCM harness connector.

Is the resistance below 5.0 ohms?

Yes >> Go to 5

No >> Repair the open in the Switch Supply circuit.
Perform FDCM VERIFICATION TEST.



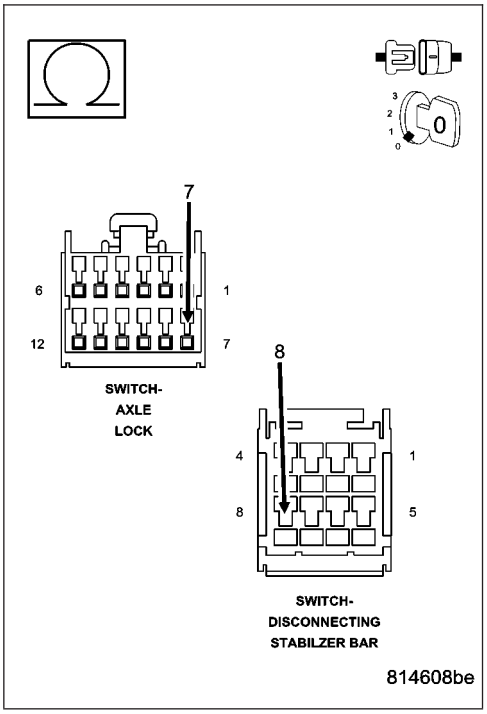
https://truckmanualshub.com/

C2311-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT HIGH (CONTINUED)

5. (T536) SWITCH SUPPLY CIRCUIT OPEN FROM THE AXLE LOCKER SWITCH AND THE DISCONNECTING STABILIZER BAR SWITCH

Turn the ignition off.

Measure the resistance of the (T536) Switch Supply circuit between the Axle Locker Switch harness connector and the Disconnecting Stabilizer Bar Switch harness connector.



Is the resistance below 5.0 ohms?

Yes >> Go to 6

No >> Repair the open in the Switch Supply circuit. Perform FDCM VERIFICATION TEST.

6. DISCONNECTING STABILIZER BAR SWITCH

Turn the ignition off.

Connect the Axle Locker Switch harness connector.

Connect the Disconnecting Stabilizer Bar Switch harness connector

Turn the ignition on.

Measure the voltage on the (T536) Switch Supply circuit in the FDCM harness connector.

Does the voltmeter indicate voltage present?

Yes >> Replace the Disconnecting Stabilizer Bar Switch.

No >> Go To 7

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C2311-STABILIZER/DIFFERENTIAL INDICATOR SUPPLY CIRCUIT HIGH (CONTINUED)

7. (T532, T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT SHORTED TO VOLTAGE

Disconnect the Axle Locker Switch harness connector.

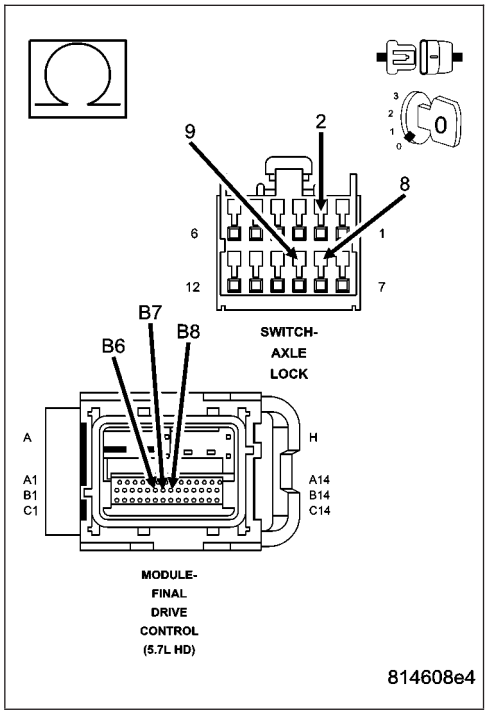
Measure the voltage at each of the following circuit at the FDCM harness connector.

- (T532) Locker Open Illumination Sense circuit
- (T533) Locker Rear Illumination Sense circuit
- (T534) Locker FR/RR Illumination Sense circuit

Does the voltmeter indicate voltage present for any of the above circuit?

Yes >> Repair the Locker Illumination Sense circuit that indicated a short to voltage.

No >> Go To 8
Perform FDCM VERIFICATION TEST.



8. (T532, T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT OPEN

Measure the resistance of each of the following circuits between the FDCM harness connector and the Axle Locker Switch harness connector.

- (T532) Locker Open Illumination Sense circuit
- (T533) Locker Rear Illumination Sense circuit
- (T534) Locker FR/RR Illumination Sense circuit

Does the ohmmeter indicate each measurement below 5.0 ohms?

Yes >> Replace the FDCM in accordance with the Service Information.
Perform FDCM VERIFICATION TEST.

No >> Repair the Locker Illumination Sense circuit that indicated an open circuit.
Perform FDCM VERIFICATION TEST.

9. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

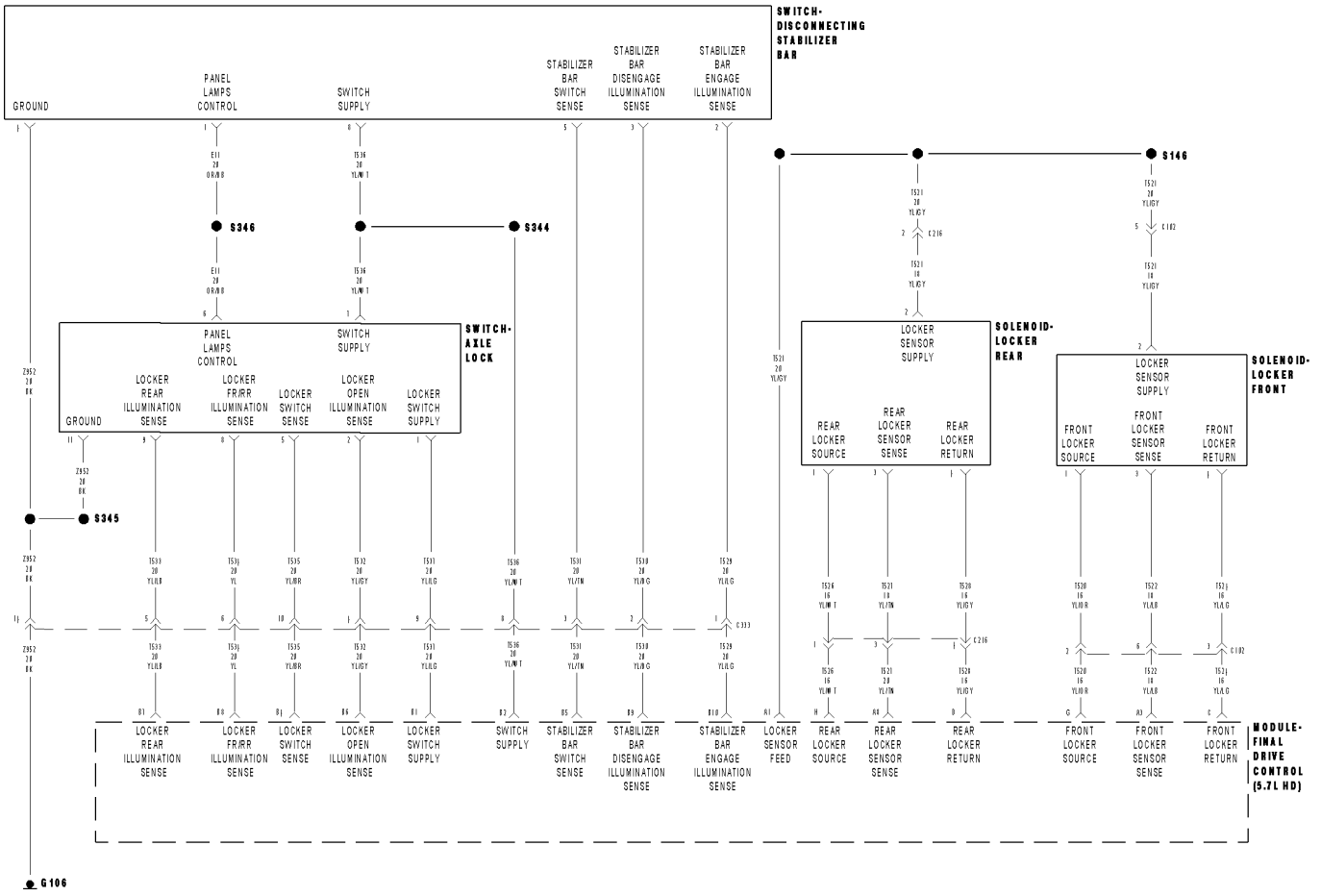
Were there any problems found?

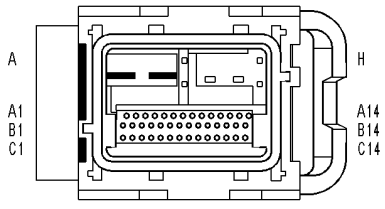
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST.

No >> Test Complete.

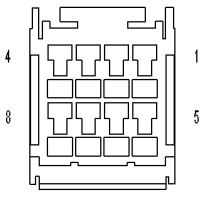
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C2314-DIFFERENTIAL INDICATOR CONTROL CIRCUIT

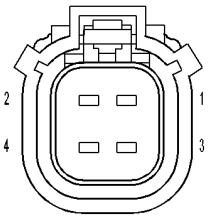




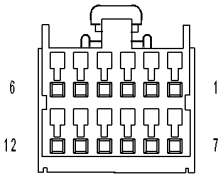
MODULE-FINAL DRIVE CONTROL (5.7L HD)



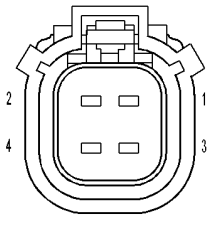
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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C2314-DIFFERENTIAL INDICATOR CONTROL CIRCUIT (CONTINUED)

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Ignition on.
- **Set Condition:**
  The FDCM senses a failure in the Alxe Locker Switch system.

Possible Causes
DISCONNECTING STABILIZER SWITCH
ALXE LOCKER SWITCH
(T536) SWITCH SUPPLY CIRCUIT OPEN/HIGH RESISTANCE
(T532,T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT OPEN/HIGH RESISTANCE
FDCM

1. DTC ACTIVE

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

Turn the ignition on, engine not running

With the DRBIII®, read FDCM DTC(s).

Is the DTC active at this time?

Yes >> Go To 2

No >> Go To 6

2. AXLE LOCKER SWITCH OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.

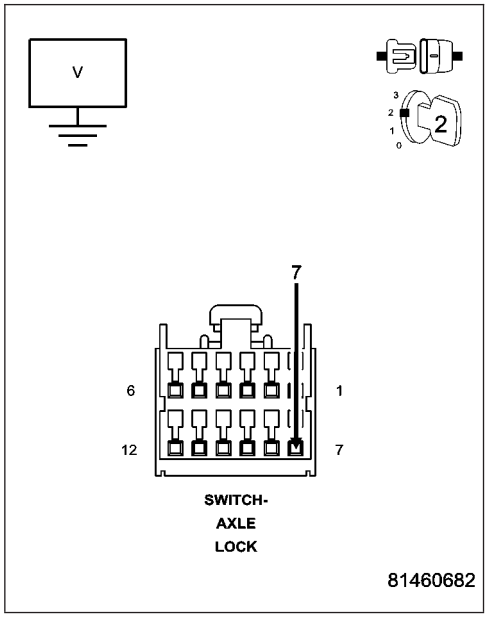
NOTE: If set along with this DTC, diagnose any Stabilizer Select Switch DTC(s) first before continuing.

Turn the ignition off.

Disconnect the Axle Locker Switch harness connector.

Turn the ignition on.

Measure the voltage on the (T536) Switch Supply circuit in the Axle Locker Switch harness connector.



Is the voltage 12 volts?

Yes >> Go To 4

No >> Go To 3

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C2314-DIFFERENTIAL INDICATOR CONTROL CIRCUIT (CONTINUED)

3. DISCONNECTING STABILIZER SWITCH

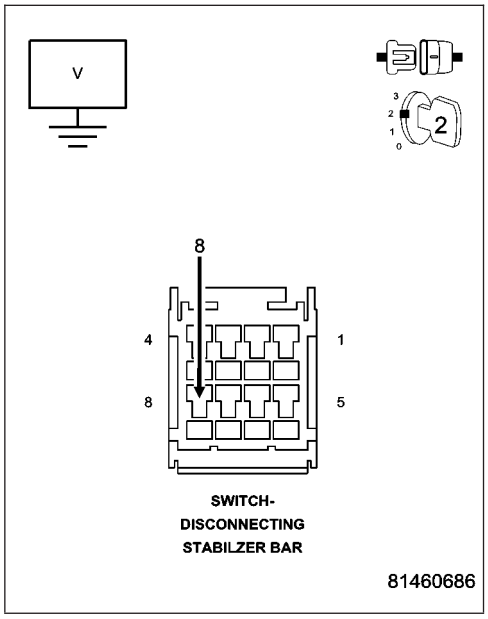
With the voltmeter still on the Switch Supply terminal in the Axle Locker Switch, disconnect the Disconnecting Stabilizer Switch.

Monitor the voltage on the voltmeter.

Is the voltage 12 volts?

Yes >> Replace the Disconnecting Stabilizer Bar Switch
Perform FDCM VERIFICATION TEST.

No >> Repair the open or high resistance in the (T536) Switch Supply circuit.
Perform FDCM VERIFICATION TEST.



4. AXLE LOCKER SWITCH

Using a test light connected to battery voltage, probe the (T532) Locker Open Illumination Sense circuit in the Axle Locker Switch harness connector.

With the DRBIII®, select System Test and actuate the Locker Open Illumination LED. Select the blinking option.

NOTE: Repeat the above test for the (T533) Locker Rear Illumination Sense circuit terminal and (T534) Locker FR/RR Illumination Sense circuit one at a time.

Does the test light illuminate and flash on and off at each circuit?

Yes >> Replace the Axle Locker Switch.
Perform FDCM VERIFICATION TEST.

No >> Go to 5

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C2314-DIFFERENTIAL INDICATOR CONTROL CIRCUIT (CONTINUED)

5. (T532, T533 or T534) LOCKER ILLUMINATION SENSE CIRCUIT OPEN/HIGH RESISTANCE

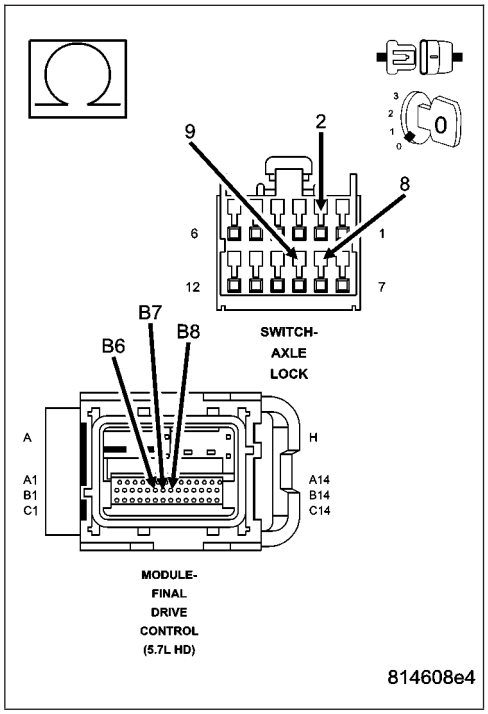
Measure the resistance of each of the following circuits between the FDCM harness connector and the Axle Locker Switch harness connector.

- (T532) Locker Open Illumination Sense circuit
- (T533) Locker Rear Illumination Sense circuit
- (T534) Locker FR/RR Illumination Sense circuit

Does the ohmmeter indicate each measurement below 5.0 ohms?

Yes >> Replace the FDCM in accordance with the Service Information.
Perform FDCM VERIFICATION TEST.

No >> Repair the open or high resistance in the Illumination Sense circuit that indicated the incorrect resistance reading.
Perform FDCM VERIFICATION TEST.



6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the DRBIII®, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

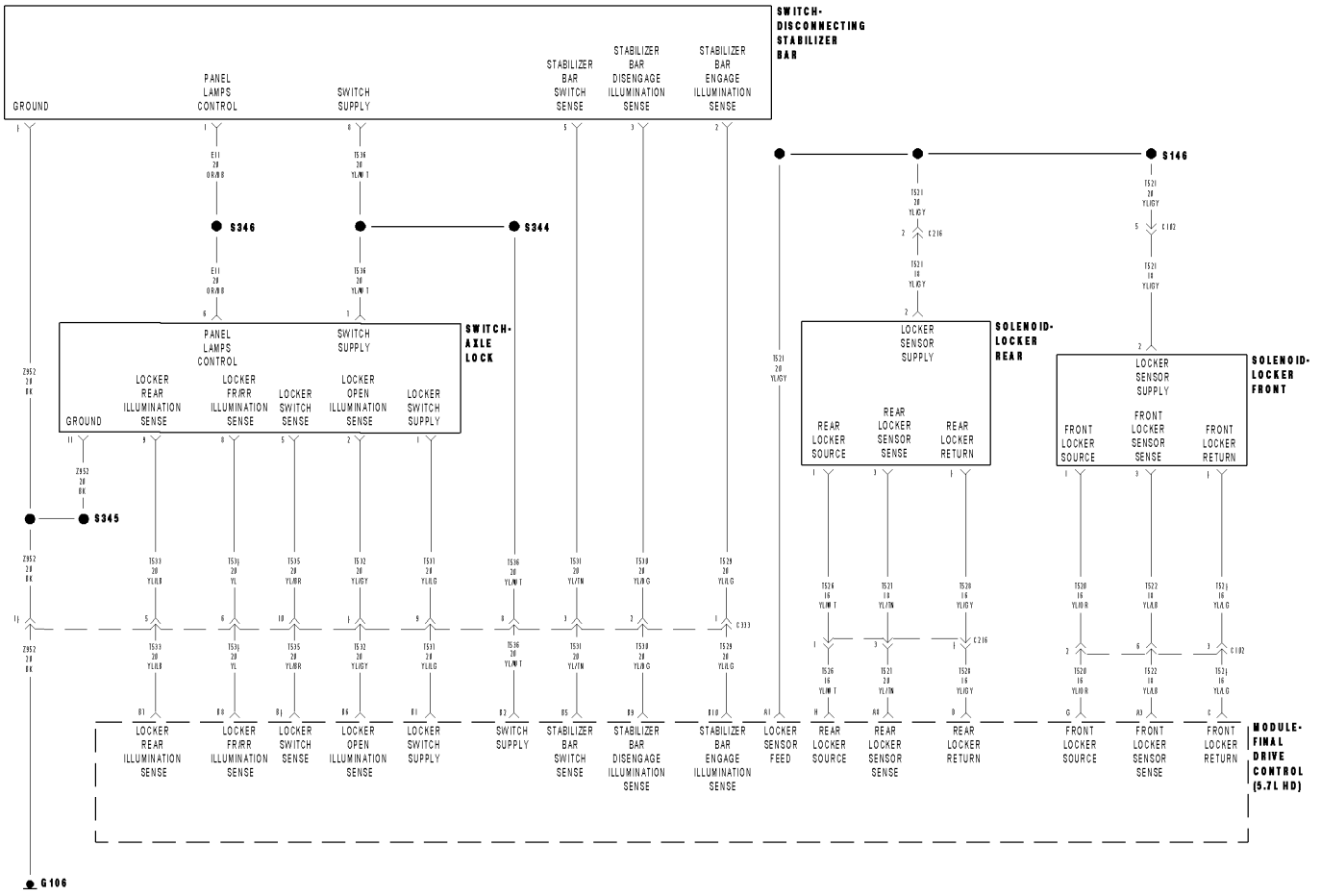
Were there any problems found?

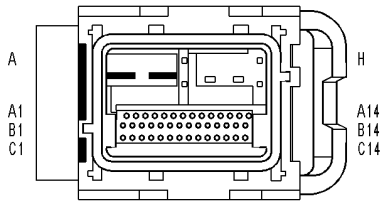
Yes >> Repair as necessary.
Perform TRANSFER CASE VERIFICATION TEST.

No >> Test Complete.

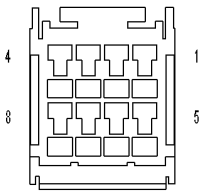
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CHECKING FRONT LOCKER SOLENOID OPERATION

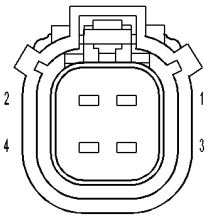




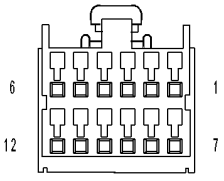
MODULE-FINAL DRIVE CONTROL (5.7L HD)



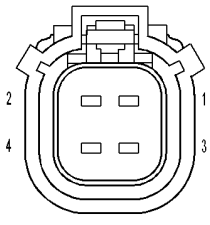
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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CHECKING FRONT LOCKER SOLENOID OPERATION (CONTINUED)
For a complete wiring diagram **Refer to Section 8W**.

Possible Causes
FRONT LOCKER SOLENOID
(T520) FRONT LOCKER SOURCE CIRCUIT SHORTED TO GROUND
(T520) FRONT LOCKER SOURCE CIRCUIT SHORTED TO FRONT LOCKER RETURN CIRCUIT
FDCM

Diagnostic Test

1. AXLE OPERATION

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.
Turn the ignition off.
Secure the vehicle by blocking the rear wheels from the front and back.
Lift one front wheel off the ground.
Turn the ignition on.
Place the vehicle in the drive/first gear and transfer case in LOW LOCK.
With the scan tool, actuate the Front Locker Solenoid.
Manually rotate the wheel that is off the ground. The wheel should lock once the dog clutch is aligned.
Stop the actuation of the Front Locker Solenoid.
Manually rotate the wheel that is off the ground. The wheel should turn.

Does the Front Axle operate as described above?

Yes >> Front Locker Solenoid is operating normally. Test complete.

No >> Go To 2

---

2. FRONT LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.
Turn the ignition off.
Disconnect the Front Locker Solenoid harness connector.
Ignition on, engine not running.
Using a 12-volt test light, jump across from the (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit in the Front Locker harness connector.
With the DRBIII®, actuate the Front Locker Solenoid.

Does the test light illuminate and flash on and off?

Yes >> Inspect the Front Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Front Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

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CHECKING FRONT LOCKER SOLENOID OPERATION (CONTINUED)

3. (T520) FRONT LOCKER SOURCE CIRCUIT SHORTED TO GROUND

Turn the ignition off.

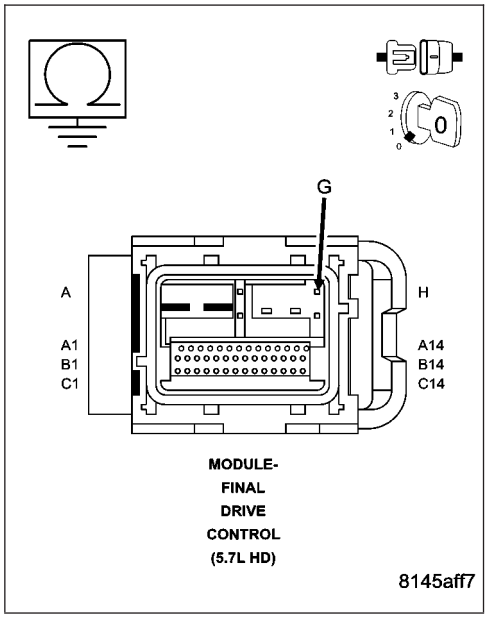
Disconnect the FDCM harness connector.

Measure the resistance of the (T520) Front Locker Source circuit at the FDCM harness connector.

Is the resistance below 100 ohms?

Yes >> Repair the short to ground in the Front Locker Source circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4



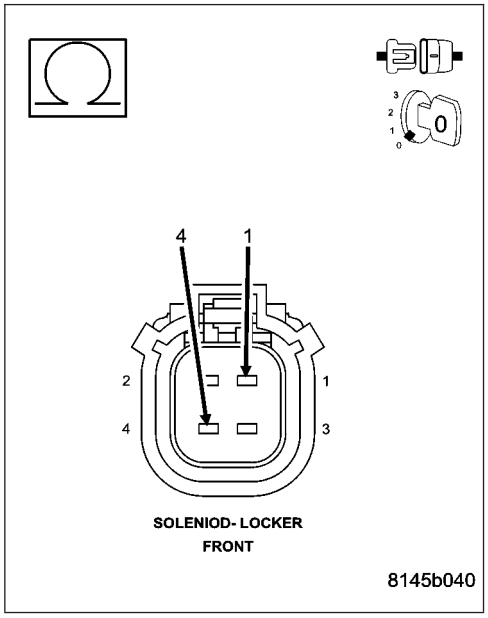
4. (T520) FRONT LOCKER SOURCE CIRCUIT SHORTED TO (T524) FRONT LOCKER RETURN CIRCUIT

Measure the resistance between the (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit in the Front Locker Solenoid harness connector.

Is the resistance below 100 ohms?

Yes >> Repair the short between (T520) Front Locker Source circuit and the (T524) Front Locker Return circuit.
Perform FDCM VERIFICATION TEST

No >> Go To 5



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CHECKING FRONT LOCKER SOLENOID OPERATION (CONTINUED)

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

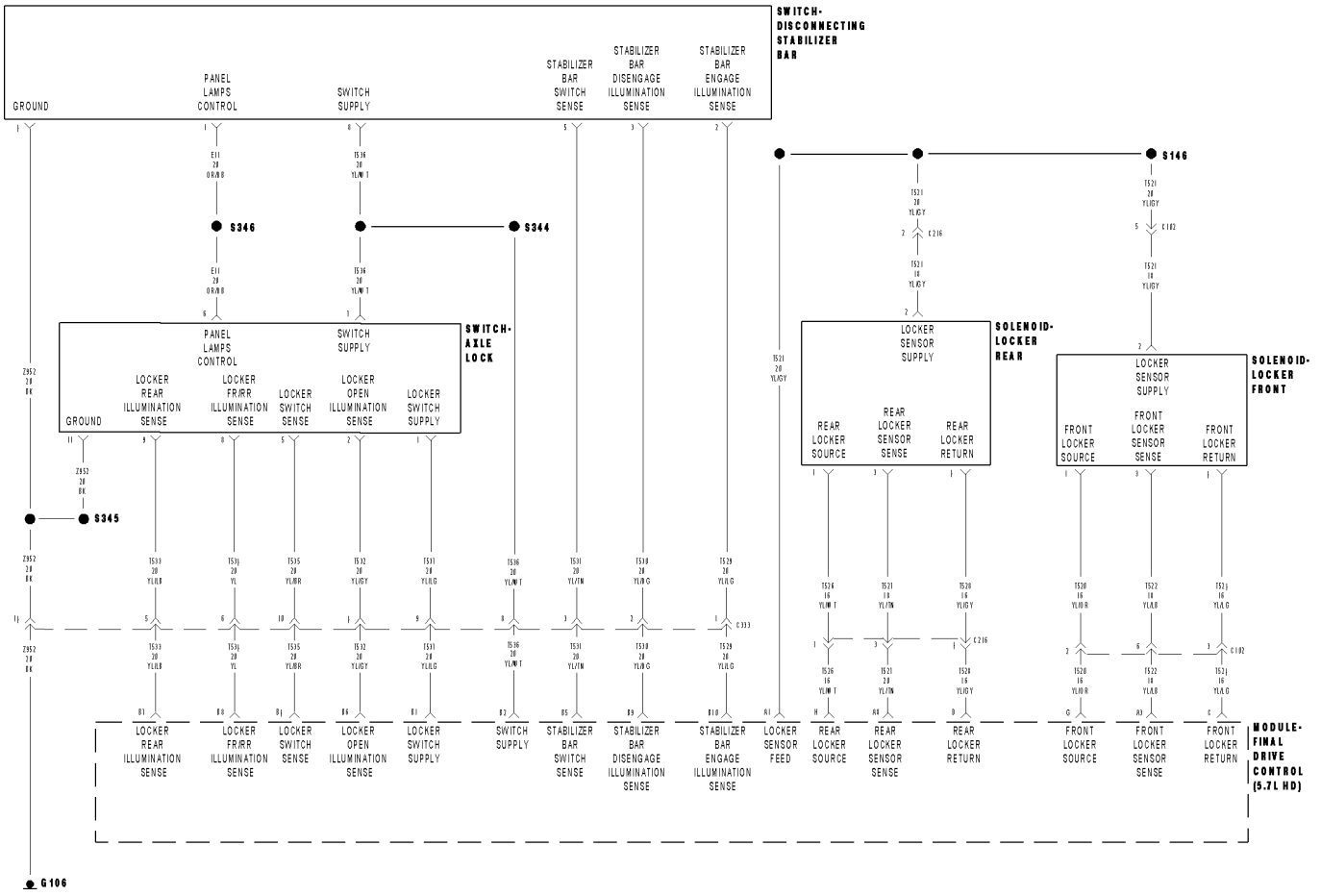
Were there any problems found?

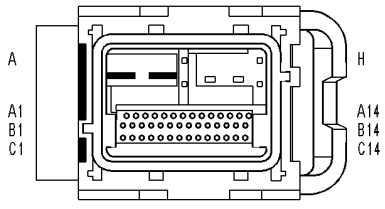
Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

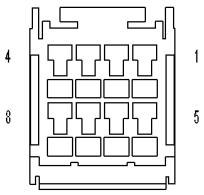
https://truckmanualshub.com/

CHECKING REAR LOCKER SOLENOID OPERATION

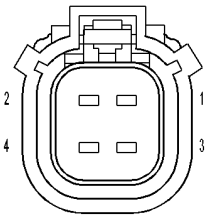




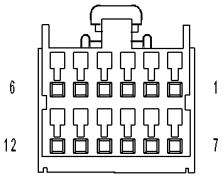
MODULE-FINAL DRIVE CONTROL (5.7L HD)



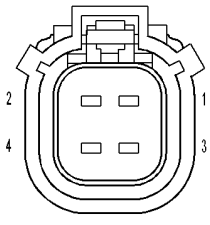
SWITCH-DISCONNECTING STABILZER BAR



SOLENOID-LOCKER REAR



SWITCH-AXLE LOCK



SOLENIOD-LOCKER FRONT

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CHECKING REAR LOCKER SOLENOID OPERATION (CONTINUED)
For a complete wiring diagram **Refer to Section 8W**.

Possible Causes
REAR LOCKER SOLENOID
(T526) REAR LOCKER SOURCE CIRCUIT SHORTED TO GROUND
(T528) REAR LOCKER SOURCE CIRCUIT SHORTED TO (T528) REAR LOCKER RETURN CIRCUIT
FDCM

Diagnostic Test

1. AXLE OPERATION

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.
Turn the ignition off.
Secure the vehicle by blocking the front wheels from the front and back.
Lift one rear wheel off the ground.
Turn the ignition on.
Place the vehicle in the drive/first gear and transfer case in LOW LOCK.
With the scan tool, actuate the Rear Locker Solenoid.
Manually rotate the wheel that is off the ground. The wheel should lock once the dog clutch is aligned.
Stop the actuation of the Rear Locker Solenoid.
Manually rotate the wheel that is off the ground. The wheel should turn.

Does the Front Axle operate as described above?

Yes >> Rear Locker Solenoid is operating normally. Test complete.

No >> Go To 2

---

2. REAR LOCKER SOLENOID OPERATION

NOTE: Before continuing with the below diagnostic test, ensure the FDCM harness connector seal is installed correctly. Inspect the terminals on both harness connector and the module for damage. Failure to do so can result in misdiagnoses of the system.
Turn the ignition off.
Disconnect the Rear Locker Solenoid harness connector.
Ignition on, engine not running.
Using a 12-volt test light, jump across from the (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit in the Rear Locker harness connector.
With a scan tool, actuate the Rear Locker Solenoid.

Does the test light flash on and off?

Yes >> Inspect the Rear Locker Solenoid terminals and connectors for corrosion and/or dirty that may compromise the connection. If OK, replace the Rear Locker Solenoid.
Perform FDCM VERIFICATION TEST.

No >> Go To 3

---

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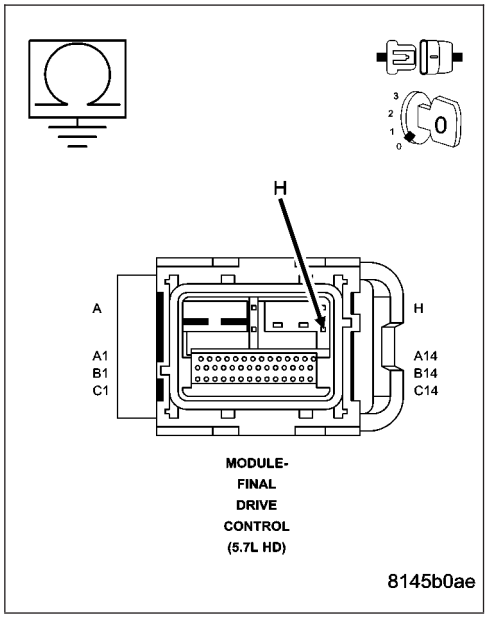
CHECKING REAR LOCKER SOLENOID OPERATION (CONTINUED)

3. (T526) REAR LOCKER SOURCE CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the FDCM harness connector.

Measure the resistance of the (T526) Rear Locker Source circuit at the FDCM harness connector.



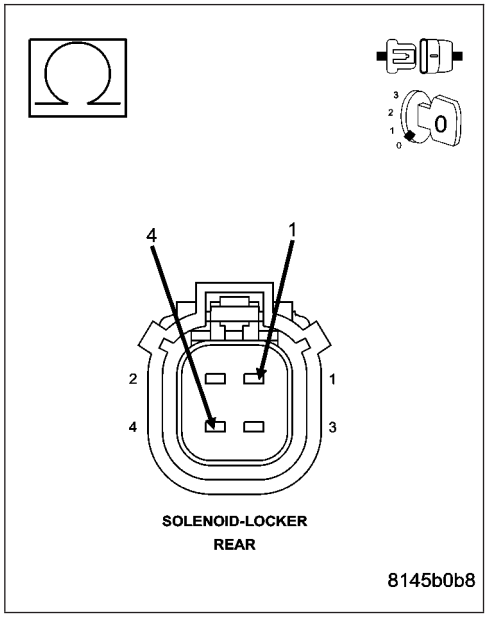
Is the resistance below 100 ohms?

Yes >> Repair the short to ground in the Rear Locker Source circuit.
Perform FDCM VERIFICATION TEST.

No >> Go To 4

4. (T526) REAR LOCKER SOURCE CIRCUIT SHORTED TO (T528) REAR LOCKER RETURN CIRCUIT

Measure the resistance between the (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit in the Rear Locker Solenoid harness connector.



Is the resistance below 100 ohms?

Yes >> Repair the short between (T526) Rear Locker Source circuit and the (T528) Rear Locker Return circuit.
Perform FDCM VERIFICATION TEST

No >> Go To 5

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CHECKING REAR LOCKER SOLENOID OPERATION (CONTINUED)

5. FDCM

NOTE: Before continuing, check the FDCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes >> Repair as necessary.
Perform FDCM VERIFICATION TEST

No >> Replace and program the Final Drive Control Module in accordance with Service Information.
Perform FDCM VERIFICATION TEST.

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FDCM VERIFICATION TEST

Diagnostic Test

1. PERFORM FDCM VERIFICATION TEST

CAUTION: Before removing the FDCM harness connector, clean the connector and locking cam area of dirt and debris. Failure to do so can result in the connector being jammed or damage to the locking cams on the harness connector or module. Do not force the assist arm when releasing or installing the harness connector.

NOTE: If the SKIM, PCM or FCM was replaced, refer to the service information for proper programming procedures.

1. Disconnect all jumper wires and reconnect all previously disconnected components and connectors.
2. Ensure that all accessories are turned off.
3. Ensure that the battery is fully charged.
4. With the DRBIII®, record and erase all DTC(s) from the FDCM
5. Start and run the engine for 2 minutes while operating all functions of the system that caused the original concern.
6.

NOTE: When a Stabilizer System DTC diagnostic is complete and all repairs have been made, running the Stabilizer Motor System Test and/or LED System Test can also provide verification that the DTC has been repaired and the system is operating normally.

7. Turn the ignition off, wait 5 seconds, then turn the ignition on. Using the DRBIII®, read DTC(s) from the FDCM.

Are any FDCM DTC(s) present or is the original condition still present?

Yes >> The repair is not complete. Refer to the related category for the DTC or symptom that is still present.

No >> The repair is complete.

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DIFFERENTIAL & DRIVELINE - SERVICE INFORMATION

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PROPELLER SHAFT

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PROPELLER SHAFT

DIAGNOSIS AND TESTING

PROPELLER SHAFT

PROPELLER SHAFT VIBRATION

Out-of-round tires or wheels that are out of balance, will cause a low frequency vibration.

Driveline vibration can also caused by loose or damaged engine mounts.

Propeller shaft vibration increases with vehicle speed. A vibration that occurs at a specific speed range, is not usually caused by an out of balance propeller shaft. Defective universal joints or an incorrect propeller shaft angle are usually the cause of such a vibration.

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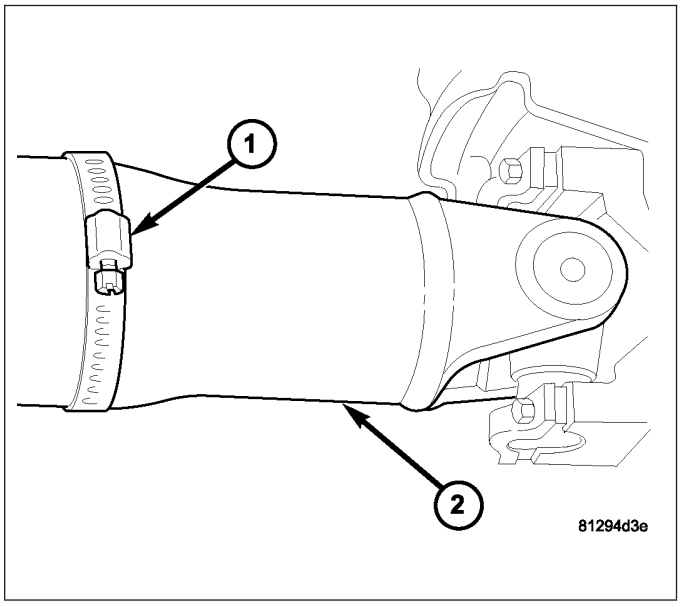
DRIVELINE VIBRATION

Drive Condition	Possible Cause	Correction
Propeller Shaft Noise	1) Undercoating or other foreign material on shaft.	1) Clean exterior of shaft and wash with solvent.
	2) Loose U-joint clamp screws.	2) Install new clamps and screws and tighten to proper torque.
	3) Loose or bent U-joint yoke or excessive runout.	3) Install new yoke.
	4) Incorrect driveline angularity.	4) Measure and correct driveline angles.
	5) Rear spring center bolt not in seat.	5) Loosen spring u-bolts and seat center bolt.
	6) Worn U-joint bearings.	6) Install new U-joint.
	7) Propeller shaft damaged or out of balance.	7) Installl new propeller shaft.
	8) Broken rear spring.	8) Install new rear spring.
	9) Excessive runout or unbalanced condition.	9) Re-index propeller shaft, test, and evaluate.
	10) Excessive drive pinion gear shaft runout.	10) Re-index propeller shaft and evaluate.
	11) Excessive axle yoke deflection.	11) Inspect and replace yoke if necessary.
	12) Excessive transfer case runout.	12) Inspect and repair as necessary.
Universal Joint Noise	1) Loose U-joint clamp screws.	1) Install new clamps and screws and tighten to proper torque.
	2) Lack of lubrication.	2) Replace as U-joints as necessary.

PROPELLER SHAFT BALANCE

If propeller shaft is suspected of being out of balance, use the following procedure.

NOTE: Indexing propeller shaft 180° relative to the yoke may eliminate some vibrations.



1. Raise and support vehicle.
2. Clean all foreign material from the propeller shaft and universal joints.
3. Inspect propeller shaft for missing balance weights, broken welds and bent areas. **If propeller shaft is bent, it must be replaced.**
4. Inspect universal joints for wear and properly installed.
5. Check propeller shaft bolt torques.
6. Remove wheels and install lug nuts to retain brake rotors.
7. Mark and number the shaft six inches from the pinion yoke end at four positions 90° apart.
8. Run and accelerate vehicle until vibration occurs. Note the intensity and speed the vibration occurred. Stop the engine.

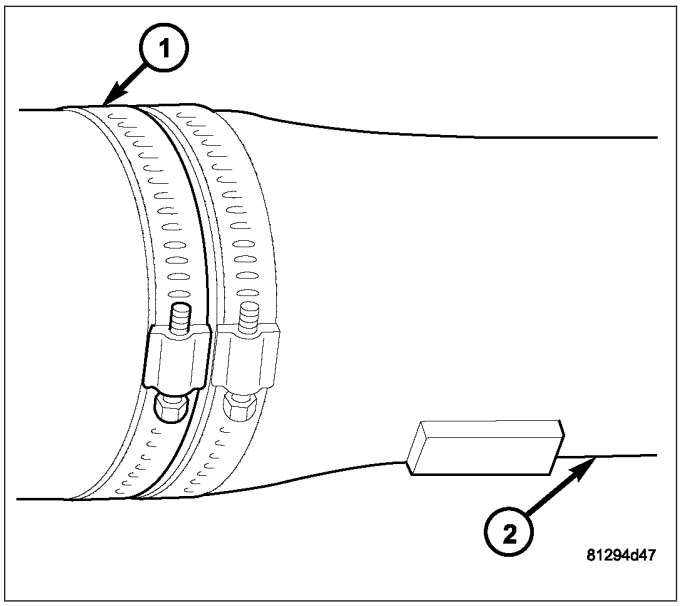
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9. Install a screw clamp at position (1).

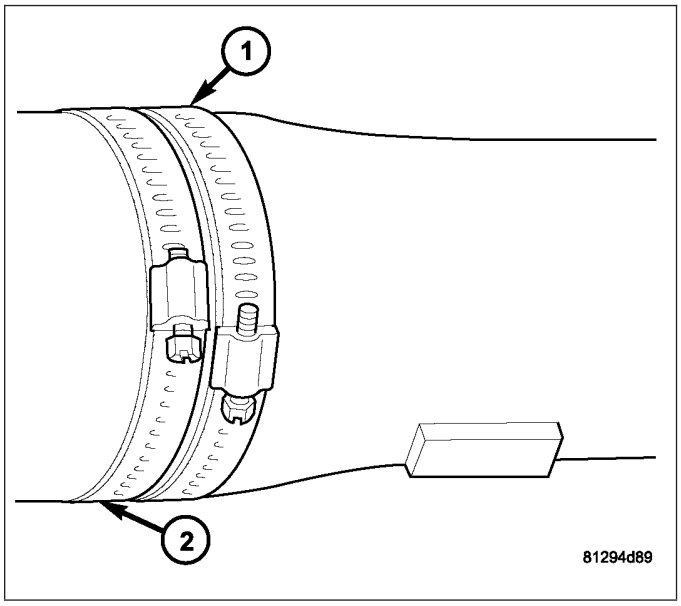
10. Start engine and check vibration. If there is little or no change move the clamp to the next positions. Repeat the vibration test.

NOTE: If there is no difference in vibration at this positions, the vibration may not be the propeller shaft.

11. If vibration decreased, install a second clamp (1) and repeat the test.



12. If additional clamp causes an additional vibration, separate the clamps 1/2 inch (1) above and below the mark. Repeat the vibration test.
13. Increase distance between the clamp screws (1) (2) and repeat test, until the least amount of vibration is noticed. Bend the slack end of the clamps so screws will not loosen.
14. If vibration remains unacceptable, repeat the procedure to the front end of the propeller shaft.
15. Install wheels and lower vehicle.



PROPELLER SHAFT RUNOUT

1. Clean propeller shaft surface, where dial indicator will contact the shaft.
2. Install dial indicator perpendicular to the shaft surface.
3. Measure runout at the center and ends of the shaft away from weld areas, so weld process does not affect measurements.
4. Refer to Runout Specifications chart.
5. If runout is out of specification, index the shaft 180° and take shaft runout measurements again.
6. If runout is now within specifications, mark shaft and yokes for proper orientation.
7. If runout is not within specifications, verify runout of the transmission/transfer case and axle are within specifications. Correct as necessary and measure propeller shaft runout again.
8. Replace propeller shaft if the runout still exceeds the limits.

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RUNOUT SPECIFICATIONS

Front of Shaft	0.020 in. (0.50 mm)
Center of Shaft	0.025 in. (0.63 mm)
Rear of Shaft	0.020 in. (0.50 mm)
NOTE: Measure front/rear runout approximately 3 inches (76 mm) from the weld seam at each end of the shaft tube for tube lengths over 30 inches. For tube lengths under 30 inches, the maximum allowed runout is 0.020 in. (0.50 mm) for the full length of the tube.	

STANDARD PROCEDURE

PROPELLER SHAFT ANGLE

ONE PIECE PROPELLER SHAFT

This procedure applies to front and rear propeller shafts.

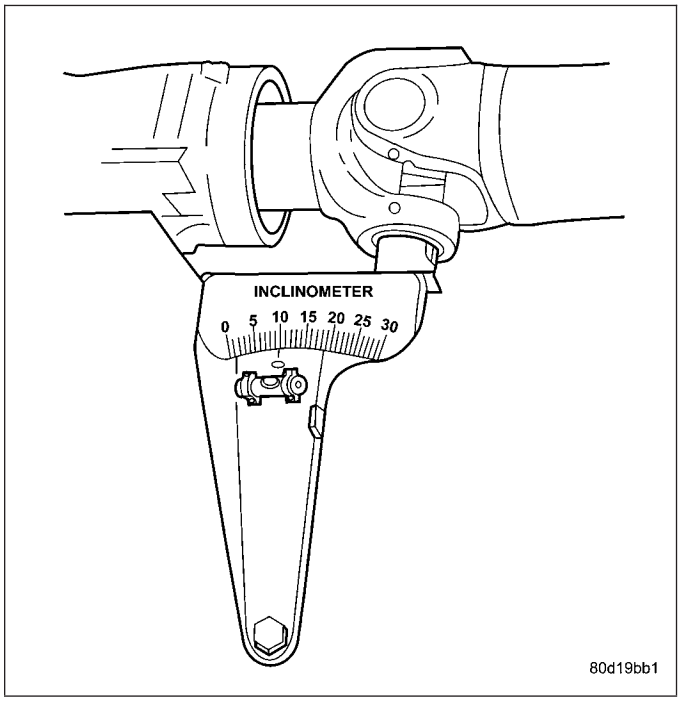
NOTE: To obtain output angle (A) on the front propeller shaft equipped with a C/V joint, place inclinometer on machined surface of the C/V joint.

1. Raise vehicle and support the axles as level as possible, allowing the wheels and propeller shaft to turn.
2. Remove universal joint snap rings if equipped, so inclinometer base sits flat.
3. Rotate shaft until transmission/transfer case output yoke bearing is facing downward.

NOTE: Always take measurements from front to rear and on the same side of the vehicle.

4. Place Inclinometer 7663 on yoke bearing cap or pinion flange ring parallel to the shaft. Center bubble in sight glass and record measurement (A).

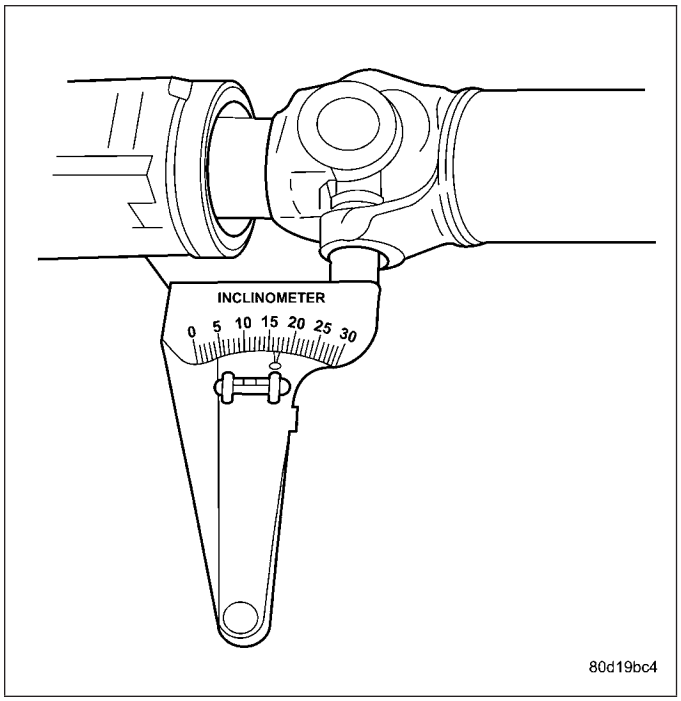
This measurement will give you the transmission yoke Output Angle (A).



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5. Rotate propeller shaft 90 degrees and place Inclinometer on yoke bearing parallel to the shaft. Center bubble in sight glass and record measurement. This measurement can also be taken at the rear end of the shaft.

This measurement will give you the Propeller Shaft Angle (C).

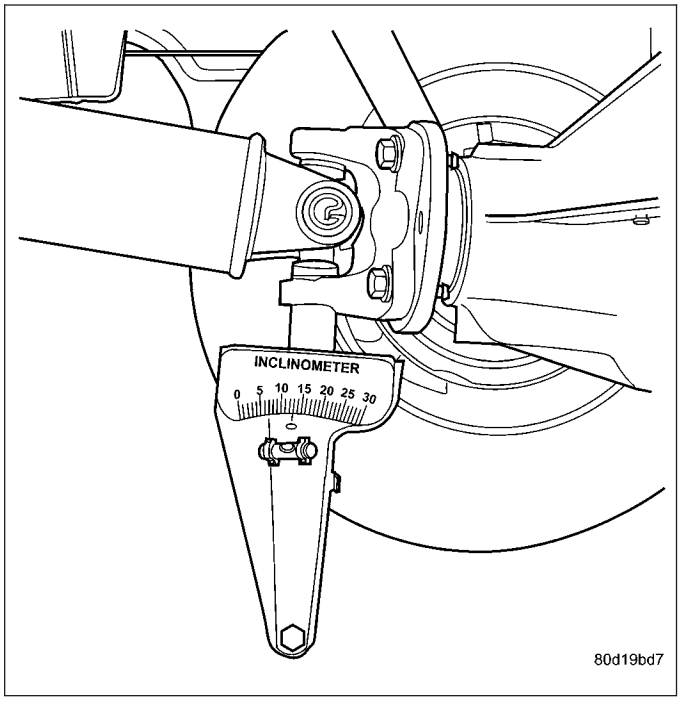


6. Rotate propeller shaft 90 degrees and place inclinometer on companion flange yoke bearing parallel to the shaft. Center bubble in sight glass and record measurement.

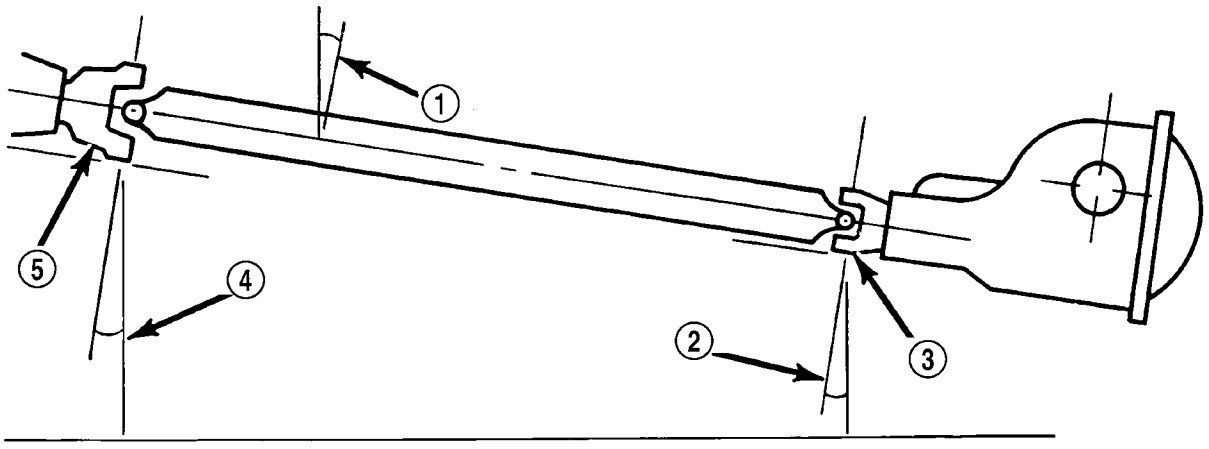
This measurement will give you the pinion Companion Flange Input Angle (B).

7. Subtract smaller figure from larger (C minus A) to obtain Transmission/Transfer Case **Output Operating Angle**.
8. Subtract smaller figure from larger (C minus B) to obtain axle **Input Operating Angle**.

Refer to rules and example in for additional information.



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Horizontal Level

(A) Output Yoke = 3.0° or 4.9°		(B) Axle Input Yoke = 3.2° or 4.9°	
(C) Prop. Shaft = 4.9° or -3.0°		(C) Prop. Shaft = 4.9° or -3.2°	
Transmission Output Operating Angle	1.9°	Axle Input Operating Angle	1.7°

Trans. Output Operating Angle	1.9°
Axle Input Operating Angle	-1.7°
Amount of U-Joint Cancellation	0.2°

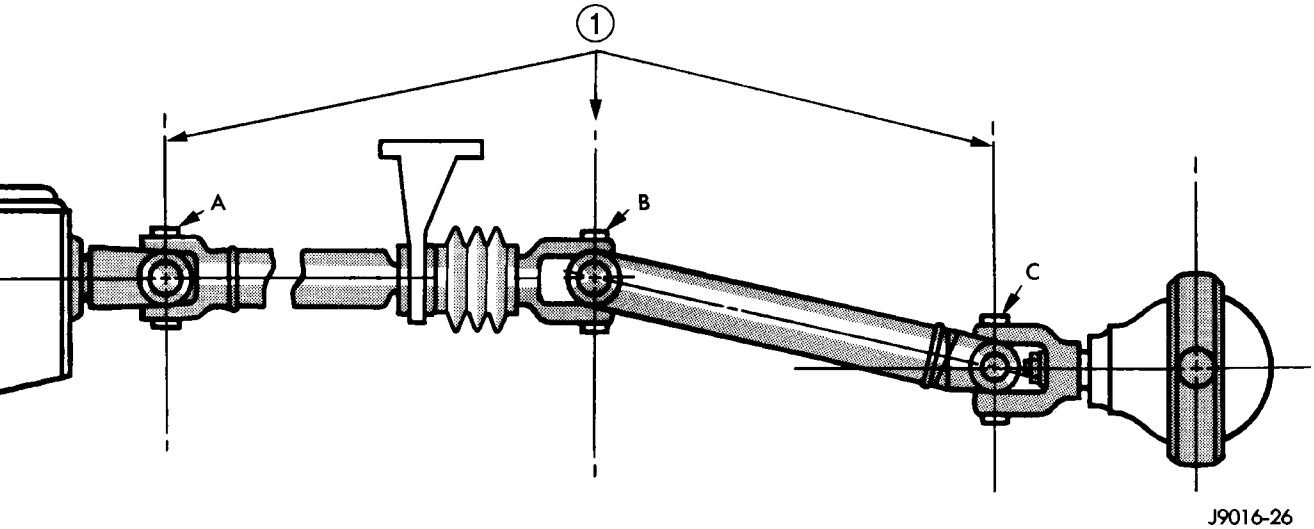
J9316-3

RULES

- Good cancellation of U-joint operating angles should be within 1 degree.
- Operating angles should be less than 3 degrees.
- Operating angles less than 10 degrees for double cardan U-joint.
- At least 1/2 of one degree continuous operating propeller shaft angle.

TWO PIECE PROPELLER SHAFT

Two piece propeller shaft angles measurement is the same as a one-piece propeller shaft.

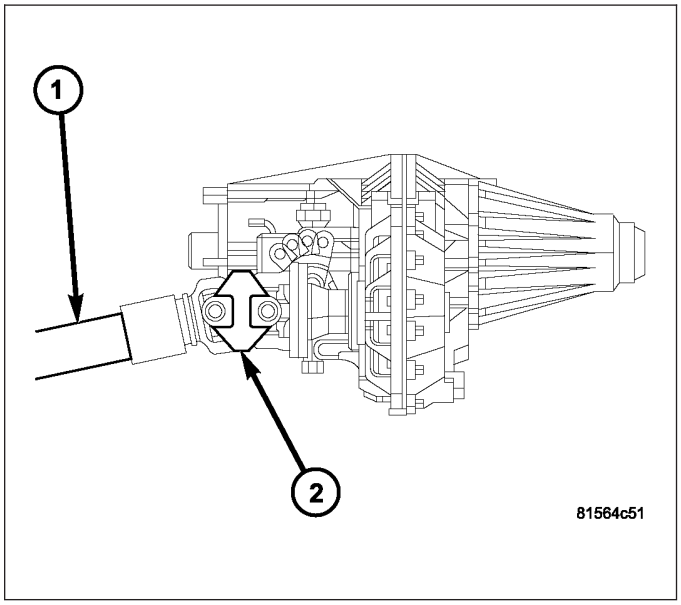


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STANDARD PROCEDURE - LUBRICATION

Vehicles with double cardan universal joint front propeller shaft (1) are equipped with a grease fitting (2). Grease the double cardan universal joint at each oil change.



SPECIFICATIONS

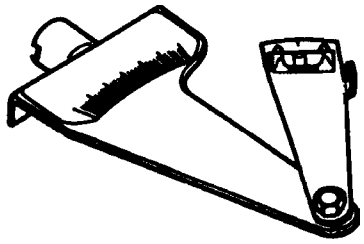
PROPELLER SHAFT

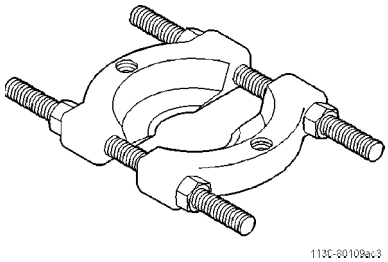
TORQUE SPECIFICATIONS

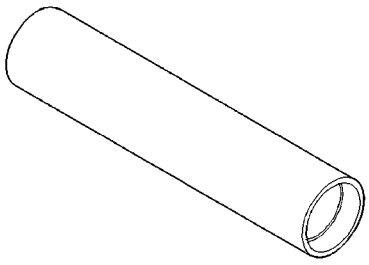
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Center Bearing Bolts	54	40	-
Transfer Case Flange Bolts	88	65	-
LD - Front Pinion Flange Bolts	115	85	-
HD - Front Pinion Flange Bolts	28	21	-
Rear Pinion Flange Bolts	115	85	-
Rear Pinion Yoke Bolts	29	22	-

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SPECIAL TOOLS





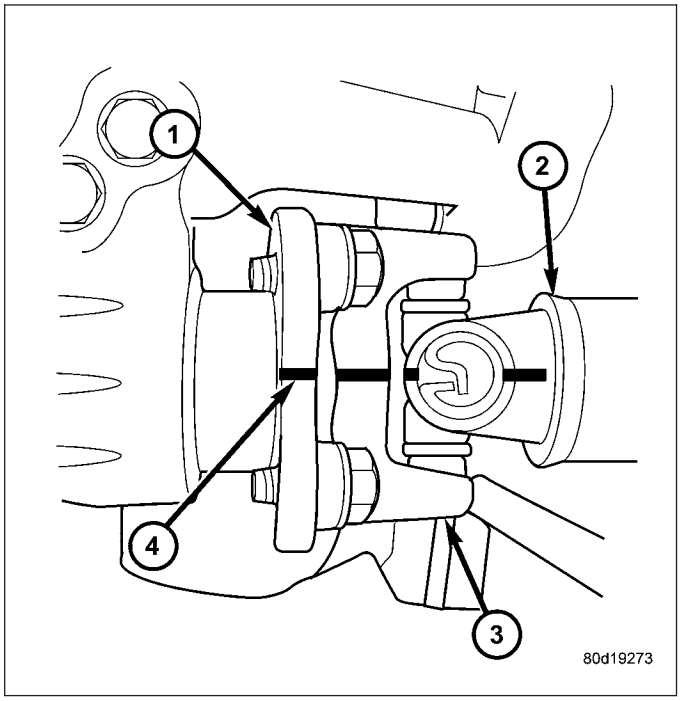


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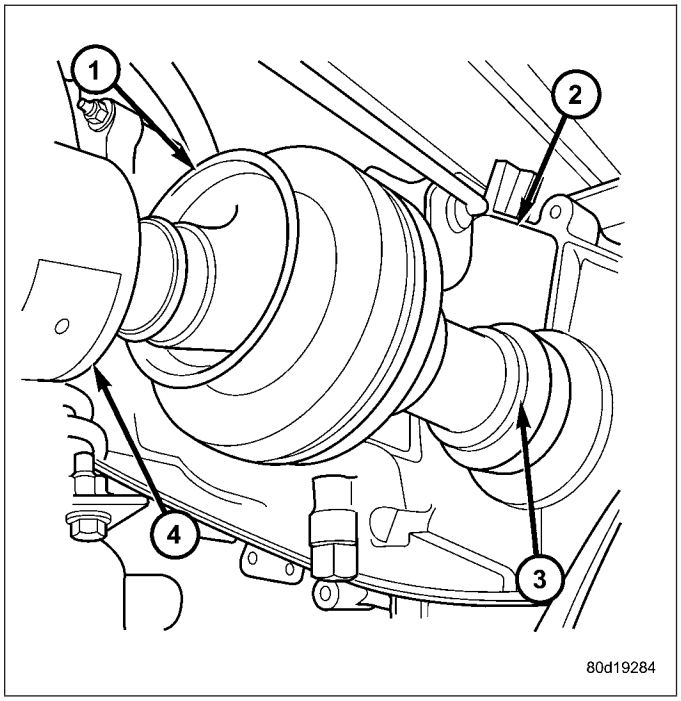
SHAFT-PROPELLER LD FRONT

REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Remove exhaust crossover pipe.
3. Mark a line across the axle companion flange (1), propeller shaft (2), flange yoke (3) and transfer case for installation reference.



4. Remove axle/transfer case companion flange bolts. Remove dust boot clamp (3) from the C/V jonit (1) end of the shaft if equipped.
5. Remove propeller shaft.



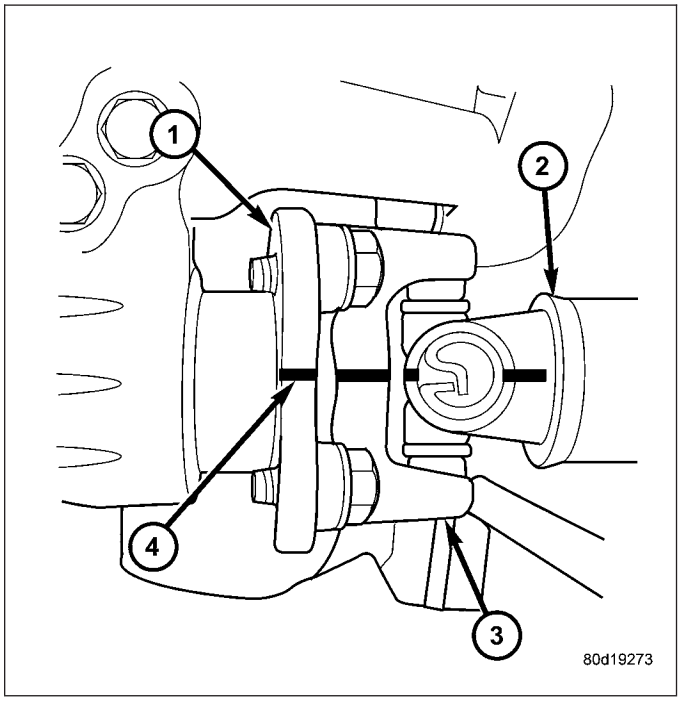
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INSTALLATION

1. Install propeller shaft with all reference marks (4) aligned.
2. Install with dust boot clamp at transfer case end.
3. Install **new** axle companion flange bolts and tighten to 115 N·m (85 ft. lbs.).

NOTE: Companion flange bolts incorporate a Loctite® patch, new bolts should be used. If bolts are not available, clean bolts and apply Loctite® 242 to the threads.

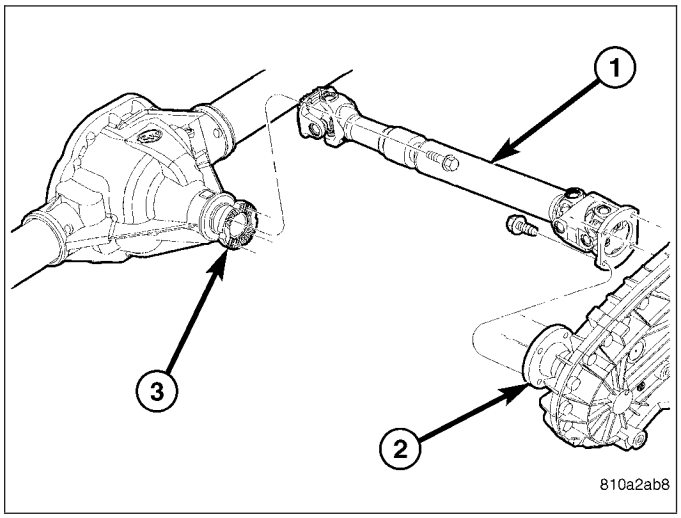
4. Install skid plate, if equipped.



SHAFT-PROPELLER HD FRONT

REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Remove exhaust crossover pipe.
3. Mark a line across axle (3)/transfer case (2) companion flange and propeller shaft flange yokes for installation reference.
4. Remove axle/transfer case companion flange bolts.
5. Remove propeller shaft.



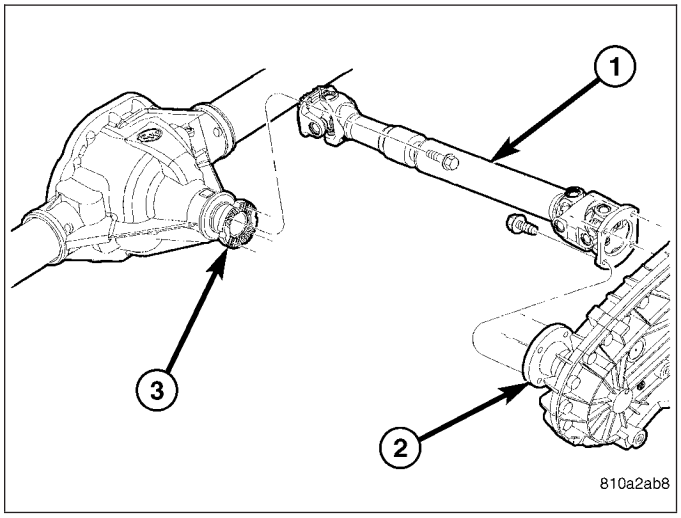
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INSTALLATION

1. Install propeller shaft (1) with all reference marks aligned.
2. Install transfer case companion flange (2) bolts and tighten to 88 N·m (65 ft. lbs.).
3. Install **new** axle companion flange (3) bolts and tighten to 28 N·m (21 ft. lbs.).

NOTE: Companion flange bolts incorporate a Loctite® patch, new bolts should be used. If bolts are not available, clean bolts and apply Loctite® 242 to the threads.

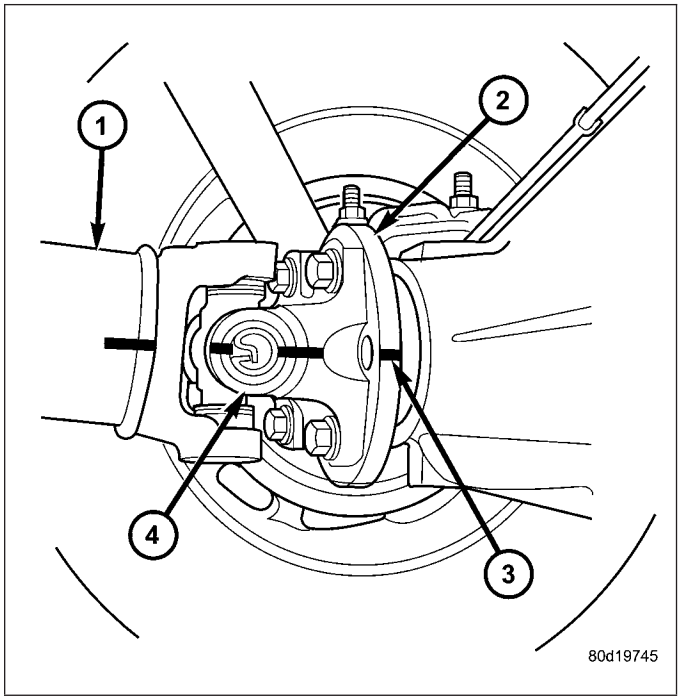
4. Install skid plate, if equipped.



SHAFT-PROPELLER REAR

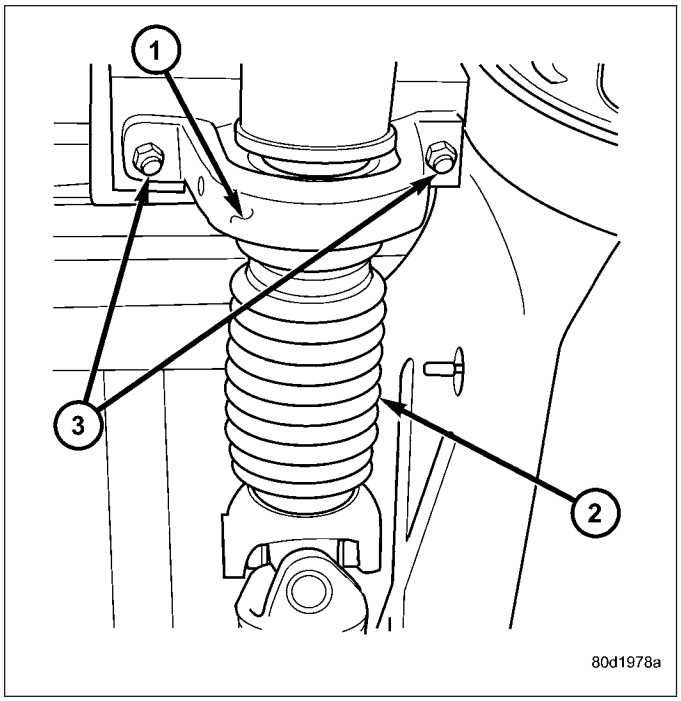
REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Mark pinion flange (3) or yoke and propeller shaft (1) flange (4) or yoke for installation reference.



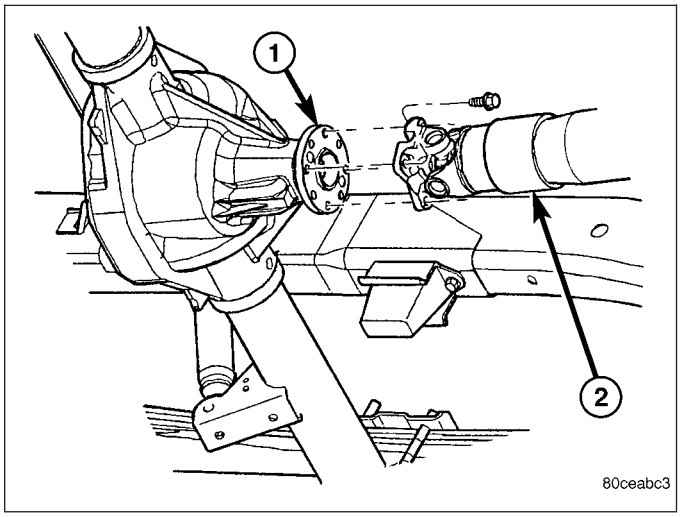
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3. Mark the outline of the center bearing (1) on the crossmember for installation reference, if equipped.
4. Remove center bearing mounting nuts (3), if equipped.
5. Remove pinion flange or yoke clamp bolts.
6. Slide propeller shaft back on transmission then mark the shaft and transmission for installation reference.
7. Remove propeller shaft from transmission/ transfer case.



INSTALLATION

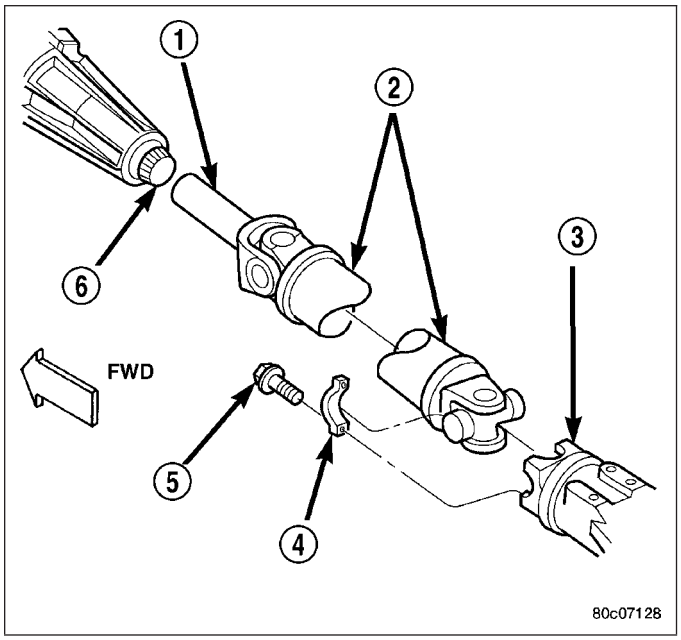
1. Slide slip yoke onto the transmission/transfer case output shaft with reference marks aligned.
2. Align and install center bearing on crossmember, if equipped and tighten nuts to 54 N·m (40 ft. lbs.).
3. Align reference marks on propeller shaft (2) and pinion flange or pinon yoke.
4. Install **new** companion flange (1) bolts and tighten to 15 N·m (85 ft. lbs.)



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5. Install **new** SRT-10 yoke clamp (4) bolts and tighten to 29 N·m (22 ft. lbs.)

NOTE: Companion flange bolts incorporate a Loctite® patch, new bolts should be used. If bolts are not available, clean bolts and apply Loctite® 242 to the threads.



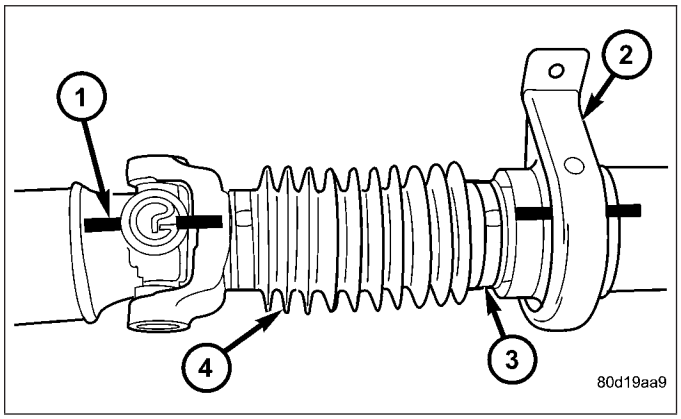
BEARING-CENTER

REMOVAL

1. Remove rear propeller shaft.
2. Make installation reference mark (1) on the two shafts.
3. Remove slip joint boot (4) clamp (3) and separate the two shafts.
4. Use hammer and punch to tap slinger away from shaft to provide room for bearing splitter.
5. Position Bearing Splitter Tool 1130 between slinger and shaft.

CAUTION: Do not damage shaft spline during removal of center bearing.

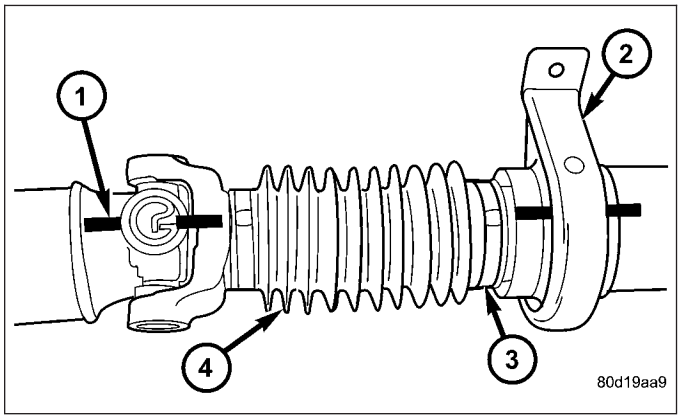
6. Set shaft in press and press bearing off the shaft.



INSTALLATION

NOTE: Two types of center bearings are used and are not interchangeable. Install the same type as the vehicle was built with.

1. Install new slinger on shaft and drive into position with appropriate installer tool.
2. Install new center bearing (2) on shaft with Bearing Installer Tool 6052. Drive on shaft with hammer until bearing is seated.
3. Clean shaft splines and apply a coat of multi-purpose grease.



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4. Align master splines and slide front and rear half-shafts together. Reposition slip yoke boot (4) and install new clamp (3).
5. Install propeller shaft in vehicle.

ADJUSTMENTS

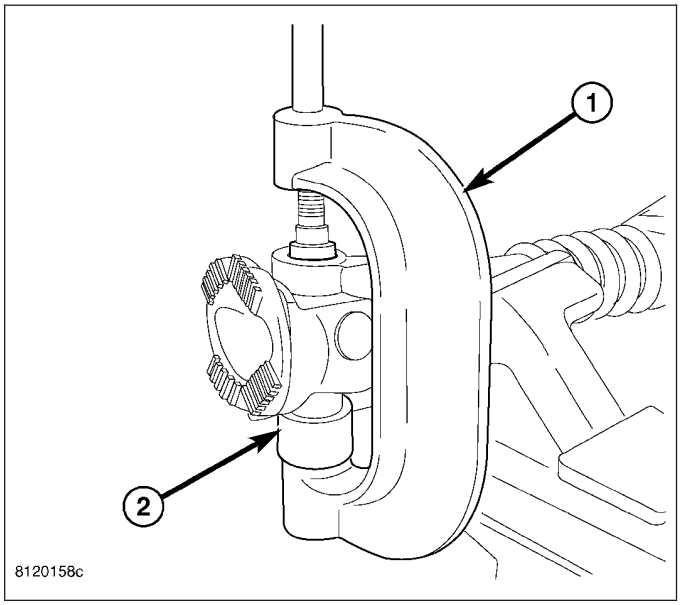
Launch shudder is a vibration that occurs at first acceleration from a stop. Shudder vibration usually peaks at the engines highest torque output. Shudder is a symptom associated with vehicles using a two-piece propeller shaft. To decrease shudder, lower the center bearing in 1/8 inch increments. Use shim stock or fabricated plates. Plate stock must be used to maintain compression of the rubber insulator around the bearing. Do not use washers. Replace the original bolts with the appropriate increased length bolts.

UNIVERSAL JOINTS-SINGLE CARDAN

DISASSEMBLY

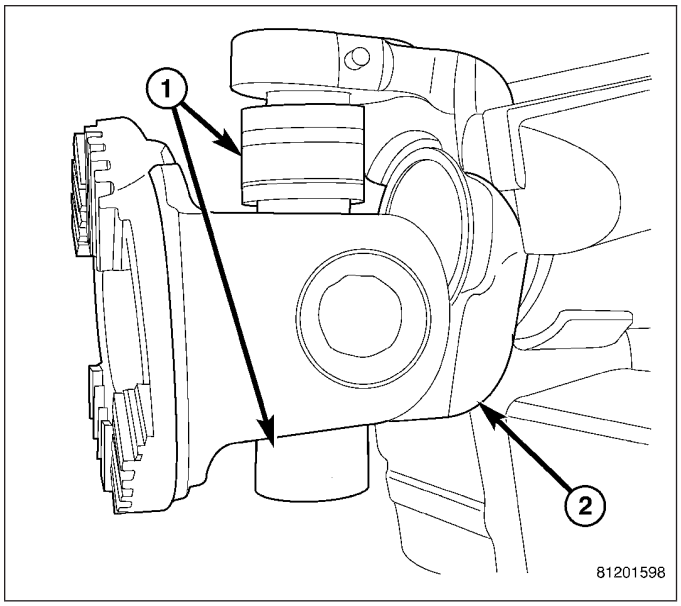
DISASSEMBLY - WITH INJECTED RING

1. Place shaft yoke in vise.
2. Position U-joint press (1) with receiver (2) on propeller shaft yoke.

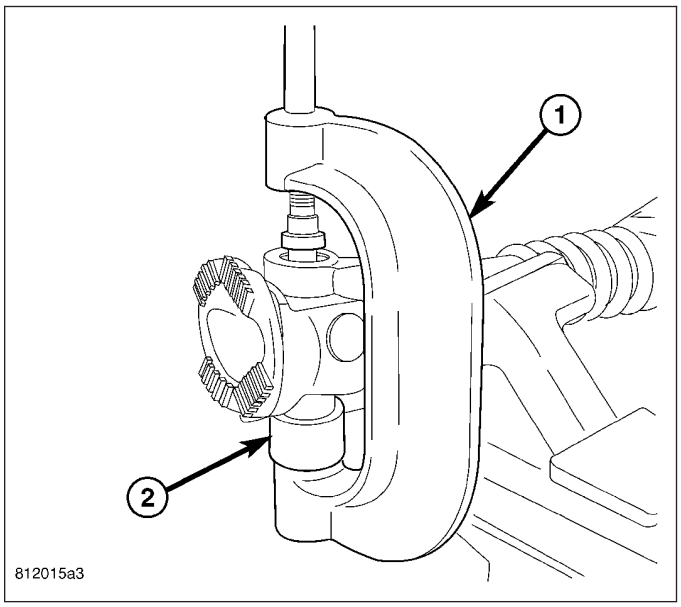


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3. Pressed U-joint bearing caps (1) out of shaft yoke (2).
4. Remove lower bearing cap from shaft yoke.

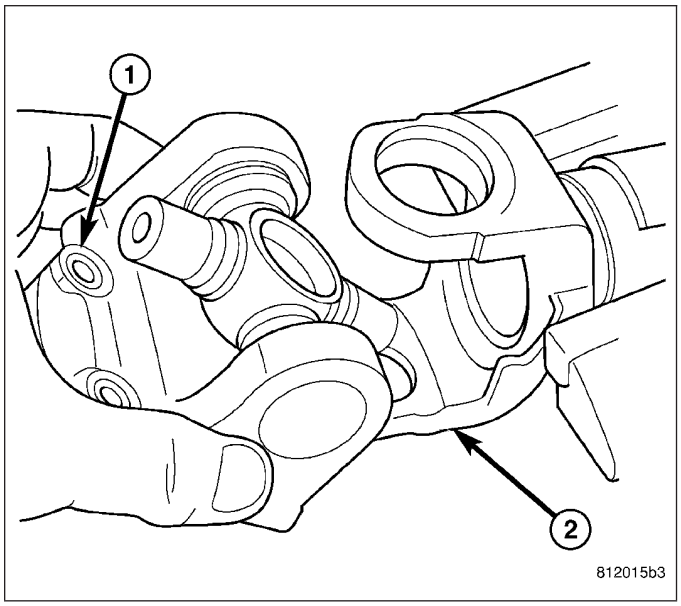


5. Turn shaft over and position press (1) with receiver (2) on shaft yoke.
6. Press remaining U-joint bearing cap out of shaft yoke.

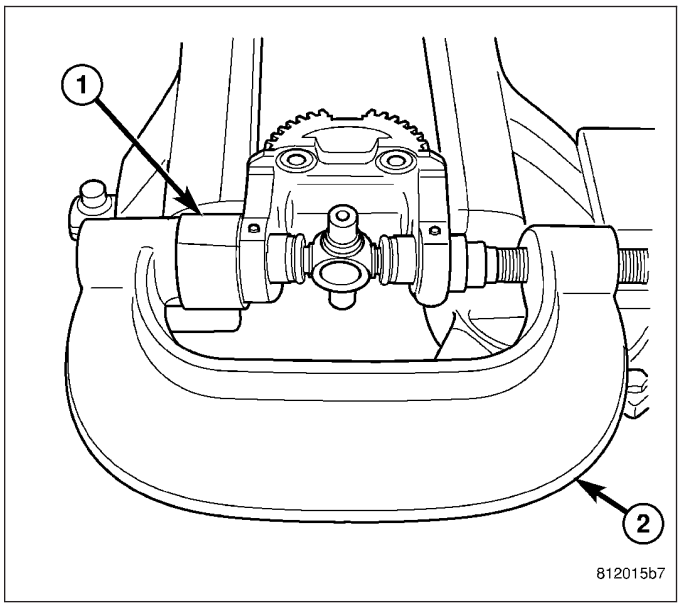


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7. Remove flange (1) with U-joint out of shaft yoke (2).

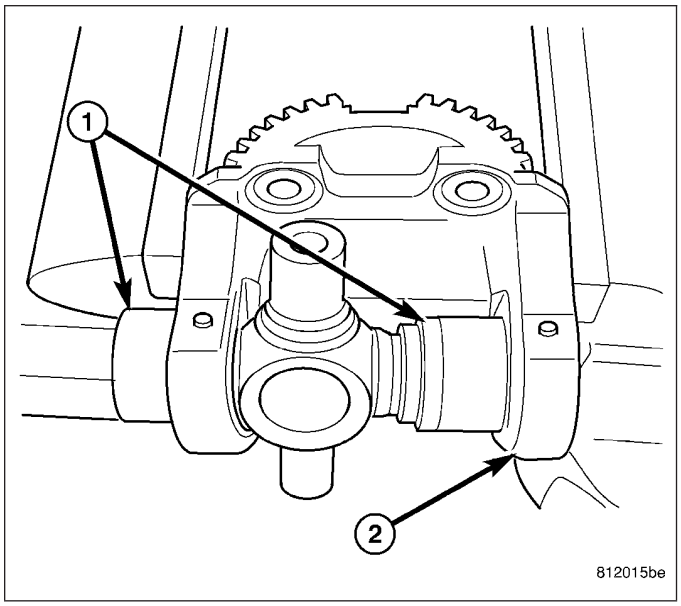


8. Position U-joint press (2) with receiver (1) on flange.

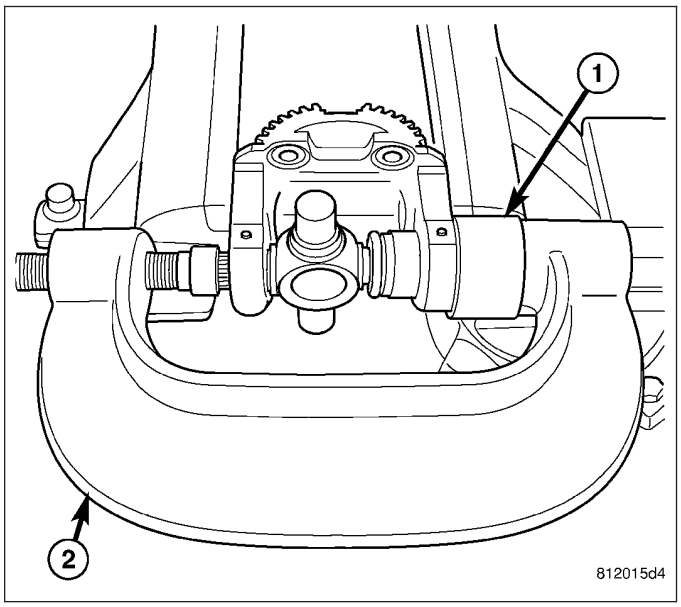


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9. Press U-joint bearing caps (1) out of flange (2).
10. Remove bearing cap on the outside of the flange.



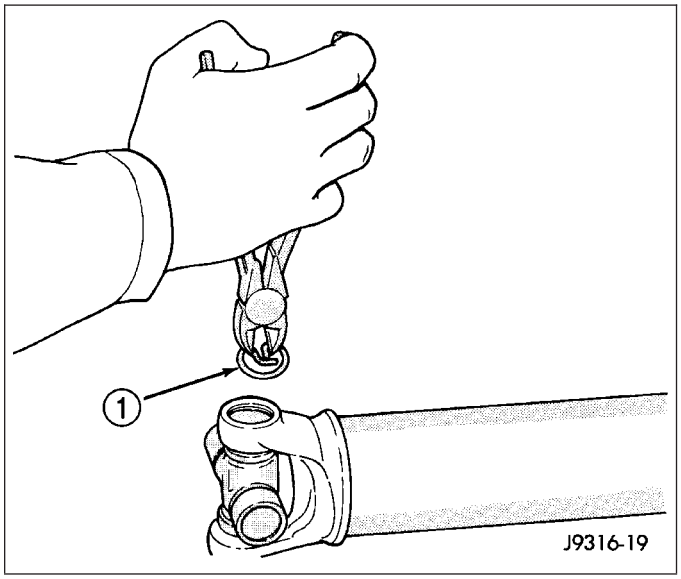
11. Position U-joint press (2) with receiver (1) on flange.
12. Press remaining U-joint bearing cap out of flange.
13. Remove U-joint from flange.



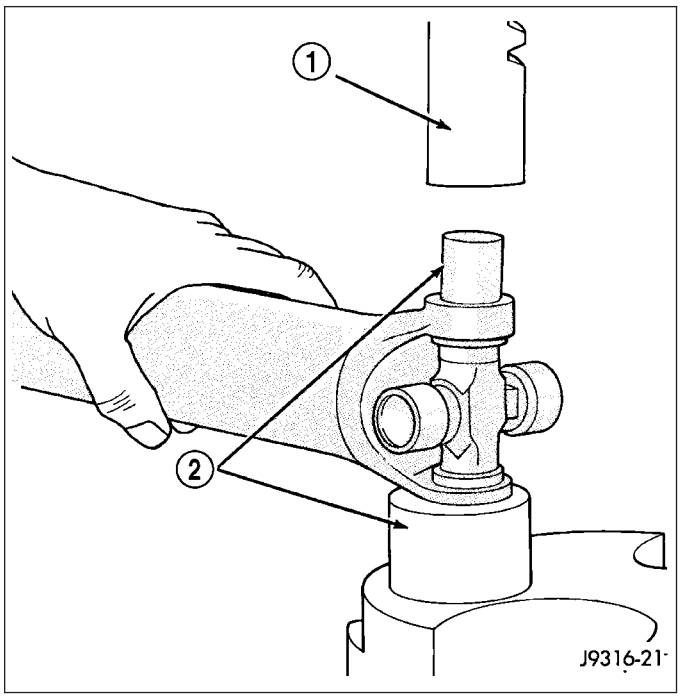
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DISASSEMBLY - WITH SNAP RINGS

1. Tap outside of bearing cap with a drift to loosen snap ring.
2. Remove snap rings (1) from both sides of yoke.



3. Position yoke with the grease fitting if equipped, pointing up.
4. Position a socket (2) with a inside diameter large enough to receive the bearing cap, beneath the yoke on a press.
5. Place another socket with an outside diameter smaller than bearing cap on the upper bearing cap and press (1) the lower cap through the yoke.

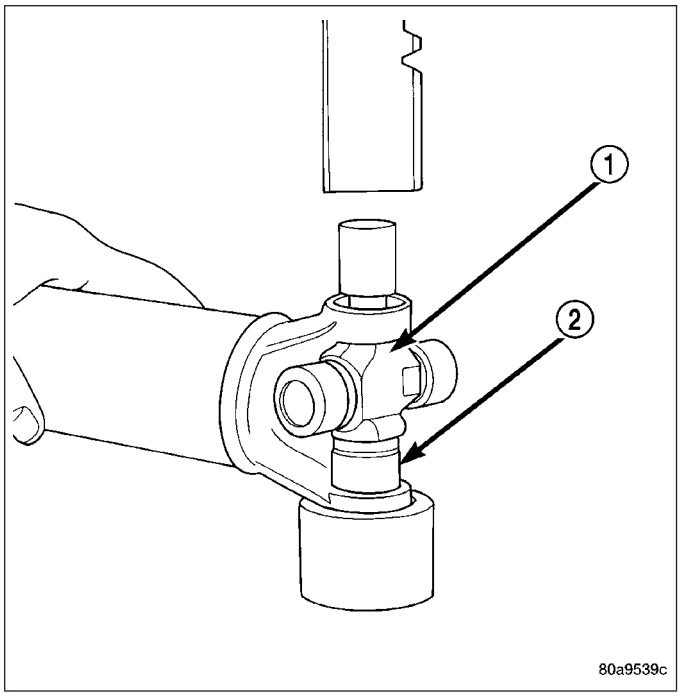


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NOTE: If the bearing cap will not pull out of the yoke by hand after pressing, tap the yoke ear near the bearing cap to dislodge the cap.

6. Pull bearing cap of the yoke.
7. Turn yoke over in the press and straighten the cross (1). Press the cross until the remaining bearing cap (2) can be removed.

CAUTION: If cross or bearing cap are not straight during removal, the bearing cap will score the walls of the yoke bore and damage can occur.

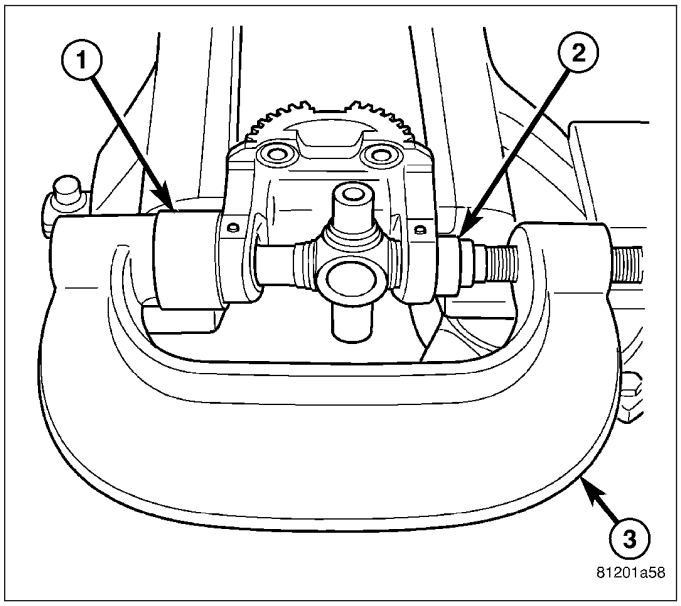


ASSEMBLY

ASSEMBLY - WITH INJECTED RING

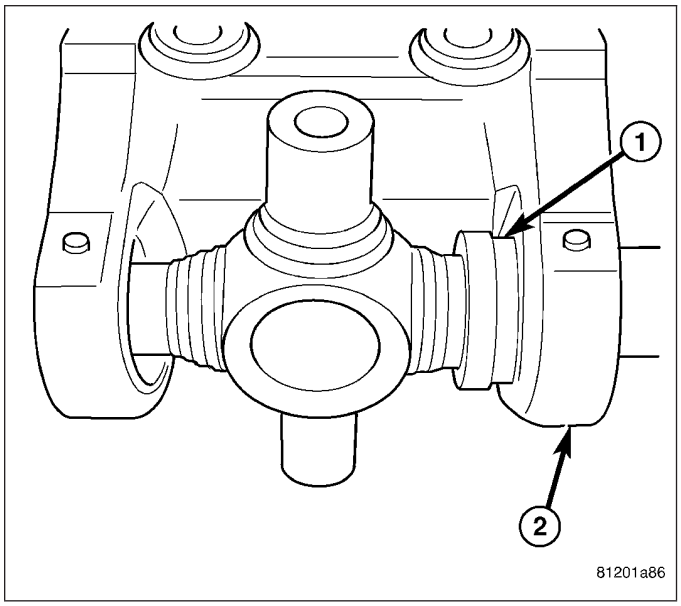
NOTE: Replacement joint has internal snap rings.

1. Place joint in flange with one bearing cap.
2. Position press (3) with receiver (1) on flange and bearing cap (2).

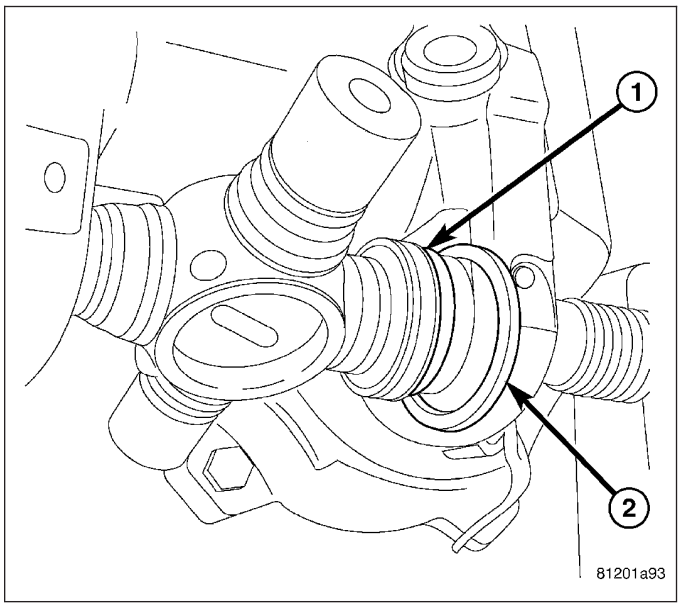


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3. Press bearing cap until snap ring groove (1) is through the flange (2).

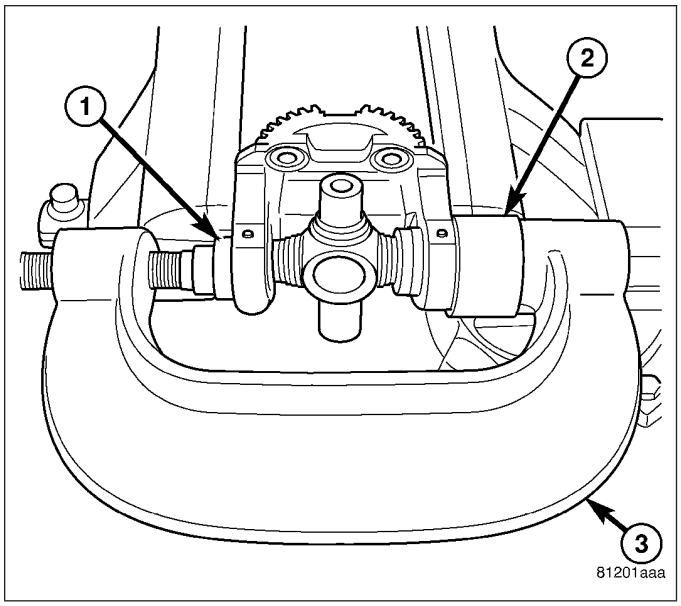


4. Install snap ring (2) on bearing (1).

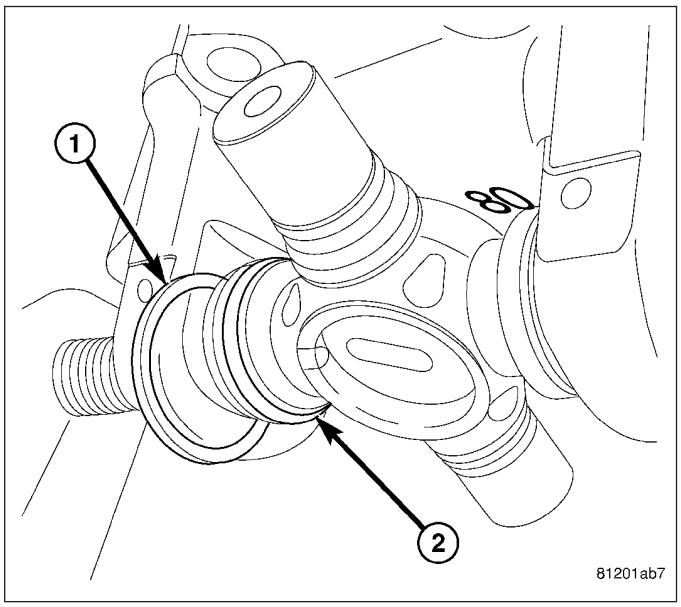


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5. Position press (3) with receiver (2) on remaining bearing cap (1) and flange.
6. Press bearing cap until snap ring groove is through the flange.

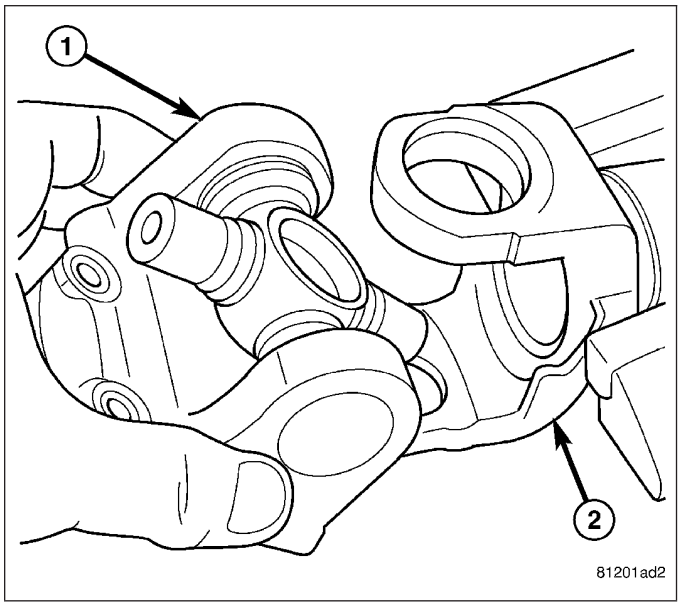


7. Install snap ring (1) on bearing cap (2).

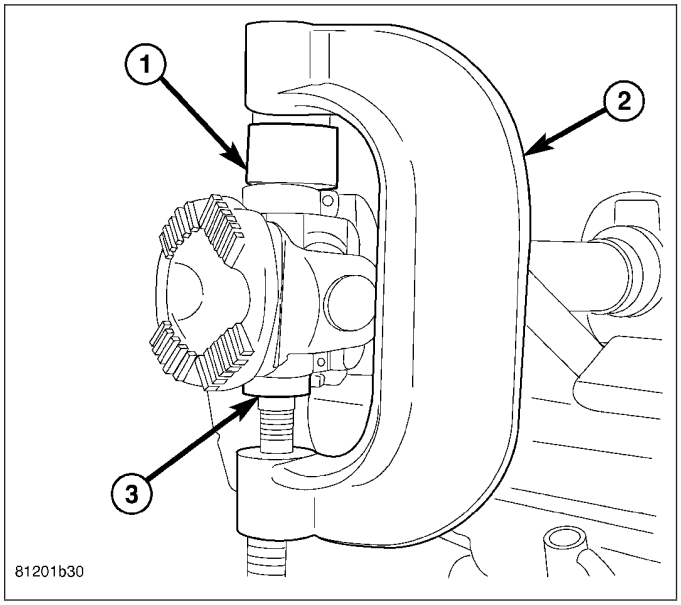


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8. Install flange (1) with U-joint in yoke (2).

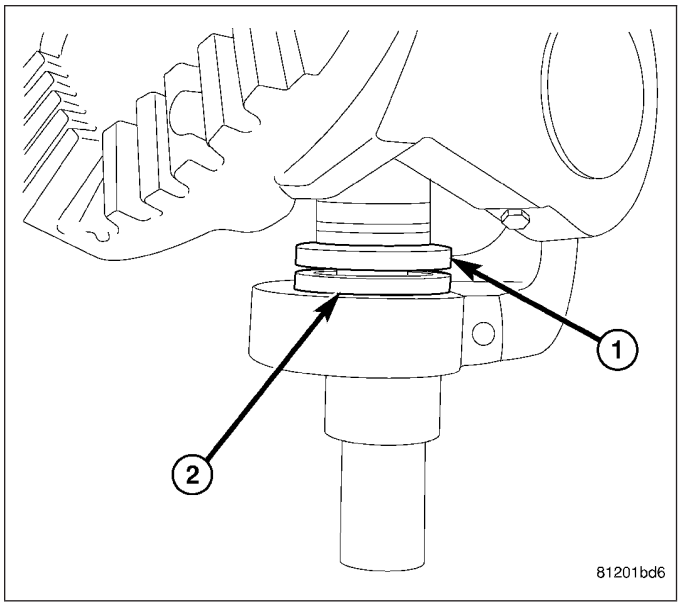


9. Position press (2) with receiver (1) and lower bearing cap (3) on yoke.
10. Press bearing cap until snap ring groove is through the yoke.

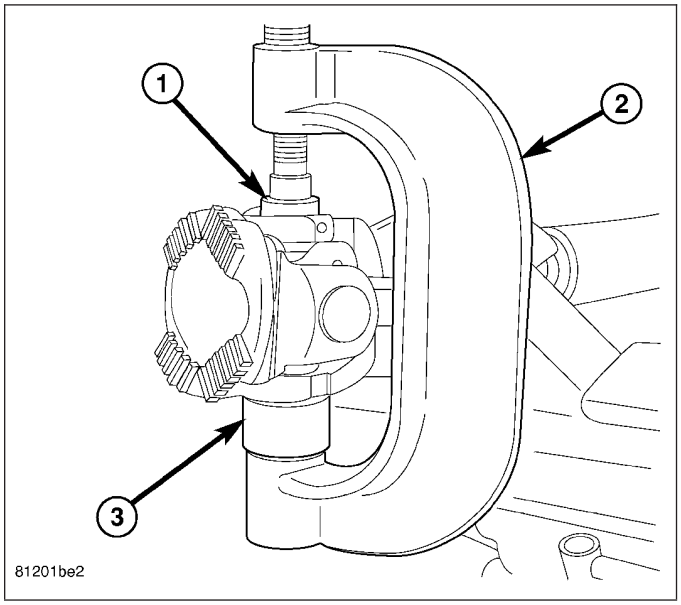


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11. Install snap ring (2) on bearing cap (1).

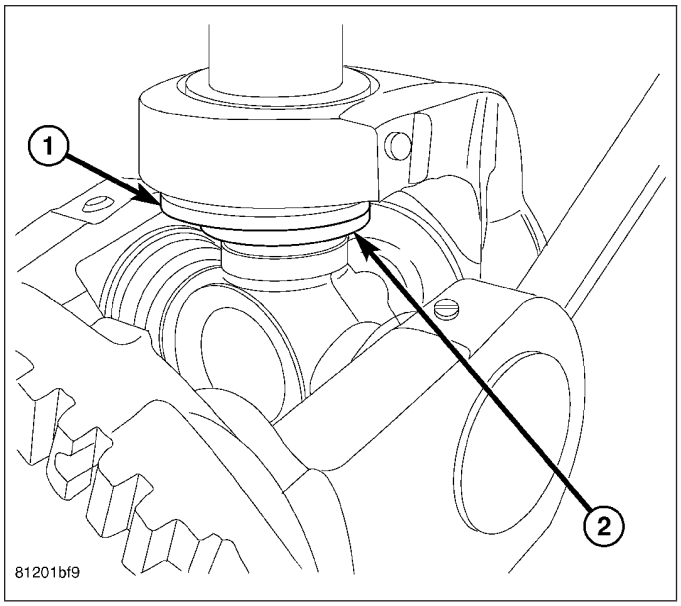


12. Position press (2) with receiver (3) on remaining bearing cap (1) and yoke.
13. Press remaining bearing cap until snap ring groove is through the yoke.



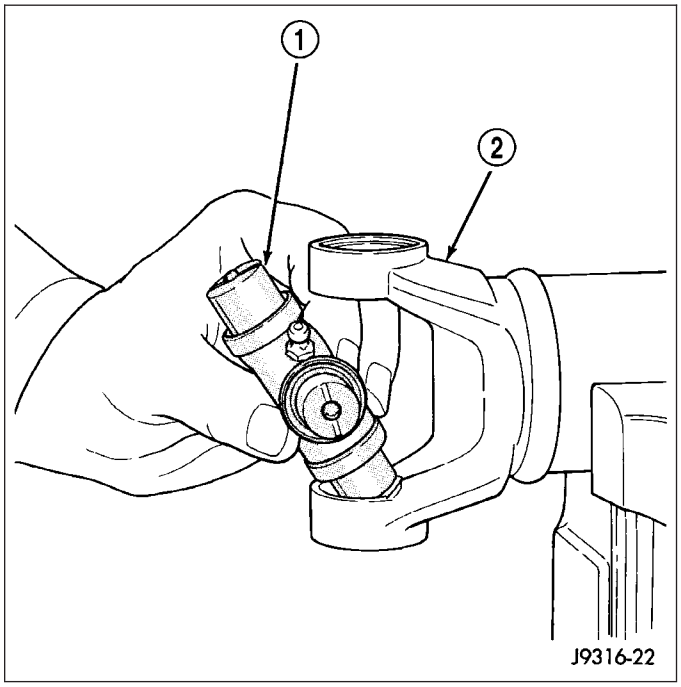
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14. Install snap ring (2) on bearing cap (1).



ASSEMBLY - WITH SNAP RINGS

1. Apply (EP) N.L.G.I. Grade 1 or 2 grease to inside of yoke bores.
2. Position cross (1) in yoke with lube fitting pointing up, if equipped.

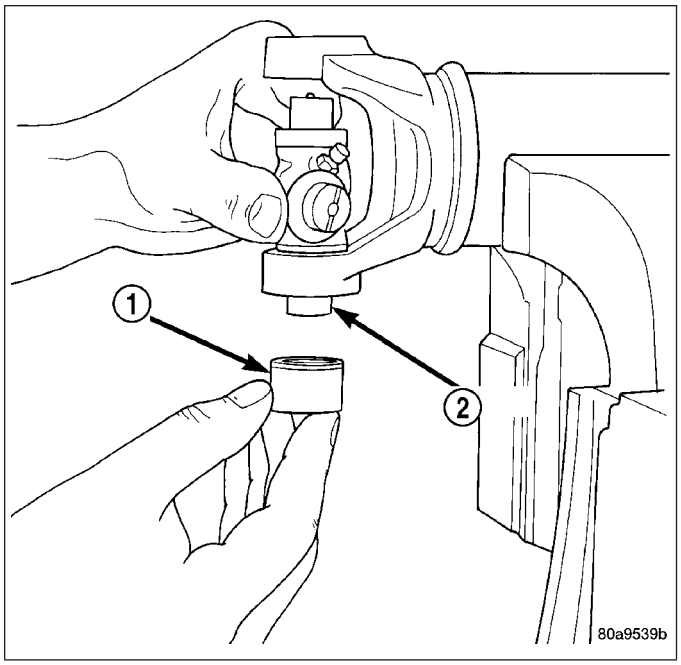


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3. Place a bearing cap (1) over the cross end (2) and align cap with yoke bore.
4. Press bearing cap into the yoke bore enough to clear snap ring groove.
5. Repeat Step 3 and Step 4 to install the opposite bearing cap.

NOTE: If joint is stiff or binding, strike the yoke with a soft hammer to seat the needle bearings.

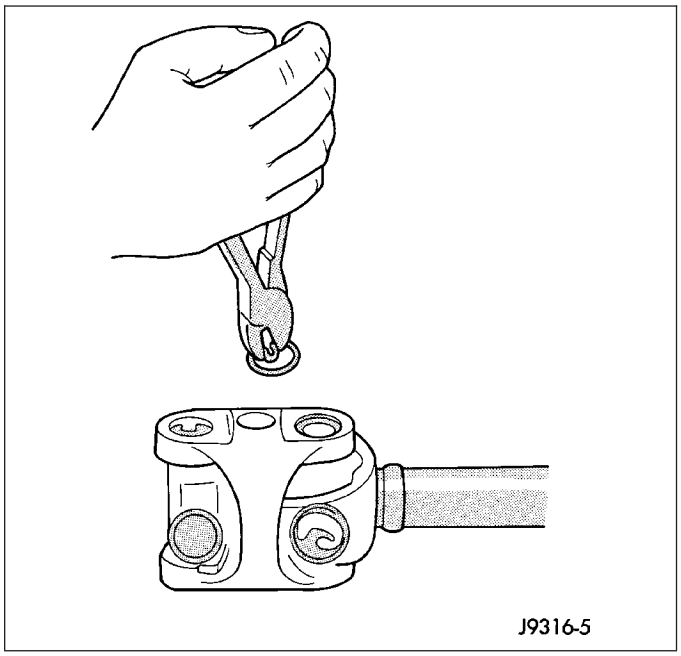
6. Add grease to lube fitting, if equipped.
7. Install propeller shaft.



UNIVERSAL JOINTS-DOUBLE CARDAN

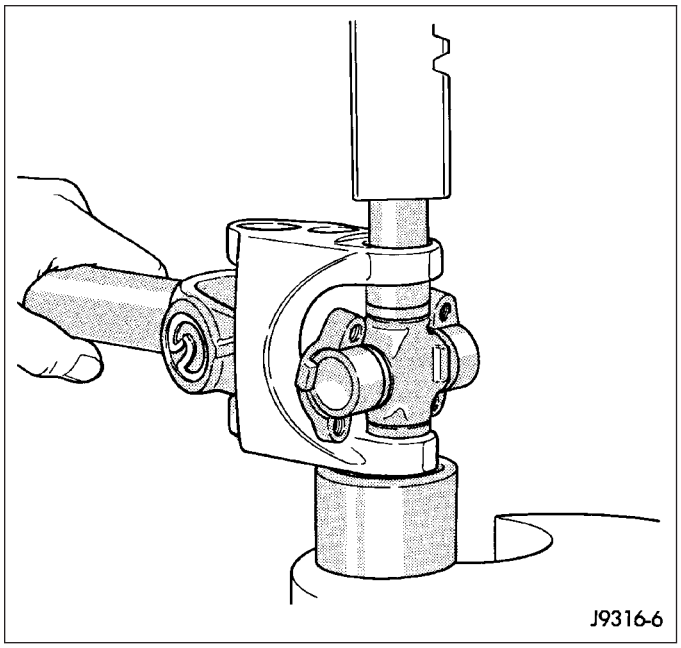
DISASSEMBLY

1. Remove propeller shaft.
2. Mark propeller shaft, link yoke and flange yoke for assembly reference.
3. Tap outside of the bearing cap assembly with drift to loosen snap rings.
4. Remove all bearing cap snap rings.
5. Remove grease fittings if equipped.
6. Position a socket on the press with an inside diameter large enough to receive the bearing cap under the link yoke.
7. Place another socket with an outside diameter smaller than the bearing cap on the upper bearing cap.

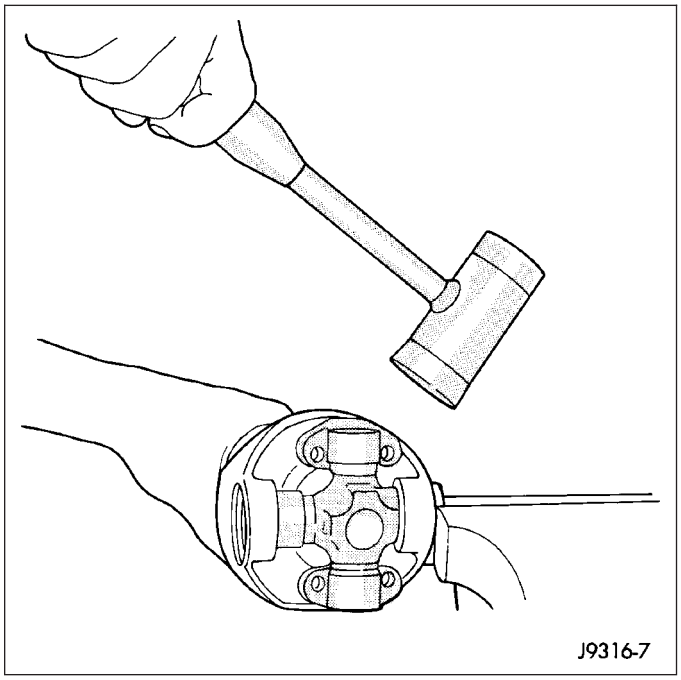


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8. Press one bearing cap from outboard side of the link yoke, enough to grasp the cap with vise jaws.

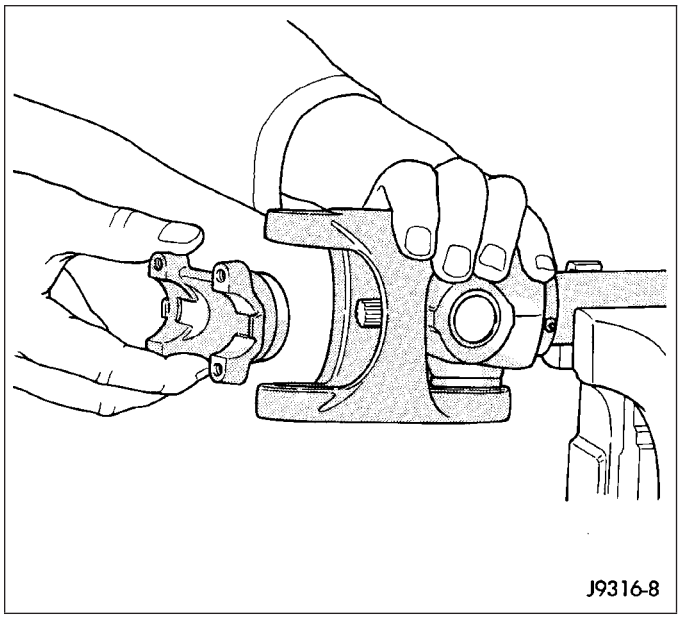


9. Grasp protruding bearing cap with vise jaws and tap link yoke with a mallet to remove bearing cap.
10. Flip assembly and repeat Step 6, Step 7, Step 8 and Step 9 to remove the opposite bearing cap.



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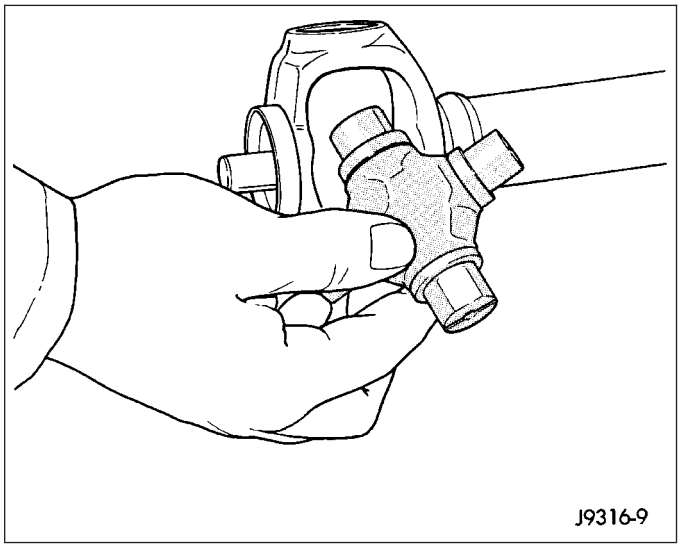
11. Remove cross centering kit assembly and spring.
12. Press remaining bearing caps out the other end of the link yoke.



ASSEMBLY

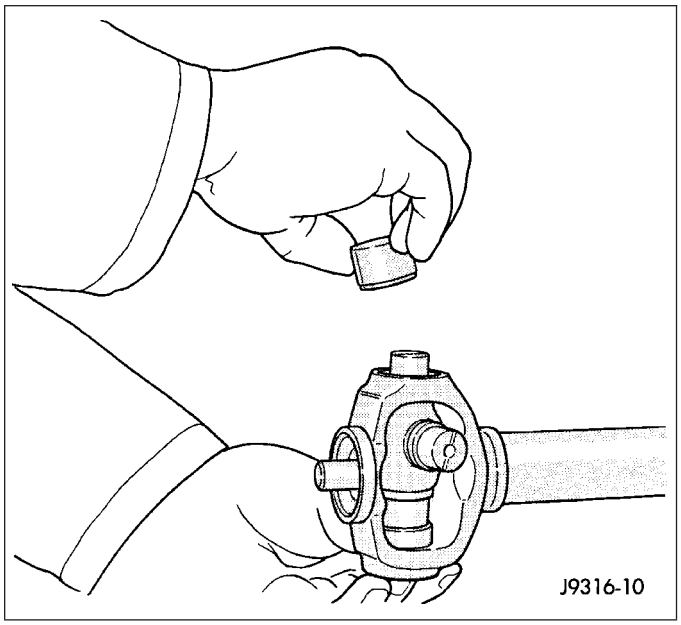
CAUTION: All alignment marks on the link yoke and propeller shaft yoke must be aligned during assembled.

1. Apply (EP) N.L.G.I. Grade 1 or 2 grease to inside of yoke bores.
2. Fit cross into the propeller shaft yoke.

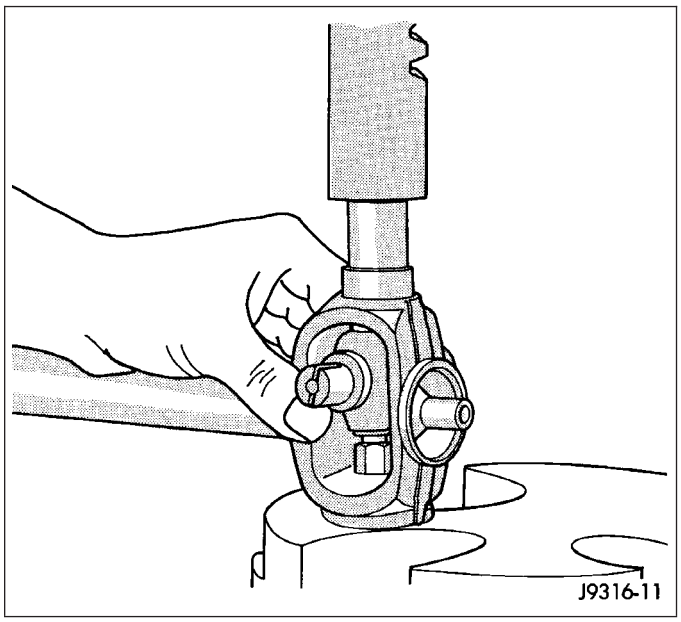


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3. Place bearing cap over the trunnion and align cap with the yoke bore. Keep needle bearings upright in the bearing cap.

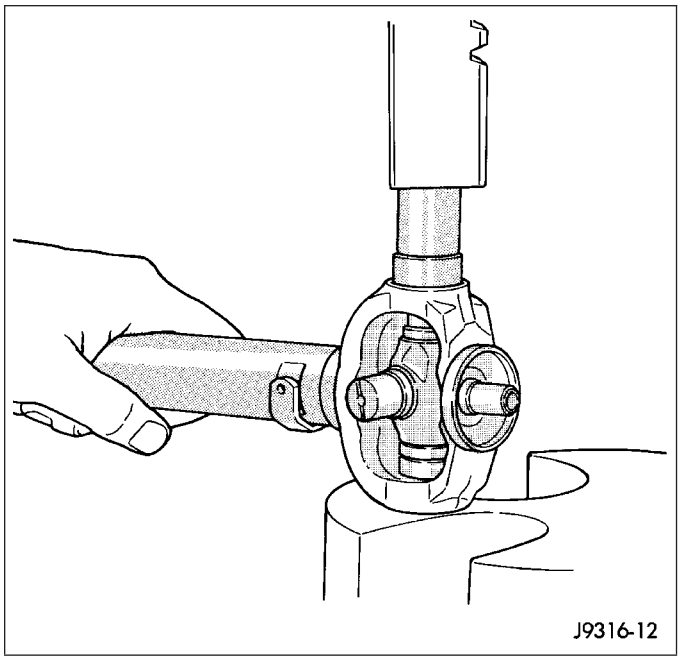


4. Press bearing cap into yoke bore enough to clear snap ring groove and install snap-ring.

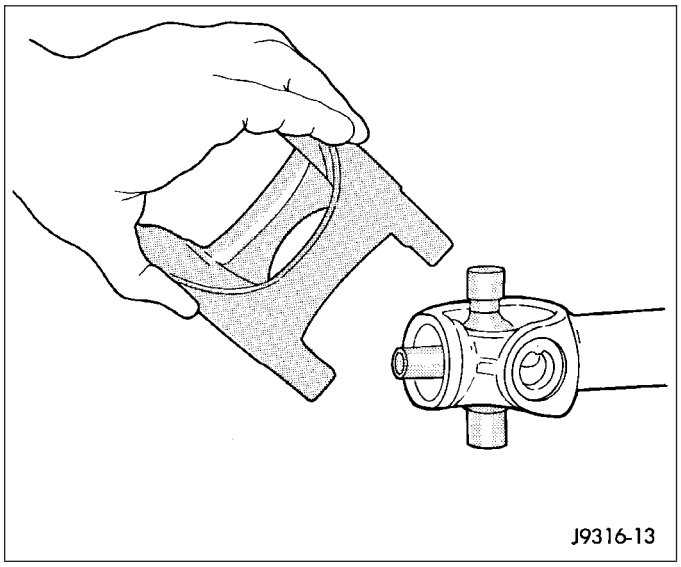


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5. Flip propeller shaft yoke and install other bearing cap onto the opposite trunnion and install a snap ring.



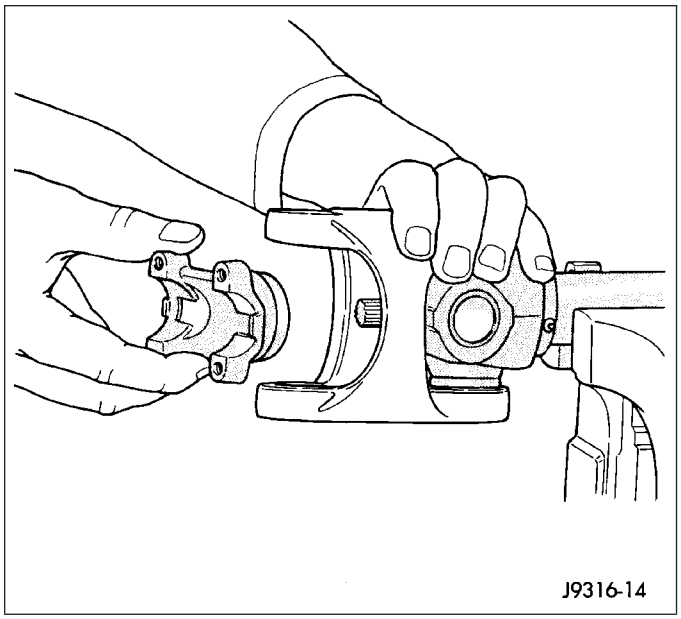
6. Fit link yoke onto remaining trunnions and press both bearing caps into place and install snap rings.



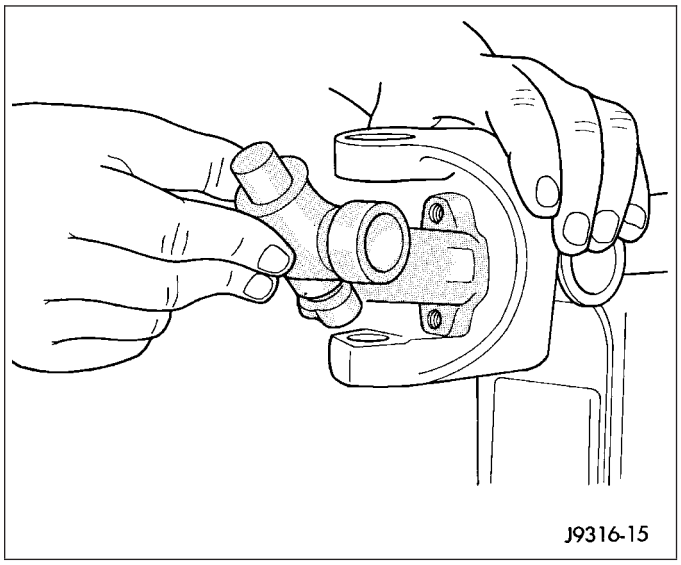
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7. Install centering kit assembly inside the link yoke.

NOTE: Verify spring is properly positioned.

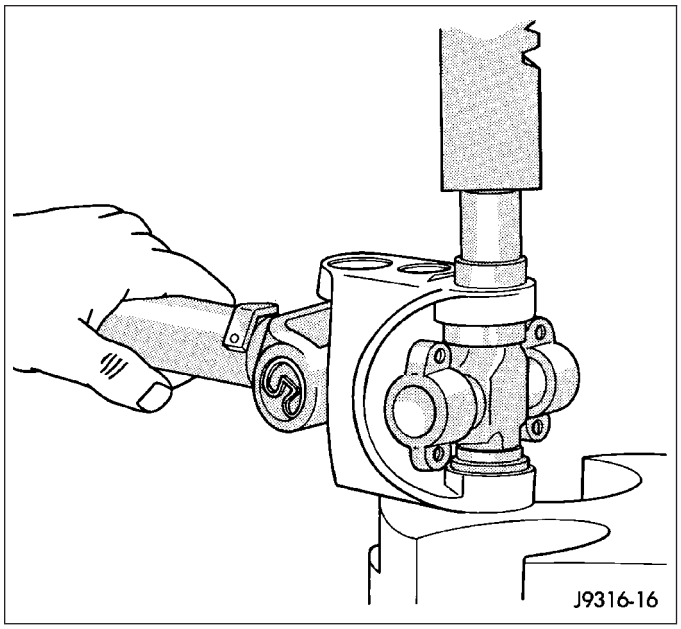


8. Place two bearing caps on opposite trunnions of the remaining cross. Fit open trunnions into the link yoke bores and bearing caps into the centering kit.

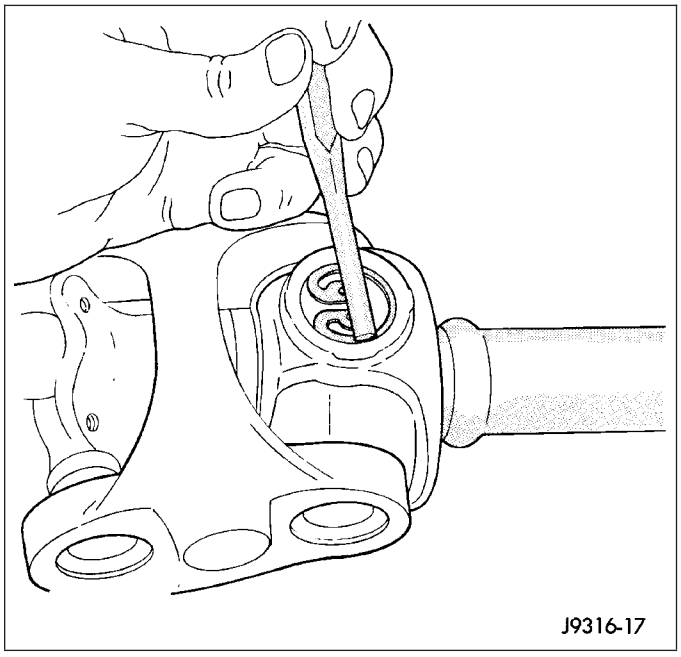


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9. Press remaining two bearing caps into place and install snap rings.

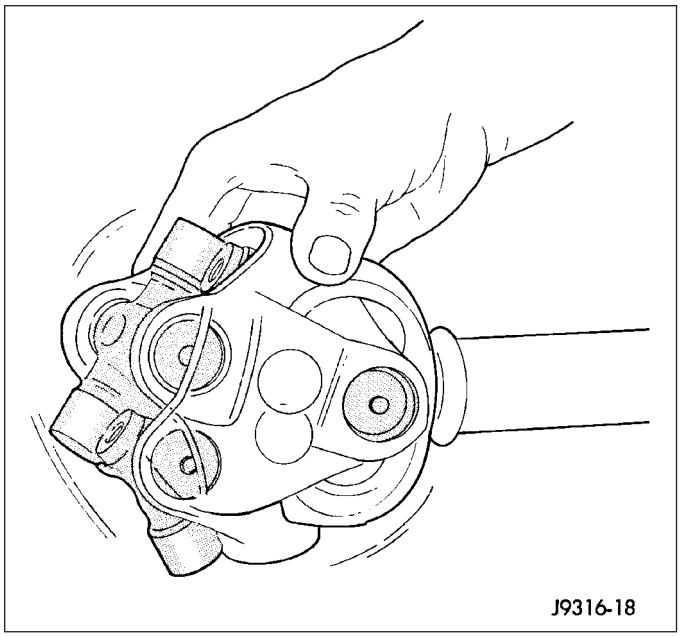


10. Tap snap rings to seat them into the grooves.



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11. Flexing the joint beyond center, the joint should snap over-center in both directions if correctly assembled.
12. Install propeller shaft.



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HALF SHAFT

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HALF SHAFT

CAUTION

CAUTION:: Never grasp half shaft assembly by the boots. This may cause the boot to pucker or crease and reduce the service life of the boot.
Avoid over angulating or stroking the C/V joints when handling the half shaft.
Half shafts exposed to battery acid, transmission fluid, brake fluid, differential fluid or gasoline may cause the boots to deteriorate. Failure to follow these instruction will result in damage.

DIAGNOSIS AND TESTING

HALF SHAFT

Check inboard and outboard C/V joint for leaking grease. This is a sign of boot or boot clamp damage.

NOISE/VIBRATION IN TURNS

A clicking noise or vibration in turns could be caused by a damaged outer C/V or inner tripod joint seal boot or seal boot clamps. This will result in the loss/contamination of the joint grease, resulting in inadequate lubrication of the joint. Noise could also be caused by another component of the vehicle coming in contact with the half shafts.

CLUNKING NOISE DURING ACCELERATION

This noise may be a damaged or worn C/V joint. A torn boot or loose/missing clamp on the inner/outer joint which has allowed the grease to be lost will damage the C/V joint.

SHUDDER/VIBRATION DURING ACCELERATION

This could be a worn/damaged inner tripod joint or a sticking tripod joint. Improper wheel alignment may also cause a shudder or vibration.

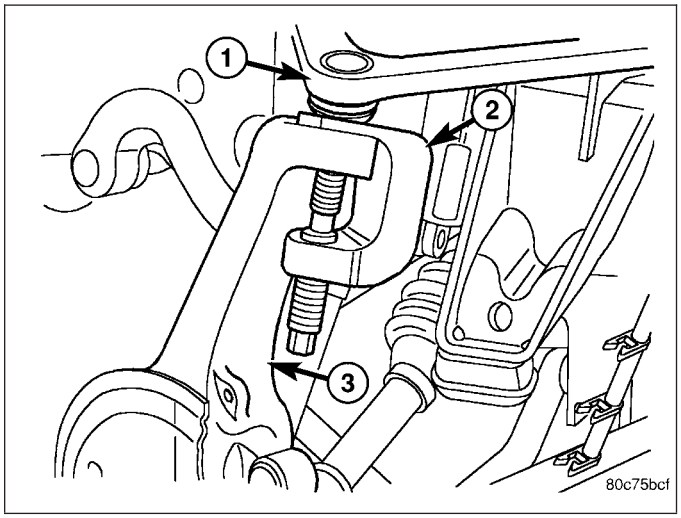
VIBRATION AT HIGHWAY SPEEDS

This problem could be a result of out of balance front tires or tire/wheel runout. Foreign material (mud, etc.) packed on the backside of the wheel(s) will also cause a vibration.

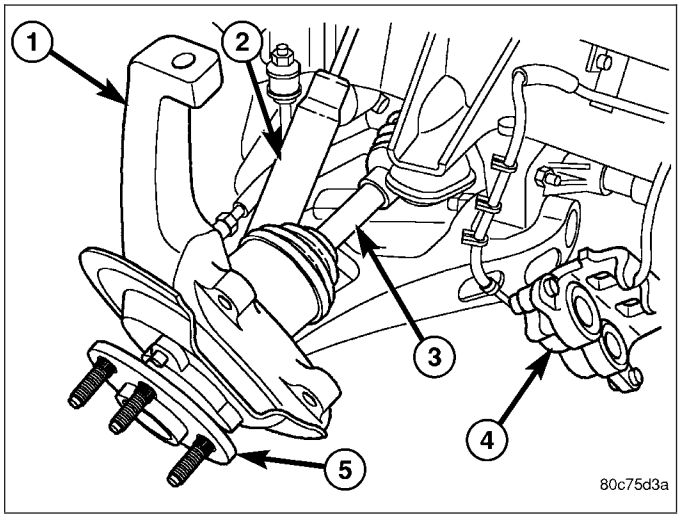
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REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Remove half shaft hub nut.
3. Remove brake caliper and rotor.
4. Position hydraulic jack under lower suspension arm and raise jack to unload rebound bumper.
5. Remove lower shock absorber bolt.
6. Remove upper ball joint nut and seperate ball with Remover 8677 (2).
7. Disengage inner C/V joint from axle shaft with two pry bars between the C/V housing and axle housing.

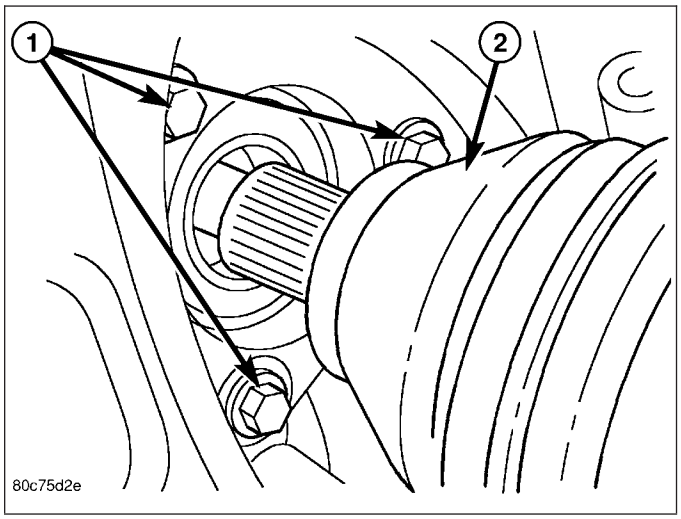


8. Tilt knuckle (1) out and push half shaft (3) out of the knuckle.
9. Remove half shaft from vehicle.



INSTALLATION

1. Clean hub bearing bore, hub bearing mating surface and half shaft splines.
2. Apply a light coating of grease to the front axle shaft output splines.
3. Install half shaft (2) into the knuckle.
4. Install half shaft on axle shaft. Push firmly to engage axle shaft snap ring into the inner C/V housing.
5. Install upper ball joint into the knuckle.
6. Install upper ball joint nut and tighten to specification.
7. Install lower shock absorber bolt and tighten to specification.
8. Install brake rotor and caliper.



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9. Install half shaft hub nut and tighten to 251 N·m (185 ft. lbs.).

SPECIFICATIONS

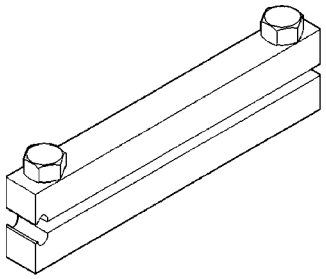
HALF SHAFT

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Half Shaft Nut	251	185	-

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SPECIAL TOOLS



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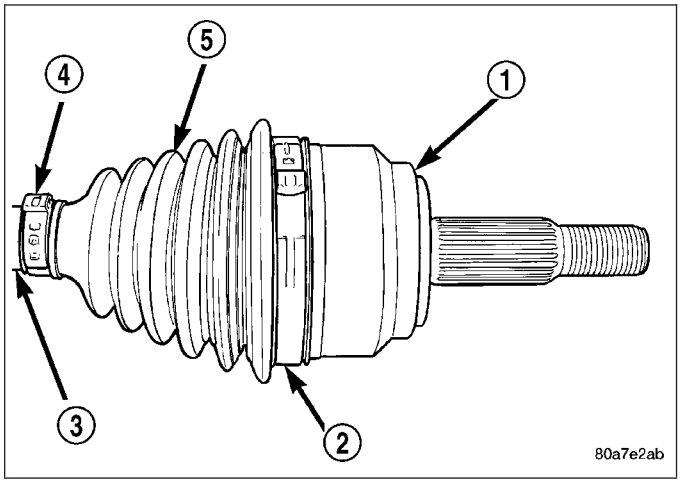
CV JOINT-OUTER

REMOVAL

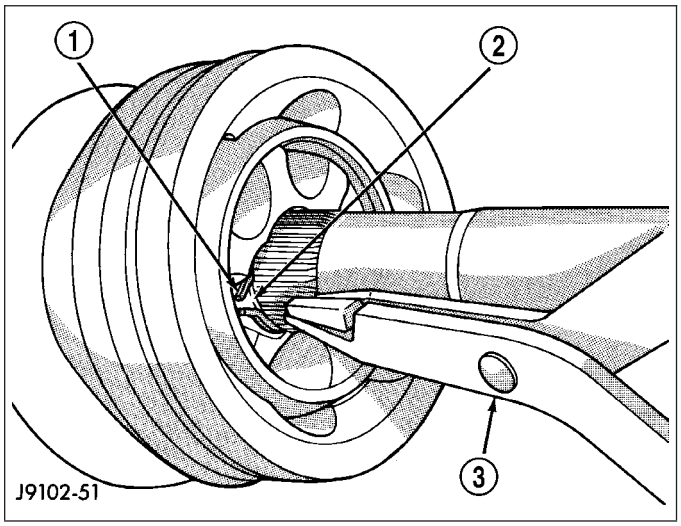
1. Clamp shaft in a vise (with soft jaws) and support C/V joint.

CAUTION: Do not damage C/V housing or half shaft.

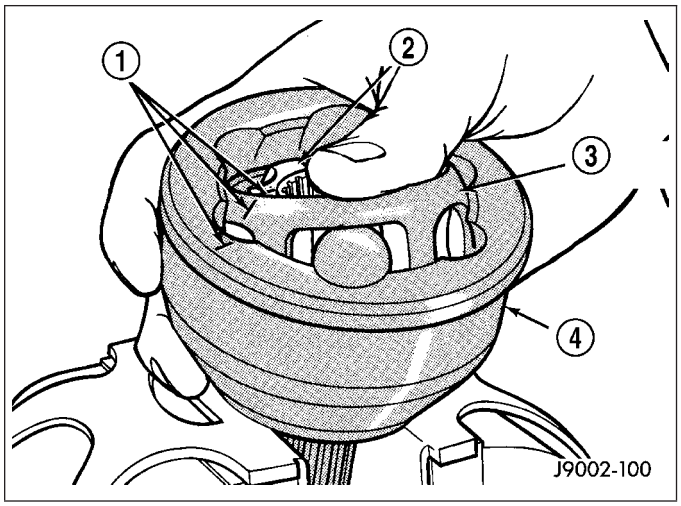
2. Remove clamps (2) (4) with a cut-off wheel or grinder.



3. Slide the boot down the shaft.
4. Remove lubricant to expose the C/V joint snap ring (1).
5. Spread snap ring (1) and slide the joint off the shaft.
6. Slide boot off the shaft and discard old boot.



7. Mark alignment marks (1) on the inner race/hub (2), bearing cage (3) and housing with dabs of paint.



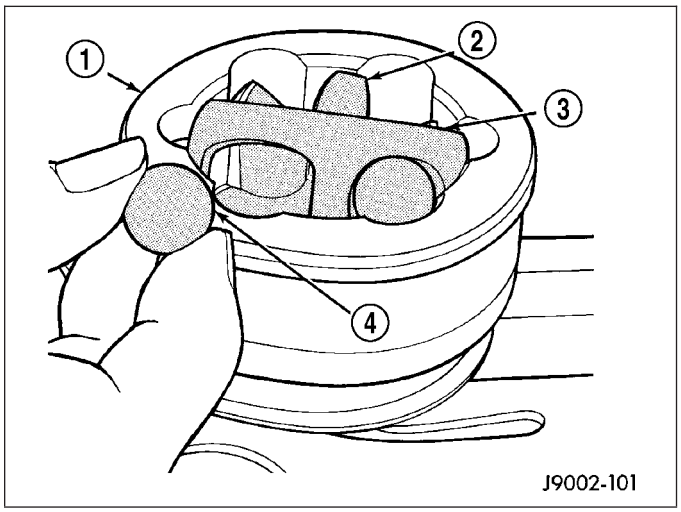
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8. Clamp C/V joint in a vertical position in a soft jawed vise.

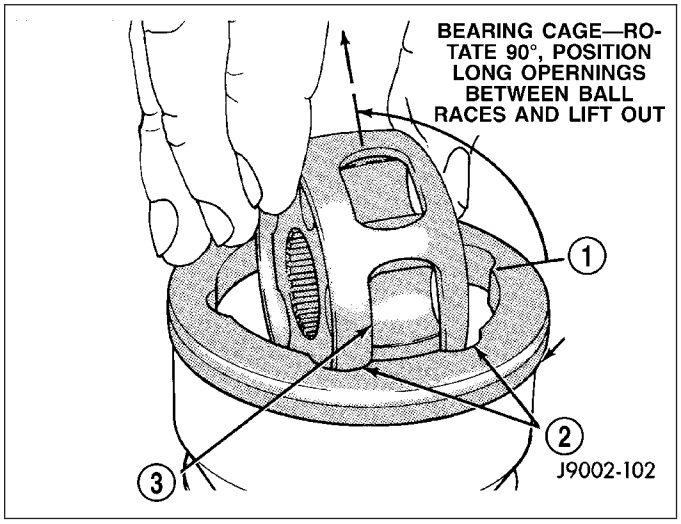
9. Press down one side of the bearing cage (3) to gain access to the ball at the opposite side.

NOTE: If joint is tight, use a hammer and brass drift to loosen the bearing hub. Do not contact the bearing cage with the drift.

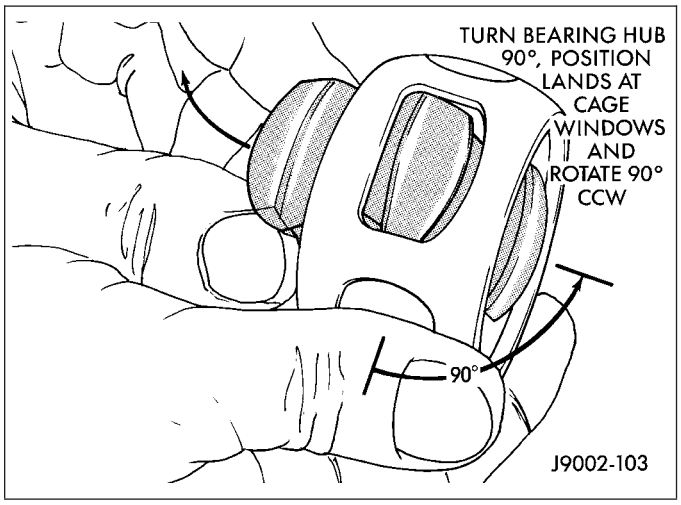
10. Remove ball (4) from the bearing cage (3).
11. Repeat step above until all six balls are removed from the bearing cage.



12. Lift cage and inner race (2) upward and out from the housing (1).



13. Turn inner race 90° in the cage and rotate the inner race/hub out of the cage.

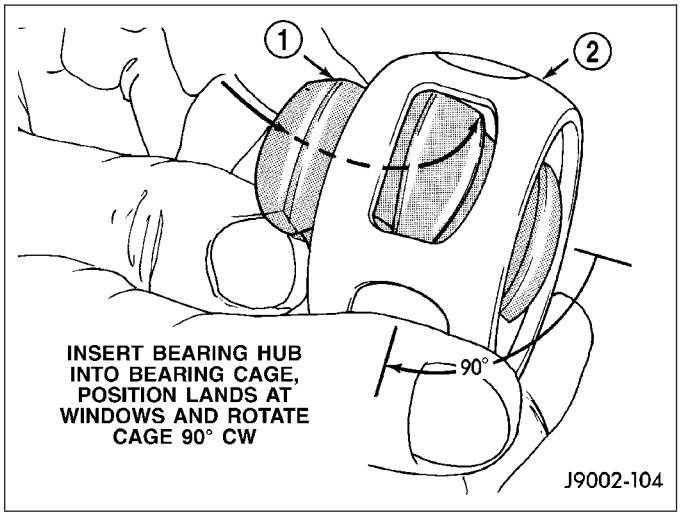


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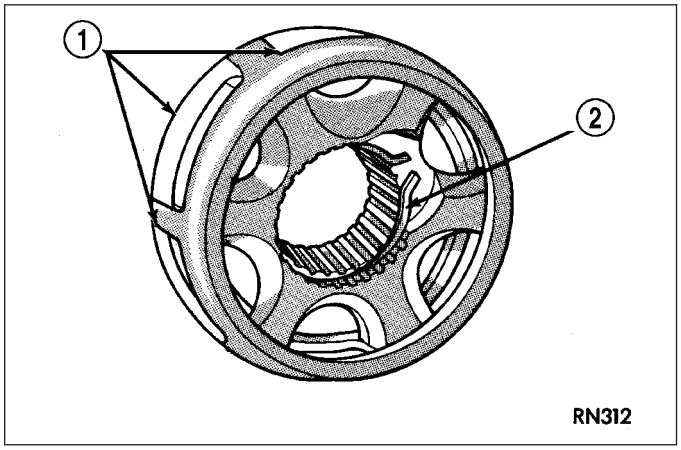
INSTALLATION

NOTE: If C/V joint is worn, replace entire C/V joint and boot.

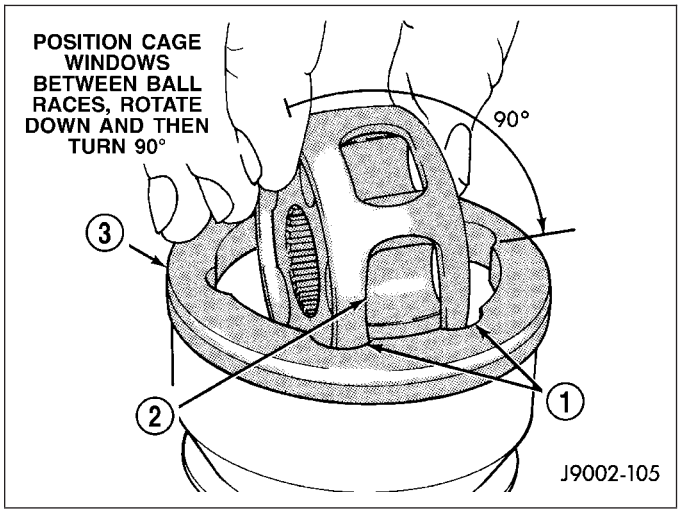
1. Clean all C/V joint components and shaft.
2. Apply a light coat of grease supplied with the joint/boot to the C/V joint components before assembling them.
3. Align the inner race (1) cage (2) and housing according to the alignment reference marks.
4. Insert the inner race (1) into the cage (2) and rotate race into the cage.



5. Rotate the inner race/hub (2) in the cage.

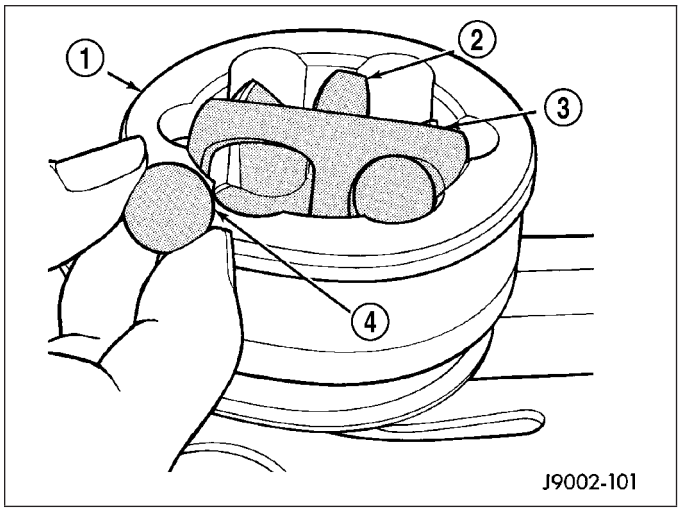


6. Insert cage (2) into the housing. Rotate the cage 90° into the housing (3) so the large bearing hub counterbore is facing outwards.
7. Apply the grease supplied with the joint/boot to the ball races. Spread the grease equally between all the races.



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8. Tilt inner race/hub (1) and cage (3) and install the balls(4).
9. Place new clamps onto new boot and slide boot onto the shaft to it's original position.
10. Apply the rest of grease to the C/V joint and boot.

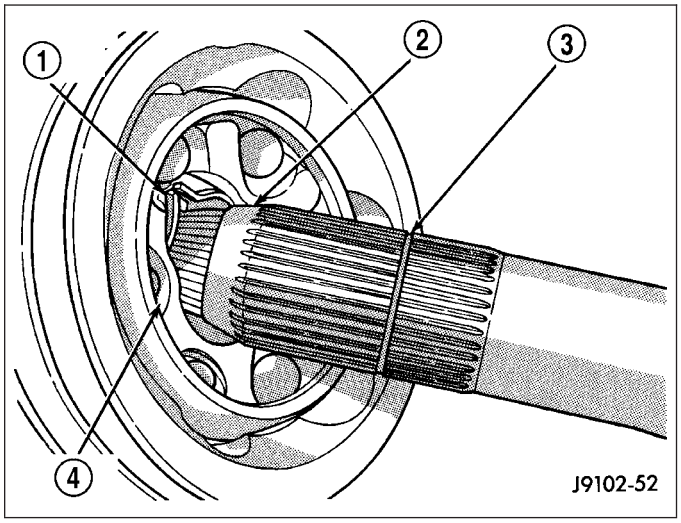


11. Install the joint onto the shaft (2). Push the joint onto the shaft until the snap ring (1) seats in the groove (3).

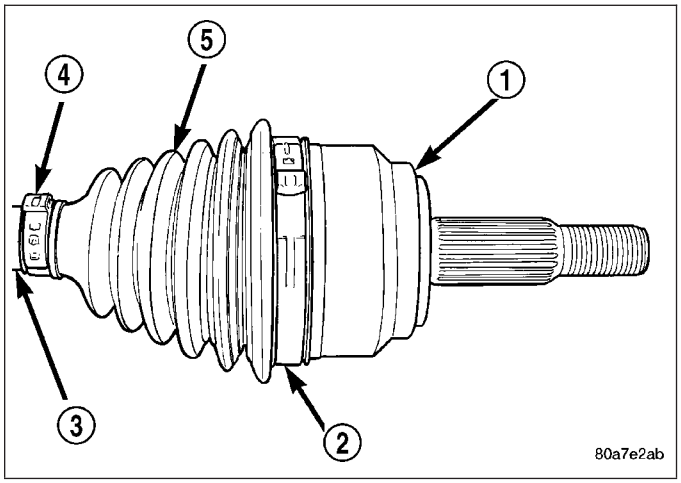
NOTE: Pull on the joint to verify the span ring has engaged.

12. Position the boot on the joint in it's original position.

NOTE: Verify boot is not twisted and remove any excess air.



13. Secure both boot (5) clamps (2) (4) with Clamp Installer C-4975A. Place tool on clamp bridge and tighten tool until jaws of the tool are closed.



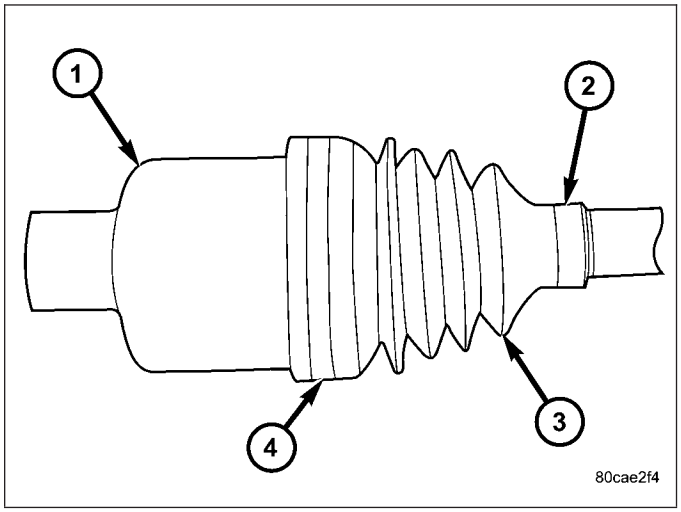
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CV JOINT-INNER

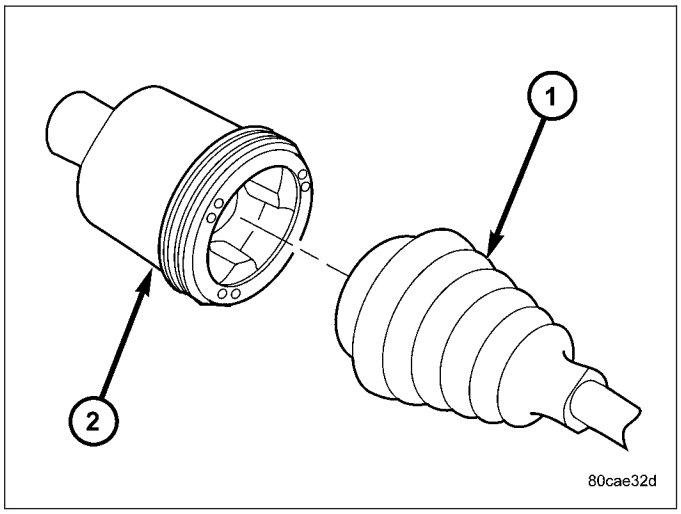
REMOVAL

1. Clamp shaft in vise (with soft jaws) and support C/V joint.
2. Remove clamps (2) (4) with a cut-off wheel or grinder.

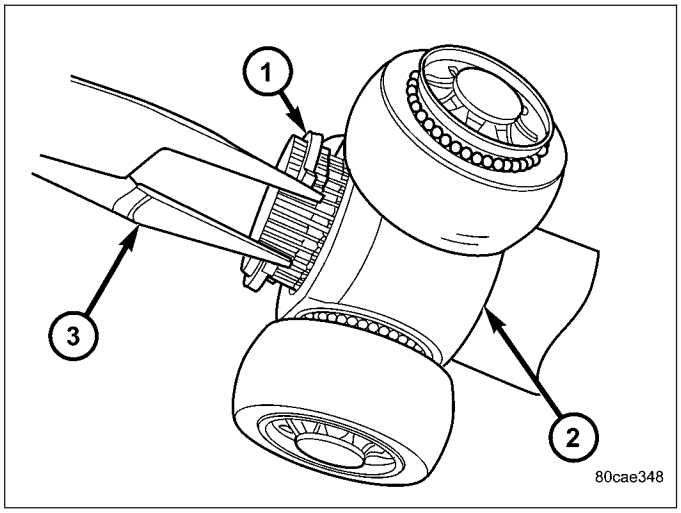
CAUTION: Do not damage C/V housing or half shaft with cut-off wheel or grinder.



3. Remove housing (1) from the half shaft and slide boot (2) down shaft.
4. Remove housing bushing from the housing.



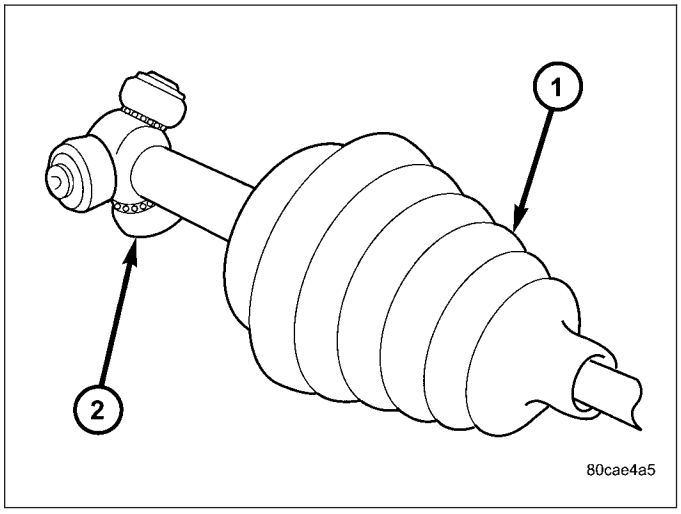
5. Remove tripod (2) snap ring (1).
6. Remove tripod (2) and boot from the half shaft.
7. Clean and inspect C/V components for excessive wear and damage. Replace the tripod as a unit only if necessary.



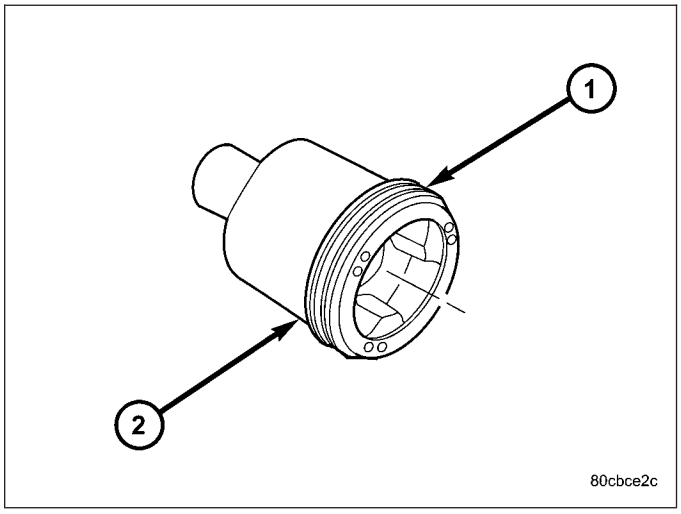
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INSTALLATION

1. Clean all C/V joint components and shaft.
2. Slide **new** boot (1) down the half shaft.
3. Install tripod (2) and tripod snap ring on the half shaft.
4. Pack grease supplied with the joint/boot into the housing and boot.
5. Coat tripod with supplied grease.



6. Install **new** bushing (1) onto the housing (2).
7. Insert the tripod and shaft in the housing.



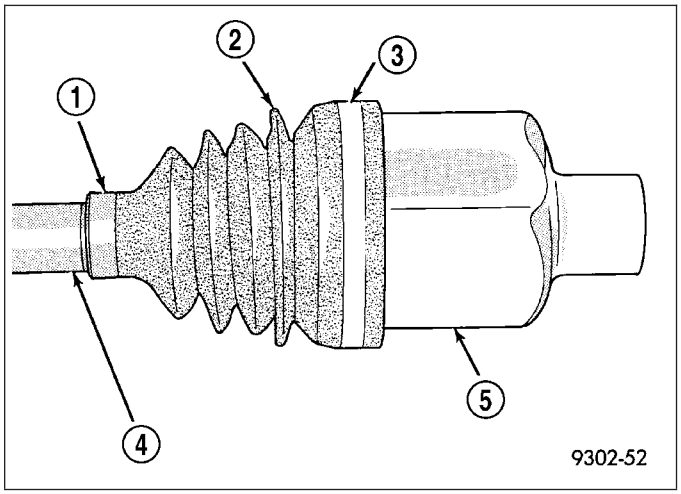
8. Position the boot (2) on the housing (5) and shaft (4) in it's original position.

NOTE: Verify boot is not twisted and remove any excess air.

9. Measure the distance from the end of the housing to the end of the boot on the shaft. This measurement should be 260 mm (10.25 in.).

NOTE: If measurement is not correct, allow more or less air into the boot.

10. Secure both boot clamps (1) (3) with Clamp Installer C-4975A. Place tool on clamp bridge and tighten tool until the jaws of the tool are closed.



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FRONT AXLE - C205F

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FRONT AXLE - C205F

DIAGNOSIS AND TESTING

FRONT AXLE - C205F

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, tooth contact, worn/damaged gears or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant.
- Incorrect ring gear backlash.
- Gear damage.

Differential side gears and pinions can be checked by turning the vehicle. The side gears are loaded during turns. They usually do not cause noise during straight-ahead driving when the gears are unloaded. A worn pinion mate shaft can also cause a snapping or a knocking noise.

BEARING NOISE

The axle shaft, differential and pinion bearings can all produce noise when worn or damaged. Bearing noise can be either a whining, or a growling sound.

Pinion bearings have a constant-pitch noise. This noise changes only with vehicle speed. Pinion bearing noise will be higher pitched because it rotates at a faster rate. Drive the vehicle and load the differential. If bearing noise occurs, the rear pinion bearing is the source of the noise. If the bearing noise is heard during a coast, the front pinion bearing is the source.

Differential bearings usually produce a low pitch noise. Differential bearing noise is similar to pinion bearing noise. The pitch of differential bearing noise is also constant and varies only with vehicle speed.

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Axle shaft bearings produce noise and vibration when worn or damaged. The noise generally changes when the bearings are loaded. Road test the vehicle. Turn the vehicle sharply to the left and to the right. This will load the bearings and change the noise level. Where axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 m.p.h.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joints/CV joint.
- Worn side-gear thrust washers.
- Worn pinion shaft bore.

VIBRATION

Vibration at the rear of the vehicle is usually caused by:

- Damaged drive shaft.
- Missing drive shaft balance weight(s).
- Worn or out of balance wheels.
- Loose wheel lug nuts.
- Worn U-joint(s).
- Loose/broken springs.
- Damaged axle shaft bearing(s).
- Loose pinion gear nut.
- Excessive pinion yoke run out.
- Bent axle shaft(s).

Check for loose or damaged front end components or engine/transmission mounts. These components can contribute to what appears to be a rear end vibration. Do not overlook engine accessories, brackets and drive belts.

All driveline components should be examined before starting any repair.

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear (or the clutch engaged) can be caused by:

- High engine idle speed.
- Transmission shift operation.
- Loose engine/transmission/transfer case mounts.
- Worn U-joints/CV joint.
- Loose spring mounts.
- Loose pinion gear nut and yoke.
- Excessive ring gear backlash.
- Excessive side gear to case clearance.

The source of a snap or a clunk noise can be determined with the assistance of a helper. Raise the vehicle on a hoist with the wheels free to rotate. Instruct the helper to shift the transmission into gear and listen for the noise. A mechanics stethoscope is helpful in isolating the source of a noise.

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DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose.	1. Tighten loose nuts.
	2. Faulty, brinelled wheel bearing.	2. Replace bearing.
Axle Shaft Noise	1. Misaligned axle tube.	1. Inspect axle tube alignment. Correct as necessary.
	2. Bent or sprung axle shaft.	2. Inspect and correct as necessary.
	3. End-play in pinion bearings.	3. Refer to pinion pre-load information and correct as necessary.
	4. Excessive gear backlash between the ring gear and pinion.	4. Check adjustment of the ring gear and pinion backlash. Correct as necessary.
	5. Improper adjustment of pinion gear bearings.	5. Adjust the pinion bearings pre-load.
	6. Loose pinion yoke nut.	6. Tighten the pinion yoke nut.
	7. Scuffed gear tooth contact surfaces.	7. Inspect and replace as necessary.
Axle Shaft Broke	1. Misaligned axle tube.	1. Replace the broken shaft after correcting tube mis-alignment.
	2 Vehicle overloaded.	2. Replace broken shaft and avoid excessive weight on vehicle.
	3. Erratic clutch operation.	3. Replace broken shaft and avoid or correct erratic clutch operation.
	4. Grabbing clutch.	4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	1. Improper adjustment of the differential bearings.	1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly.
	2. Excessive ring gear backlash.	2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly.
	3. Vehicle overloaded.	3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight.
	4. Erratic clutch operation.	4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.

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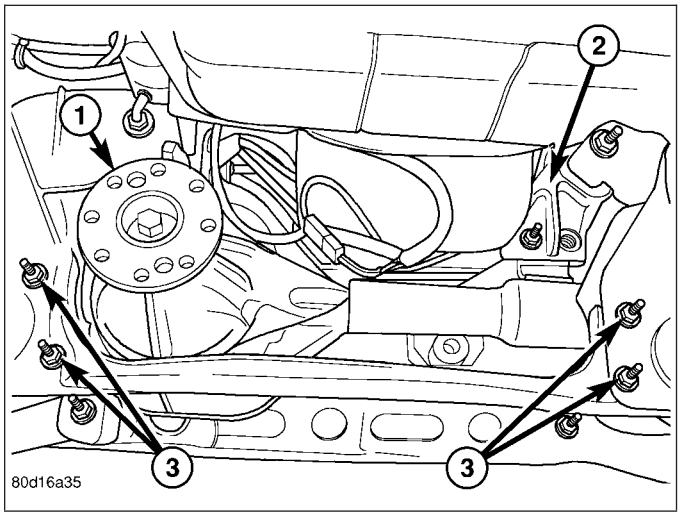
Condition	Possible Causes	Correction
Differential Gears Scored	1. Insufficient lubrication.	1. Replace scored gears. Fill differential with the correct fluid type and quantity.
	2. Improper grade of lubricant.	2. Replace scored gears. Fill differential with the correct fluid type and quantity.
	3. Excessive spinning of one wheel/tire.	3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	1. Lubricant level too high.	1. Drain lubricant to the correct level.
	2. Worn axle shaft seals.	2. Replace seals.
	3. Cracked differential housing.	3. Repair as necessary.
	4. Worn pinion seal.	4. Replace seal.
	5. Worn/scored yoke.	5. Replace yoke and seal.
	6. Axle cover not properly sealed.	6. Remove, clean, and re-seal cover.
Axle Overheating	1. Lubricant level low.	1. Fill differential to correct level.
	2. Improper grade of lubricant.	2. Fill differential with the correct fluid type and quantity.
	3. Bearing pre-loads too high.	3. Re-adjust bearing pre-loads.
	4. Insufficient ring gear backlash.	4. Re-adjust ring gear backlash.
Gear Teeth Broke	1. Overloading.	1. Replace gears. Examine other gears and bearings for possible damage.
	2. Erratic clutch operation.	2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation.
	3. Ice-spotted pavement.	3. Replace gears and examine remaining parts for damage.
	4. Improper adjustments.	4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.

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Condition	Possible Causes	Correction
Axle Noise	1. Insufficient lubricant.	1. Fill differential with the correct fluid type and quantity.
	2. Improper ring gear and pinion adjustment.	2. Check ring gear and pinion contact pattern.
	3. Unmatched ring gear and pinion.	3. Replace gears with a matched ring gear and pinion.
	4. Worn teeth on ring gear and/or pinion.	4. Replace ring gear and pinion.
	5. Loose pinion bearings.	5. Adjust pinion bearing pre-load.
	6. Loose differential bearings.	6. Adjust differential bearing pre-load.
	7. Mis-aligned or sprung ring gear.	7. Measure ring gear run-out. Replace components as necessary.
	8. Loose differential bearing cap bolts.	8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued tot he proper specification.
	9. Housing not machined properly.	9. Replace housing.

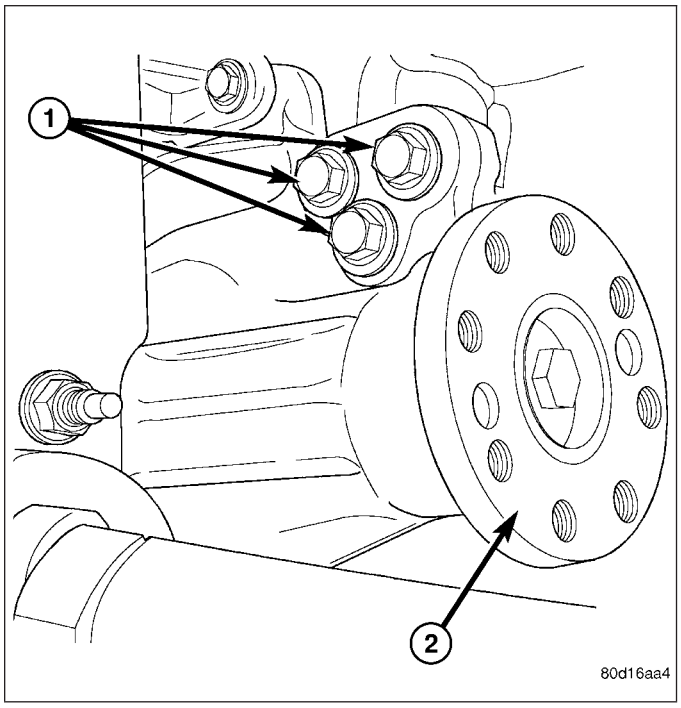
REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Remove axle half shafts.
3. Remove exhaust crossover.
4. Mark front propeller shaft and remove shaft.
5. Remove suspension crossmember mounting bolts (3) and remove crossmember.

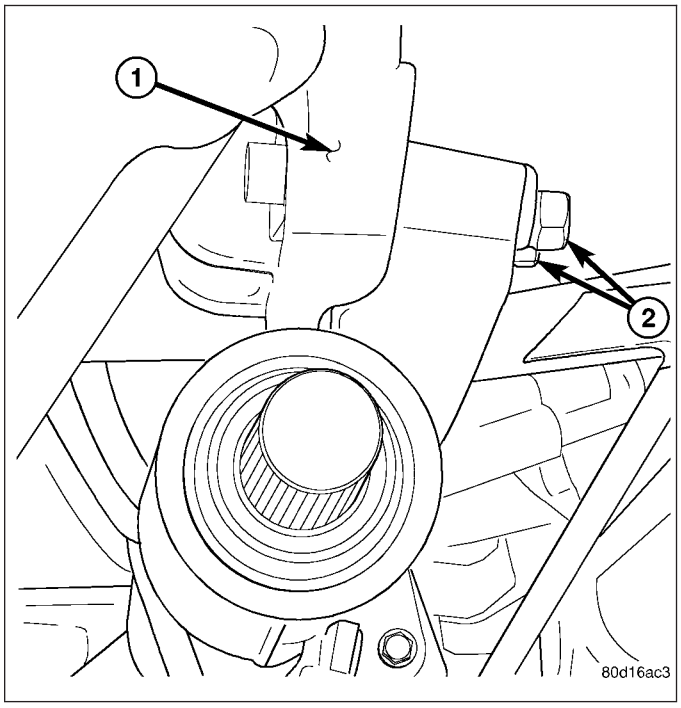


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6. Support axle with hydraulic jack.
7. Remove axle housing pinion mounting bolts (1).

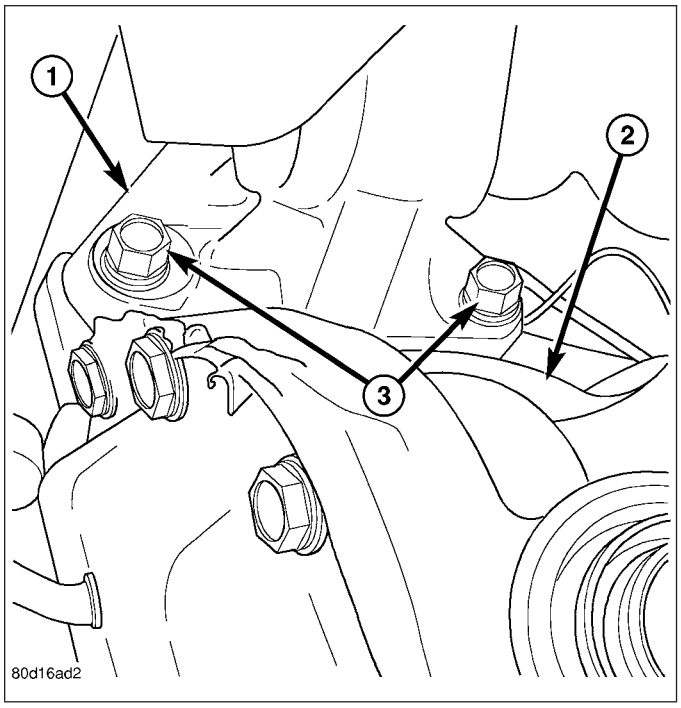


8. Remove axle shaft tube mounting bolts (2).



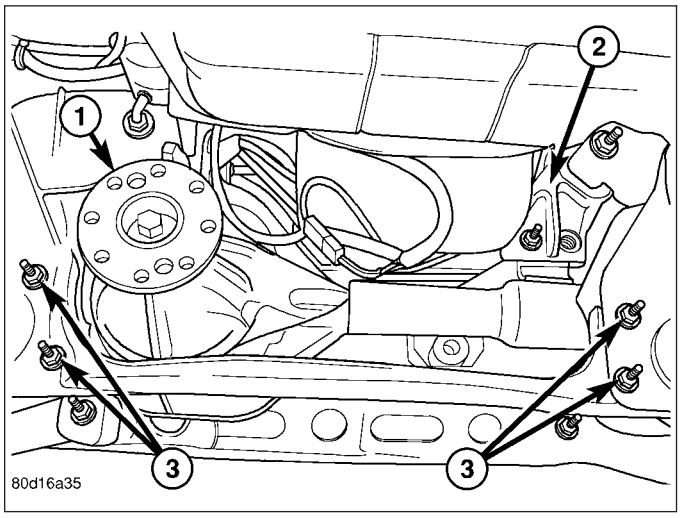
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9. Remove differential housing (2) mounting bolts (3).
10. Lower axle from the vehicle.



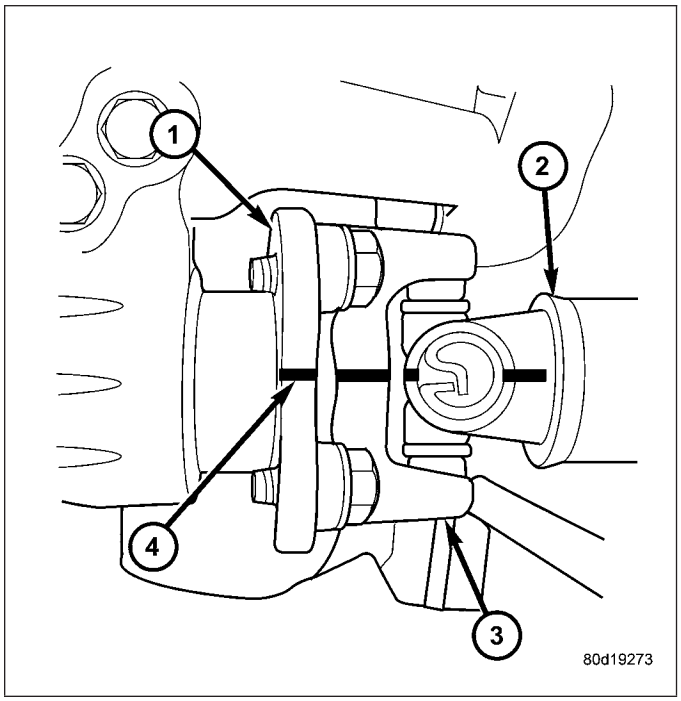
INSTALLATION

1. Raise axle into position.
2. Install axle mounting bolts and tighten nuts to 95 N·m (70 ft. lbs.).
3. Install suspension crossmember and bolts. Tighten crossmember nuts (3) to 102 N·m (75 ft. lbs.).



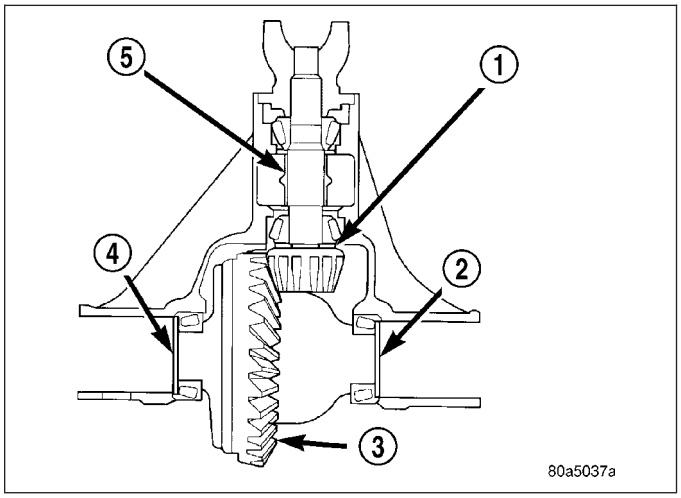
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4. Install front propeller shaft (2) with reference marks (4) aligned and tighten bolts to 115 N·m (85 ft. lbs.).
5. Install exhaust crossover.
6. Install axle half shafts.



ADJUSTMENTS

Ring gear (3) and pinion are supplied as a matched sets. Identifying numbers for the ring gear and pinion are painted onto the pinion gear shaft and the side of the ring gear. A plus (+) number, minus (–) number or zero (0) along with the gear set sequence number (01 to 99) is on each gear. This first number is the amount (in thousandths of an inch) the depth varies from the standard depth setting of a pinion marked with a (0). The next two numbers are the sequence number of the gear set. The standard depth provides the best teeth contact pattern. Compensation for pinion depth variance is achieved with select shims (1) located between the rear pinion bearing cone and pinion gear head.



If installing a new gear, note the depth variance number of the original and replacement pinion. Add or subtract this number from the original depth shim/oil slinger to compensate for the difference in the depth variances. The numbers represent thousands of an inch deviation from the standard. If the number is negative, add that value to the required thickness of the depth shims. If the number is positive, subtract that value from the thickness of the depth shim.

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Pinion Gear Depth Variance Chart: Note where Old and New Pinion Marking columns intersect. Intersecting figure represents plus or minus the amount needed.

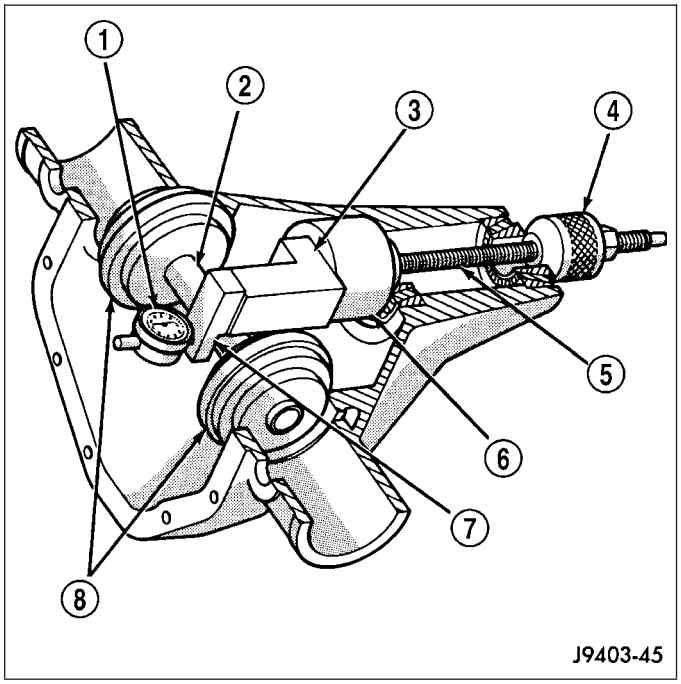
PINION GEAR DEPTH VARIANCE

Original Pinion Gear Depth Variance	New Pinion Gear Depth Variance								
	−4	−3	−2	−1	0	+1	+2	+3	+4
+4	+0.008	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0
+3	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001
+2	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002
+1	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003
0	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004
−1	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005
−2	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006
−3	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006	−0.007
−4	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006	−0.007	−0.008

PINION DEPTH MEASUREMENT

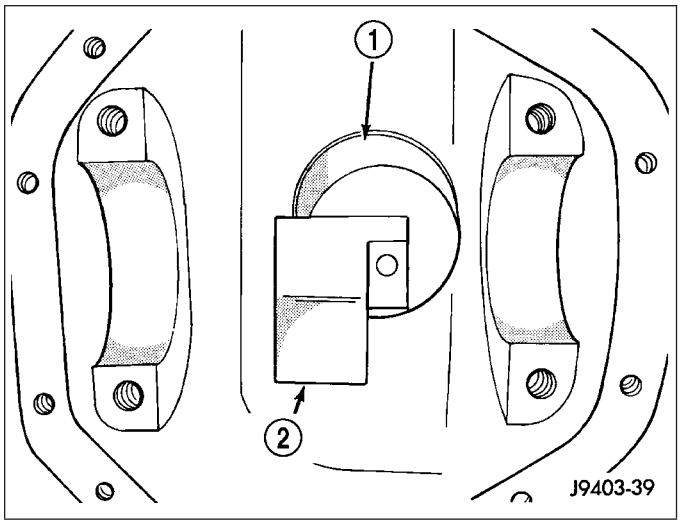
Measurements are taken with pinion cups and pinion bearings installed in housing. Take measurements with a Pinion Gauge Set, Pinion Block 8177 (6), Arbor Discs 8541(8) and Dial Indicator C-3339 (1).

1. Assemble Pinion Height Block 6739 (3), Pinion Block 8177 (6) and rear pinion bearing onto Screw 6741 (5).

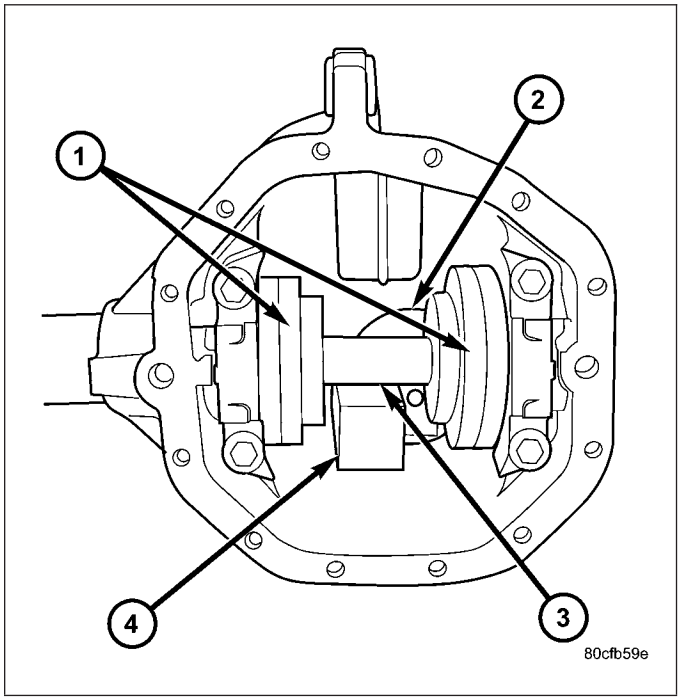


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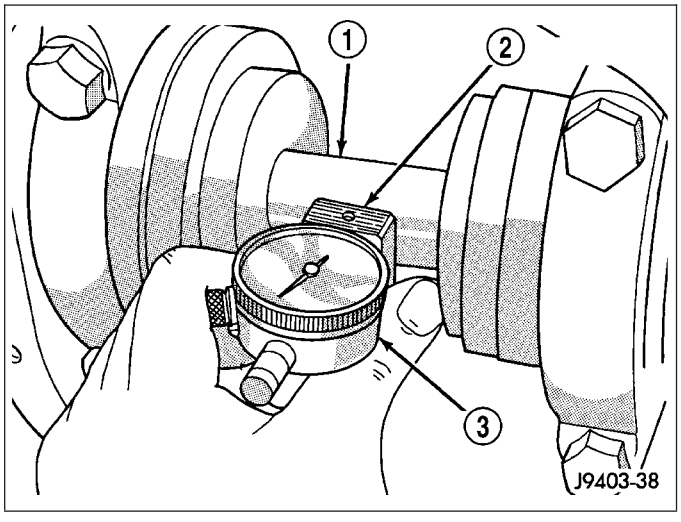
2. Insert assembled height gauge components (1) (2), rear bearing and screw into the housing through the pinion bearing cups.
3. Install front pinion bearing and Cone-Nut 6740 onto the screw. Tighten cone-nut until Torque To Rotate the screw is 2.0 N·m (18 in. lbs.).



4. Place Arbor Discs 8541 (1) on Arbor D-115-3 (3) in position in the housing side bearing cradles. Install differential bearing caps on arbor discs (1) and tighten cap bolts to specification.
5. Assemble Dial Indicator C-3339 into Scooter Block D-115-2 and secure set screw.
6. Place Scooter Block/Dial Indicator in position in the housing so dial probe and scooter block are flush against the surface of the pinion height block. Hold scooter block in place and zero the dial indicator. Tighten dial indicator face lock screw.

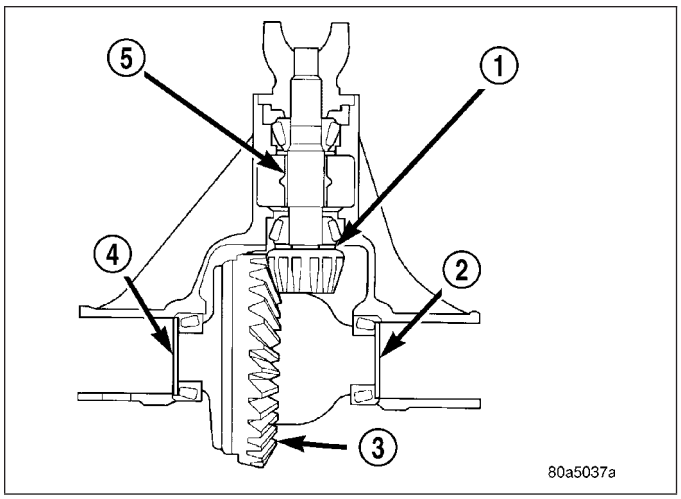


7. Slide the dial indicator (3) probe across the gap between the pinion height block and the arbor bar (1) with the scooter block (2) against the pinion height block. Slide the dial probe to the crest of the arbor bar and record the highest reading.
8. Select a shim equal to the dial indicator reading plus the drive pinion gear depth variance number marked on the shaft of the pinion gear using the opposite sign on the variance number. For example, if the depth variance is –2, add +0.002 in. to the dial indicator reading.
9. Remove the pinion depth gauge components from the housing.



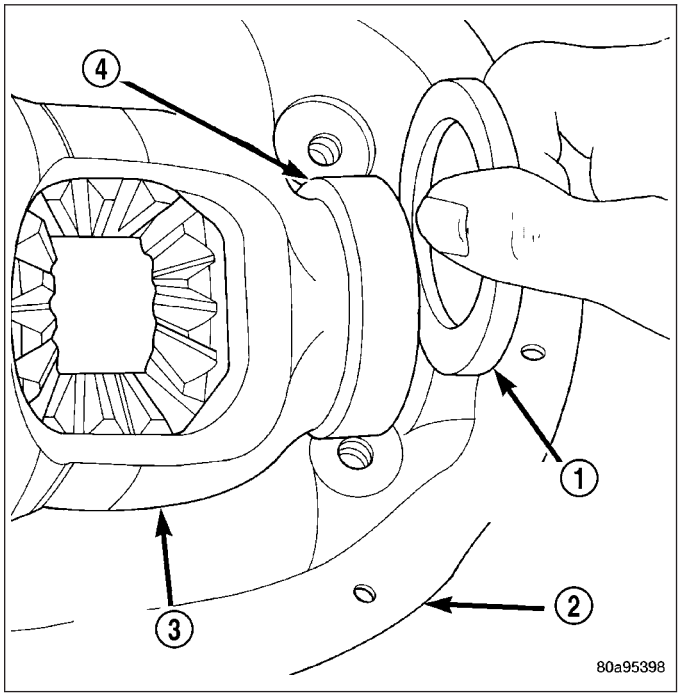
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DIFFERENTIAL BEARING PRELOAD



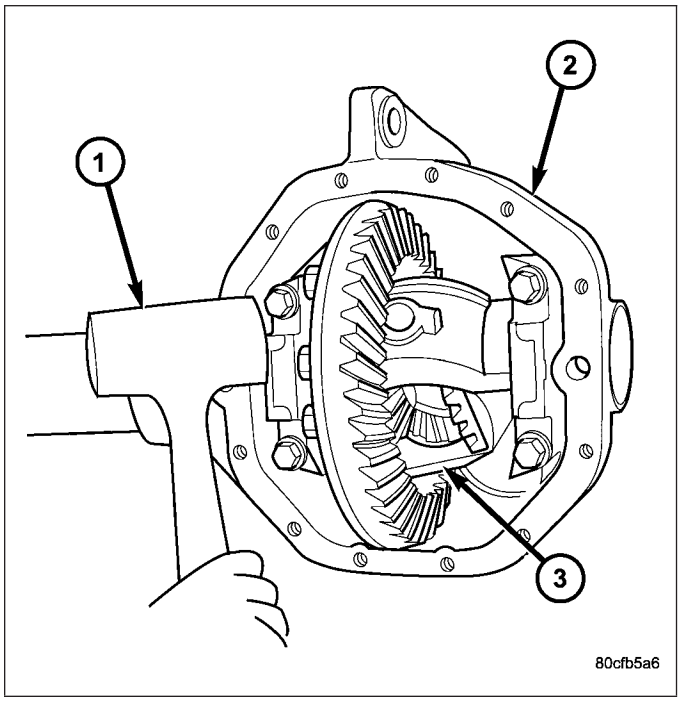
Differential side bearing preload and gear backlash is achieved by selective shims (2) (4) inserted between the bearing cup and the housing. The proper shim thickness can be determined using slip-fit Dummy Bearings 8398 in place of the differential side bearings and a Dial Indicator C-3339. Before measuring differential bearing preload and gear backlash, measure pinion gear depth and prepare pinion for installation. Pinion gear depth is essential to establishing gear backlash and tooth contact patterns. After measuring shim thickness to take up differential side play, install pinion and measure gear backlash shim thickness. Overall shim thickness is the dial indicator reading and preload specification added together. The gear backlash measurement determines the shim thickness used on the ring gear (3) side of the differential case. Subtract gear backlash shim thickness from overall shim thickness to determine shim thickness for pinion gear side of the differential.

SHIM SELECTION

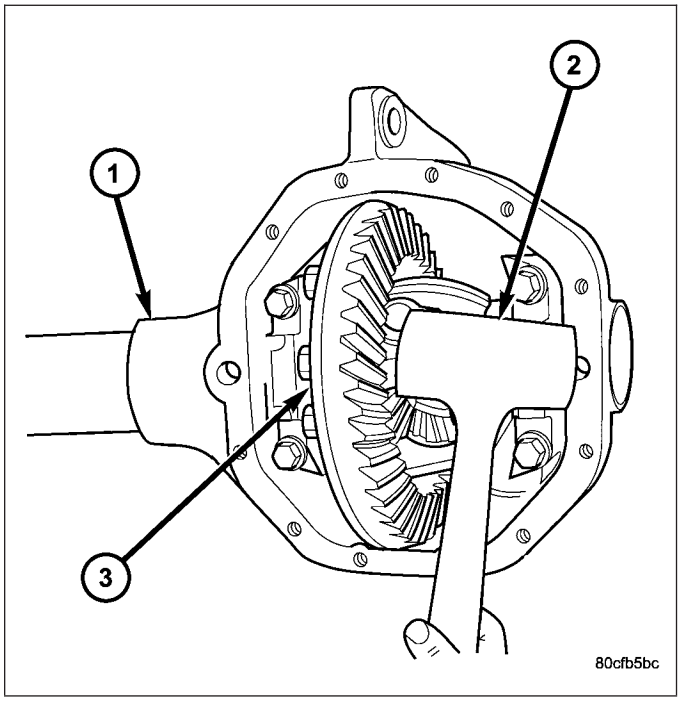


1. Remove side bearings from differential case.
2. Install ring gear if necessary, on differential case and tighten bolts to specification.
3. Install Dummy Bearings 8398 (4) on differential case.
4. Install differential case in the housing.
5. Insert Dummy Shims 8107 (1) starting point shims between both dummy bearings (4) and the housing.

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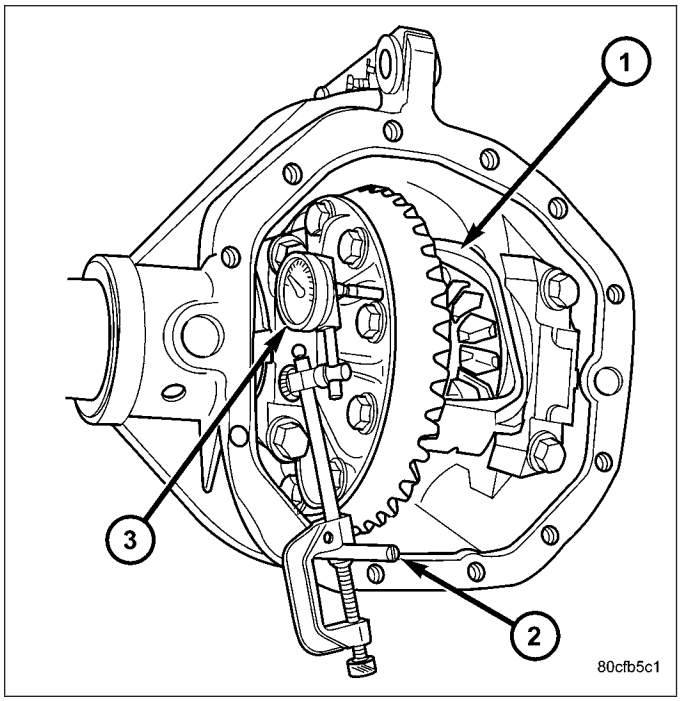


6. Install the marked bearing caps in their correct positions. Install and snug the bolts.
7. Using a dead-blow hammer (1) (2) to seat the differential dummy bearings to each side of the differential housing (2) (1).

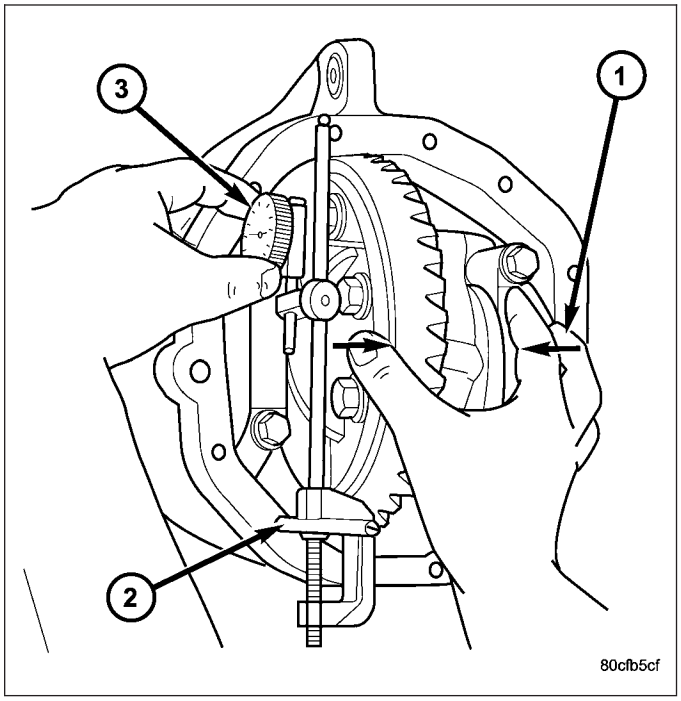


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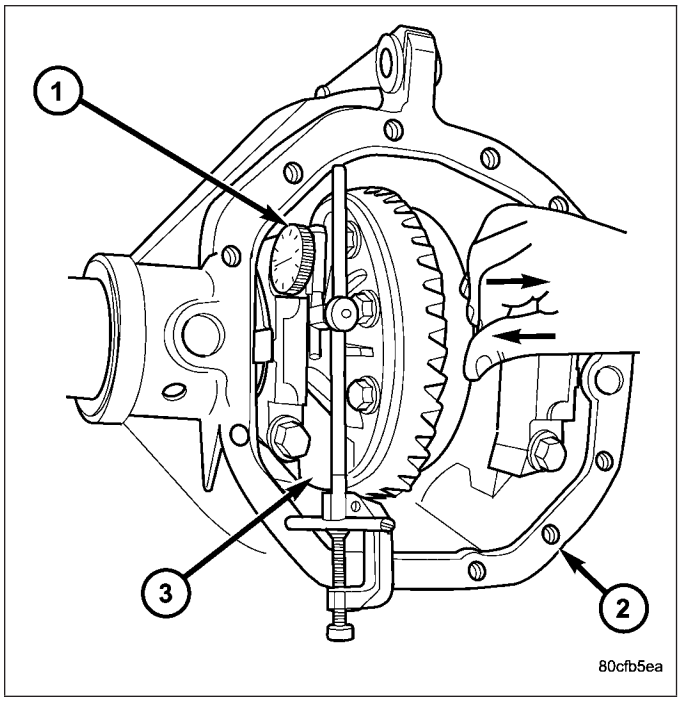
8. Install Pilot Stud C-3288-B (2) in cover bolt hole below ring gear.
9. Attach Dial Indicator C-3339 (3) to post and position dial indicator plunger on a flat surface on a ring gear bolt head.



10. Push and hold differential to the pinion gear side (1) of the housing and zero dial indicator (3).



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11. Push and hold differential case to the ring gear side (3) and record dial indicator (1) reading.
12. Add the dial indicator reading to the starting point shim thicknesses to determine the total shim thickness necessary to achieve zero differential end play.
13. Add 0.2 mm (0.008 in) to the zero end play total. This new total represents the shims needed to preload the new differential case bearings.
14. Rotate dial indicator out of the way on pilot stud.
15. Remove differential case, dummy bearings and dummy shims from the housing.
16. Install the pinion gear in the housing. Install the companion flange and establish the correct pinion rotating torque.
17. Install differential case and Dummy Bearings in the housing with a single dummy shim on the ring gear side of the axle and tighten retaining cap bolts.
18. Position the dial indicator plunger on a flat surface between the ring gear bolt heads.
19. Push and hold differential case toward pinion.
20. Zero dial indicator face to pointer.
21. Push and hold differential case to ring gear side of the housing.
22. Record dial indicator reading.
23. Subtract 0.05 mm (0.002 in.) from the dial indicator reading to compensate for backlash between ring and pinion gears. Add the resulting measurement to the thickness of the single dummy shim. This is the thickness of shim required to achieve proper backlash.
24. Subtract the backlash shim thickness from the total preload shim thickness. The remainder is the shim thickness required on the pinion side of the housing.
25. Rotate dial indicator out of the way on pilot stud.
26. Remove differential case, dummy bearings and dummy shim from the housing.
27. Install new side bearing cones and cups on differential case.
28. Install Spreader W-129-B and Adapter Plates 8142-A on the housing and spread open enough to receive differential case.

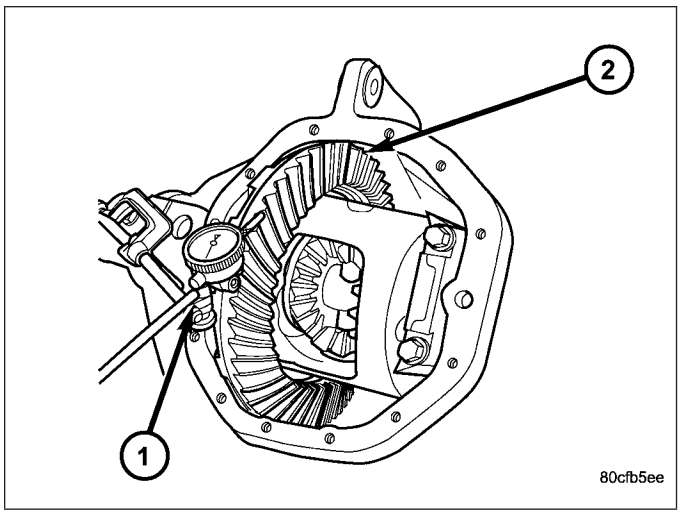
CAUTION: Never spread over 0.50 mm (0.020 in). If the housing is over-spread, it could be distorted or damaged.

29. Place the side bearing shims in the differential housing against the housing shoulder.
30. Install the differential case in the housing.
31. Rotate the differential case several times to seat the side bearings.

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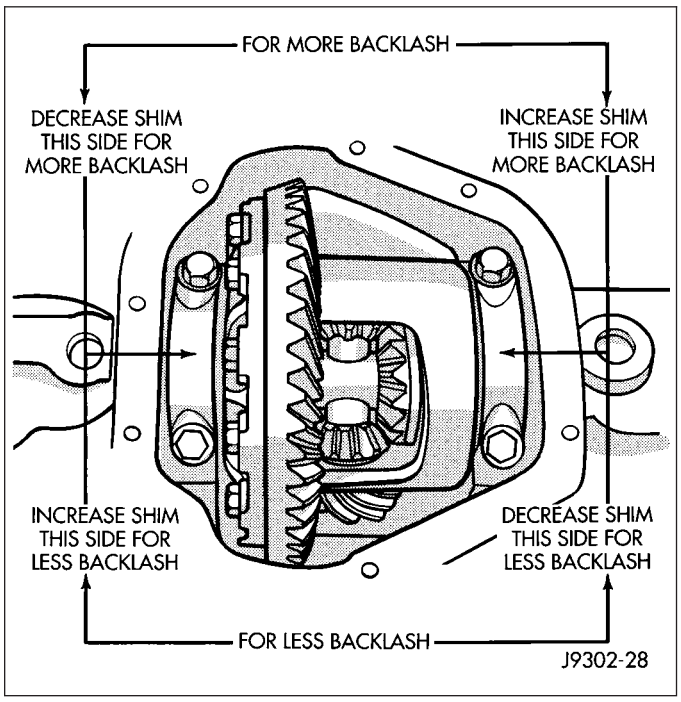
GEAR BACKLASH

1. Position the dial indicator (1) plunger against a ring gear tooth (2).
2. Push and hold ring gear upward while not allowing the pinion gear to rotate.
3. Zero dial indicator face to pointer.



4. Push and hold ring gear downward while not allowing the pinion gear to rotate. Dial indicator reading should be between 0.12 mm (0.005 in.) and 0.20 mm (0.008 in.). If backlash is not within specifications transfer the necessary amount of shim thickness from one side of the differential housing to the other.
5. Verify differential case and ring gear runout by measuring ring to pinion gear backlash at eight locations around the ring gear. Readings should not vary more than 0.05 mm (0.002 in.). If readings vary more than specified, the ring gear or the differential case is defective.

After the proper backlash is achieved, perform the Gear Contact Pattern procedure.

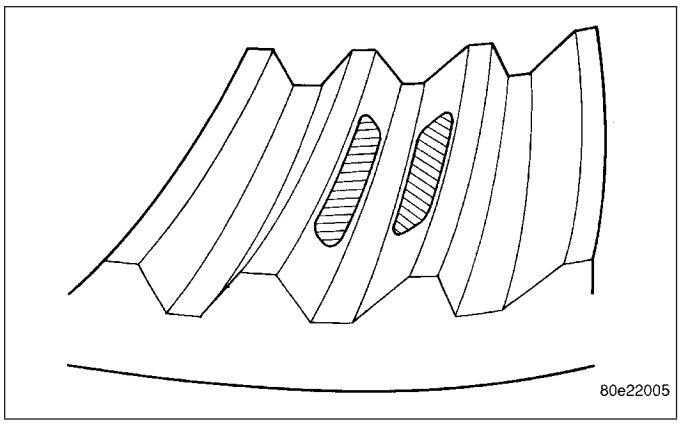


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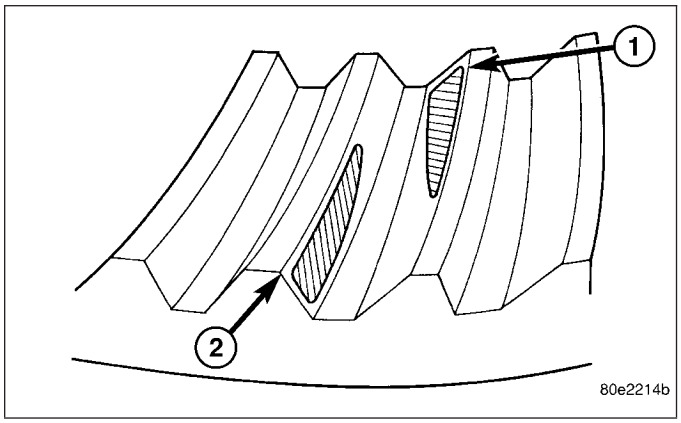
GEAR CONTACT PATTERN

1. Wipe clean each tooth of the ring gear.
2. Apply gear marking compound to all of the ring gear teeth.
3. Verify bearing cap bolts are torque specification.
4. Apply the brakes lightly to create at 14 N·m (10 ft. lbs.) pinion rotating torque.
5. Rotate the pinion/pinion yoke 4 full revolutions in each directions.
6. Read gear tooth contact pattern.

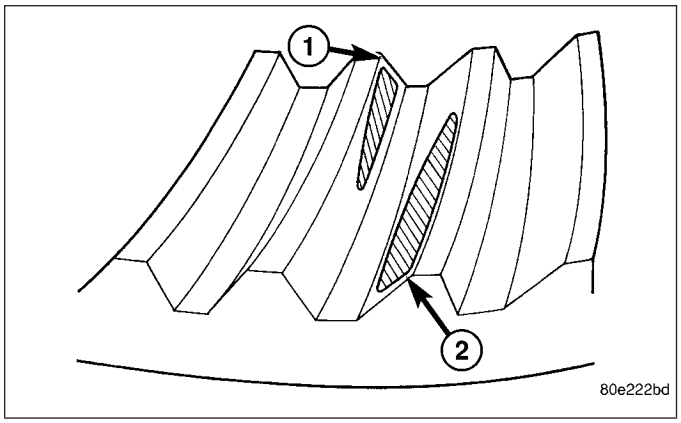
Gear contact pattern correct. Backlash and pinion depth is correct.



Ring gear too far away from pinion gear coast side toe (1) drive side heel (2). Decrease backlash by moving the ring closer to the pinion gear.

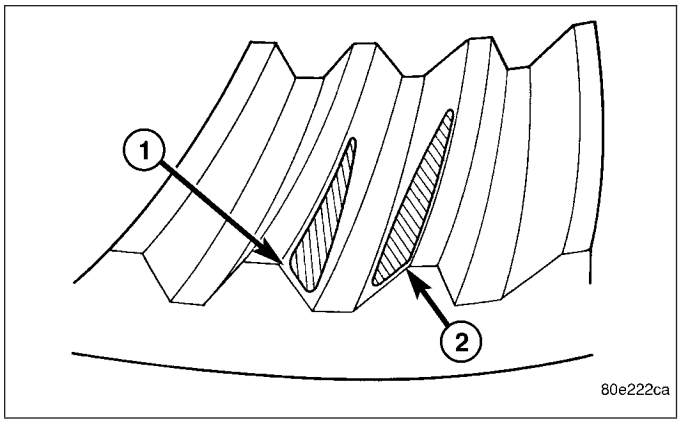


Ring gear too close to pinion gear drive side toe (1) coast side heel (2). Increase backlash, by moving the ring away from the pinion gear.

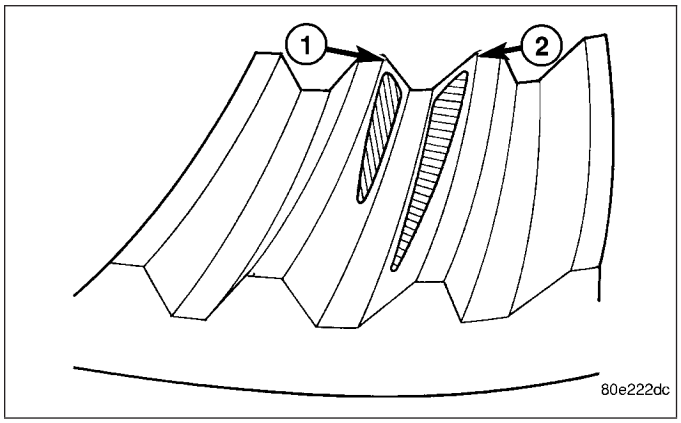


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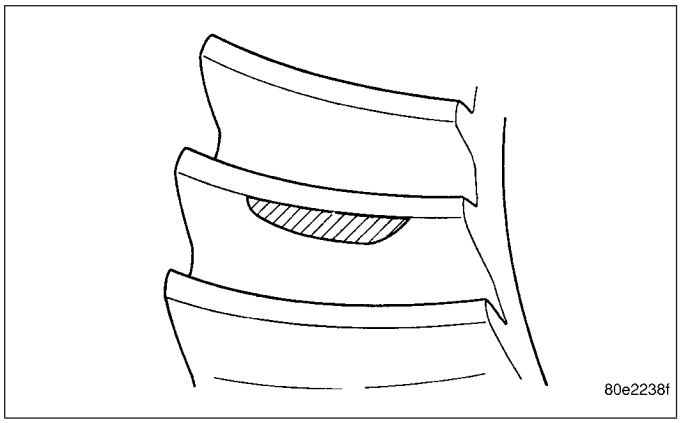
Ring gear too far away from pinion gear drive side heel (1) coast side heel (2). Decrease backlash, by moving the ring closer to the pinion gear.



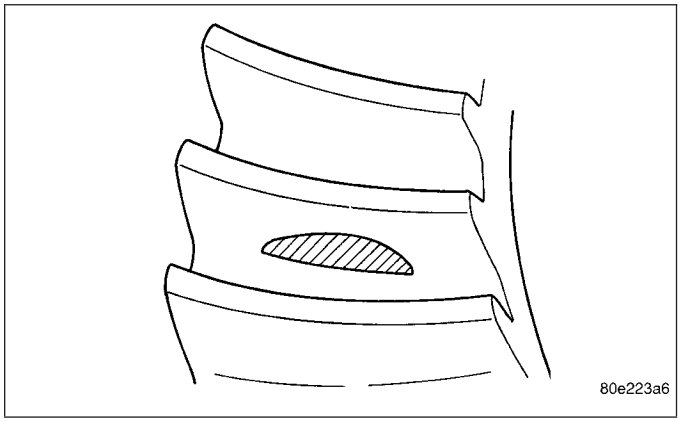
Ring gear too close to pinion gear drive side toe (1) coast side toe (2). Increase backlash, by moving the ring away from the pinion gear.



Pinion gear set too low. Increase pinion gear height, by increasing the pinion depth shim thickness.



Pinion gear set too high. Decrease pinion depth, by decreasing the pinion depth shim thickness.



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SPECIFICATIONS

AXLE SPECIFICATIONS

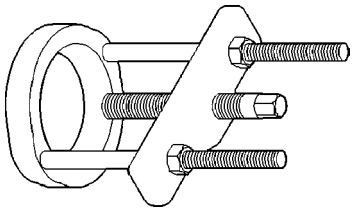
DESCRIPTION	SPECIFICATION
Axle Ratio	3.21,3.55, 3.73,3.92
Differential Case Flange Runout	0.076 mm (0.003 in.)
Differential Side Gear Clearance	0-0.15 mm (0-0.006 in.)
Ring Gear Diameter	205 mm (8.0 in.)
Ring Gear Backlash	0.12-0.20 mm (0.005-0.008 in.)
Ring Gear Runout	0.12 mm (0.005 in.)
Pinion Bearing Preload - New Bearings	2.0-2.8 N·m (18-25 in. lbs.)
Pinion Bearing Preload - Original Bearings	1-2 N·m (10-20 in. lbs.)

TORQUE SPECIFICATIONS

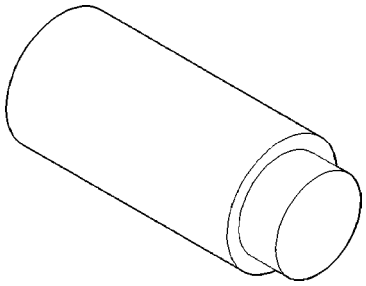
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Mounting Nuts	95	70	-
Differential Fill Hole Plug	34	25	-
Differential Cover Bolts	22	15	-
Bearing Cap Bolts	61	45	-
Ring Gear Bolts	108	80	-
Pinion Nut	271-475	200-350	-

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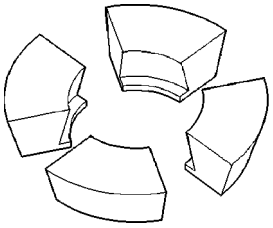
SPECIAL TOOLS



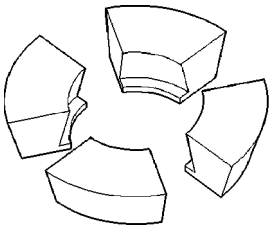
PULLER C-293-PA



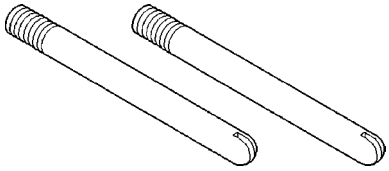
PLUG C-293-3



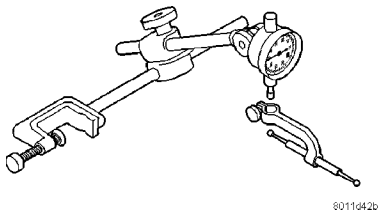
ADAPTER C-293-42



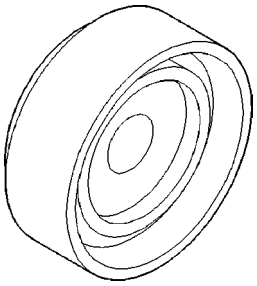
ADAPTER C-293-48



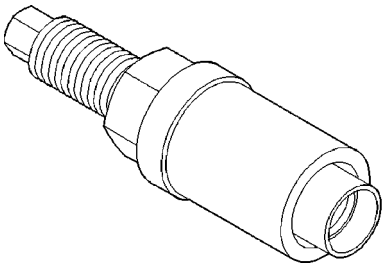
PILOTS C-3288-B



DIAL INDICATOR C-3339

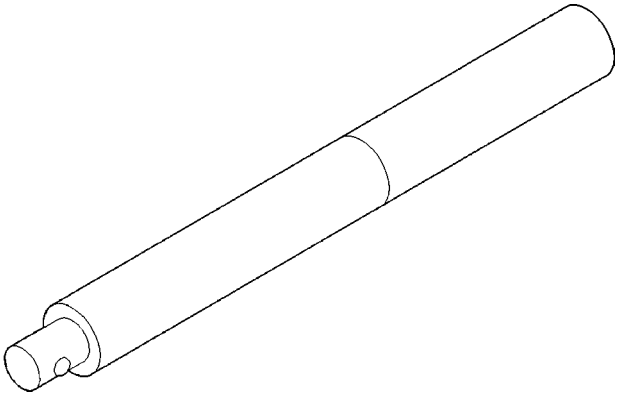


INSTALLER C-3716-A

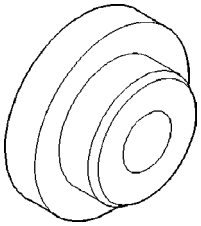


INSTALLER C-3718

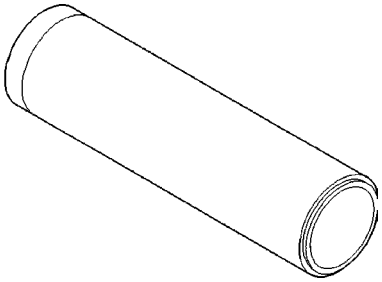
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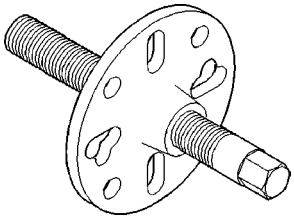
HANDLE C-4171



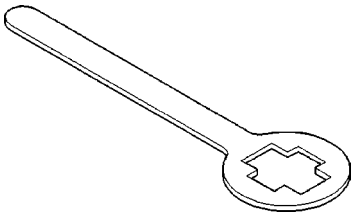
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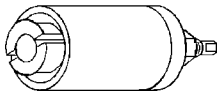
INSTALLER 6448



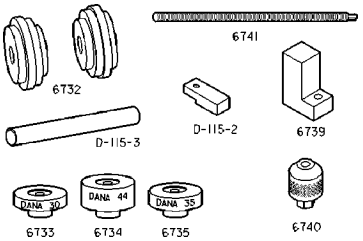
PULLER C-452

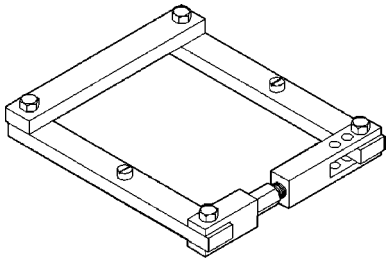


HOLDER 6719A



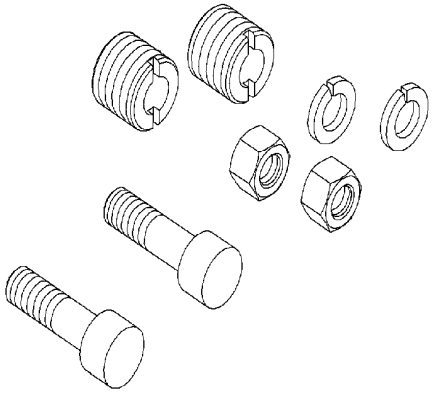
REMOVER C-4660-A



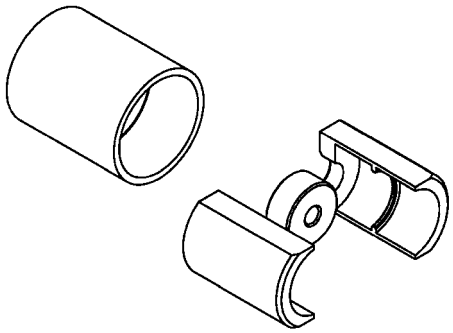


SPREADER W-129-B

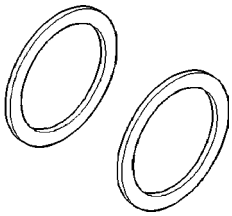
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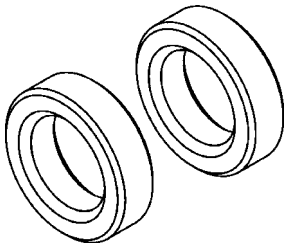
ADAPTER KIT 6987B



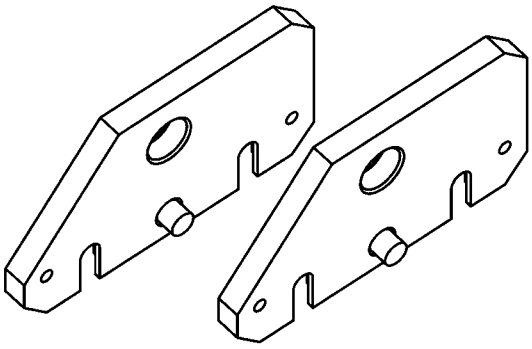
REMOVER 8240A



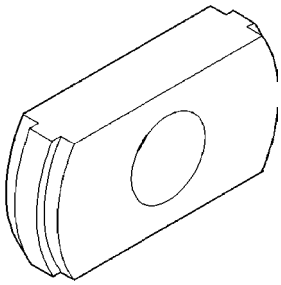
DUMMY SHIM 8107



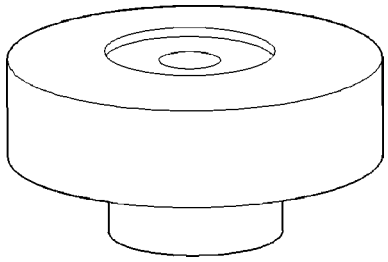
DUMMY BEARING 8398



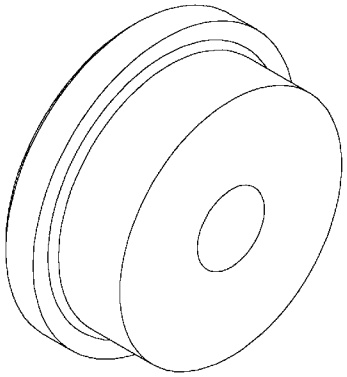
ADAPTER PLATES 8142A



REMOVER 8401

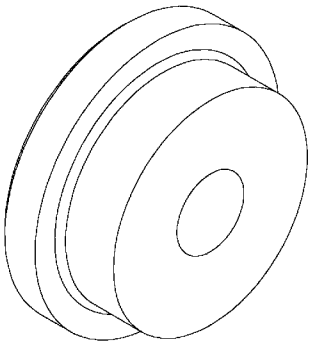


PINION BLOCK 8177

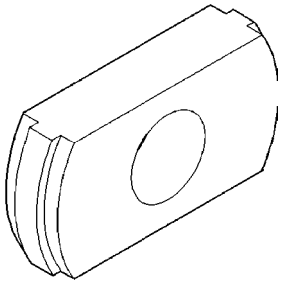


INSTALLER 8692

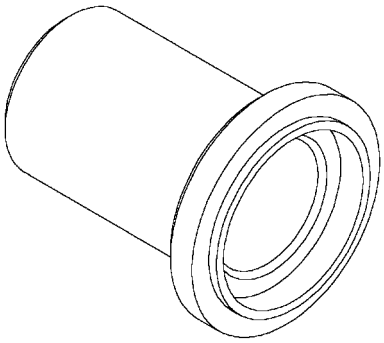
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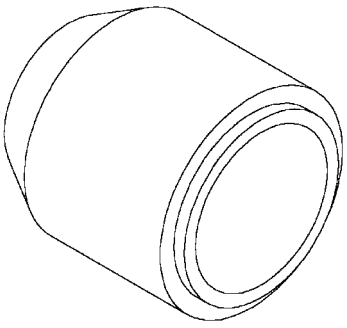
INSTALLER 8693



REMOVER 8831



INSTALLER 8694



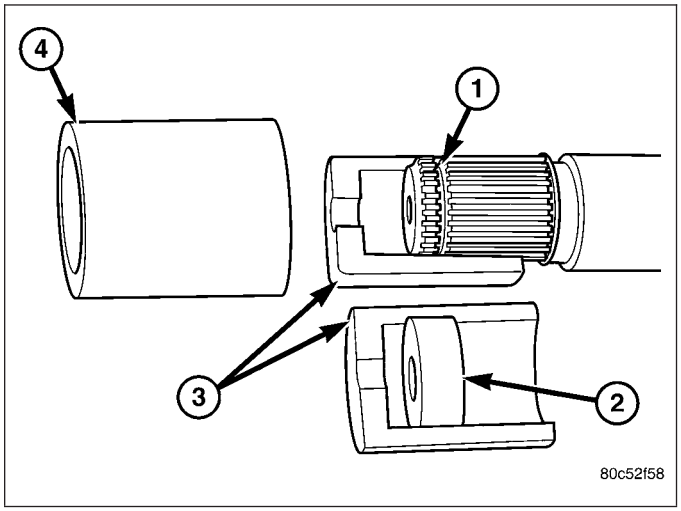
INSTALLER 8695

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SHAFT-AXLE

REMOVAL

1. Remove half shaft from vehicle.
2. Remove skid plate, if equipped.
3. Clean axle seal area.
4. Remove snap ring (1) from the axle shaft.
5. Remove axle with Remove 8420A (2) (3) Collar 8420-3 (4) and Slide Hammer C-3752.



INSTALLATION

1. Lubricate bearing bore and seal lip with gear lubricant.
2. Install axle shaft and push firmly on axle to engage snap-ring.
3. Check differential fluid level and add fluid if necessary.
4. Install half shaft.
5. Install skid plate, if necessary.

SEAL-AXLE SHAFT

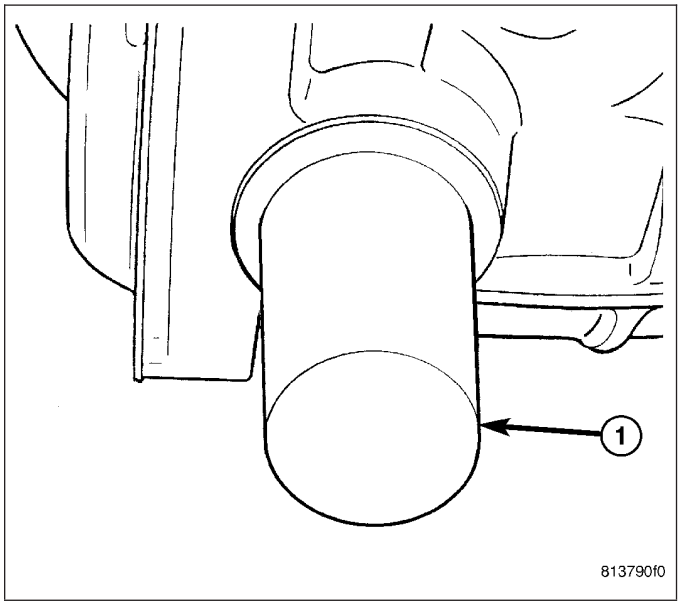
REMOVAL

1. Remove half shaft from vehicle.
2. Remove skid plate, if equipped.
3. Clean axle seal area.
4. Remove axle shaft O-ring.
5. Remove axle shaft.
6. Remove axle shaft seal with a small pry bar.

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INSTALLATION

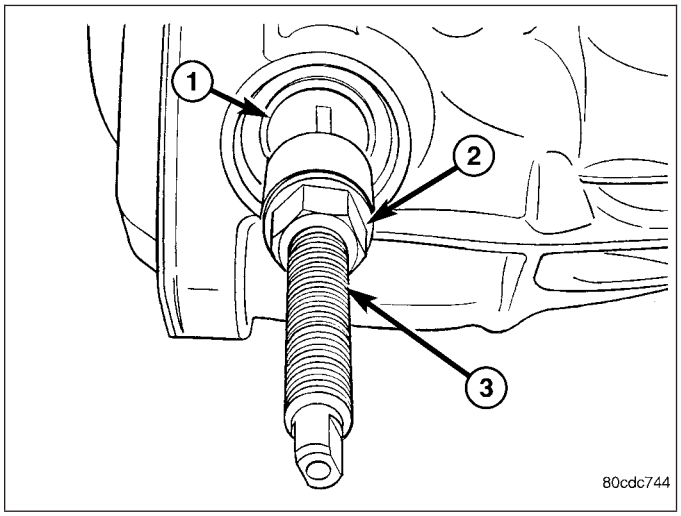
1. Wipe axle shaft tube bore clean.
2. Install **new** axle shaft seal with Installer 8402 (1).
3. Install axle shaft and half shaft.



BEARING-AXLE

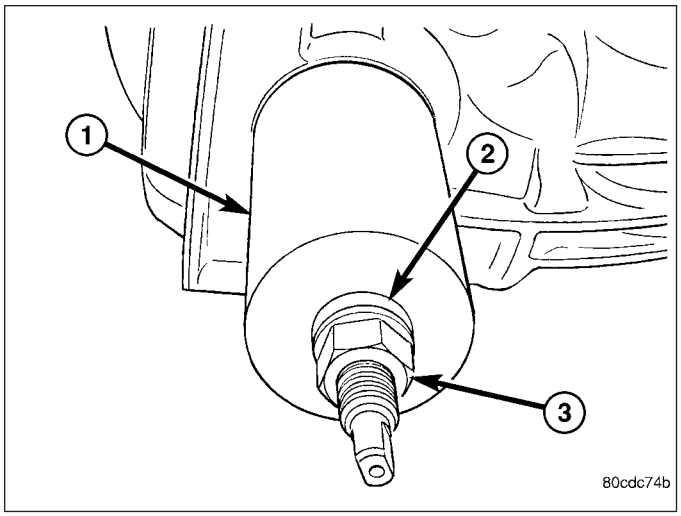
REMOVAL

1. Remove half shaft, axle shaft and seal.
2. Install axle shaft bearing Remover C-4660-A (3) in the bearing (1). Then tighten the nut (2) to spread the remover in the bearing.



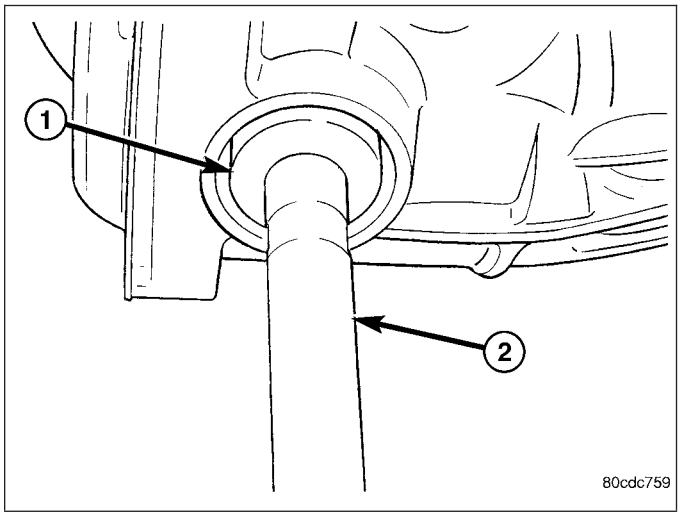
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3. Install bearing remove cup (1) bearing (2) and nut (3). Tighten nut (3) to draw the bearing out.
4. Inspect axle shaft tube bore for roughness and burrs.

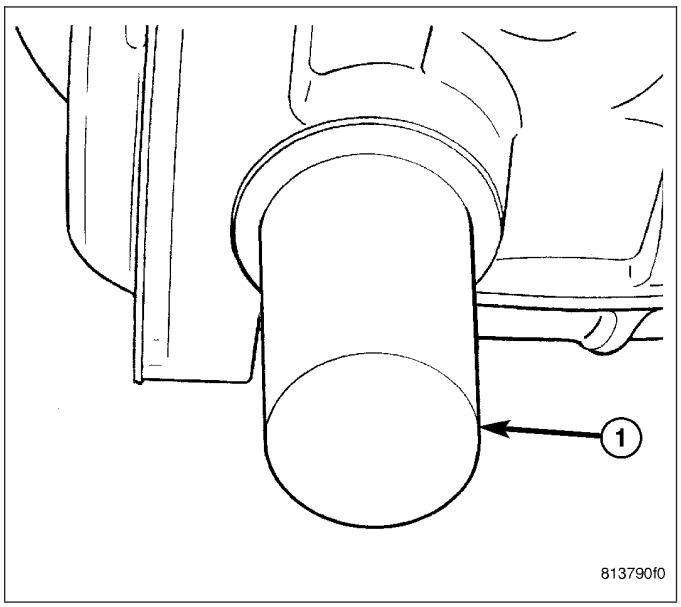


INSTALLATION

1. Wipe the axle shaft tube bore clean.
2. Install axle shaft bearing with Installer 5063 (1) and Handle C-4171 (2).



3. Install a **new** axle shaft seal with Installer 8694 (1).
4. Lubricate seal lip with gear lubricant.
5. Insert axle shaft through seal, bearing and engage it into side gear splines. Push firmly on the axle shaft to engage the snap-ring.
6. Install axle shaft O-ring.
7. Install skid plate, if necessary.
8. Install half shaft.

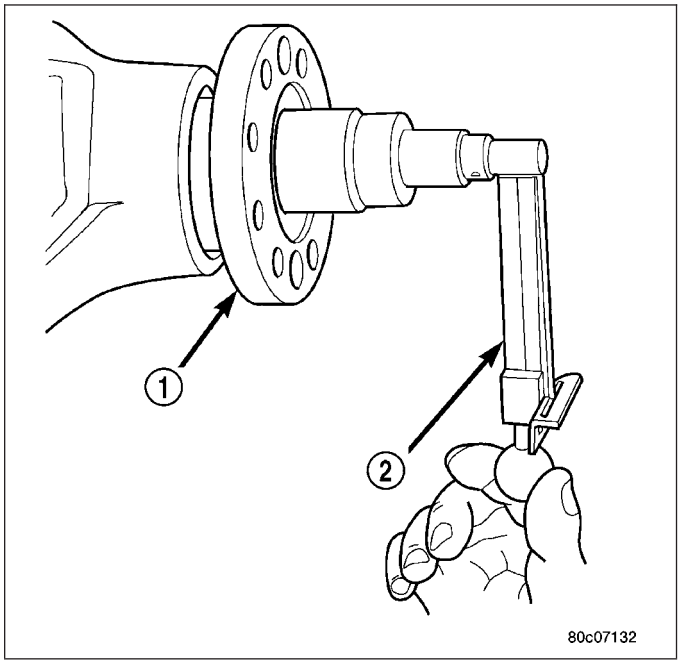


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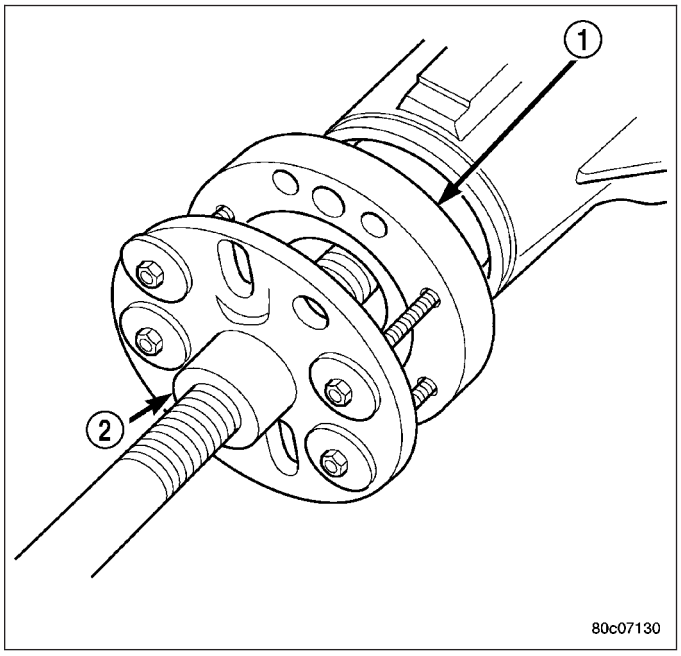
SEAL-PINION

REMOVAL

1. Remove both half shafts.
2. Remove front propeller shaft.
3. Rotate pinion gear three or four times and verify pinion rotates smoothly.
4. Record pinion rotating torque with an inch pound torque wrench (2), for installation reference.
5. Position Holder 6719 against the companion flange (1) and install a four bolts and washers into the threaded holes and tighten the bolts.
6. Remove pinion nut.



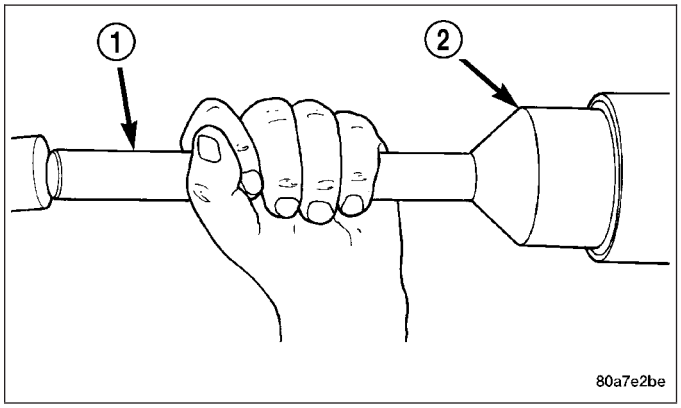
7. Remove companion flange with (1) Remover C-452 (2).
8. Remove pinion seal with a pry tool or a slide hammer mounted screw.



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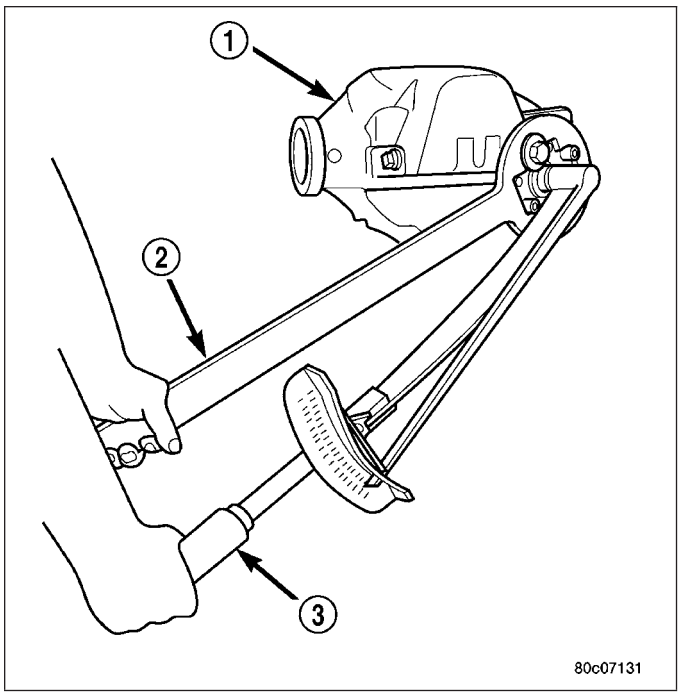
INSTALLATION

1. Apply a light coating of gear lubricant on the lip of pinion seal.
2. Install seal with Installer 8695 (2) and Handle C-4171 (1).
3. Install companion flange onto the pinion with Installer C-3718 and Holder 6719A.



4. Position holder (2) against the companion flange and install four bolts and washers into the threaded holes. Tighten the bolt and washer so that the holder is held to the flange.
5. Install a **new** pinion nut onto the pinion shaft and tighten the pinion nut until there is zero bearing end-play

CAUTION: Do not exceed 271 N·m (200 ft. lbs.) the minimum tightening torque when installing the companion flange at this point. Never loosen pinion nut to decrease pinion bearing rotating torque and never exceed specified preload torque. Failure to these instruction will damage the axle.

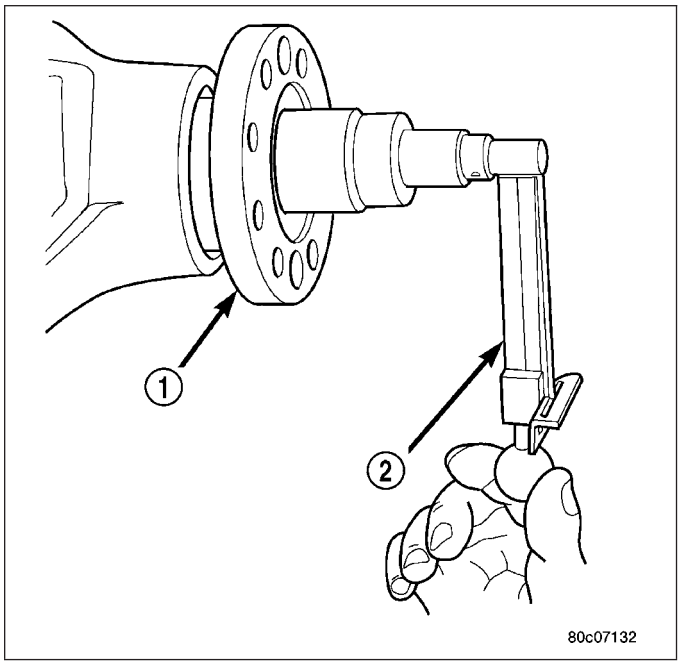


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6. Record pinion rotating torque using an inch pound torque wrench (2). The rotating torque should be equal to the reading recorded during removal plus an additional 0.56 N·m (5 in. lbs.).
7. If rotating torque is low, tighten the pinion nut in 6.8 N·m (5 ft. lbs.) increments until the proper rotating torque is achieved.

CAUTION: If maximum tightening torque 475 N·m (350 ft. lbs.) is reached prior to reaching the required rotating torque, the collapsible spacer may have been damaged. Failure to these instruction will damage the axle.

8. Install propeller shaft.



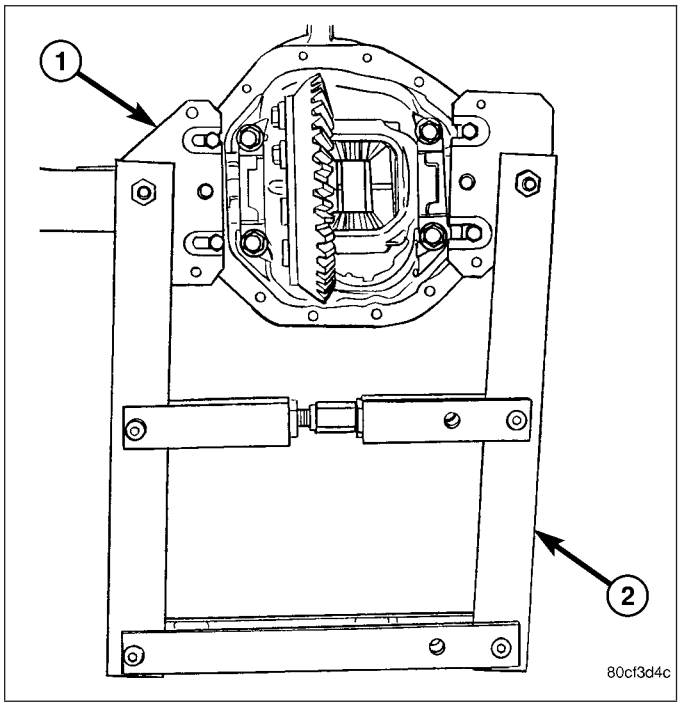
DIFFERENTIAL

REMOVAL

1. Remove differential housing cover and drain fluid.
2. Remove axle shafts.
3. Loosen bearing cap bolts.

NOTE: Differential bearing cap reference numbers are stamped on caps and machined flat on the housing. If reference numbers cannot be found, make new marks for later reference.

4. Install Adapter Plates 8142-A (1) onto the housing.
5. Install Spreader W-129-B (2) onto the adapter plates (1) and tighten the turnbuckle finger-tight.

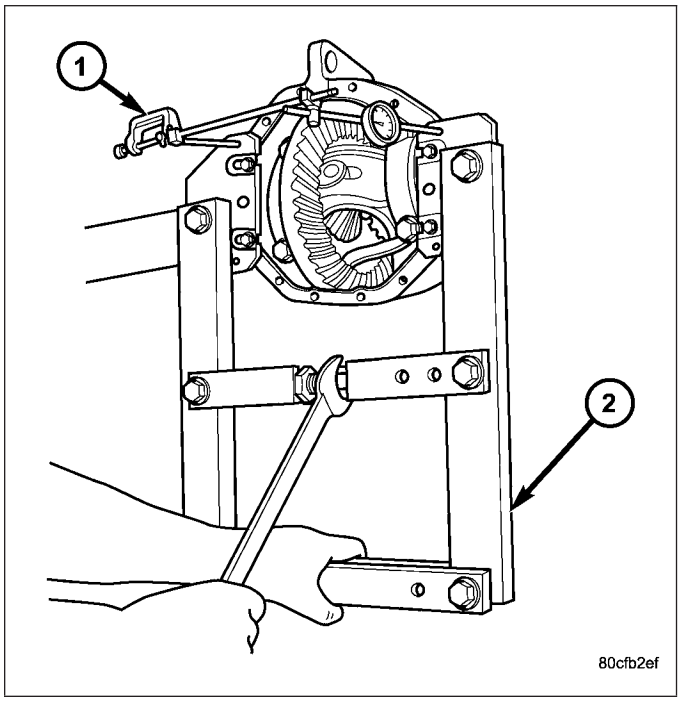


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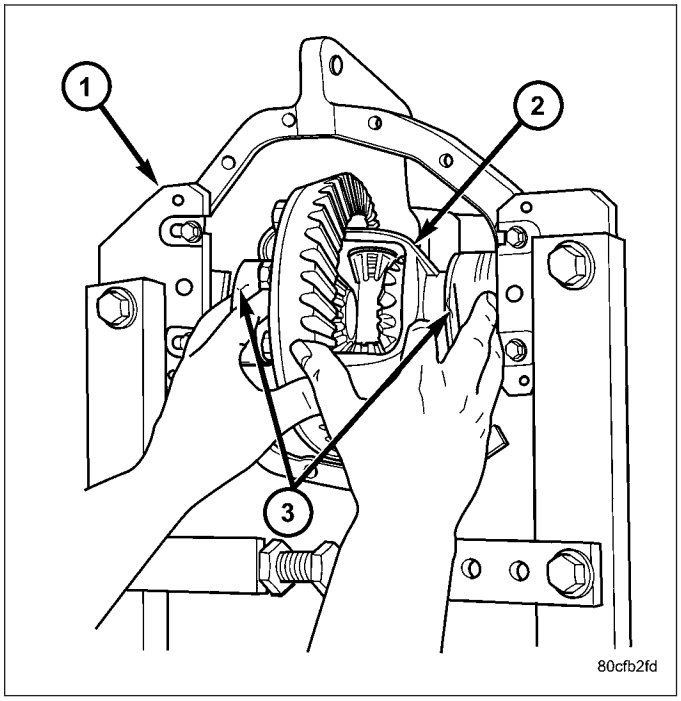
6. Install a Pilot Stud L-4438 at the left side of the differential housing. Attach Dial Indicator C-3339 (1) to pilot stud. Load the indicator plunger against the opposite side of the housing and zero the indicator.
7. Spread the housing to remove the differential case from the housing. Measure the distance with the dial indicator.

CAUTION: Never spread housing over 0.50 mm (0.020 in). Failure to follow these instructions will damaged the housing.

8. Remove dial indicator.
9. While holding the differential case in position, remove bearing cap bolts and caps.



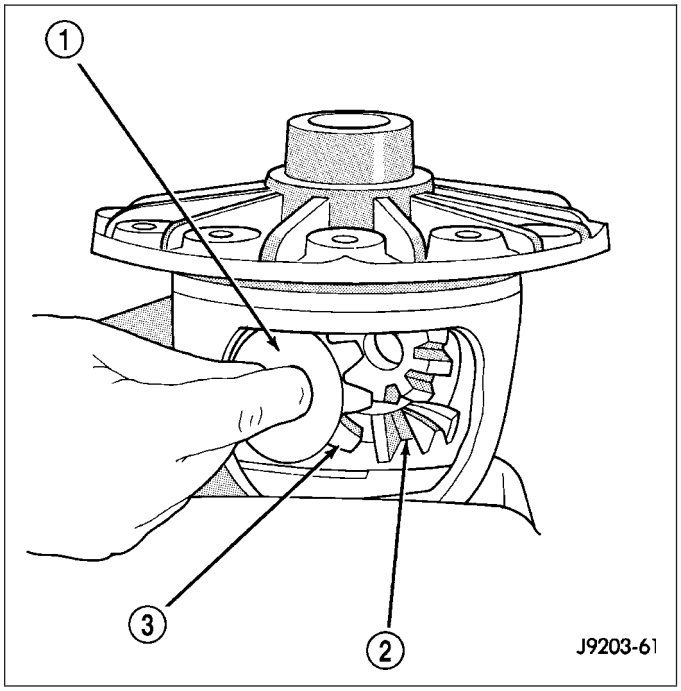
10. Remove differential (2) from the housing (1). Ensure differential bearing cups (3) and shims remain in position on the differential bearings.
11. Tag differential bearing cups and shims to indicate their location.
12. Remove spreader from housing.



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DISASSEMBLY

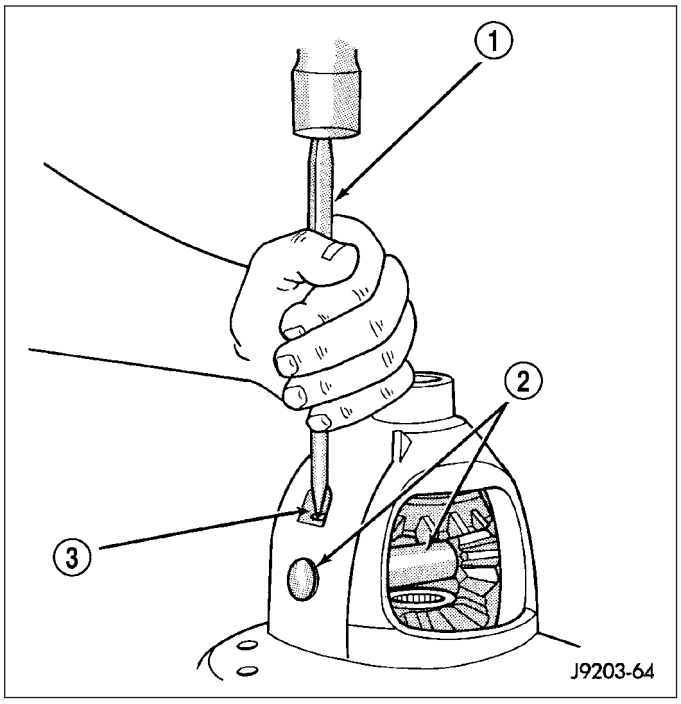
1. Remove ring gear.
2. Remove roll-pin holding mate shaft in housing.
3. Remove pinion gear mate shaft.
4. Rotate differential side gears (2) and remove pinion gears (3) and thrust washers (1).
5. Remove differential side gears and thrust washers.



ASSEMBLY

NOTE: If the same gears and thrust washers are being used, install them into their original locations.

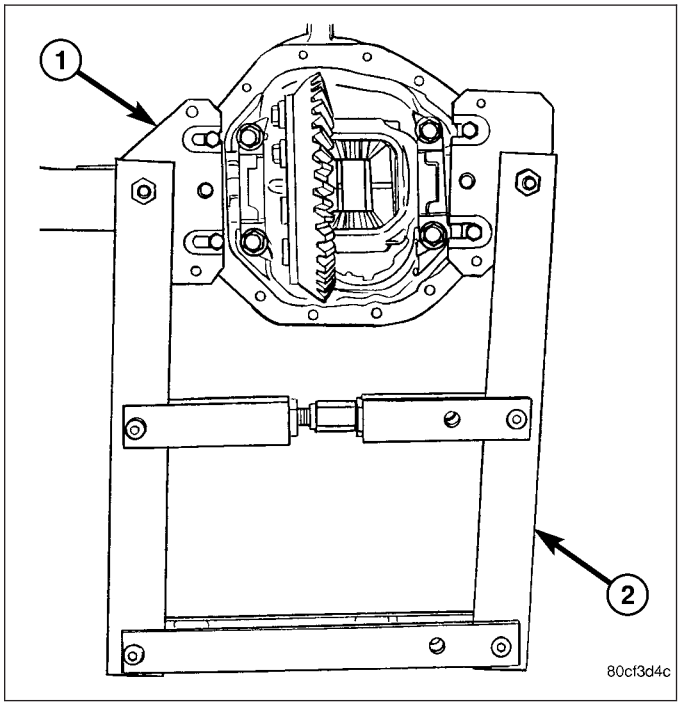
1. Lubricate differential components with hypoid gear lubricant.
2. Install side gears and thrust washers into the differentail case.
3. Rotate pinion mate gears and thrust washers into the differentail case.
4. Install pinion gear mate shaft (2).
5. Align hole in pinion gear mate shaft with hole in the differential case.
6. Install roll-pin (3) in the differential case with a punch (1) and hammer. Peen edge of roll-pin hole in differential case in two places 180° apart.
7. Install ring gear.



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INSTALLATION

NOTE: If replacement differential bearings or differential case are replaced, Refer to adjustments for Differential Bearing Preload and Gear Backlash procedures.



1. Install Spreader W-129-B (2) with the Adapter Plates 8142-A (1) and install the safety holddown clamps. Tighten the tool turnbuckle finger-tight.
2. Install a Pilot Stud L-4438 at the left side of the differential housing. Attach Dial Indicator C-3339 to pilot stud. Load indicator plunger against the opposite side of the housing and zero the indicator.
3. Spread housing and measure the distance with the dial indicator.

CAUTION: Never spread housing over 0.50 mm (0.020 in). Failure to follow these instruction will damage the housing.

4. Remove dial indicator.
5. Install differential case in the housing. Ensure differential bearing cups remain in position on the bearings and the differential preload shims are seated in the housing. Tap differential case to ensure bearings cups are seated in the housing.
6. Install bearing caps to their original locations and loosely install cap bolts.
7. Remove housing spreader.
8. Tighten the bearing cap bolts to 61 N·m (45 ft. lbs.).
9. Install axle shafts.
10. Apply a bead of orange Mopar Axle RTV sealant or equivalent to the housing cover.

CAUTION: If cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instruction will cause a leak.

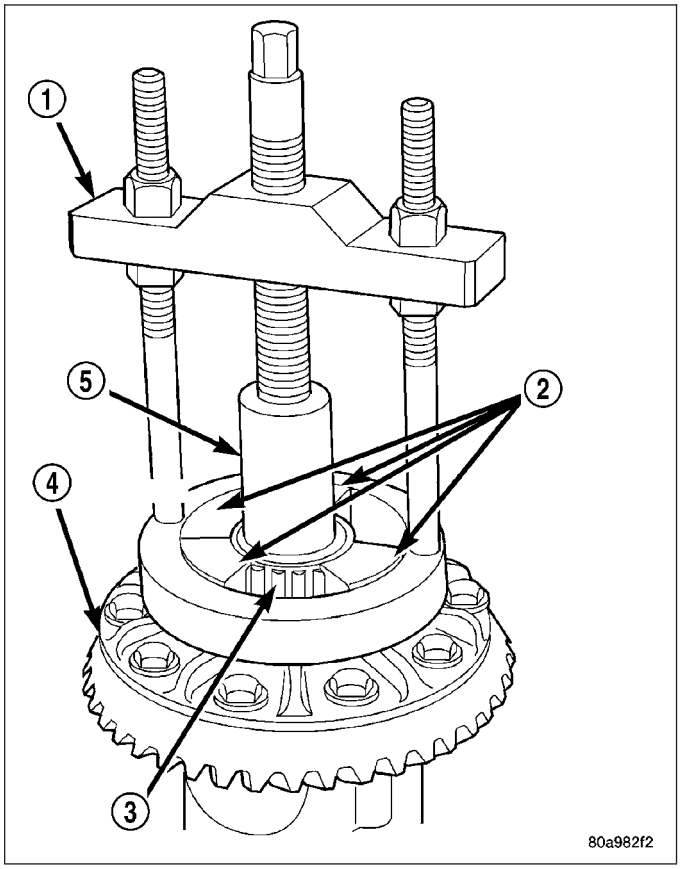
11. Install cover and tighten bolts in a criss-cross pattern to 22 N·m (15 ft. lbs.).
12. Fill differential with lubricant.

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BEARINGS-DIFFERENTIAL CASE

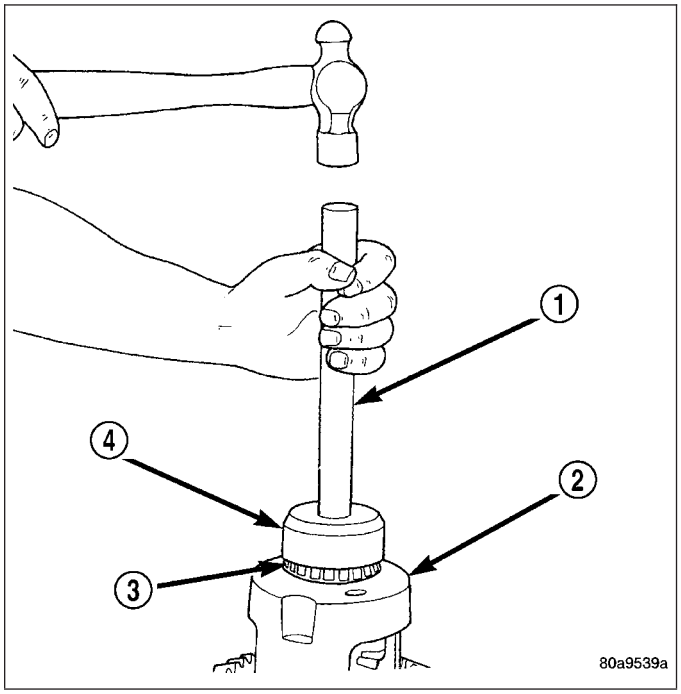
REMOVAL

1. Remove differential from housing.
2. Remove bearings (3) from differential case (4) with Puller C-293-PA (1) Adapters C-293-48 (2) and Plug C-293-3 (5).



INSTALLATION

1. Install differential case bearings (3) with Installer C-3716-A (4) and Handle C-4171(1).
2. Install differential into the housing.



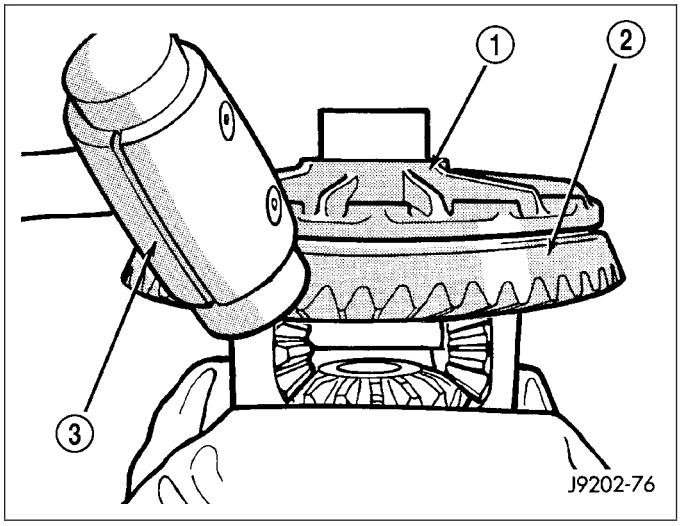
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GEAR-PINION/RING

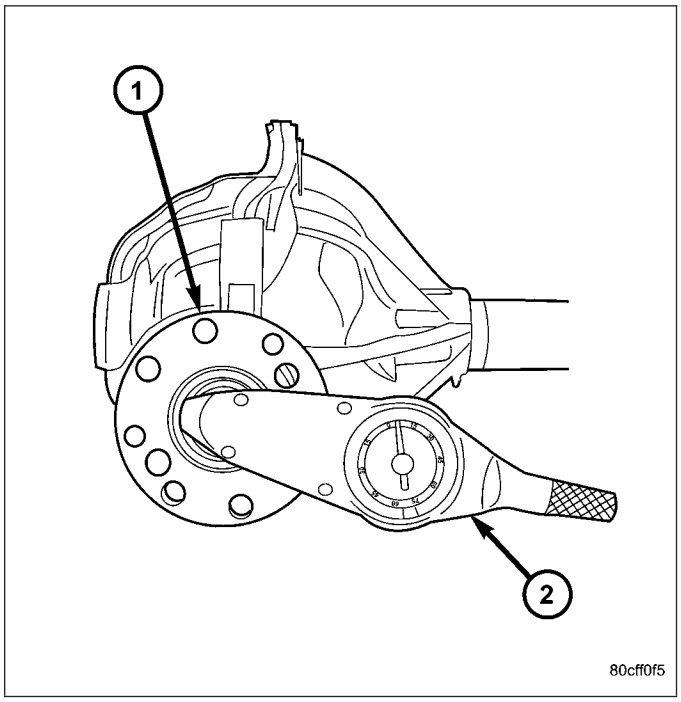
REMOVAL

NOTE: The ring gear and pinion are serviced in a matched set. Never replace one without replacing the other.

1. Remove differential from housing.
2. Place differential case (1) in a vise with soft jaw.
3. Remove bolts holding ring gear to differential case.
4. Drive ring gear (2) from differential case (1) with a soft hammer (3).

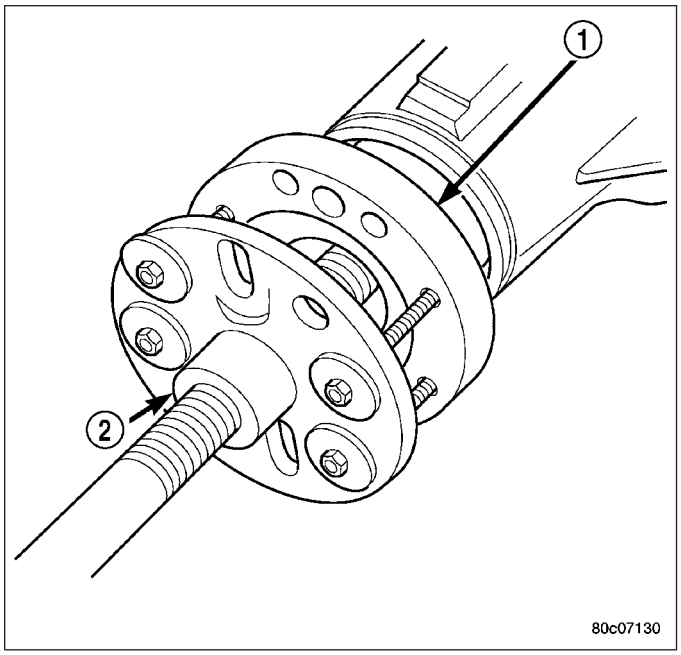


5. Mark companion yoke and companion flange for installation reference.
6. Remove companion flange bolts and tie the propeller shaft to the vehicle underbody.
7. Rotate companion flange (1) three or four times and verify flange rotates smoothly.
8. Record pinion rotating torque an inch pound torque wrench (2) for installation reference.

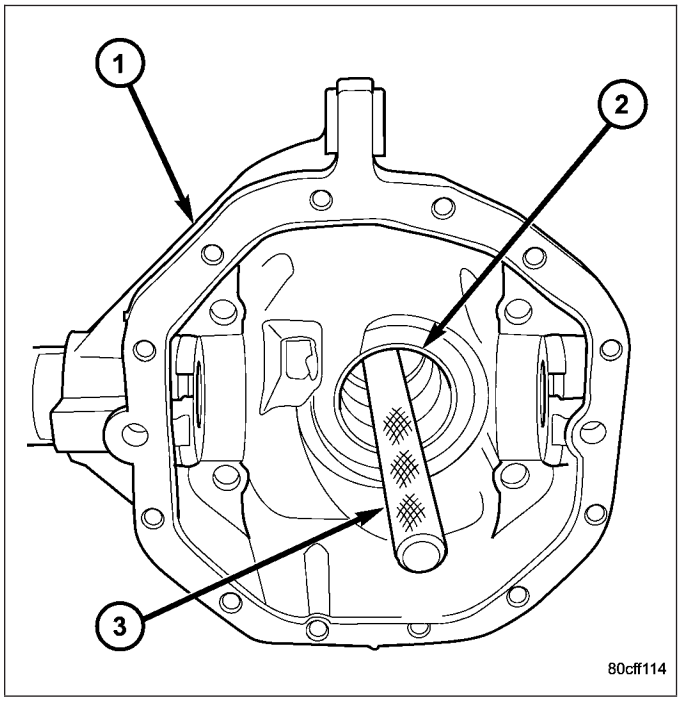


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9. Install bolts into two of the threaded holes in the companion flange 180° apart.
10. Position Holder 6719 against the companion flange (1) and install a bolt and washer into one of the remaining threaded holes. Tighten the bolts so that the Holder 6719 is held to the flange.
11. Remove the pinion nut.
12. Remove the companion flange with Remover C-452 (2).

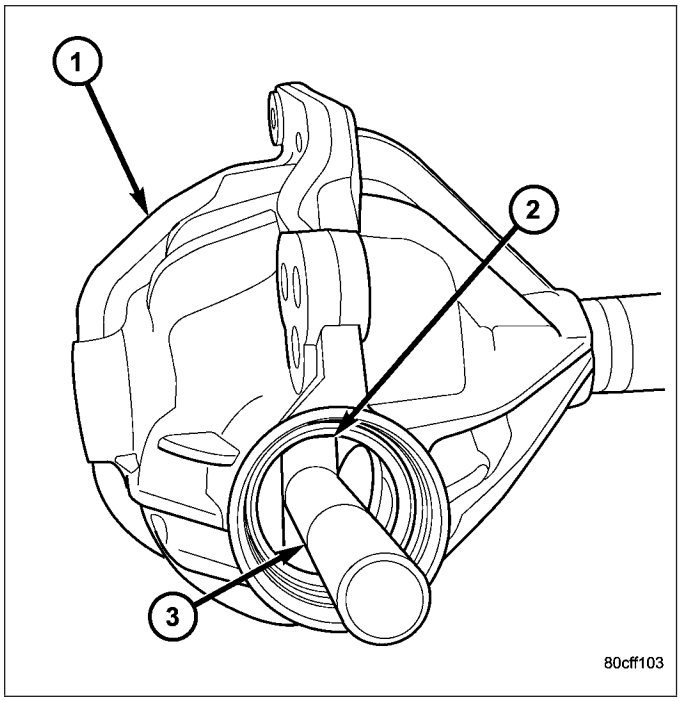


13. Remove pinion from differential housing.
14. Remove pinion seal with a pry tool or a slide hammer mounted screw.
15. Remove oil slinger, if equipped and front pinion bearing.
16. Remove front pinion bearing cup with Remover 8831 (2) and Handle C-4171 (3).

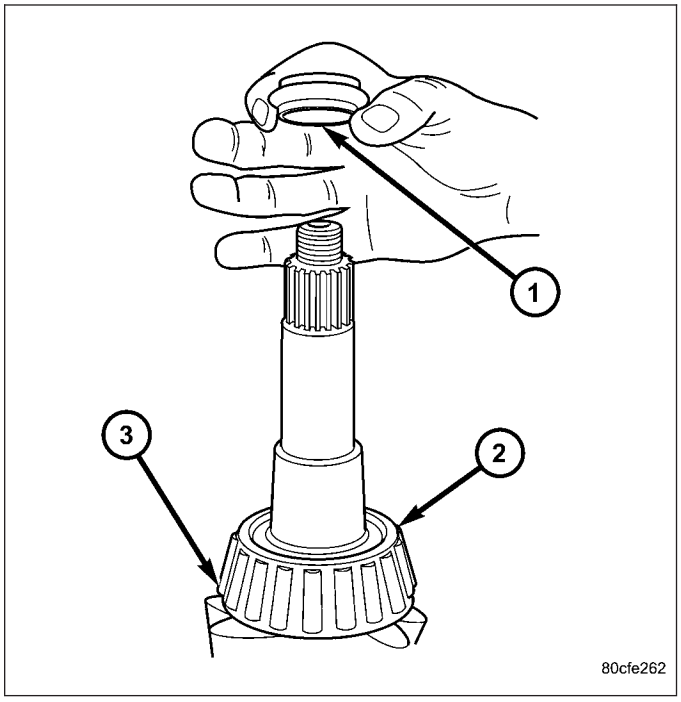


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17. Remove rear pinion bearing cup from housing (1) with Remover 8401 (2) and Handle C-4171(3).

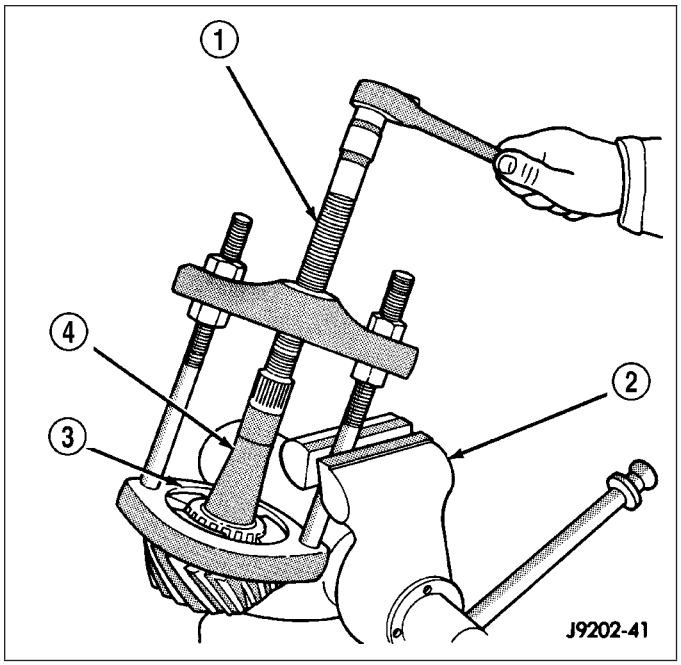


18. Remove collapsible spacer (1) from pinion.



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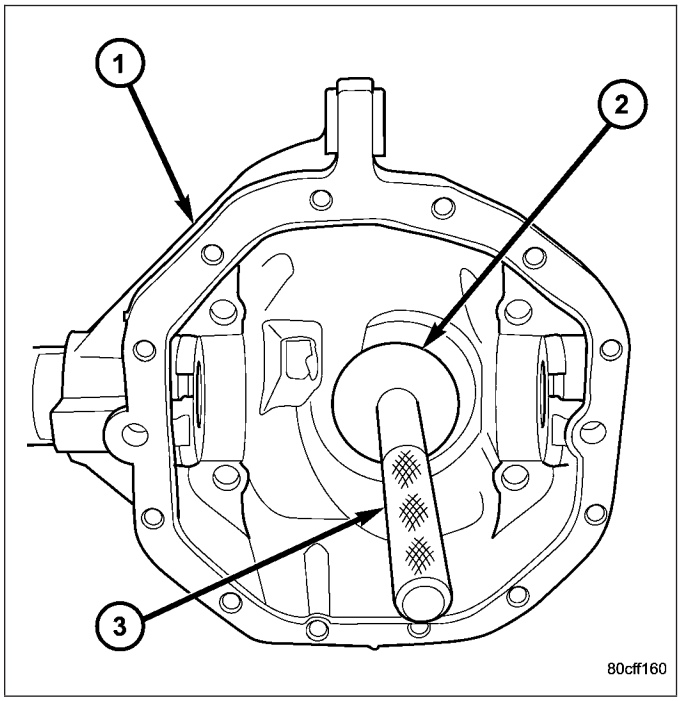
19. Remove rear pinion bearing with Puller/Press C-293-PA (1) and Adapters C-293-42 (3).
20. Remove depth shims from the pinion shaft and record thickness of shims.



INSTALLATION

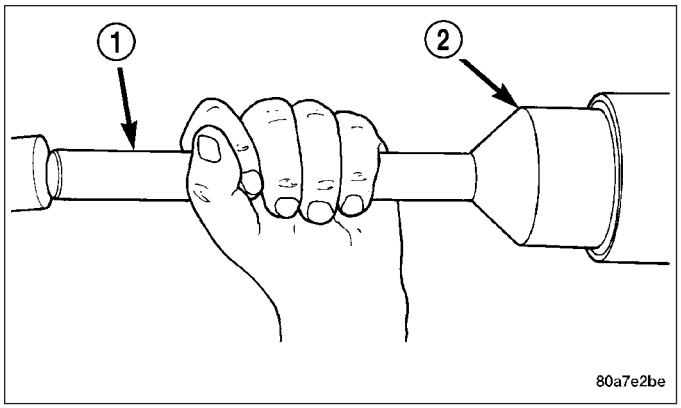
NOTE: The ring gear and pinion are serviced in a matched set. Never replace one gear without replacing the other matching gear. If ring and pinion gears or bearings are replaced, Refer to Adjustments for Pinion Gear Depth Setting.

1. Apply Mopar Door Ease or equivalent lubricant to outside surface of the bearing cups.
2. Install rear pinion bearing cup with Installer 8692 (2) and Driver Handle C-4171 (3).

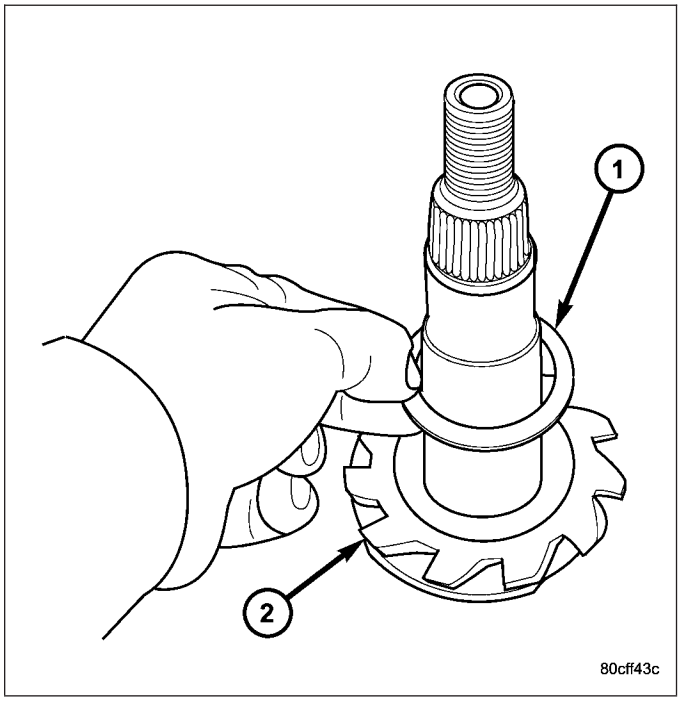


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3. Install front pinion bearing cup with Installer 8693 and Handle C-4171.
4. Lubricate front pinion bearing and install bearing in the housing.
5. Apply a light coating of gear lubricant on the lip of pinion seal.
6. Install pinion seal with Installer 8695 (2) and Handle C-4171 (1).

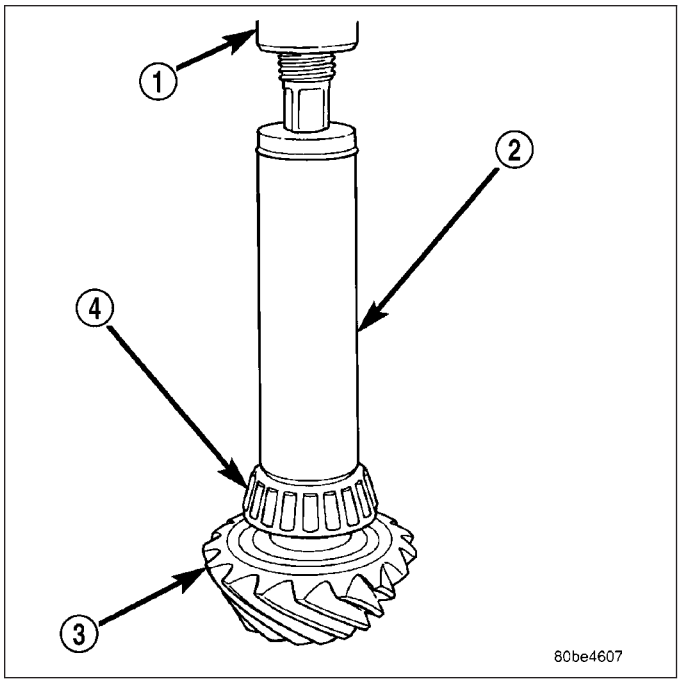


7. Place pinion depth shim (1) on the pinion shaft (2).

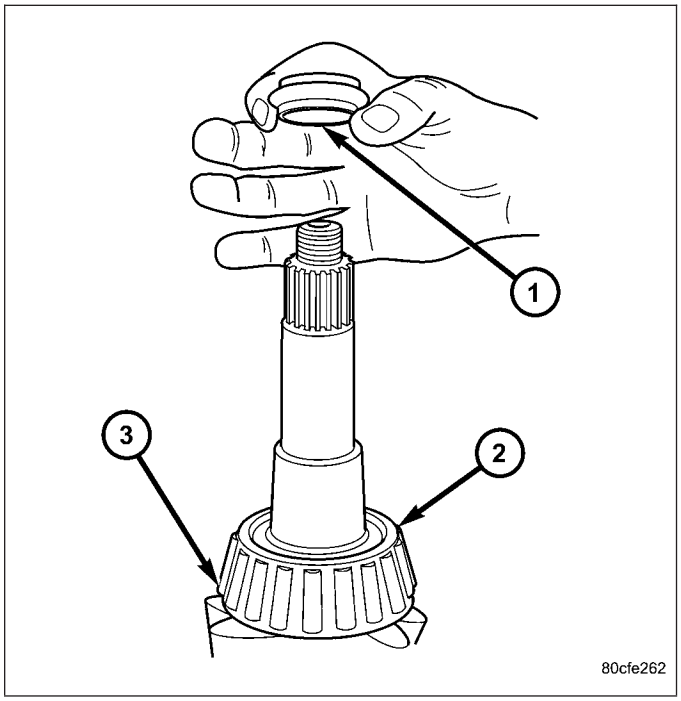


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8. Install rear pinion bearing (4) with Installer 6448 (1) and a press (1).

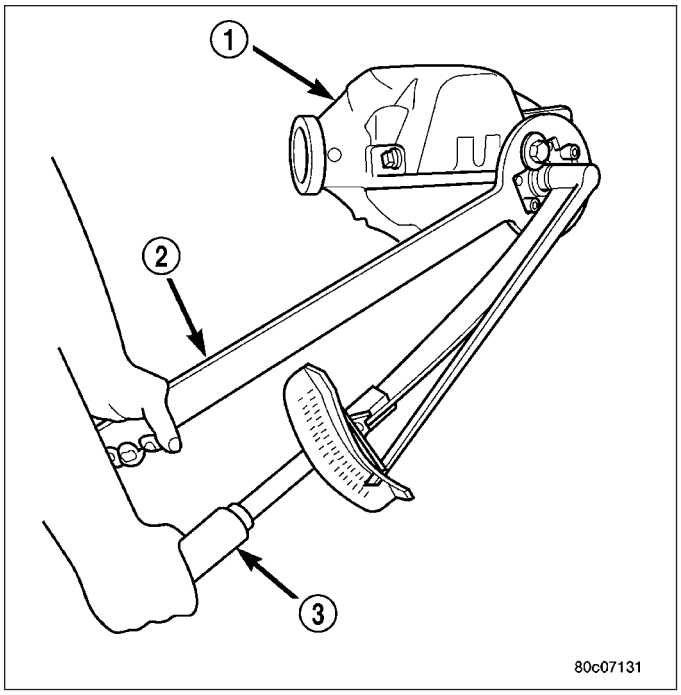


9. Install **new** collapsible spacer (1) onto the pinion shaft.
10. Lubricate rear pinion bearing and install the pinion gear in the housing.



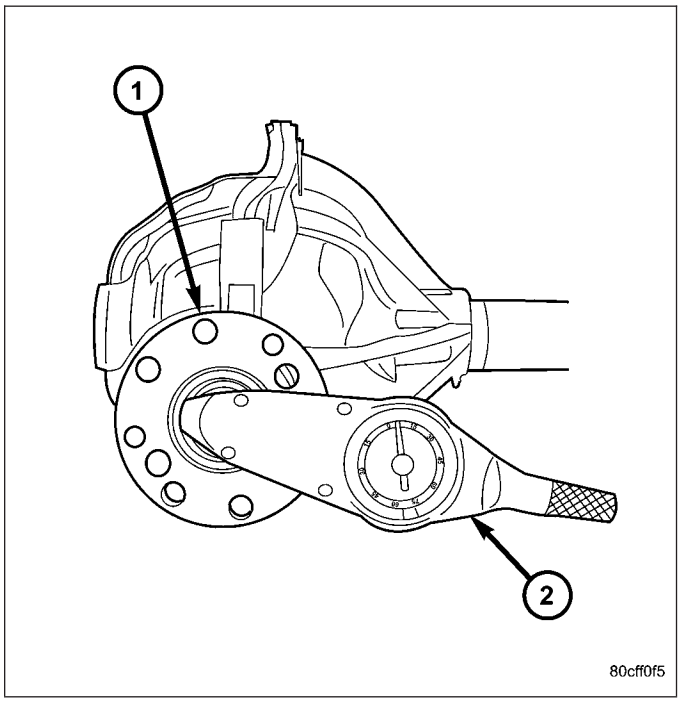
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11. Install companion flange with Installer C-3718 and Holder 6719 (2).
12. Install **new** pinion nut and tighten to 271 N·m (200 ft. lbs.).
13. Using Holder 6719 and a torque wrench set at 475 N·m (350 ft. lbs.). Tighten pinion nut until bearing end play is taken up.



14. Slowly tighten the nut in 6.8 N·m (5 ft. lbs.) increments until desired rotating torque is achieved. Measure rotating torque frequently to avoid overcrushing the collapsible spacer. The pinion rotating torque should be:
    - Original Bearings: 1 to 2.5 N·m (10 to 20 in. lbs.)
    - New Bearings: 2.0 to 2.8 N·m (18 to 25 in. lbs.)

CAUTION: Never loosen pinion nut to decrease pinion bearing rotating torque and never exceed specified preload torque. Failure to follow these instruction will result in damage.

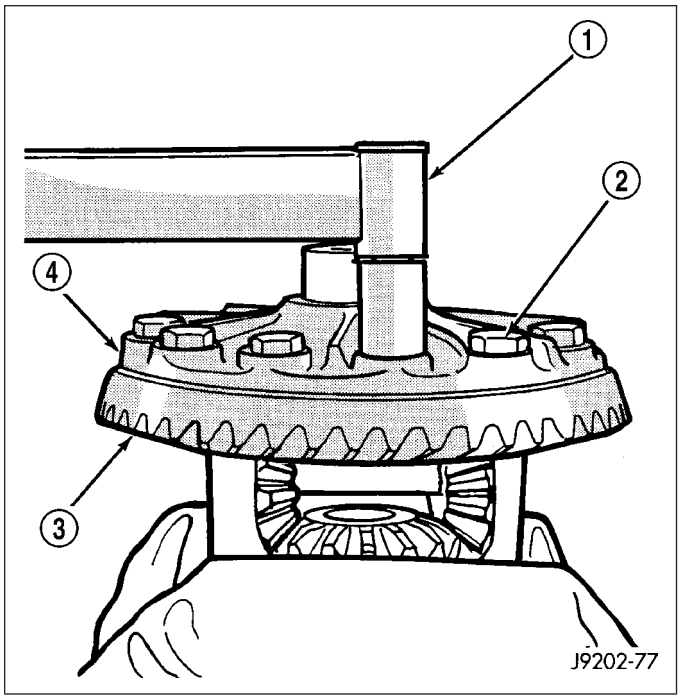


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15. Invert differential case (4) and start two ring gear (3) bolts to provide ring gear bolt hole alignment.
16. Invert differential case in the vise.
17. Install **new** ring gear bolts and alternately tighten to 108 N·m (80 ft. lbs.).

CAUTION: Never reuse the ring gear bolts. Failure to follow these instruction will result in damage.

18. Install differential in housing and verify gear mesh, backlash and contact pattern.



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FRONT AXLE - 9 1/4 AA

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FRONT AXLE - 9 1/4 AA

DIAGNOSIS AND TESTING

FRONT AXLE - 9 1/4 AA

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, tooth contact, worn/damaged gears or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant.
- Incorrect ring gear backlash.
- Gear damage.

Differential side gears and pinions can be checked by turning the vehicle. The side gears are loaded during turns. They usually do not cause noise during straight-ahead driving when the gears are unloaded. A worn pinion mate shaft can also cause a snapping or a knocking noise.

BEARING NOISE

The axle shaft, differential and pinion bearings can all produce noise when worn or damaged. Bearing noise can be either a whining, or a growling sound.

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Pinion bearings have a constant-pitch noise. This noise changes only with vehicle speed. Pinion bearing noise will be higher pitched because it rotates at a faster rate. Drive the vehicle and load the differential. If bearing noise occurs, the rear pinion bearing is the source of the noise. If the bearing noise is heard during a coast, the front pinion bearing is the source.

Differential bearings usually produce a low pitch noise. Differential bearing noise is similar to pinion bearing noise. The pitch of differential bearing noise is also constant and varies only with vehicle speed.

Axle shaft bearings produce noise and vibration when worn or damaged. The noise generally changes when the bearings are loaded. Road test the vehicle. Turn the vehicle sharply to the left and to the right. This will load the bearings and change the noise level. Where axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 m.p.h.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joint(s).
- Worn side-gear thrust washers.
- Worn pinion shaft bore.

VIBRATION

Vibration at the front/rear of the vehicle is usually caused by:

- Damaged drive shaft.
- Missing drive shaft balance weight(s).
- Worn or out of balance wheels.
- Loose wheel lug nuts.
- Worn U-joint(s).
- Loose/broken springs.
- Damaged axle shaft bearing(s).
- Loose pinion gear nut.
- Excessive pinion yoke run out.
- Bent axle shaft(s).

Check for loose or damaged front end components or engine/transmission mounts. These components can contribute to what appears to be a vibration. Do not overlook engine accessories, brackets and drive belts.

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear (or the clutch engaged) can be caused by:

- High engine idle speed.
- Transmission shift operation.
- Loose engine/transmission/transfer case mounts.
- Worn U-joints.
- Loose spring mounts.
- Loose pinion gear nut and yoke.
- Excessive ring gear backlash.
- Excessive side gear to case clearance.

The source of a snap or a clunk noise can be determined with the assistance of a helper. Raise the vehicle on a hoist with the wheels free to rotate. Instruct the helper to shift the transmission into gear and listen for the noise. A mechanics stethoscope is helpful in isolating the source of a noise.

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DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose.	1. Tighten loose nuts.
	2. Faulty, brinelled wheel bearing.	2. Replace bearing.
Axle Shaft Noise	1. Misaligned axle tube.	1. Inspect axle tube alignment. Correct as necessary.
	2. Bent or sprung axle shaft.	2. Inspect and correct as necessary.
	3. End-play in pinion bearings.	3. Refer to pinion pre-load information and correct as necessary.
	4. Excessive gear backlash between the ring gear and pinion.	4. Check adjustment of the ring gear and pinion backlash. Correct as necessary.
	5. Improper adjustment of pinion gear bearings.	5. Adjust the pinion bearings pre-load.
	6. Loose pinion yoke nut.	6. Tighten the pinion yoke nut.
	7. Scuffed gear tooth contact surfaces.	7. Inspect and replace as necessary.
Axle Shaft Broke	1. Misaligned axle tube.	1. Replace the broken shaft after correcting tube mis-alignment.
	2 Vehicle overloaded.	2. Replace broken shaft and avoid excessive weight on vehicle.
	3. Erratic clutch operation.	3. Replace broken shaft and avoid or correct erratic clutch operation.
	4. Grabbing clutch.	4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	1. Improper adjustment of the differential bearings.	1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly.
	2. Excessive ring gear backlash.	2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly.
	3. Vehicle overloaded.	3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight.
	4. Erratic clutch operation.	4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.

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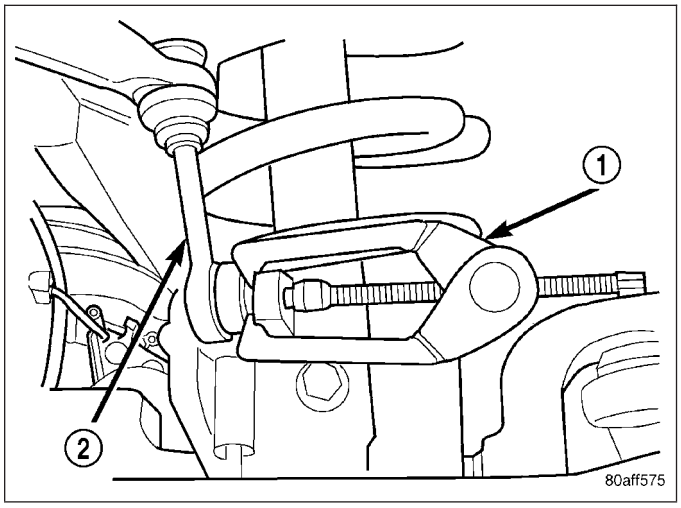
Condition	Possible Causes	Correction
Differential Gears Scored	1. Insufficient lubrication.	1. Replace scored gears. Fill differential with the correct fluid type and quantity.
	2. Improper grade of lubricant.	2. Replace scored gears. Fill differential with the correct fluid type and quantity.
	3. Excessive spinning of one wheel/tire.	3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	1. Lubricant level too high.	1. Drain lubricant to the correct level.
	2. Worn axle shaft seals.	2. Replace seals.
	3. Cracked differential housing.	3. Repair as necessary.
	4. Worn pinion seal.	4. Replace seal.
	5. Worn/scored yoke.	5. Replace yoke and seal.
	6. Axle cover not properly sealed.	6. Remove, clean, and re-seal cover.
Axle Overheating	1. Lubricant level low.	1. Fill differential to correct level.
	2. Improper grade of lubricant.	2. Fill differential with the correct fluid type and quantity.
	3. Bearing pre-loads too high.	3. Re-adjust bearing pre-loads.
	4. Insufficient ring gear backlash.	4. Re-adjust ring gear backlash.
Gear Teeth Broke	1. Overloading.	1. Replace gears. Examine other gears and bearings for possible damage.
	2. Erratic clutch operation.	2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation.
	3. Ice-spotted pavement.	3. Replace gears and examine remaining parts for damage.
	4. Improper adjustments.	4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.

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Condition	Possible Causes	Correction
Axle Noise	1. Insufficient lubricant.	1. Fill differential with the correct fluid type and quantity.
	2. Improper ring gear and pinion adjustment.	2. Check ring gear and pinion contact pattern.
	3. Unmatched ring gear and pinion.	3. Replace gears with a matched ring gear and pinion.
	4. Worn teeth on ring gear and/or pinion.	4. Replace ring gear and pinion.
	5. Loose pinion bearings.	5. Adjust pinion bearing pre-load.
	6. Loose differential bearings.	6. Adjust differential bearing pre-load.
	7. Mis-aligned or sprung ring gear.	7. Measure ring gear run-out. Replace components as necessary.
	8. Loose differential bearing cap bolts.	8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued tot he proper specification.
	9. Housing not machined properly.	9. Replace housing.

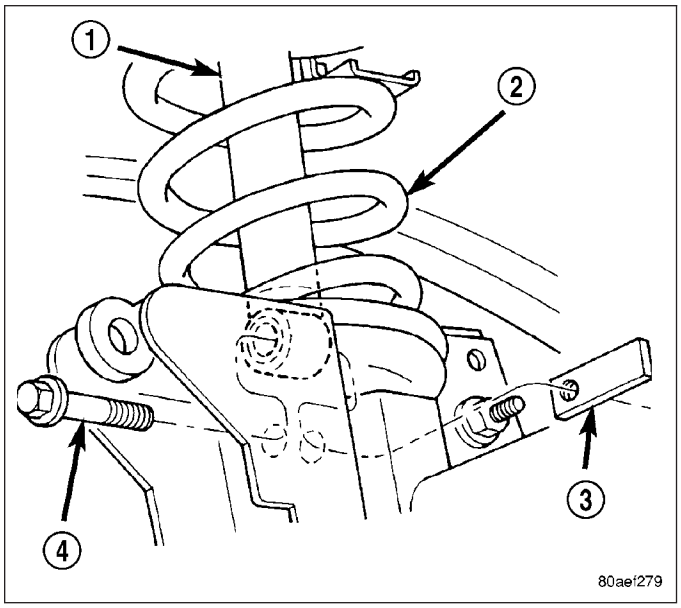
REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Remove brake calipers and rotors.
3. Disconnect ABS wheel speed sensors.
4. Disconnect axle vent hose.
5. Remove front propeller shaft.
6. Remove stabilizer bar links (2) at the axle brackets with Puller C-3894-D (1)
   .

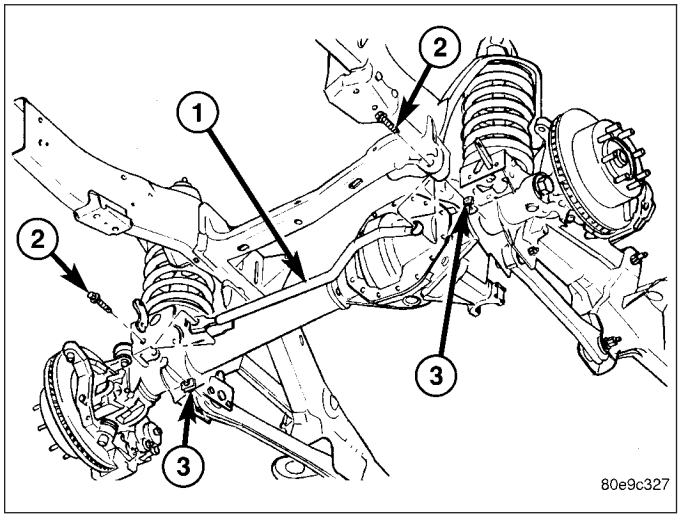


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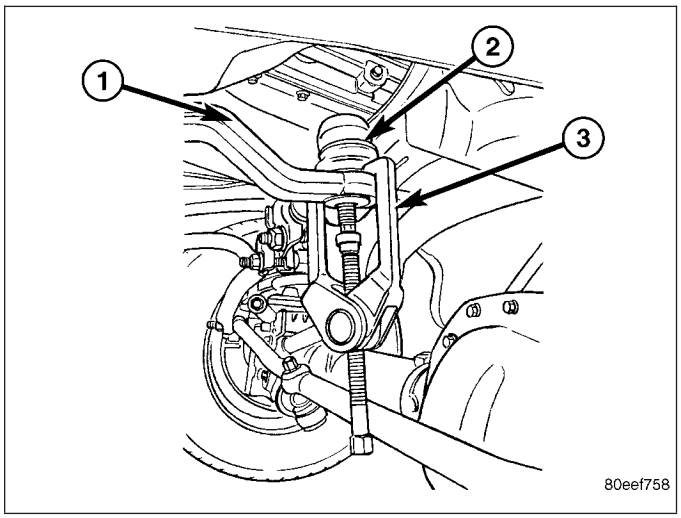
7. Disconnect shock absorbers (1) from axle brackets.



8. Remove track bar (1) from the axle bracket.

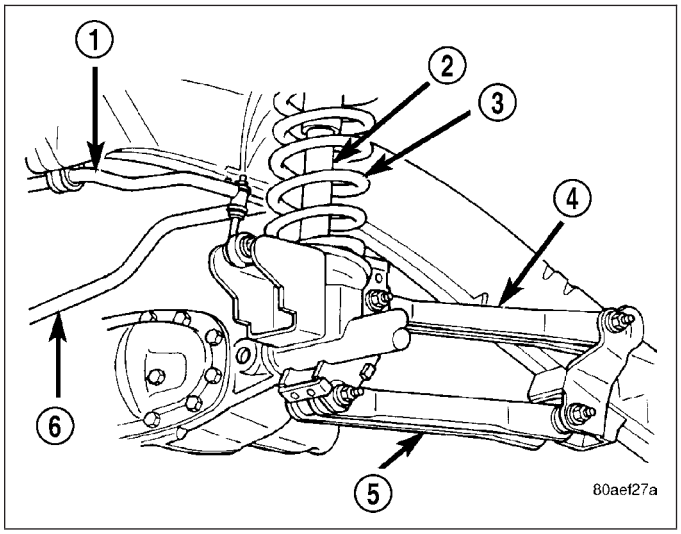


9. Remove tie rod and drag link (2) with Puller C-3894-A (3) from the steering knuckles.



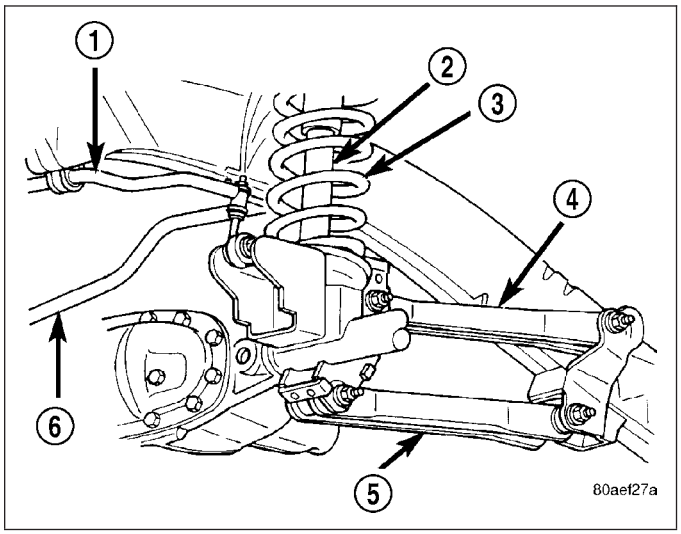
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10. Position lift under the axle assembly and secure axle to lift.
11. Mark suspension alignment cams for installation reference.
12. Remove upper suspension arms (4) and lower suspension arms (5) from the axle bracket.
13. Lower the axle. The coil springs will drop with the axle.
14. Remove coil springs from the axle bracket.



INSTALLATION

CAUTION: Suspension components with rubber bushings should be tightened with the weight of the vehicle on the suspension. Failure to follow these instructions will result in damage.



1. Support the axle on a suitable lifting device.
2. Secure axle to lifting device.
3. Position the axle under the vehicle.
4. Install springs (3), retainer clip and bolts.
5. Raise axle and align it with the spring pads.
6. Position upper (4) and lower suspension arms (5) in the axle brackets. Install bolts, nuts and align the suspension alignment cams to the reference marks. Do not tighten at this time.
7. Connect track bar (6) to the axle bracket and install the bolt. Do not tighten at this time.
8. Install shock absorber (2) and tighten bolts to 121 N·m (89 ft. lbs.).
9. Install stabilizer bar (1) link to the axle bracket. Tighten the nut to 68 N·m (50 ft. lbs.).
10. Install drag link and tie rod to the steering knuckles and tighten the nuts to 108 N·m (80 ft. lbs.).
11. Install ABS wheel speed sensors.
12. Install rotors and brake calipers.
13. Connect the axle vent hose.
14. Install front propeller shaft.
15. With vehicle on the ground, tighten upper suspension arm nuts at axle to 149 N·m (110 ft. lbs.). Tighten upper suspension arm nuts at frame to 149 N·m (110 ft. lbs.).
16. With vehicle on the ground, tighten lower suspension arm nuts at axle to 190 N·m (140 ft. lbs.). Tighten the lower suspension arm nuts at frame to 190 N·m (140 ft. lbs.).
17. Tighten track bar bolt at the axle bracket to 176 N·m (130 ft. lbs.).
18. Check front wheel alignment.

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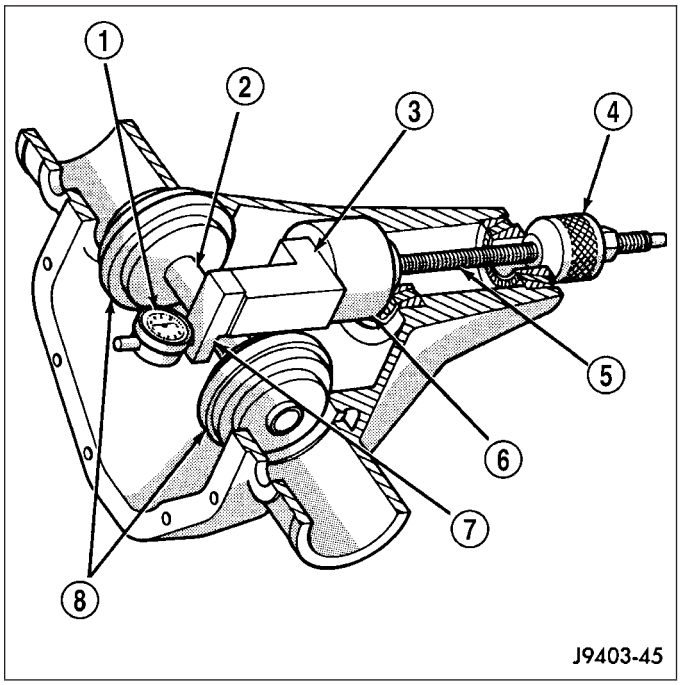
ADJUSTMENTS

PINION DEPTH MEASUREMENT

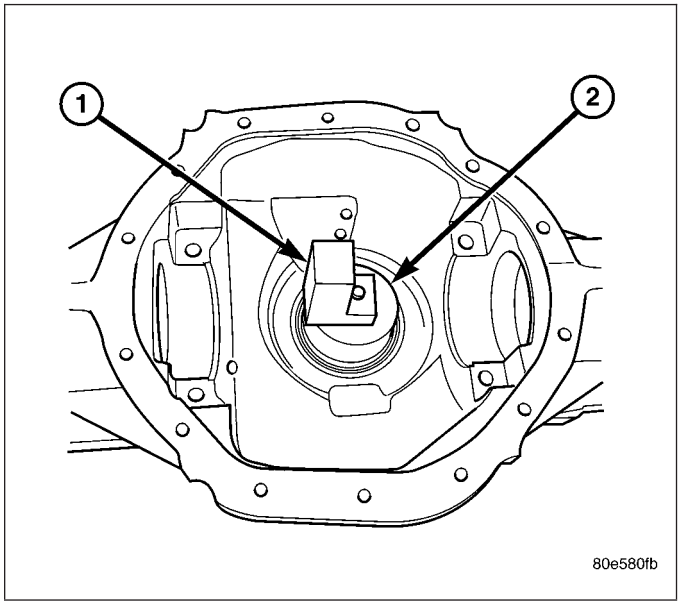
Ring and pinion gears are supplied as matched sets. Compensation for pinion depth variance is achieved with a select shim. located between the rear pinion bearing and pinion gear head.

Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take measurements with Pinion Gauge Set and Dial Indicator C-3339.

1. Assemble Pinion Height Block 6739 (3), Pinion Block 8878 (6) and rear pinion bearing onto Screw 6741(5).



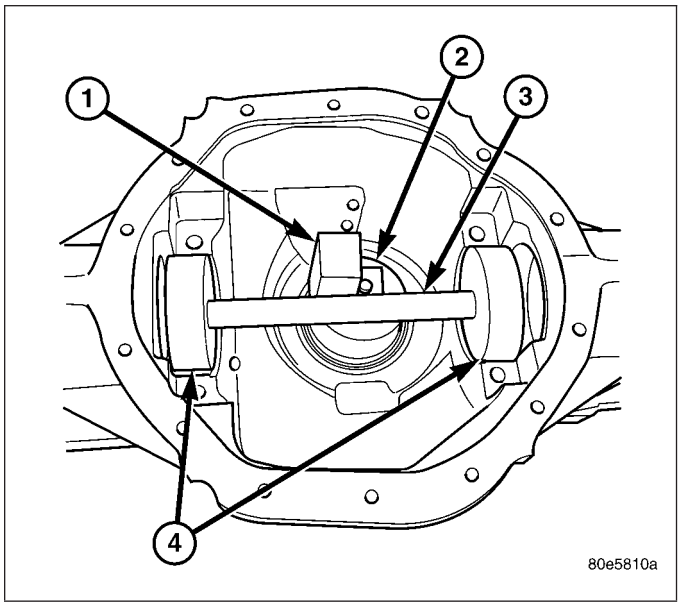
2. Insert assembled pinion height block (1), pinion block (2), rear bearing and screw into the housing through pinion bearing cups.
3. Install front pinion bearing and Cone-Nut 6740 onto the screw. Tighten cone-nut until Torque To Rotate the screw is 1.7-2.26 N·m (15-20 in. lbs.).



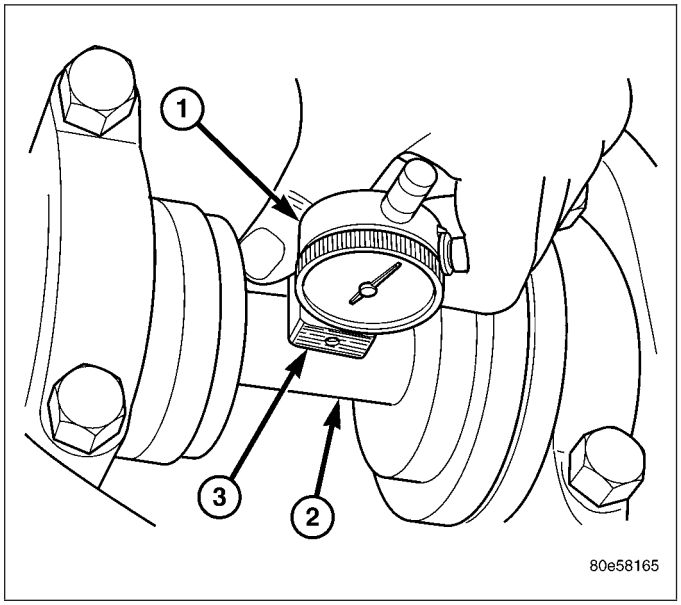
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4. Place Arbor Disc 8289 (4) on Arbor D-115-3 (3) in position in the housing side bearing cradles.
5. Install differential bearing caps on arbor discs and snug the bearing cap bolts. Then cross tighten cap bolts to 85 N·m (63 ft. lbs.).

NOTE: Arbor (3) should rotate freely in the arbor disc (4).



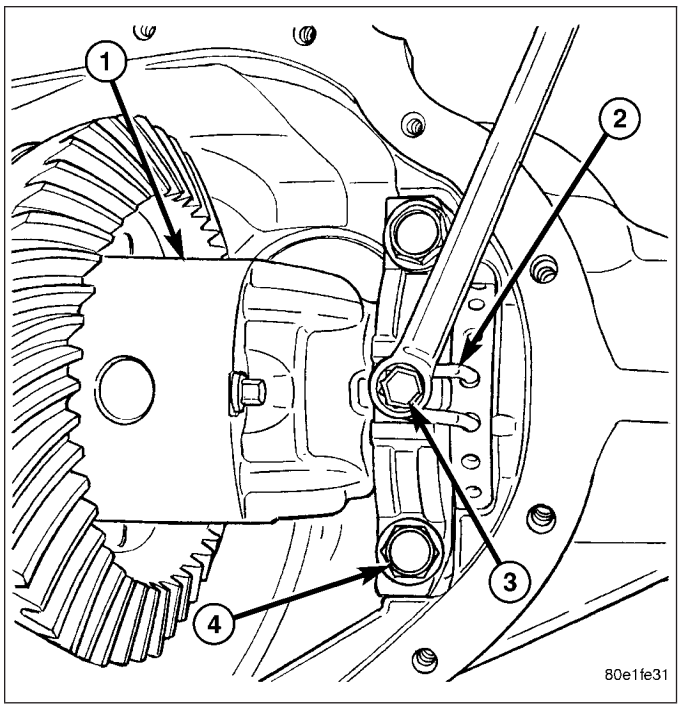
6. Assemble Dial Indicator C-3339 (1) into Scooter Block D-115-2 (3) and secure set screw.
7. Position Scooter Block/Dial Indicator flush on the pinion height block. Hold scooter block and zero the dial indicator (1).
8. Slowly slide the scooter block across the pinion height block over to the arbor. Move scooter block till dial indicator crests the arbor (2), then record the highest reading.
9. Select a shim equal to the dial indicator reading.
10. Install the select shim between the rear pinion bearing and the pinion gear head.



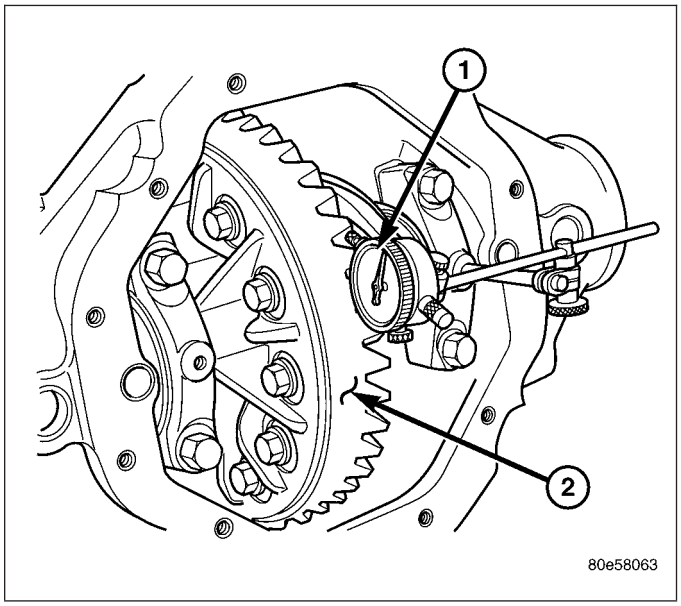
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DIFFERENTIAL BEARING PRELOAD AND GEAR BACKLASH

Backlash is adjusted by moving the adjusters in and out or both. By moving the adjusters the case/ring gear will move closer or further away from the pinion. In most cases this adjustment can be used to achieve the correct gear tooth pattern and set the case bearing preload.



1. Remove adjuster lock bolts (3) and adjuster locks (2).
2. Loosen the differential bearing caps.
3. Slide differential case (1) toward the pinion gear until the gears make contact/zero backlash. If zero backlash cannot be obtained, turn the pinion side adjuster until zero backlash is obtained.
4. Holding the differential case toward the pinion gear, turn bearing adjusters with Spanner Wrench 8883 until they make contact with the differential bearings/cups.
5. Back off the ring gear side adjuster 4 holes, to obtain initial ring gear backlash.
6. Install ring gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
7. Tighten pinion gear side adjuster firmly against the differential case bearing cup.
8. Rotate the pinion several times to seat the differential bearings.
9. Loosen pinion gear side adjuster until it is no longer in contact with the bearing cup, then tighten it until it makes contact.
10. Tighten pinion gear side adjuster an additional:
    - **New Bearings:** 6 Adjuster Holes
    - **Original Bearings:** 4 Adjuster Holes
11. Install pinion gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
12. Tighten bearing cap bolts to 85 N·m (63 ft. lbs.).
13. Tighten adjuster lock bolts to 25 N·m (18 ft. lbs.).



14. Measure ring gear backlash with a Dial Indicator C-3339 (1) and Dial Indicator Stud L-4438 at eight points around the drive side of the ring gear (2). The backlash should be 0.08-0.25 mm (0.003-0.010 in) with a preferred backlash of 0.13-0.18 mm (0.005-0.007 in).

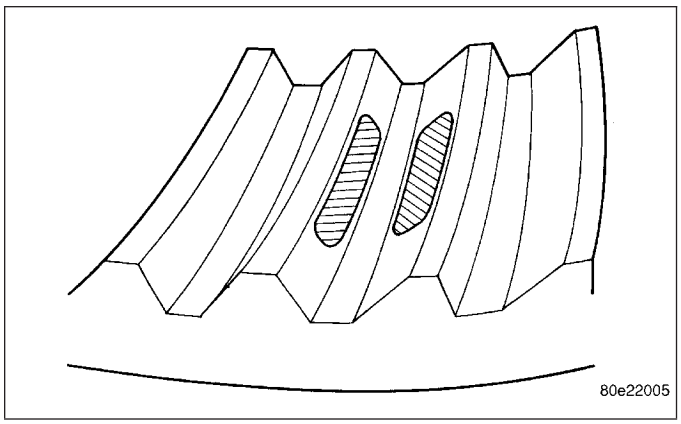
NOTE: Backlash measurement should not vary more than 0.05 mm (0.002 in) between measuring points. If measurement does vary inspect the gears for burrs, the differential case flange and ring gear mounting.

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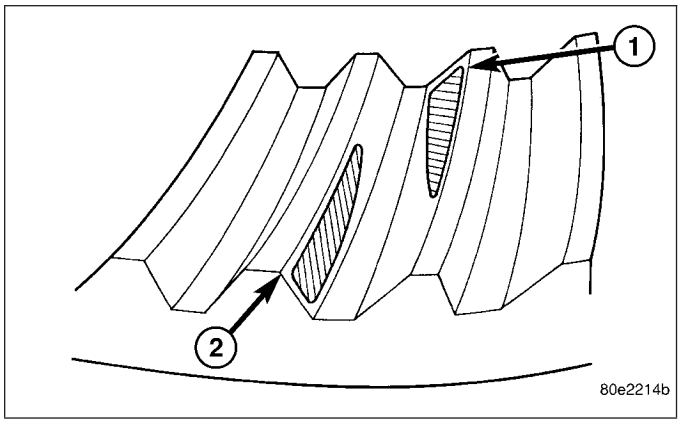
GEAR TOOTH CONTACT PATTERN

1. Wipe clean each tooth of the ring gear.
2. Apply gear marking compound to all of the ring gear teeth.
3. Verify bearing cap bolts are torque to specification.
4. Apply the brakes lightly to create a 14 N·m (10 ft. lbs.) pinion rotating torque.
5. Rotate the pinion/pinion yoke 4 full revolutions in each directions.
6. Read gear tooth contact pattern.

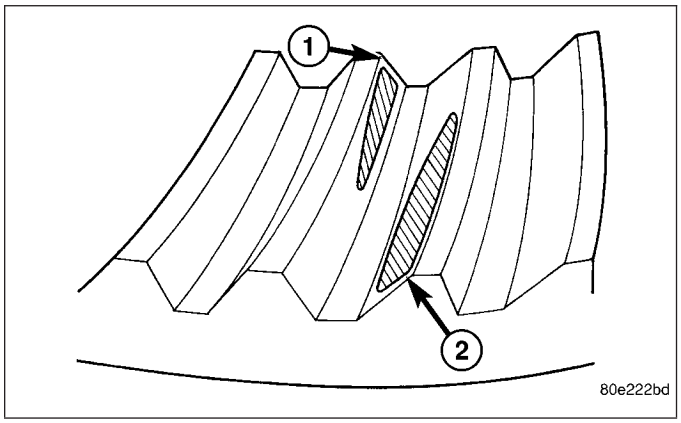
Gear contact pattern is correct. Backlash and pinion depth is correct.



Ring gear too far away from pinion gear, coast side toe (1) and drive side heel (2). Decrease backlash, by moving the ring closer to the pinion gear using the adjusters.

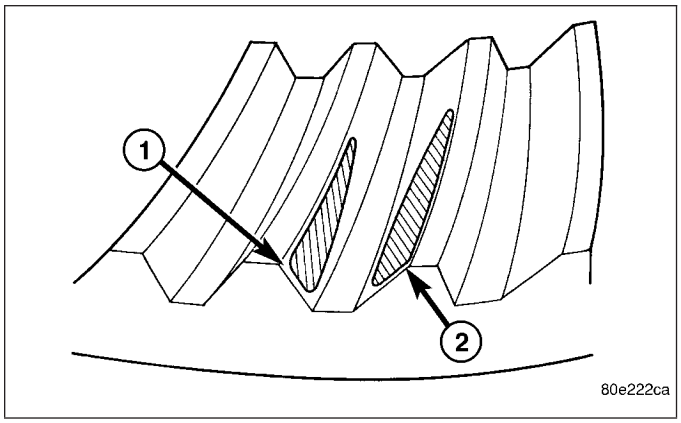


Ring gear too close to pinion gear, drive side toe (1) and coast side heel (2).. Increase backlash, by moving the ring away from the pinion gear using the adjusters.

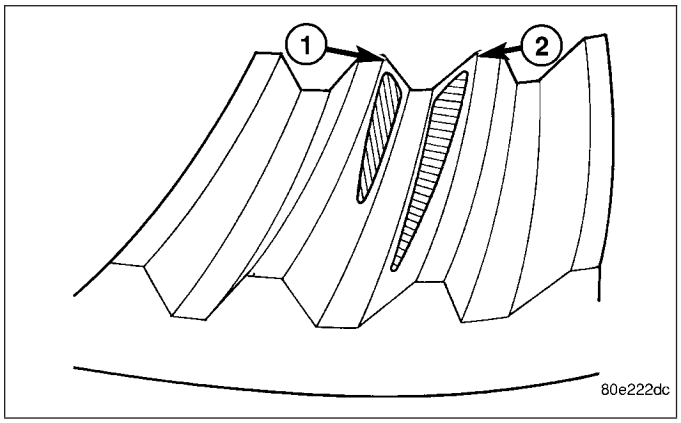


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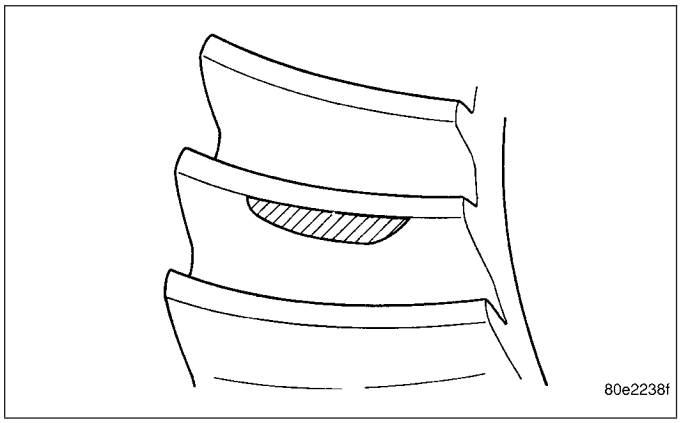
Ring gear too far away from pinion gear, drive side heel (1) and coast side heel (2).. Decrease backlash, by moving the ring closer to the pinion gear using the adjusters.



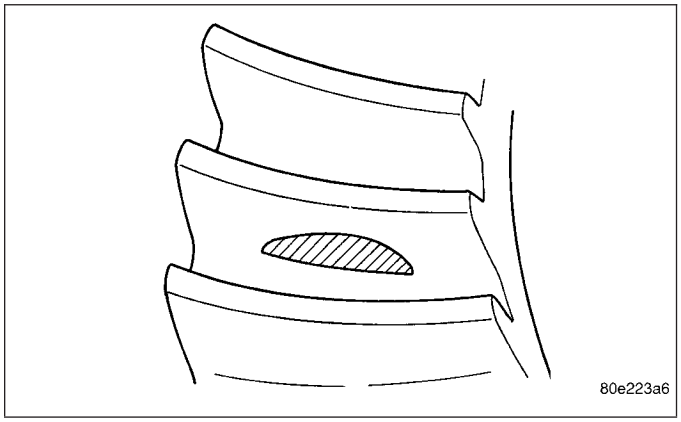
Ring gear too close to pinion gear, drive side toe (1) and coast side toe (2). Increase backlash, by moving the ring away from the pinion gear using the adjusters.



Pinion gear set too low. Increase pinion gear height, by increasing the pinion depth shim thickness.



Pinion gear set too high. Decrease pinion depth, by decreasing the pinion depth shim thickness.



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SPECIFICATIONS

AXLE SPECIFICATIONS

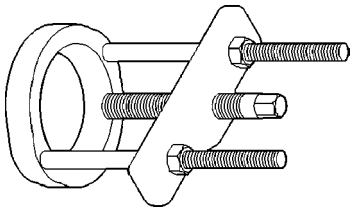
DESCRIPTION	SPECIFICATION
Axle Ratio	3.73, 4.10, 4.56
Ring Gear Diameter	235 mm (9.25 in.)
Ring Gear Backlash	0.13-0.18 mm (0.005-0.007 in.)
Pinion Bearing Preload - New Bearing	1.7-2.8 N·m (15-25 in. lbs.)
Pinion Bearing Preload - Original Bearing	1.1-2.2 N·m (10-20 in. lbs.)
Pinion Bearing Preload + Differential Case Bearing Preload - New Bearing	3.4-5.6 N·m (30-50 in. lbs.)
Pinion Bearing Preload + Differential Case Bearing Preload - Original Bearing	2.8-5.1 N·m (25-45 in. lbs.)

TORQUE SPECIFICATIONS

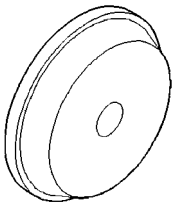
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Fill Hole Plug	32	24	-
Differential Cover Bolts	40	30	-
Bearing Cap Bolts	85	63	-
Ring Gear Bolts	140	103	-
Axle Nut	356	263	-
Pinion Shaft Lock Bolt	52	38	-
Adjuster Lock Bolt	25	18	-

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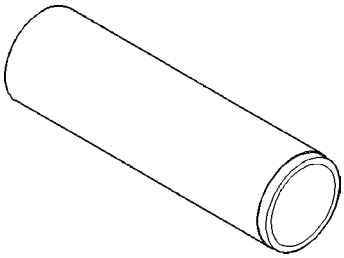
SPECIAL TOOLS



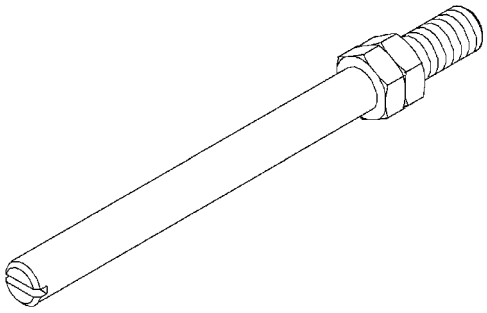
PULLER C-293-PA



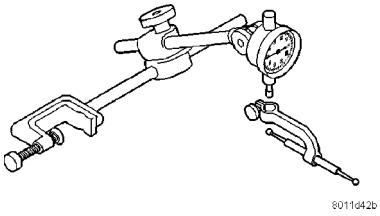
INSTALLER D-146



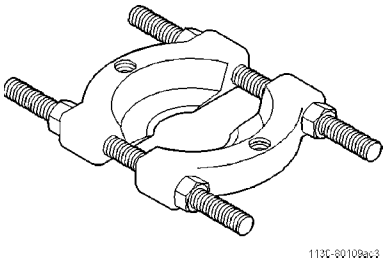
INSTALLER C-3095-A



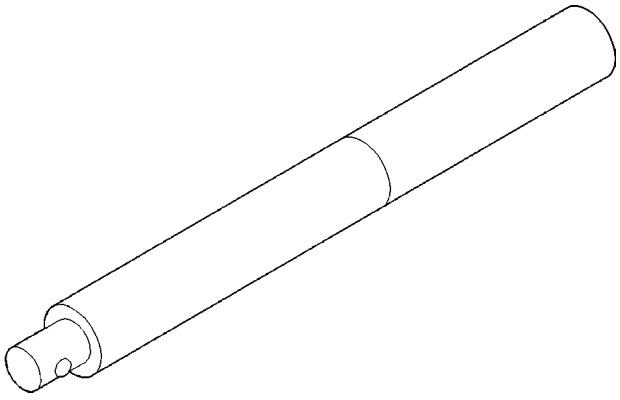
DIAL INDICATOR STUD L-4438



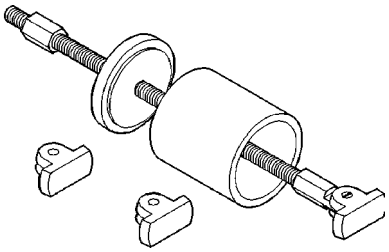
DIAL INDICATOR SET C-3339



SPLITTER 1130

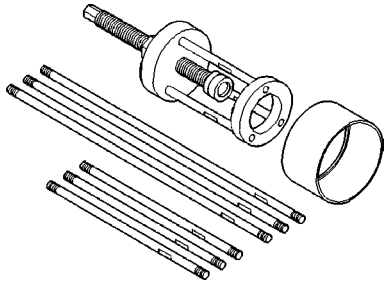


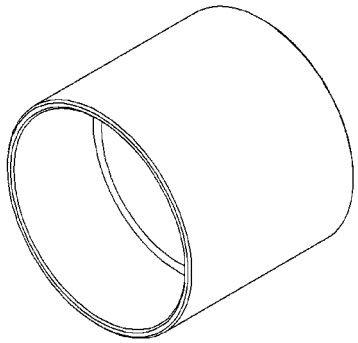
HANDLE C-4171



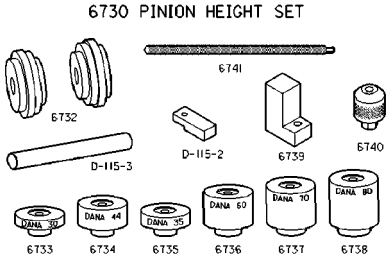
REMOVER/EXTRACTOR 6310

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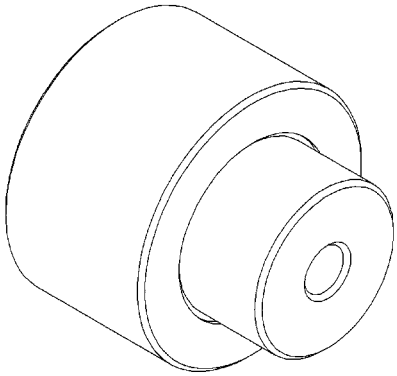




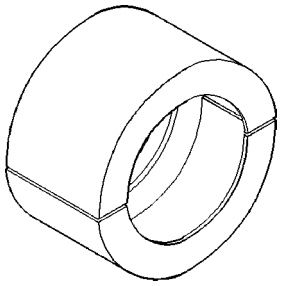
RECEIVER 8498

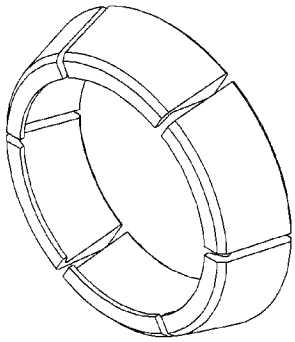


PINION DEPTH SET 6730

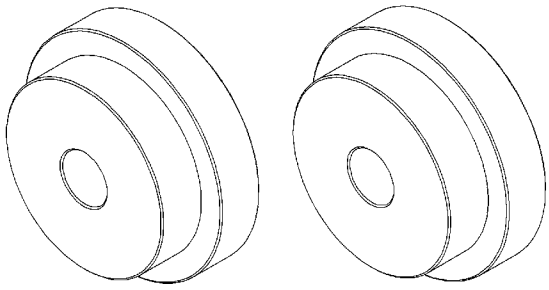


PINION BLOCK 8878



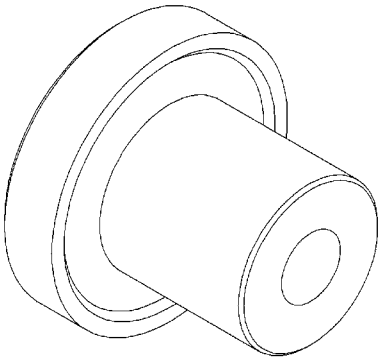


ADAPTERS 8879

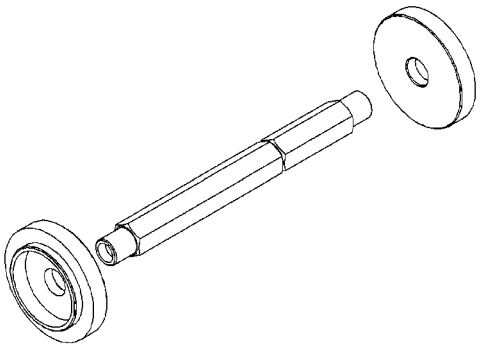


ARBOR DISCS 8289

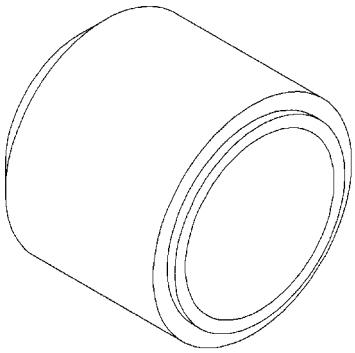
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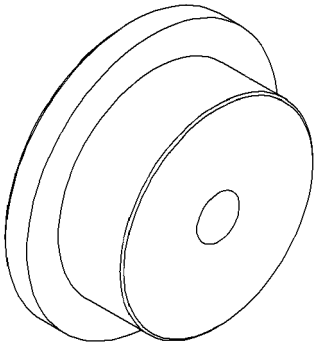
INSTALLER 8881



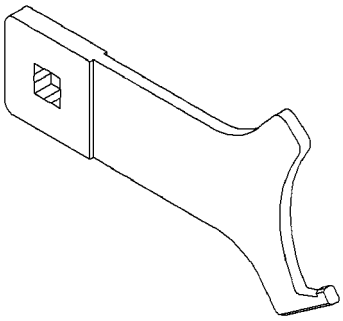
SEAL INSTALLER 8885



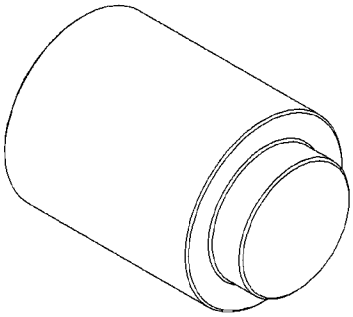
SEAL INSTALLER 8882



INSTALLER 8886

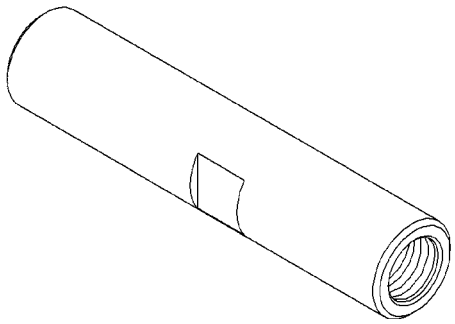


ADJUSTER WRENCH 8883

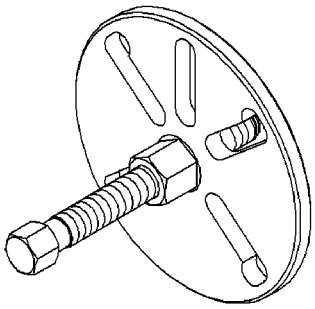


PLUG 8888

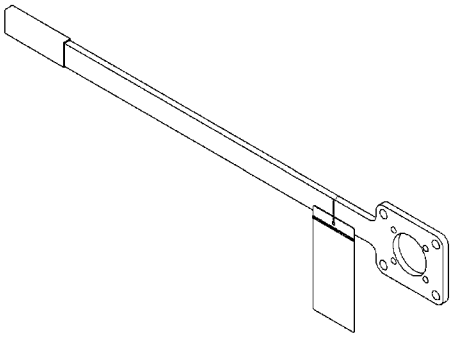
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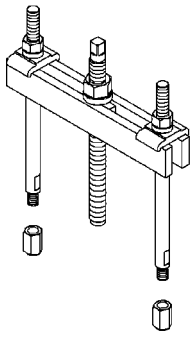
PINION DRIVER 8976



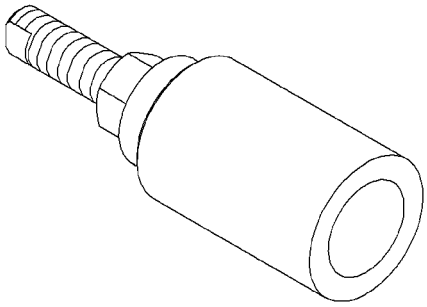
FLANGE PULLER 8992



FLANGE WRENCH 8979



BRIDGE 938



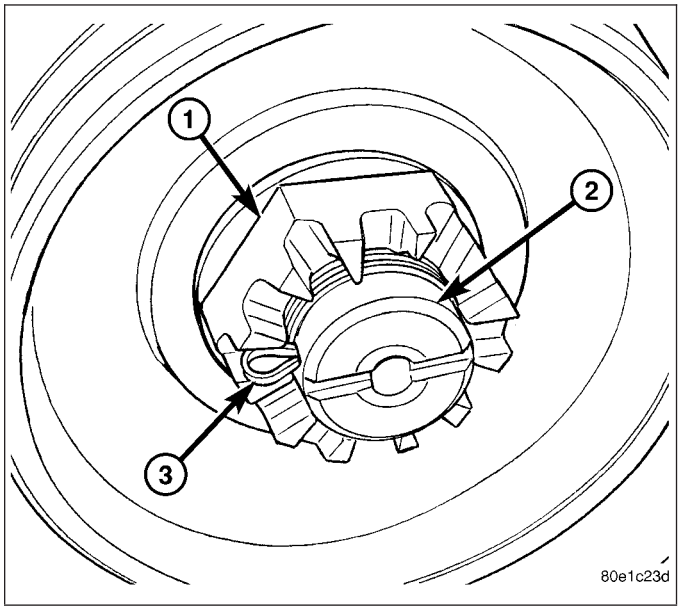
PINION INSTALLER 8982

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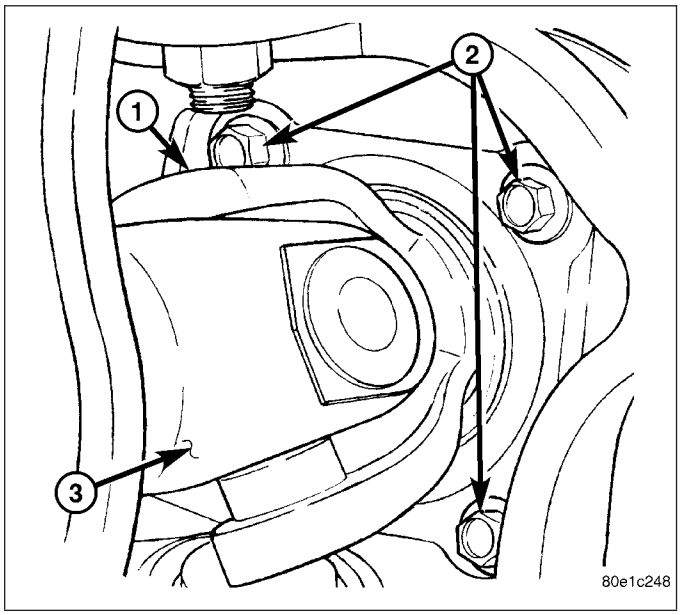
SHAFT-AXLE

REMOVAL

1. With the vehicle in neutral, position vehicle on hoist.
2. Remove brake caliper, rotor and ABS wheel speed sensor if equipped.
3. Remove axle shaft (2) cotter pin (3), hub nut (1) and washer.

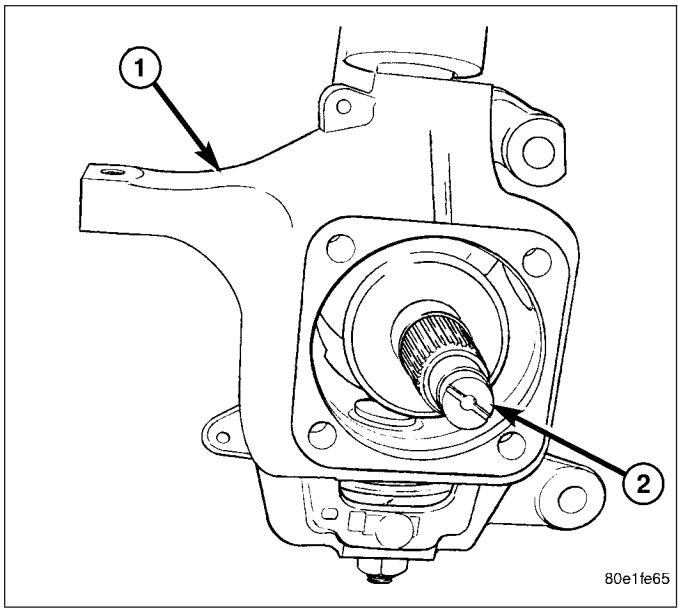


4. Remove four hub bearing bolts (2) from the back of the steering knuckle.
5. Remove hub bearing from the steering knuckle.



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6. Remove axle shaft (2) from steering knuckle (1) and axle housing.

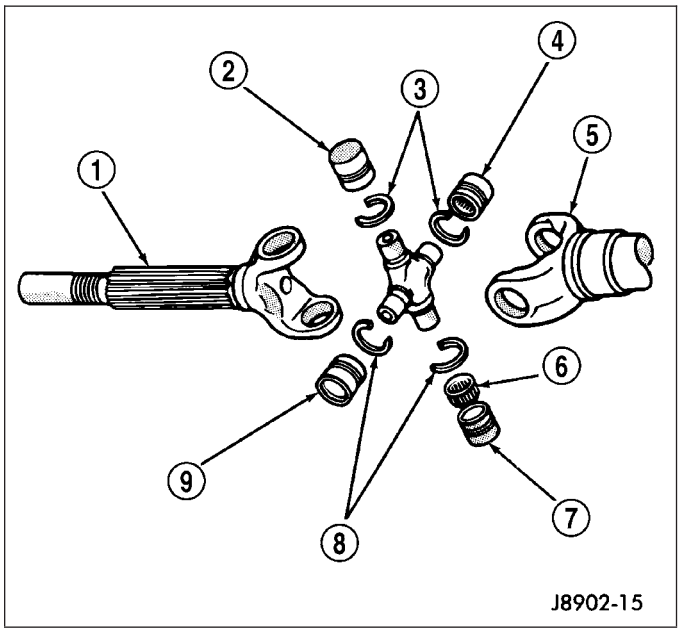


DISASSEMBLY

Single cardan U-joint components are not serviceable. If defective they must be replaced as a unit.

CAUTION: Clamp only the narrow forged portion of the yoke in the vise. Failure to follow these instructions will damage the yoke.

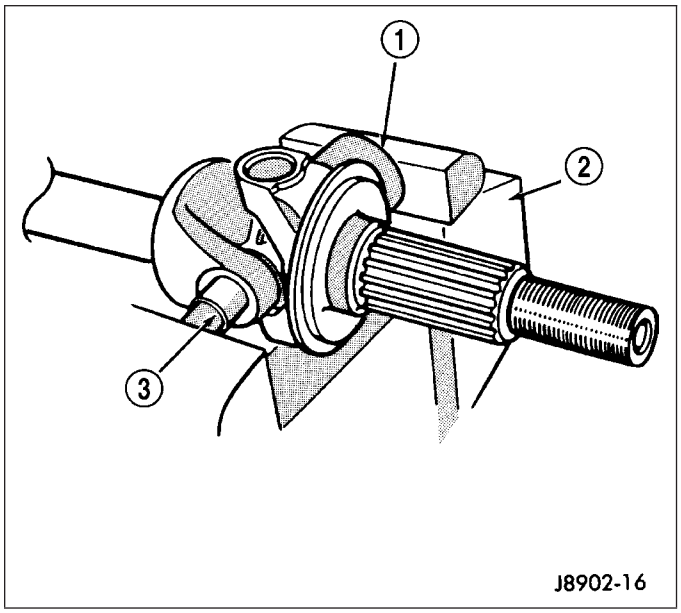
1. Remove the bearing cap (7) retaining snap rings (8).



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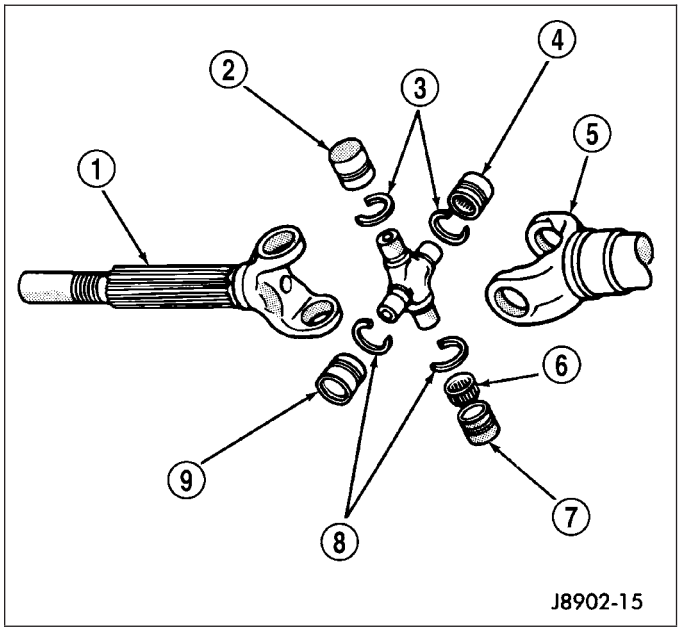
NOTE: Saturate the bearing caps with penetrating oil prior to removal.

2. Locate a socket (1) with an inside diameter that is larger than the bearing cap. Place the socket (receiver) against the yoke and around the perimeter of the bearing cap to be removed.
3. Locate a socket (3) with an outside diameter that is smaller than the bearing cap. Place the socket (driver) against the opposite bearing cap.
4. Position the yoke with the sockets in a vise (2).
5. Tighten the vise jaws to force the bearing cap into the larger socket (receiver).
6. Release the vise jaws. Remove the sockets and bearing cap that was partially forced out of the yoke.
7. Repeat the above procedure for the remaining bearing cap and remove spider from the propeller shaft yoke.



ASSEMBLY

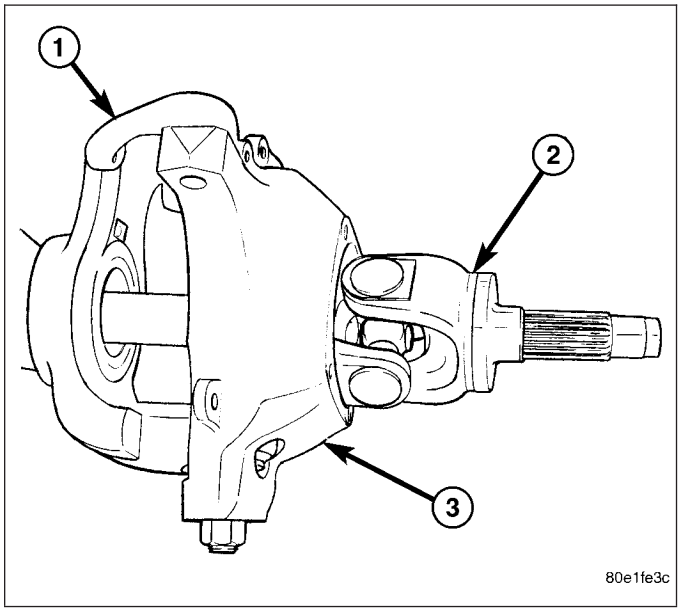
1. Pack the bearing caps 1/3 full of wheel bearing lubricant. Apply extreme pressure (EP), lithium-base lubricant to aid in installation.
2. Position the spider in the yoke (1). Insert the seals and bearings. Tap the bearing caps into the yoke bores far enough to hold the spider in position.
3. Place the socket (driver) against one bearing cap. Position the yoke with the socket in a vise.
4. Tighten the vise to force the bearing caps into the yoke. Force the caps enough to install the retaining clips.
5. Install the bearing cap retaining clips.
6. Install axle shaft.



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INSTALLATION

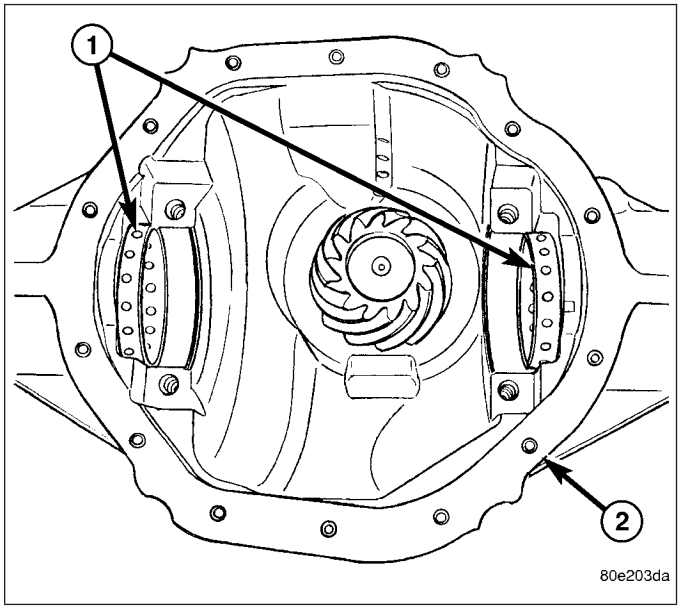
1. Clean axle shaft and apply a thin film of Mopar Wheel Bearing Grease to the shaft splines and hub bore.
2. Install axle shaft (2) through the steering knuckle and into the differential side gears.
3. Install hub bearing in the knuckle (3).
4. Install hub bearing bolts and tighten to 202 N·m (149 ft. lbs.).
5. Install ABS wheel speed sensor, brake rotor and caliper.
6. Install axle washer and nut. Tighten axle nut to 179 N·m (132 ft. lbs.).
7. Rotate axle several 5 to 10 times to seat the wheel bearing.
8. Tighten axle nut to final torque of 356 N·m (263 ft. lbs.).
9. Align nut to next cotter pin hole and install new cotter pin.



SEAL-AXLE SHAFT

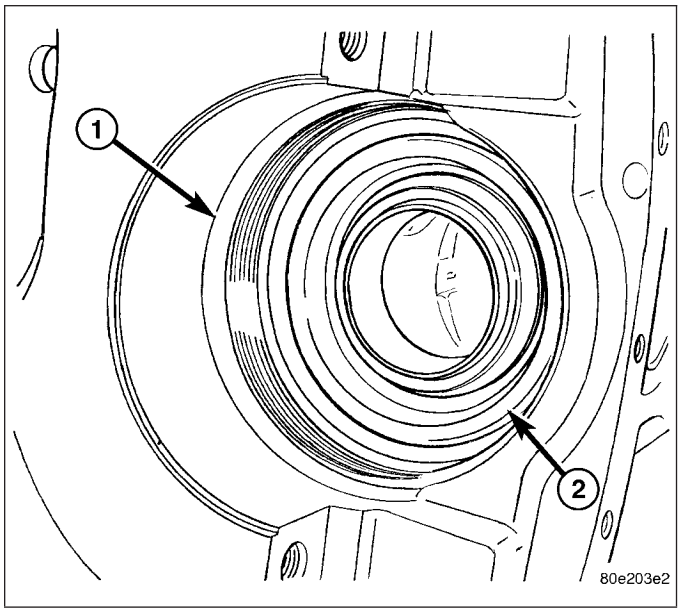
REMOVAL

1. Remove hub bearings and axle shafts.
2. Remove differential from differential housing (2).
3. Remove differential bearing adjusters (1).

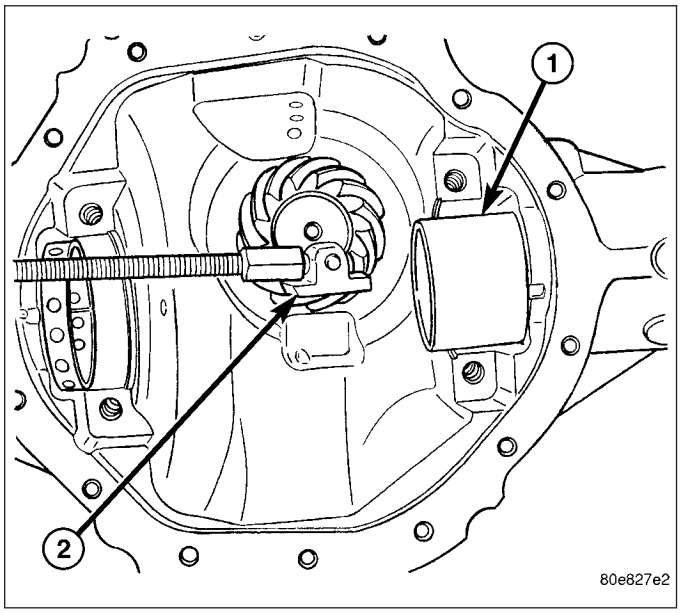


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4. Remove axle seals (2) located behind adjusters with Receiver 8498 and Extractor 6310.

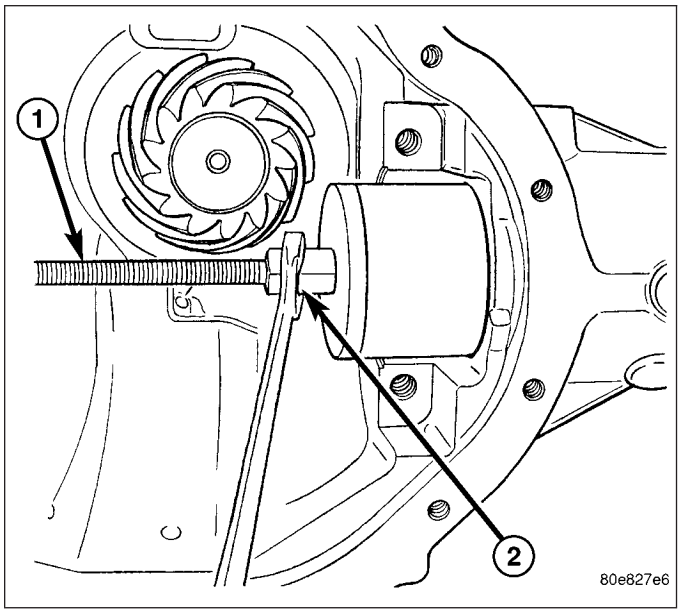


5. Install Receiver 8498 (1) into the adjuster bore.
6. Install Extractor Rod 6310 with Extractor Foot 6310-9 (2) through the receiver and the axle seal.



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7. Install Extractor Plate 6310-2 and Nut 6310-7 (2) on the extractor rod (1).
8. Tighten nut on the extractor rod and pull the seal out and into the receiver.

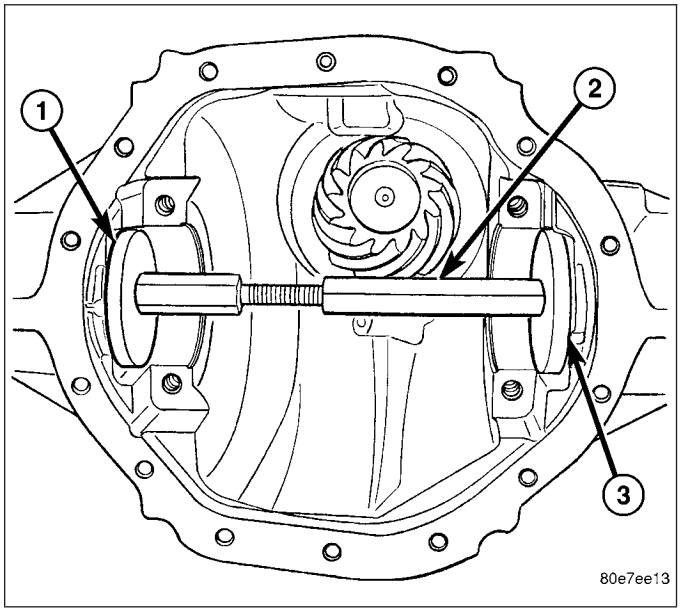


INSTALLATION

1. Install axle seal on Installer Cups 8885-2 (1) (3) and position cups with seals into the housing.

NOTE: Seal are installed with the axle guide facing outward.

2. Install Turnbuckle 8885-1(2) into the installer cups and expand the turnbuckle until the seal bottom out in the housing.
3. Install differential into the axle housing.
4. Install axle shaft and hub bearings.

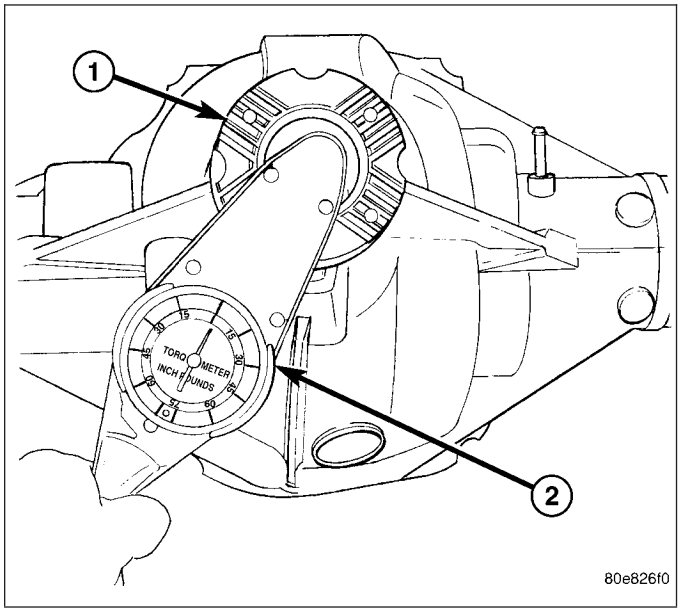


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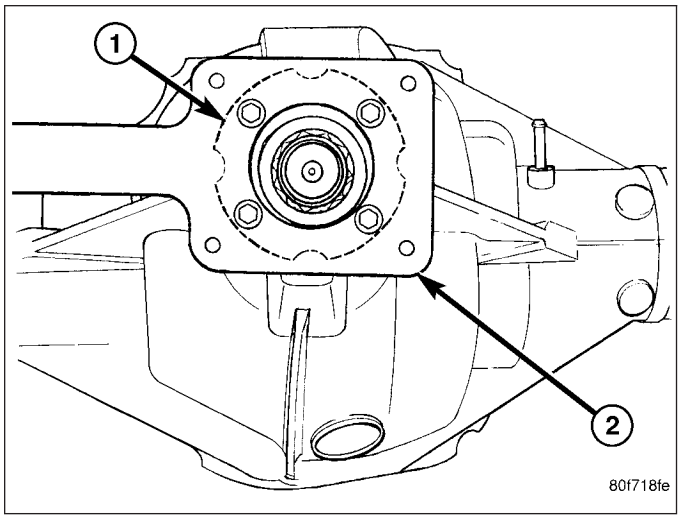
SEAL-PINION

REMOVAL

1. Mark the propeller shaft and pinion flange (1) for installation reference.
2. Remove propeller shaft.
3. Remove hub bearings and axle shafts.
4. Rotate pinion gear three or four times.
5. Measure and record the torque necessary to rotate the pinion gear with an inch pound torque wrench (2).

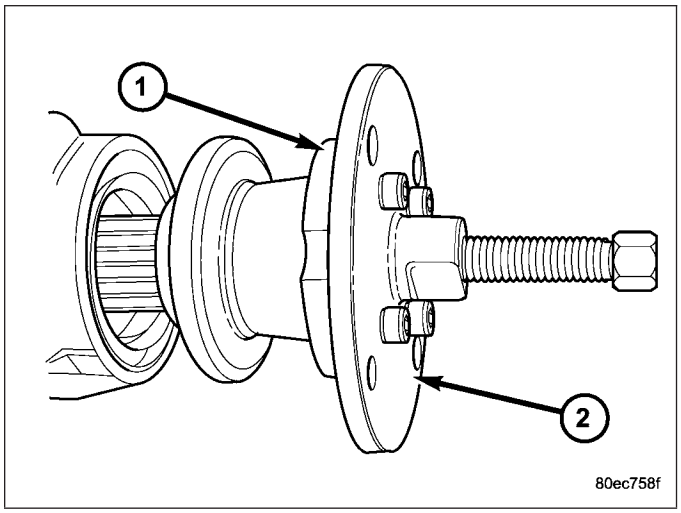


6. Hold pinion flange (1) with Flange Wrench 8979 (2) and remove pinion flange nut and washer.



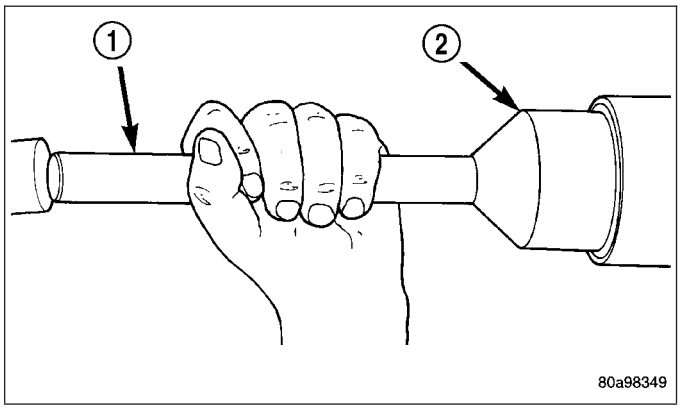
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7. Remove pinion flange (1) with Pinion Flange Puller 8992 (2).
8. Remove pinion shaft seal with a pry tool or slide hammer mounted screw.



INSTALLATION

1. Install **new** pinion seal with Installer 8882 (2) and Handle C-4171 (1).
2. Apply a light coat of teflon thread sealant to the pinion flange splines.
3. Lightly tap the pinion flange onto the pinion until a few threads are showing.
4. Install flange washer and **new** pinion nut.
5. Hold flange with Flange Wrench 8979 and tighten pinion nut until pinion end play is taken up.
6. Rotate pinion several times to seat bearings.
7. Measure pinion rotating torque with an inch pound torque wrench and compare it to recorded measurement. Tighten pinion nut in small increments, until pinion rotating torque is 0.40-0.57 N·m (3-5 in. lbs.) greater than recorded measurement.
8. Rotate pinion several times then verify pinion rotating torque again.
9. Install axle shafts and hub bearings.
10. Install propeller shaft with reference marks aligned.

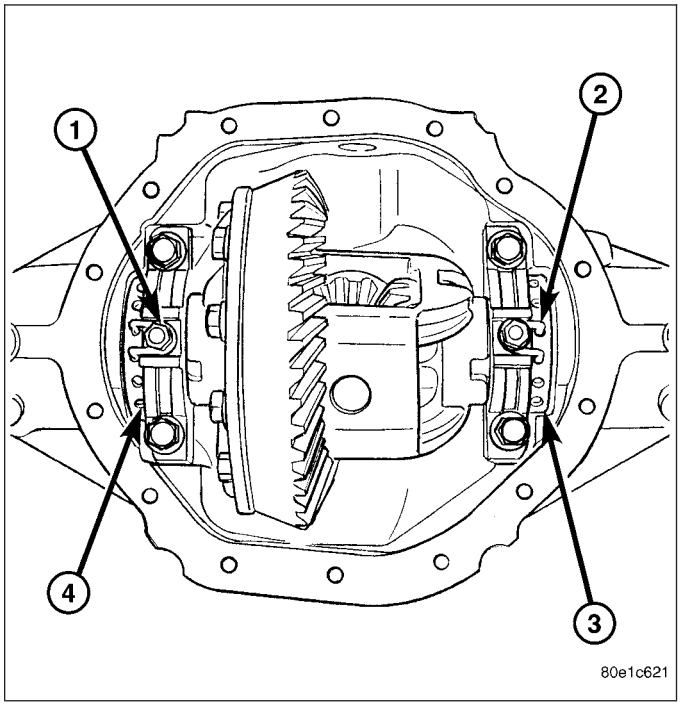


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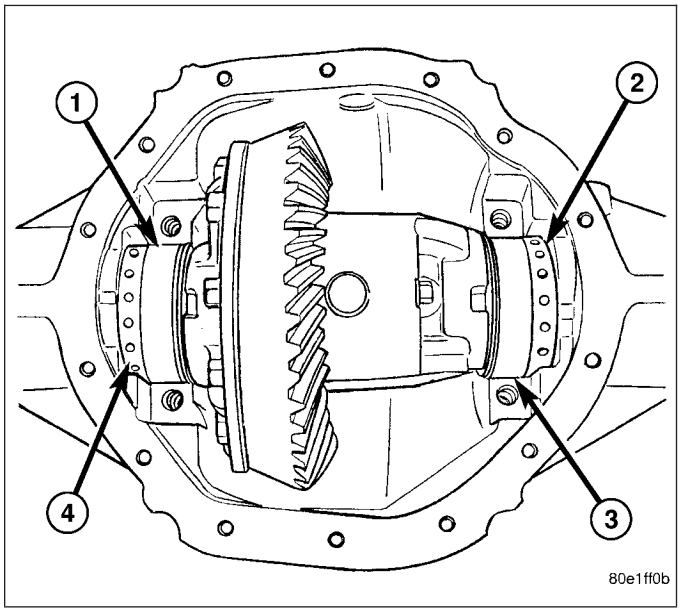
DIFFERENTIAL

REMOVAL

1. Remove differential housing cover and drain lubricant from the housing.
2. Remove hub bearings and axle shafts.
3. Remove adjuster lock bolts (1) and adjuster locks (2).
4. Mark bearing caps (4) left and right for installation reference.
5. Remove bearing cap bolts and remove bearing caps.



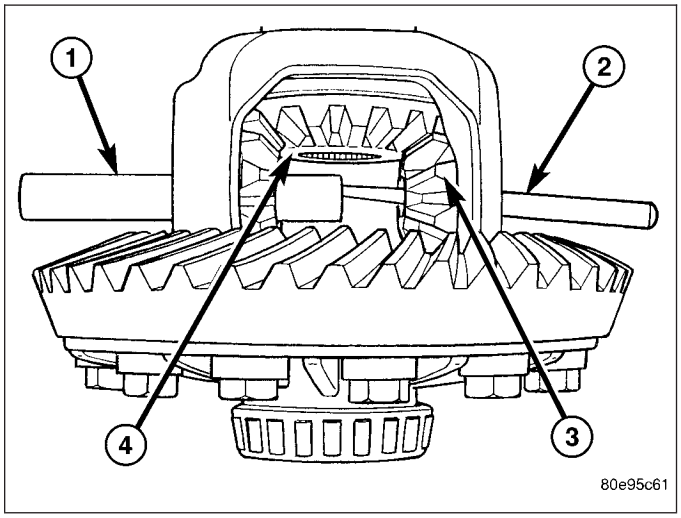
6. Loosen differential bearing adjusters (2) (4) with Spanner Wrench 8883.
7. Remove differential case from the housing.
8. Remove bearing cups (1) (3) and tag them left and right for installation reference.



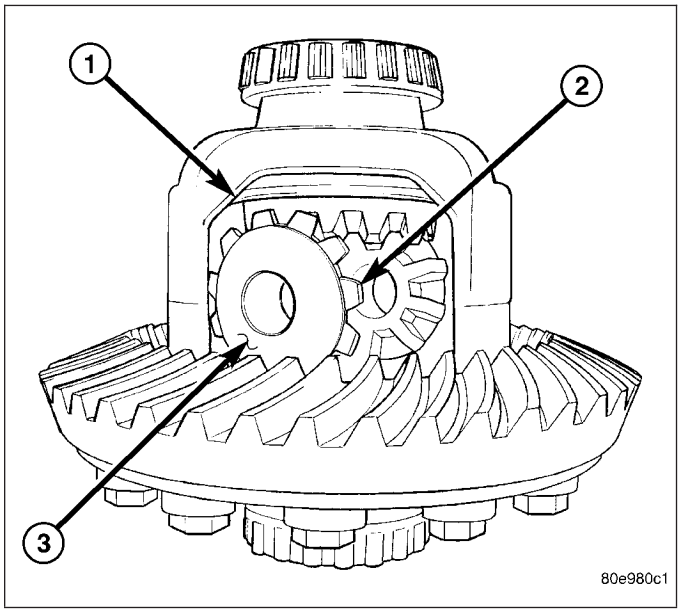
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DISASSEMBLY

1. Remove pinion shaft lock bolt.
2. Remove pinion shaft (1).

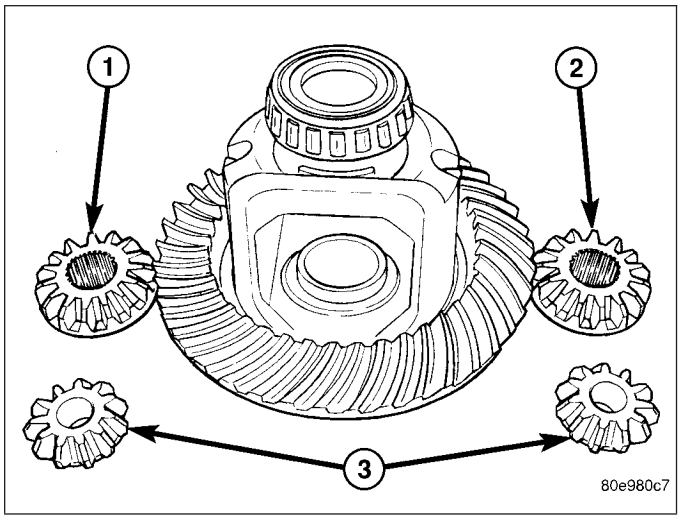


3. Rotate differential pinion gears (2) to differential window (1) and remove pinion gears and thrust washers (3).



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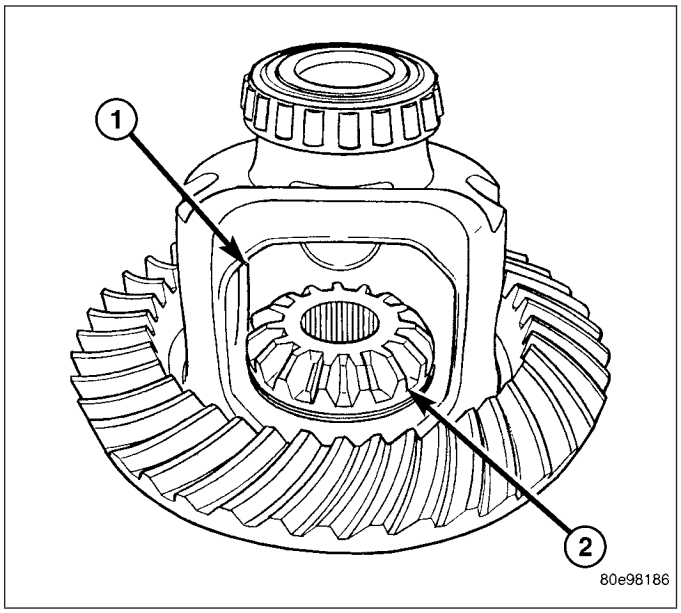
4. Remove differential side gears (1) (2) and thrust washers.



ASSEMBLY

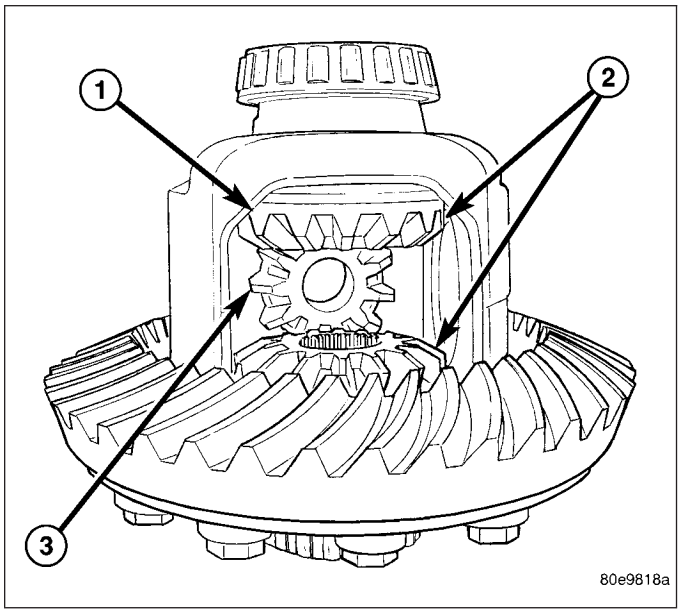
NOTE: If the same gears and thrust washers are being used, install them into their orignial locations.

1. Lubricate all differential components with axle lubricant.
2. Install differential side gears (2) and thrust washers.



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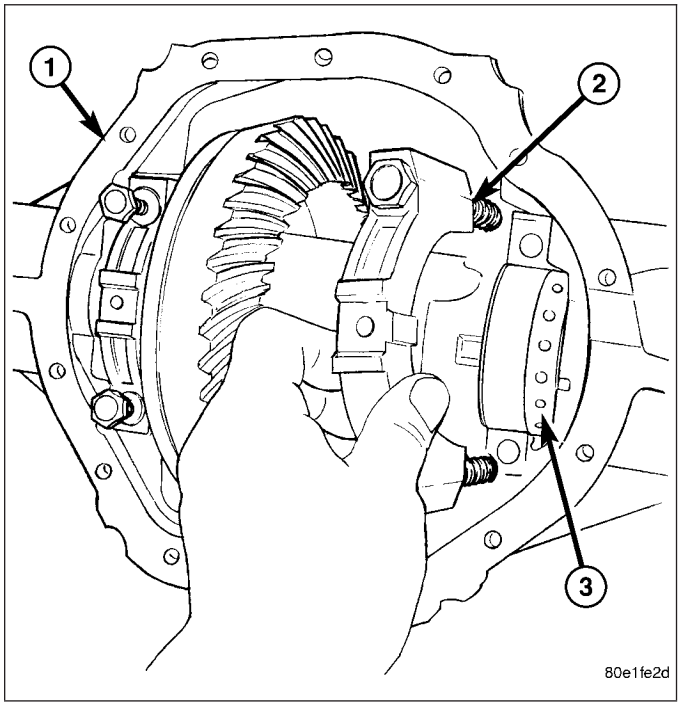
3. Rotate the one pinion gear (3) with thrust washer into the differential case. Then rotate the other pinion gear with thrust washer into the differential case.
4. Align hole in the pinion gears with hole in the differential case.
5. Install pinion shaft.
6. Install **new** pinion shaft lock bolt and tighten to 52 N·m (38 ft. lbs.).



INSTALLATION

1. Clean the housing cavity with a flushing oil, light engine oil or lint free cloth.
2. Lubricate differential case bearing.
3. Install differential case with bearings cups into the housing (1).
4. Install bearing caps (2) and bolts. Tighten the bearing cap bolts finger-tight.

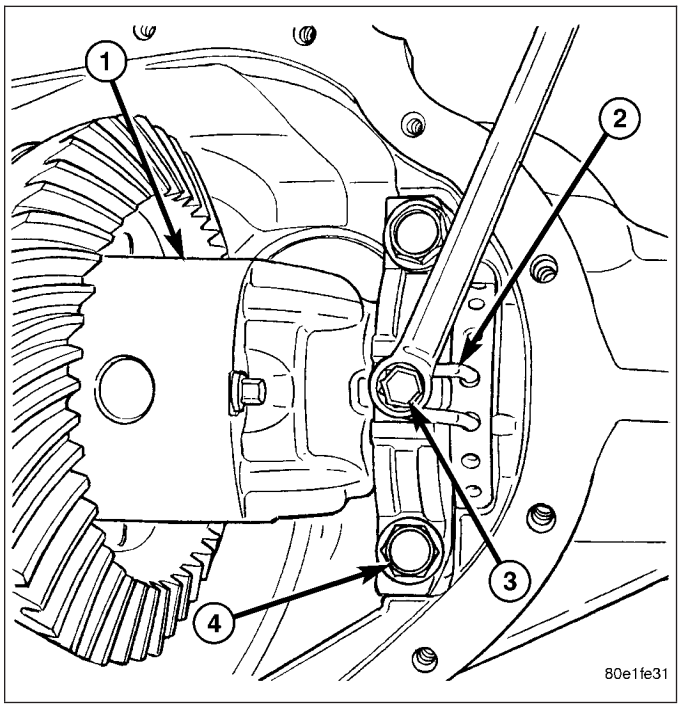
NOTE: Do not torque bearing cap and bolts at this time.



5. Slide differential case toward the pinion gear until the gears make contact/zero backlash. If zero backlash cannot be obtained, turn the pinion side adjuster until zero backlash is obtained.
6. Holding the differential case toward the pinion gear, turn bearing adjusters with Spanner Wrench 8883 until they make contact with the differential bearings/cups.
7. Back off the ring gear side adjuster 4 holes, to obtain initial ring gear backlash.
8. Install ring gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
9. Tighten pinion gear side adjuster firmly against the differential case bearing cup.
10. Rotate the pinion several times to seat the differential bearings.
11. Loosen pinion gear side adjuster until it is no longer in contact with the bearing cup.
12. Tighten pinion gear side adjuster until it just makes contact with the bearing cup.
13. Tighten pinion gear side adjuster an additional:
    - **New Bearings:** 6 Adjuster Holes
    - **Original Bearings:** 4 Adjuster Holes

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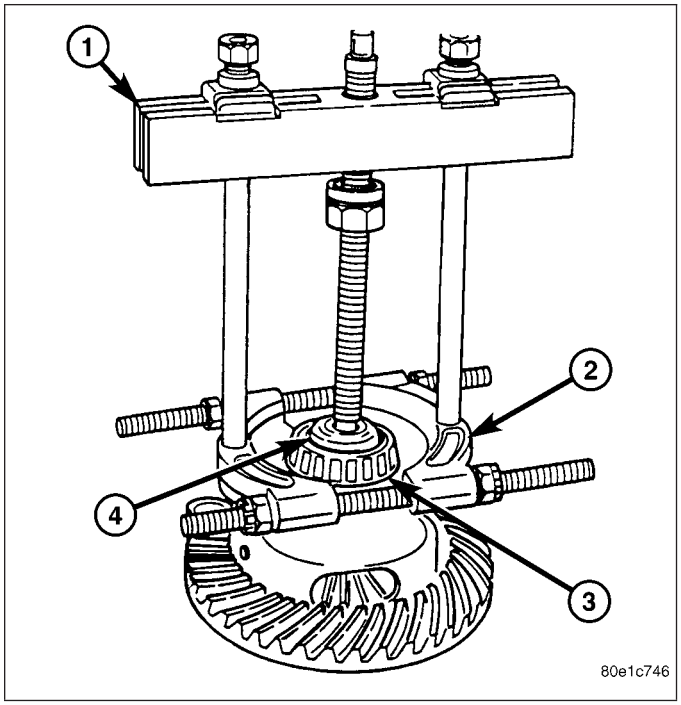
14. Install pinion gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
15. Tighten bearing cap bolts (4) to 85 N·m (63 ft. lbs.).
16. Tighten adjuster lock bolts (3) to 25 N·m (18 ft. lbs.).
17. Measure ring gear backlash and check gear tooth contact pattern. Refer to Adjustments for procedure.
18. Install axle shafts and hub bearings.
19. Install differential housing gasket and cover. Tighten cover bolts to 40 N·m (30 ft. lbs.).
20. Fill differential with lubricant.
21. Install fill plug and tighten to 32 N·m (24 ft. lbs.).



BEARING-DIFFERENTIAL CASE

REMOVAL

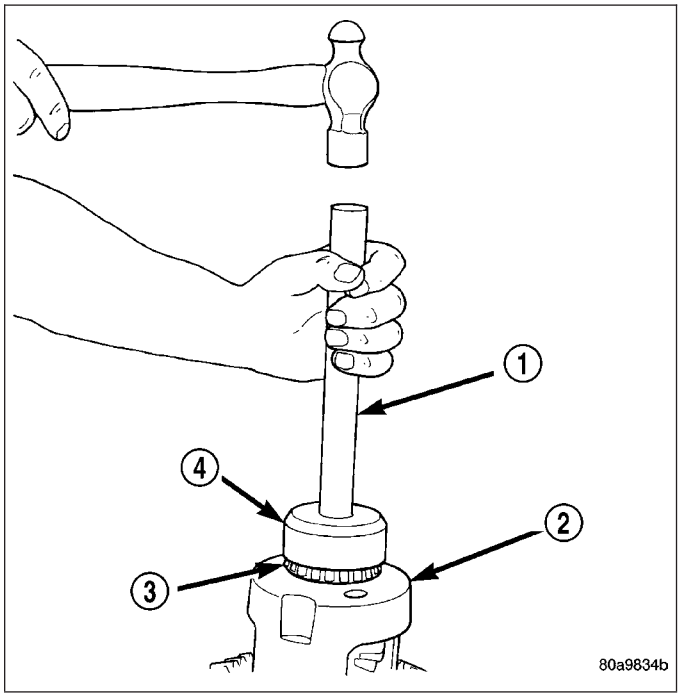
1. Remove the differential case from the housing.
2. Install Plug 8888 (4) into the end of the case.
3. Remove differential case bearings (3) with Bearing Splitter 1130 (2) and Bridge 938 (1).



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INSTALLATION

1. Set differential case (2) on Plug 8888.
2. Install differential case bearings (3) with Installer 8881 (4) and Handle C-4171 (1).
3. Install differential case into housing.



DIFFERENTIAL-ELECTRIC LOCKER

DIAGNOSIS AND TESTING

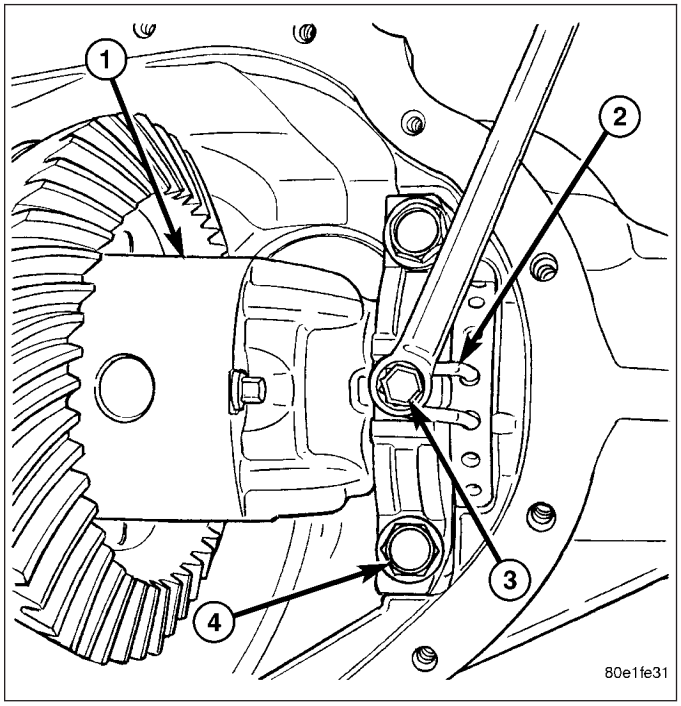
1. Lift one front wheel of the ground.
2. Turn key to the on position.
3. Place vehicle in drive/first gear and transfer case in LOW LOCK.
4. Activate locker switch.
5. Manually rotate the wheel that is off the ground. The wheel should lock once the dog clutch is aligned.
6. Turn off locker switch.
7. Manually rotate the wheel that is off the ground. The wheel should turn.

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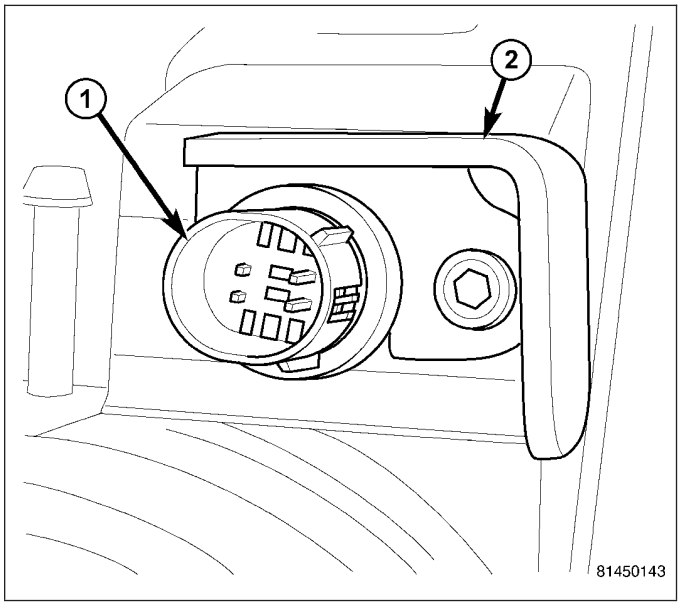
NOTE: Only the locker actuator with sensor are serviced. Internal differential components are serviced as a differential case assembly.

REMOVAL

1. Remove differential housing cover and drain lubricant from the housing.
2. Remove hub bearings and axle shafts.
3. Remove adjuster lock bolts (3) and adjuster locks (2).

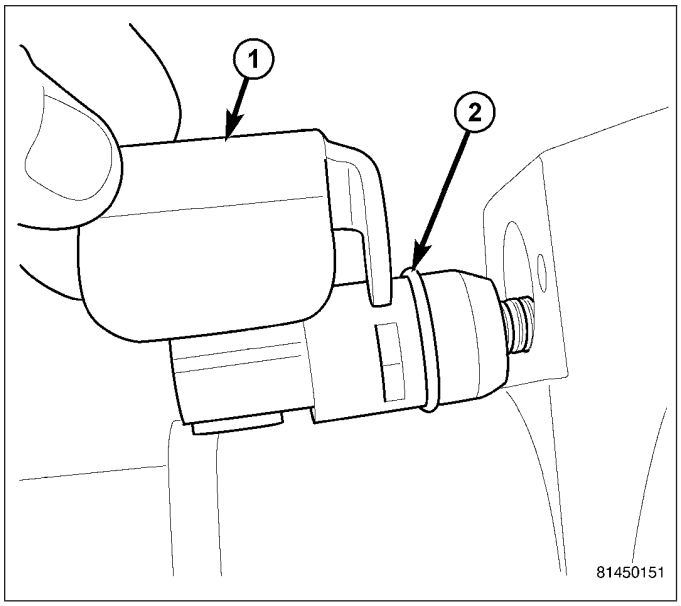


4. Remove electric locker connector (1) retainer (2) bolt (3) from differential housing.



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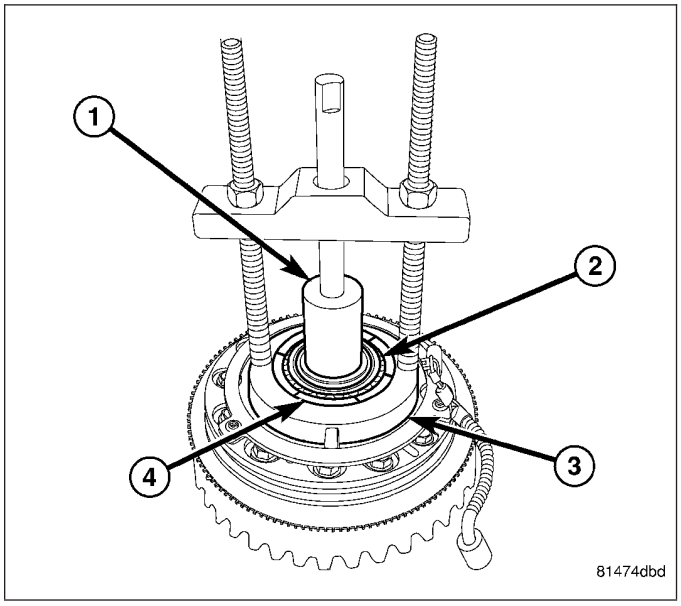
5. Remove retainer (1) and connector (2) from differential housing.
6. Remove retainer (1) from connector (2) and remove o-ring (3) from connector.
7. Mark bearing caps left and right for installation reference.
8. Loosen bearing cap bolts and loosen adjusters with Spanner Wrench 8883.
9. Remove bearing cap bolts, anti rotation bracket and bearing caps.
10. Slid electric locker connector through differential housing.
11. Remove differential case and bearing cups from the housing.
12. Tag bearing cups left and right for installation reference.



DISASSEMBLY

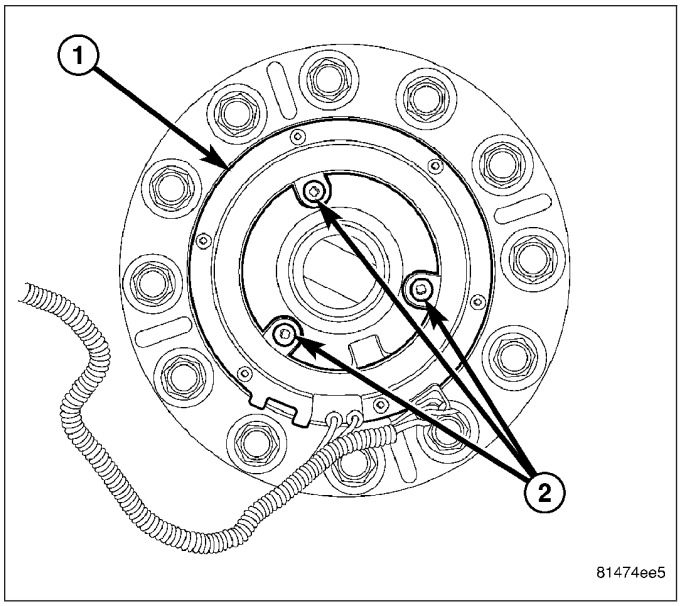
NOTE: Internal differential components are serviced with the case.

1. Install Plug 9611(1) into coil side of the case.
2. Remove differential case bearing (2) with Puller C-293-PA (3) and Adapters 9613 (4).

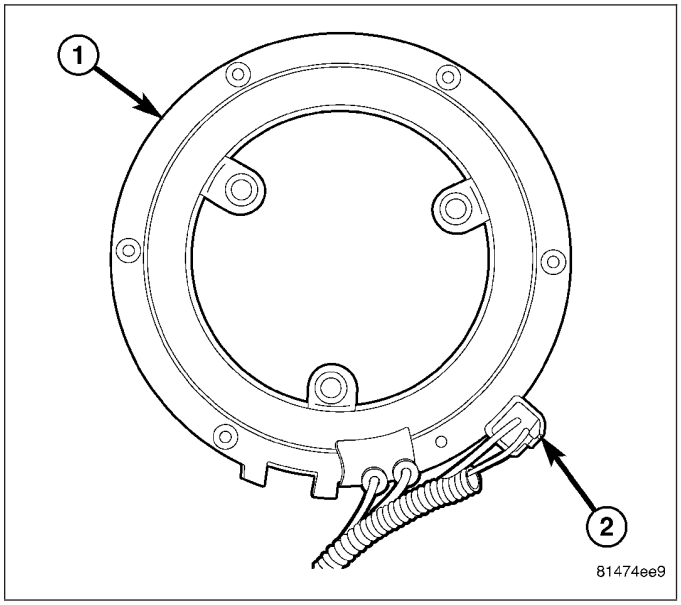


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3. Remove coil (1) mounting bolts (2).



4. Remove coil (1) with sensor (2) and harness.

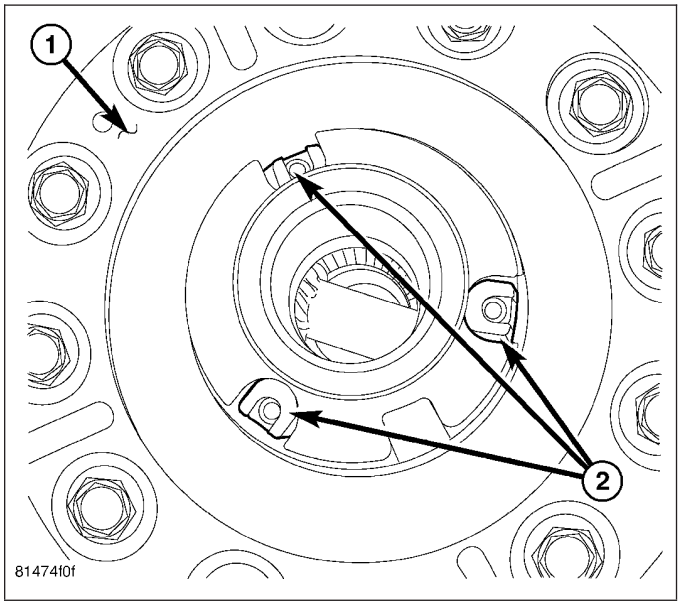


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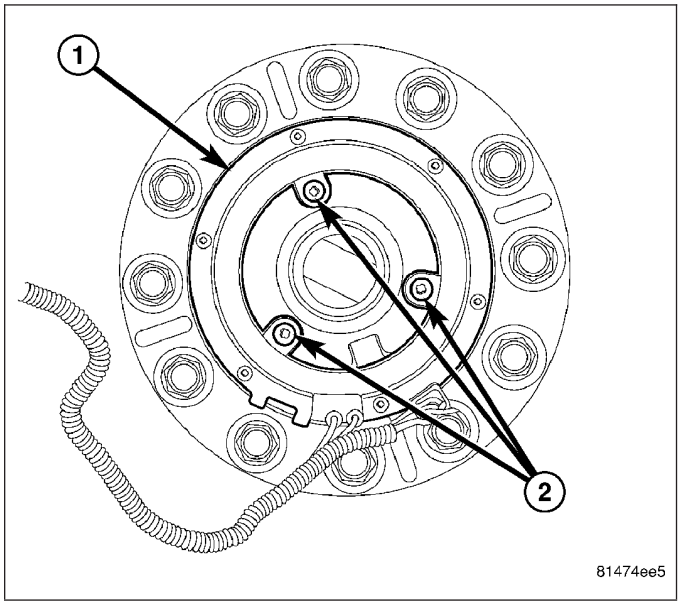
ASSEMBLY

NOTE: Internal differential components are serviced with the case.

1. Position locker coil on differential case (1) mounting location (2).

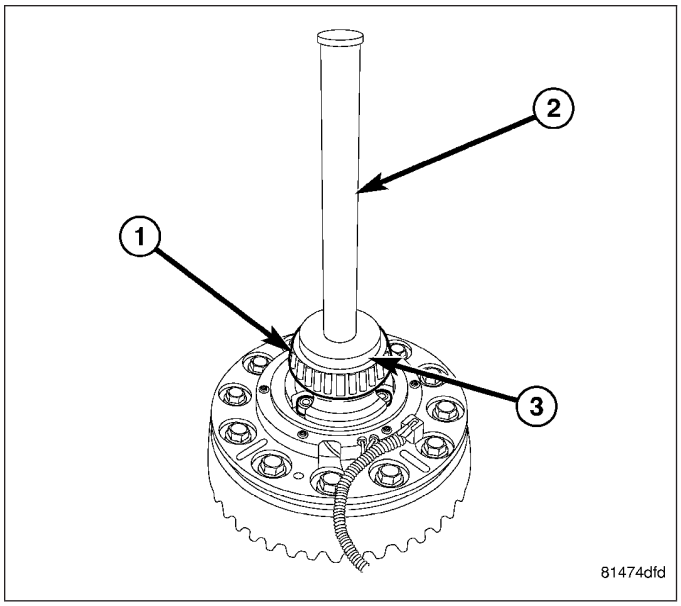


2. Clean coil bolts and apply Mopar® Lock & Seal adhesive to the threads.
3. Install coil (1) and bolts (2).



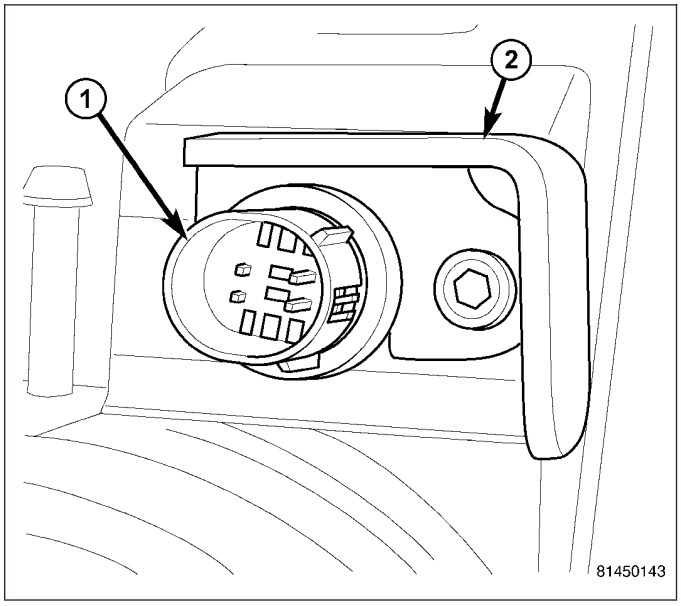
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4. Install differential case bearing (1) with Handle C-4171 (2) and Installer 9612 (3).



INSTALLATION

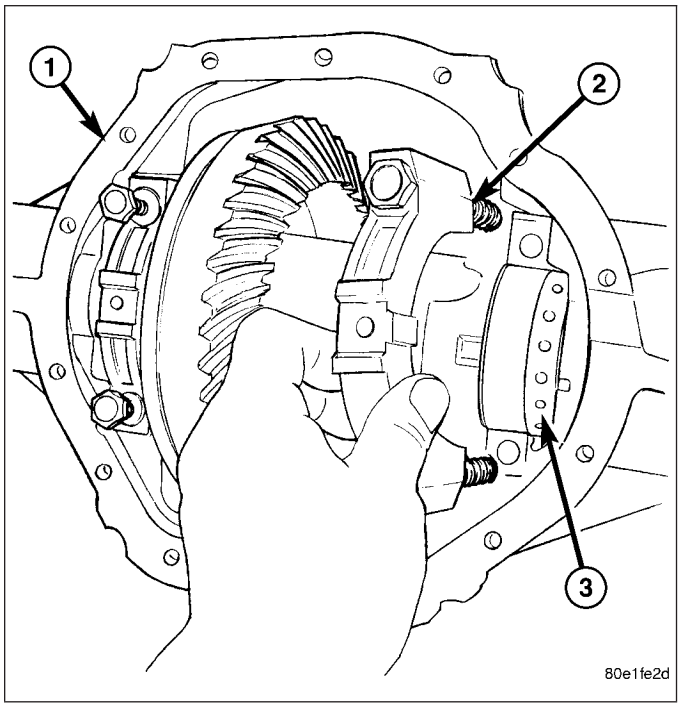
1. Clean the housing cavity with a flushing oil, light engine oil or lint free cloth.
2. Lubricate differential case bearing.
3. Install differential case with bearings cups into the housing.
4. Slid electric locker connector through differential housing.
5. Install o-ring on electric locker connector.
6. Install electric locker connector (1) with retainer (2) in differential housing.
7. Install connector retainer and bolt.



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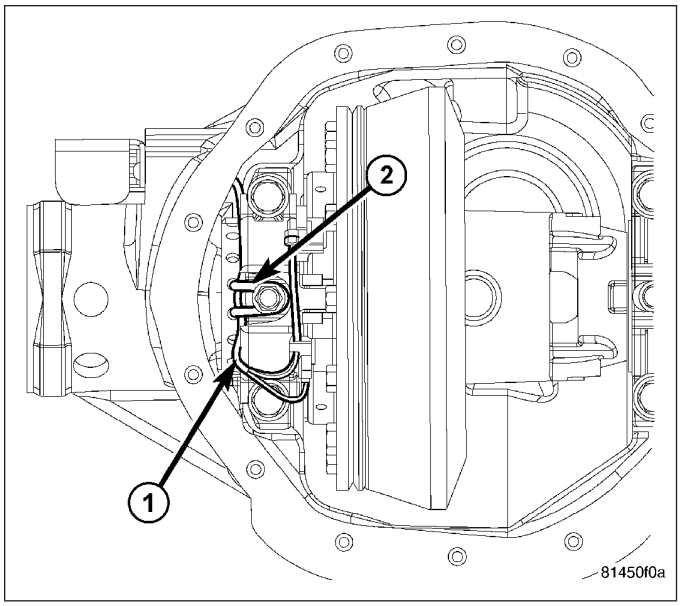
8. Install bearing caps (2), anti rotation bracket and bolts. Tighten bearing cap bolts finger-tight.

NOTE: Do not torque bearing cap and bolts at this time.



9. Slide differential case toward the pinion gear until the gears make contact/zero backlash. If zero backlash cannot be obtained, turn the pinion side adjuster until zero backlash is obtained.
10. Holding the differential case toward the pinion gear, turn bearing adjusters with Spanner Wrench 8883 until they make contact with the differential bearings/cups.
11. Back off the ring gear side adjuster 4 holes, to obtain initial ring gear backlash.
12. Install ring gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
13. Tighten pinion gear side adjuster firmly against the differential case bearing cup.
14. Rotate the pinion several times to seat the differential bearings.
15. Loosen pinion gear side adjuster until it is no longer in contact with the bearing cup.
16. Tighten pinion gear side adjuster until it just makes contact with the bearing cup.
17. Tighten pinion gear side adjuster an additional:
    - **New Bearings:** 6 Adjuster Holes
    - **Original Bearings:** 4 Adjuster Holes

18. Route locker wires (1) across anti rotation bracket and along the outside of the bearing cap.

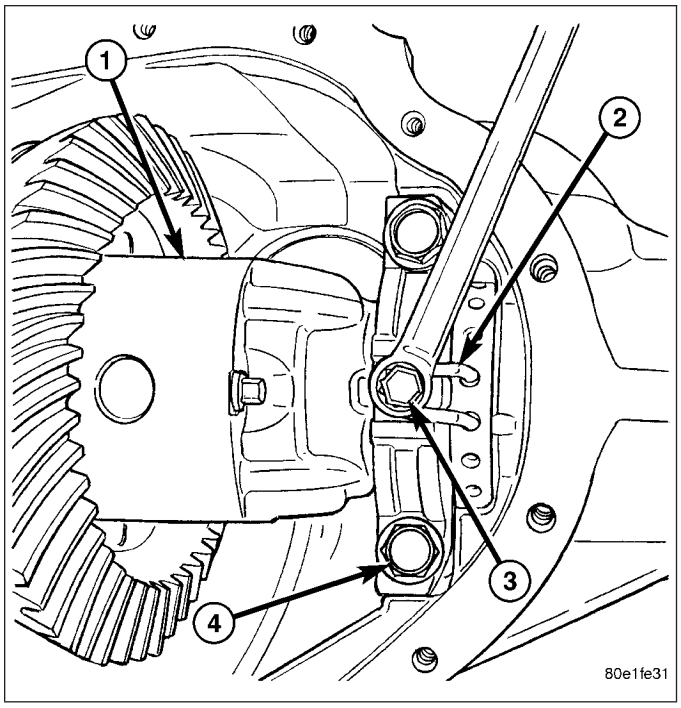


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19. Tighten bearing cap bolts (4) to 85 N·m (63 ft. lbs.).
20. Install adjuster locks (2) and tighten bolts (3) to 25 N·m (18 ft. lbs.).

NOTE: Locker wires (1) must be between the adjuster lock (2) and the bearing cap.

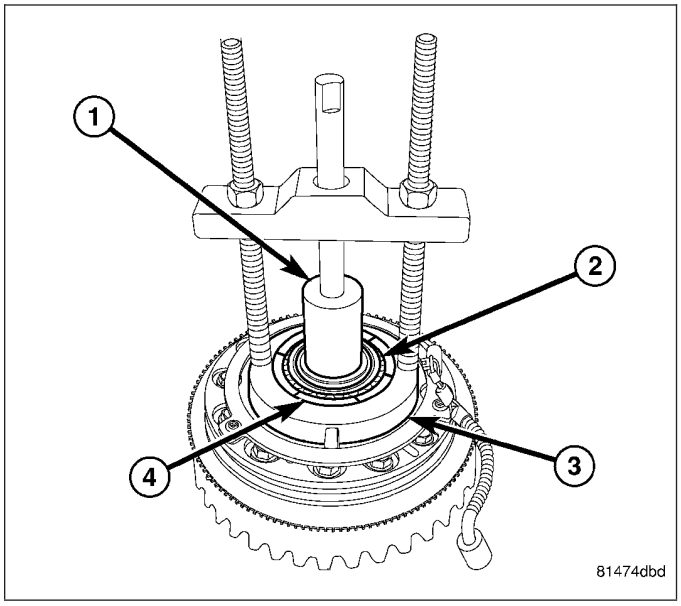
21. Measure ring gear backlash and check gear tooth contact pattern. Refer to Adjustments for procedure.
22. Install axle shafts and hub bearings.
23. Install differential housing gasket and cover. Tighten cover bolts to 40 N·m (30 ft. lbs.).
24. Fill differential with lubricant.
25. Install fill plug and tighten to 32 N·m (24 ft. lbs.).



BEARINGS-EL DIFFERENTIAL CASE

REMOVAL

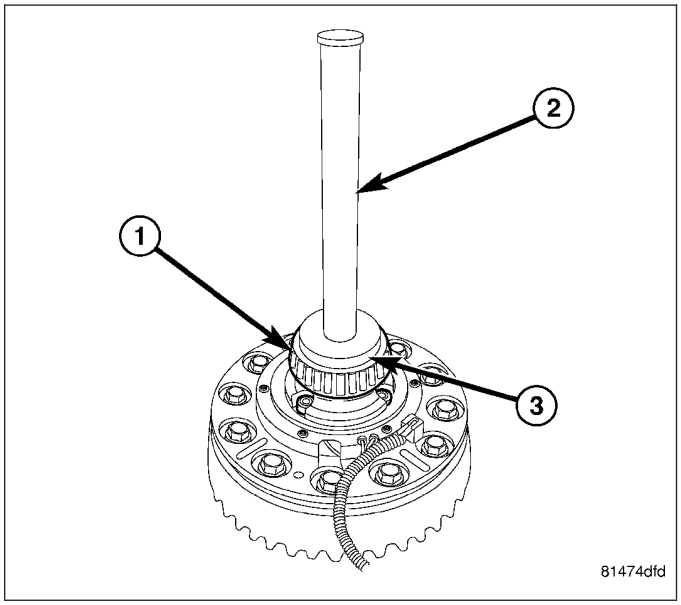
1. Remove the differential case from the housing.
2. Install Plug 9611(1) into the end of the case.
3. Remove differential case bearings (2) with Puller C-293-PA (3) and Adapters 9613 (4).



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INSTALLATION

1. Install differential case bearings (1) with Handle C-4171 (2) and Installer 9612 (3).

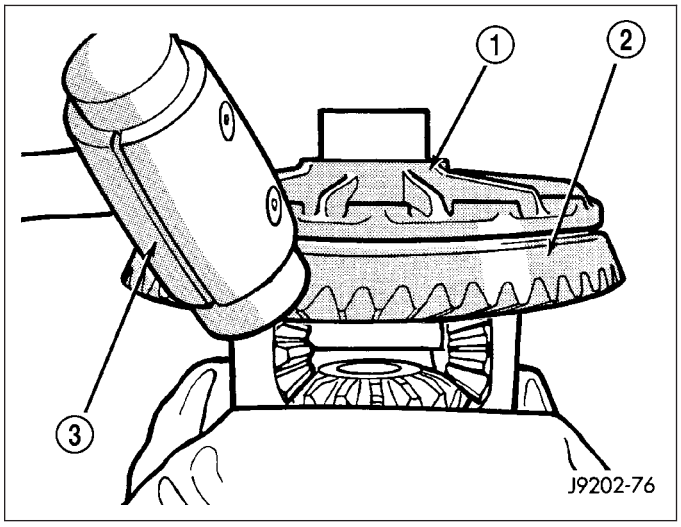


GEAR-PINION/RING

REMOVAL

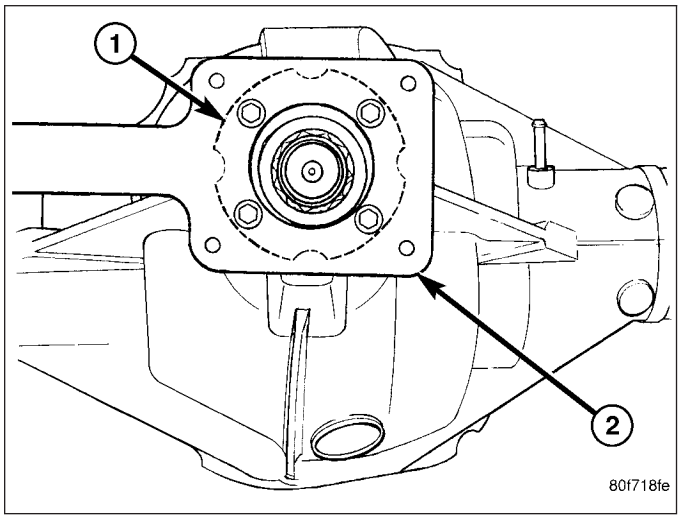
NOTE: The ring and pinion gears are service in a matched set. Never replace the ring gear/pinion gear without replacing the other matching gear.

1. Mark pinion flange and propeller shaft for installation alignment.
2. Disconnect propeller shaft from pinion flange and remove propeller shaft.
3. Remove axle shafts.
4. Remove differential from housing.
5. Place differential case in a vise with soft metal jaw protectors
6. Remove bolts holding ring gear to differential case.
7. Drive ring gear (2) from differential case (1) with a soft hammer (3).

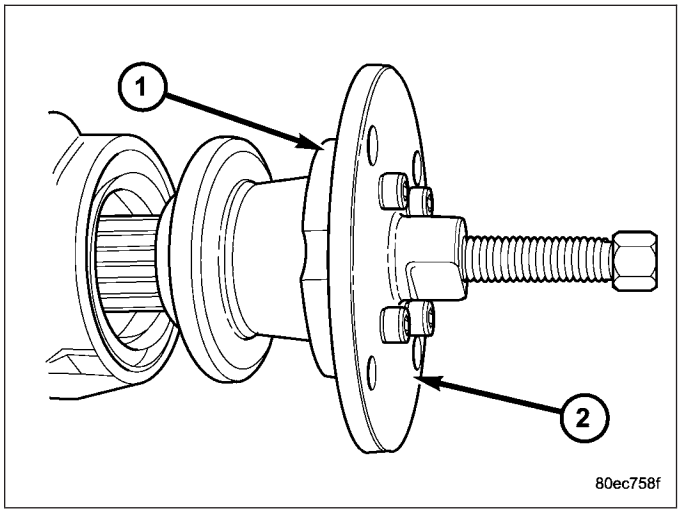


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8. Hold pinion flange (1) with Flange Wrench 8979 (2) and remove pinion flange nut and washer.



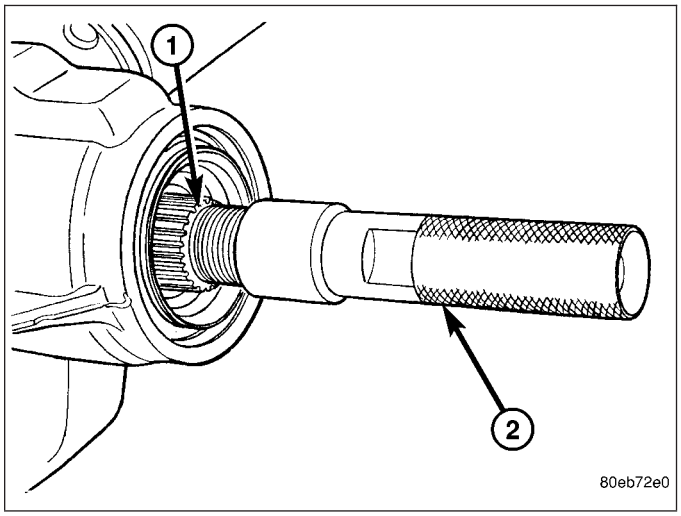
9. Remove pinion flange (1) from pinion with Pinion Flange Puller 8992 (2).



10. Remove pinion gear (1) from housing with Pinion Driver 8976 (2) and a hammer.

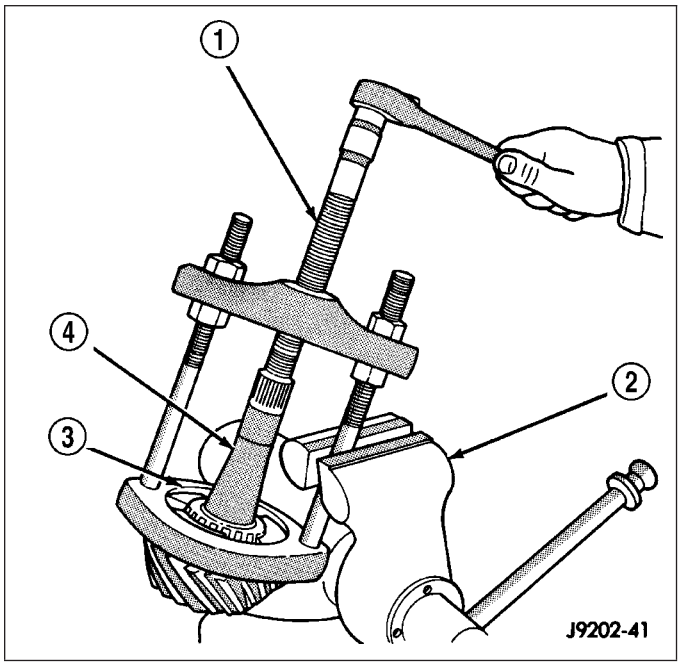
NOTE: Thread drive on shaft until it bottoms out.

11. Remove pinion seal with a slide hammer or pry bar.
12. Remove and discard front pinion bearing.
13. Remove collapsible spacer from the pinion shaft.



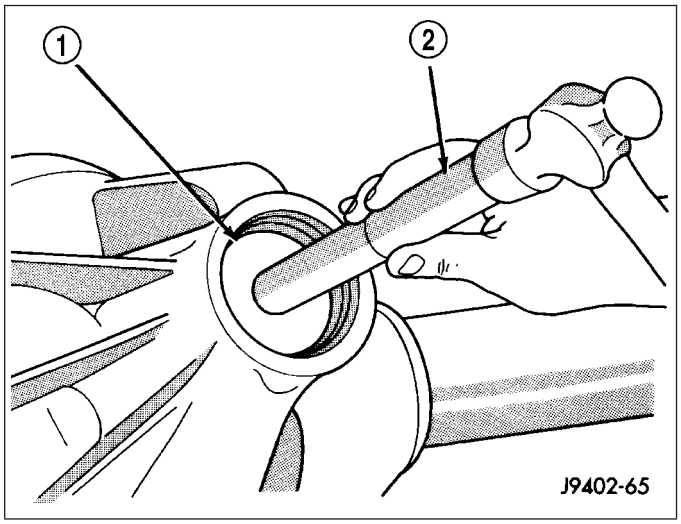
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14. Remove rear pinion bearing with Puller C-293-PA (1) and Adapters 8879 (4).
15. Remove pinion depth shim from the pinion gear shaft and record thickness of the shims.
16. Remove front pinion bearing cup from the housing with a punch and hammer and discard cup.
17. Remove rear pinion bearing cup from the housing with a punch and hammer, if bearing is replaced.



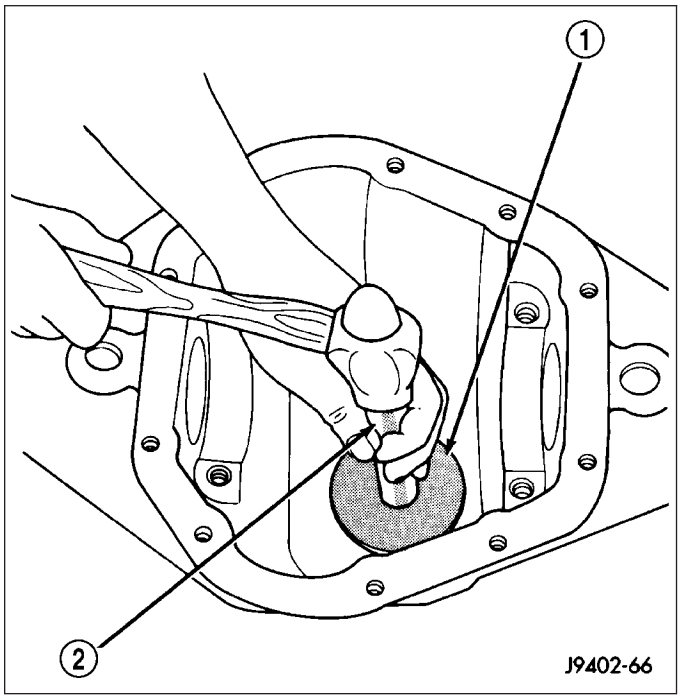
INSTALLATION

1. Install front pinion bearing cup with Installer D-146 (1) and Handle C-4171 (2).

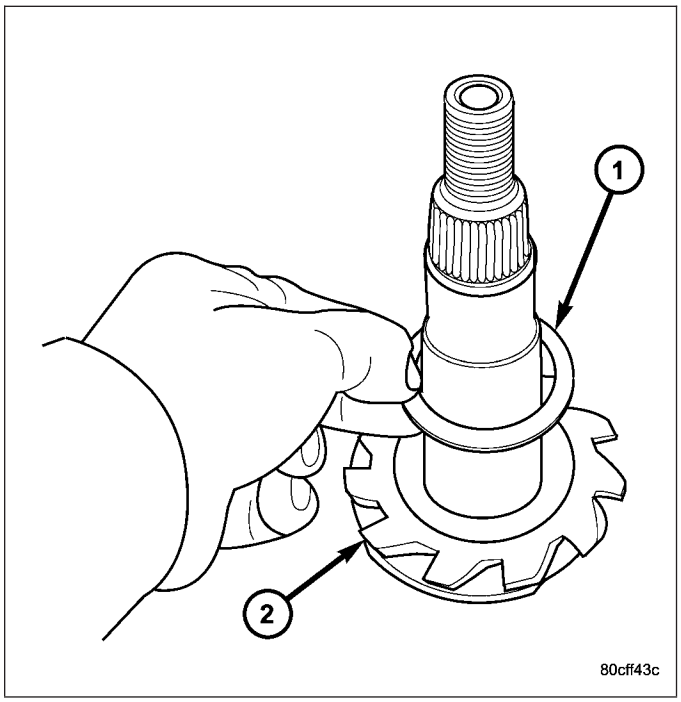


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2. Install rear pinion bearing cup with Installer 8886 (1) and Handle C-4171 (2), if bearing is replaced.

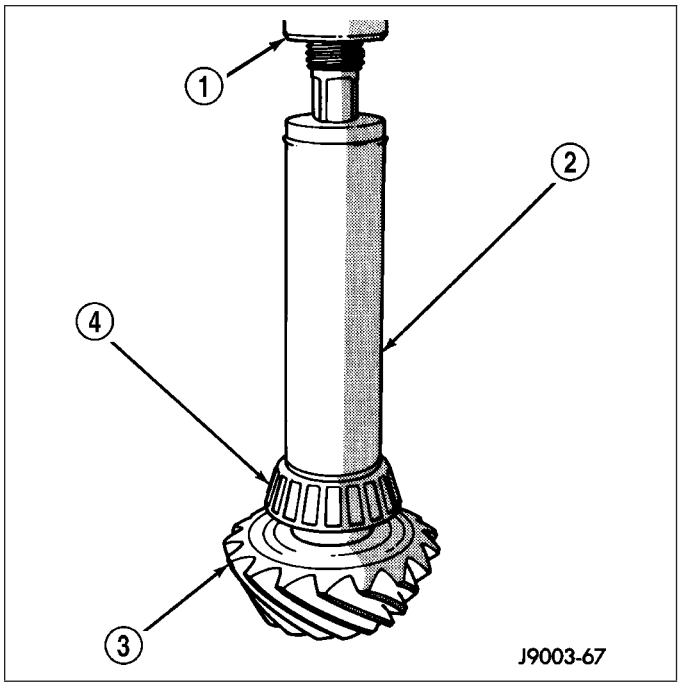


3. Install pinion depth shim (1) on the pinion gear (2) shaft.

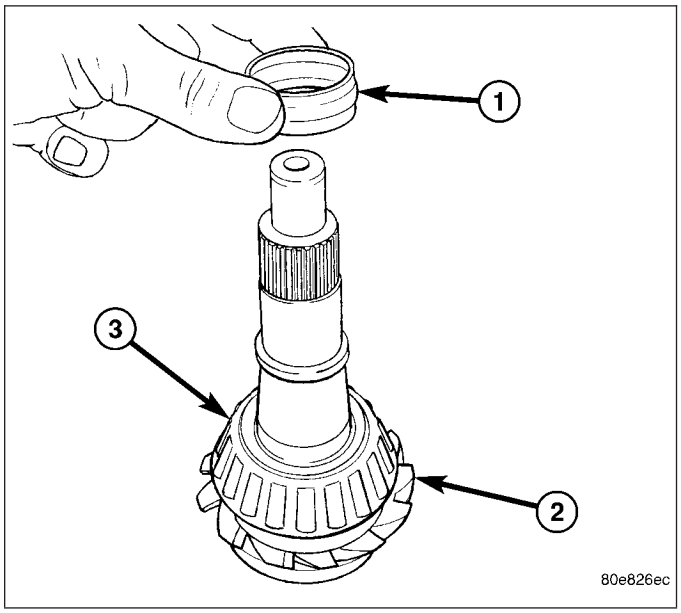


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4. Install rear pinion bearing (4) with Installer C-3095-A (2) and a press (1).

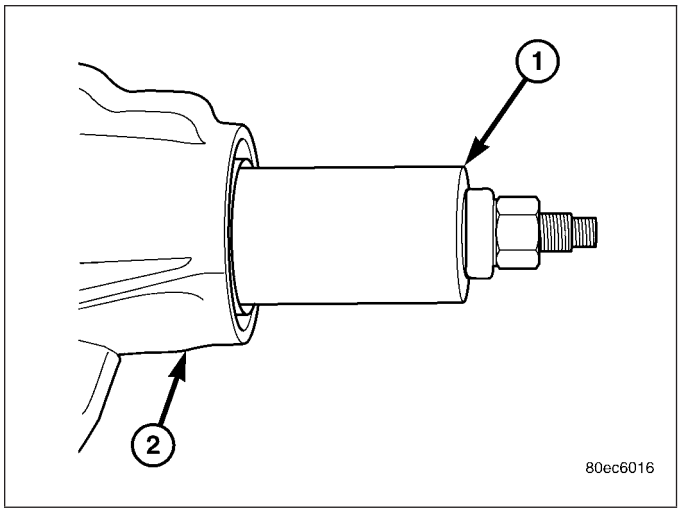


5. Install **new** collapsible spacer (1).
6. Lubricate pinion and bearings.

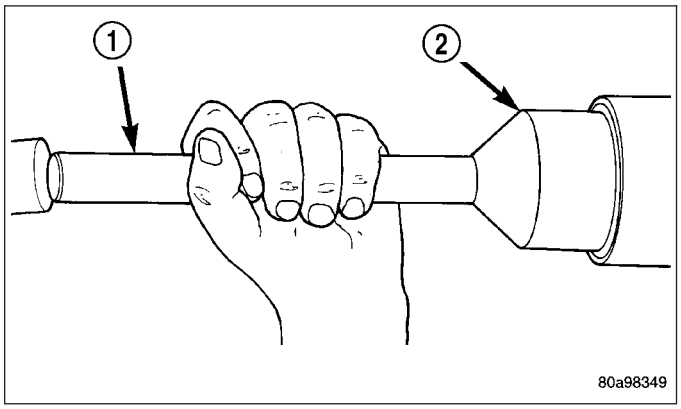


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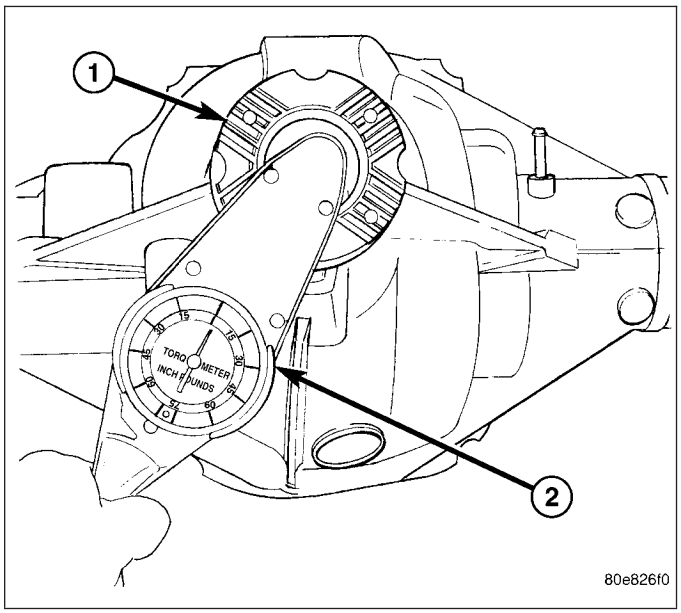
7. Install pinion into the housing (2) and place front pinion bearing onto the pinion shaft. Draw the pinion shaft into the front bearing with Installer 8982 (1).



8. Install **new** pinion seal with Installer 8882 (2) and Handle C-4171 (1).
9. Apply a light coat of teflon sealant to the pinion flange splines.
10. Hold pinion and lightly tap the pinion flange onto the pinion shaft, until a few threads are showing.
11. Install pinion flange washer and **new** pinion nut.
12. Hold pinion flange with Flange Wrench 8979 and tighten pinion nut until end play is taken up.



13. Rotate pinion several times to seat bearings.
14. Measure pinion (1) rotating torque with an inch pound torque wrench (2). Tighten pinion nut in small increments until pinion rotating torque is:
    - **New Pinion Bearings:** 1.7-2.8 N·m (15-25 in. lbs.)
    - **Original Pinion Bearings:** 1.1-2.2 N·m (10-20 in. lbs.)
15. Rotate pinion several times then verify pinion rotating torque again.
16. Position the ring gear on differential case and start two **new** ring gear bolts.
17. Install the rest of the **new** ring gear bolts and tighten them alternately to seat the ring gear.
18. Torque ring gear bolts to 140 N·m (103 ft. lbs.).
19. Install differential in housing.
20. Measure final rotating torque with an inch pound torque wrench. The final pinion rotating torque plus differential case bearing preload is:
    - **New Bearings:** 3.4-5.6 N·m (30-50 in. lbs.)
    - **Original Bearings:** 2.8-5.1 N·m (25-45 in. lbs.)
21. Install axle shafts.



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22. Verify ring gear backlash and gear contact pattern.
23. Install the propeller shaft with the reference marks aligned.
24. Install differential cover with gasket and tighten to 40 N·m (30 ft. lbs.).
25. Fill differential with fluid and tighten fill plug to 32 N·m (24 ft. lbs.).

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REAR AXLE - 9 1/4

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DIAGNOSIS AND TESTING

REAR AXLE - 9 1/4

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, incorrect pinion depth, tooth contact, worn/damaged gears, or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant.
- Incorrect ring gear backlash.
- Gear damage.

Differential side gears and pinions can be checked by turning the vehicle. They usually do not cause noise during straight-ahead driving when the gears are unloaded. The side gears are loaded during vehicle turns. A worn pinion shaft can also cause a snapping or a knocking noise.

BEARING NOISE

The axle shaft, differential and pinion bearings can all produce noise when worn or damaged. Bearing noise can be either a whining, or a growling sound.

Pinion bearings have a constant-pitch noise. This noise changes only with vehicle speed. Pinion bearing noise will be higher pitched because it rotates at a faster rate. Drive the vehicle and load the differential. If bearing noise occurs, the rear pinion bearing is the source of the noise. If the bearing noise is heard during a coast, the front pinion bearing is the source.

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Differential bearings usually produce a low pitch noise. Differential bearing noise is similar to pinion bearing noise. The pitch of differential bearing noise is also constant and varies only with vehicle speed.

Axle shaft bearings produce noise and vibration when worn or damaged. The noise generally changes when the bearings are loaded. Road test the vehicle. Turn the vehicle sharply to the left and to the right. This will load the bearings and change the noise level. Where axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 mph.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joint.
- Worn side gear thrust washers.
- Worn pinion shaft bore.

VIBRATION

Vibration at the rear of the vehicle is usually caused by a:

- Damaged drive shaft.
- Missing drive shaft balance weight(s).
- Worn or out-of-balance wheels.
- Loose wheel lug nuts.
- Worn U-joint(s).
- Loose/broken springs.
- Damaged axle shaft bearing(s).
- Loose pinion gear nut.
- Excessive pinion yoke run out.
- Bent axle shaft(s).

Check for loose or damaged front-end components or engine/transmission mounts. These components can contribute to what appears to be a rearend vibration. Do not overlook engine accessories, brackets and drive belts.

NOTE: All driveline components should be examined before starting any repair.

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear (or the clutch engaged), can be caused by:

- High engine idle speed.
- Transmission shift operation.
- Loose engine/transmission/transfer case mounts.
- Worn U-joints.
- Loose spring mounts.
- Loose pinion gear nut and yoke.
- Excessive ring gear backlash.
- Excessive side gear to case clearance.

The source of a snap or a clunk noise can be determined with the assistance of a helper. Raise the vehicle on a hoist with the wheels free to rotate. Instruct the helper to shift the transmission into gear. Listen for the noise, a mechanics stethoscope is helpful in isolating the source of a noise.

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DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose.	1. Tighten loose nuts.
	2. Faulty, brinelled wheel bearing.	2. Replace bearing.
Axle Shaft Noise	1. Misaligned axle tube.	1. Inspect axle tube alignment. Correct as necessary.
	2. Bent or sprung axle shaft.	2. Inspect and correct as necessary.
Axle Shaft Broke	1. Misaligned axle tube.	1. Replace the broken shaft after correcting tube mis-alignment.
	2 Vehicle overloaded.	2. Replace broken shaft and avoid excessive weight on vehicle.
	3. Erratic clutch operation.	3. Replace broken shaft and avoid or correct erratic clutch operation.
	4. Grabbing clutch.	4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	1. Improper adjustment of the differential bearings.	1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly.
	2. Excessive ring gear backlash.	2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly.
	3. Vehicle overloaded.	3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight.
	4. Erratic clutch operation.	4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.
Differential Gears Scored	1. Insufficient lubrication.	1. Replace scored gears. Fill differential with the correct fluid type and quantity.
	2. Improper grade of lubricant.	2. Replace scored gears. Fill differential with the correct fluid type and quantity.
	3. Excessive spinning of one wheel/tire.	3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	1. Lubricant level too high.	1. Drain lubricant to the correct level.
	2. Worn axle shaft seals.	2. Replace seals.
	3. Cracked differential housing.	3. Repair as necessary.
	4. Worn pinion seal.	4. Replace seal.
	5. Worn/scored yoke.	5. Replace yoke and seal.
	6. Axle cover not properly sealed.	6. Remove, clean, and re-seal cover.

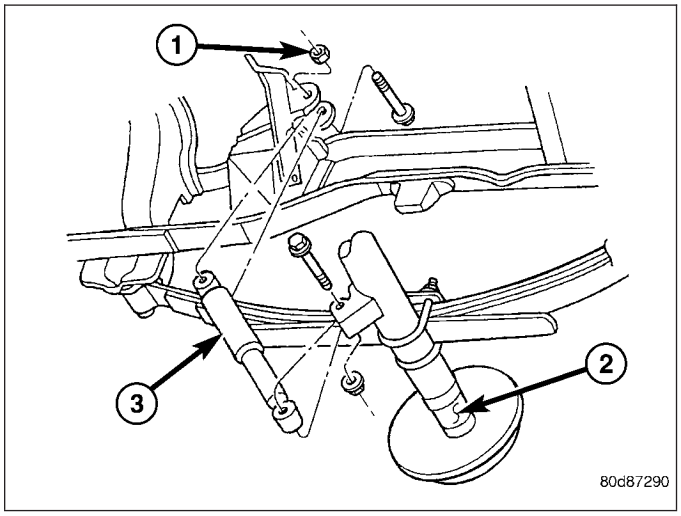
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Condition	Possible Causes	Correction
Axle Overheating	1. Lubricant level low.	1. Fill differential to correct level.
	2. Improper grade of lubricant.	2. Fill differential with the correct fluid type and quantity.
	3. Bearing pre-loads too high.	3. Re-adjust bearing pre-loads.
	4. Insufficient ring gear backlash.	4. Re-adjust ring gear backlash.
Gear Teeth Broke	1. Overloading.	1. Replace gears. Examine other gears and bearings for possible damage.
	2. Erratic clutch operation.	2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation.
	3. Ice-spotted pavement.	3. Replace gears and examine remaining parts for damage.
	4. Improper adjustments.	4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.
Axle Noise	1. Insufficient lubricant.	1. Fill differential with the correct fluid type and quantity.
	2. Improper ring gear and pinion adjustment.	2. Check ring gear and pinion contact pattern. Adjust backlash or pinion depth.
	3. Unmatched ring gear and pinion.	3. Replace gears with a matched ring gear and pinion.
	4. Worn teeth on ring gear and/or pinion.	4. Replace ring gear and pinion.
	5. Loose pinion bearings.	5. Adjust pinion bearing pre-load.
	6. Loose differential bearings.	6. Adjust differential bearing pre-load.
	7. Mis-aligned or sprung ring gear.	7. Measure ring gear run-out. Replace components as necessary.
	8. Loose differential bearing cap bolts.	8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued tot he proper specification.
	9. Housing not machined properly.	9. Replace housing.

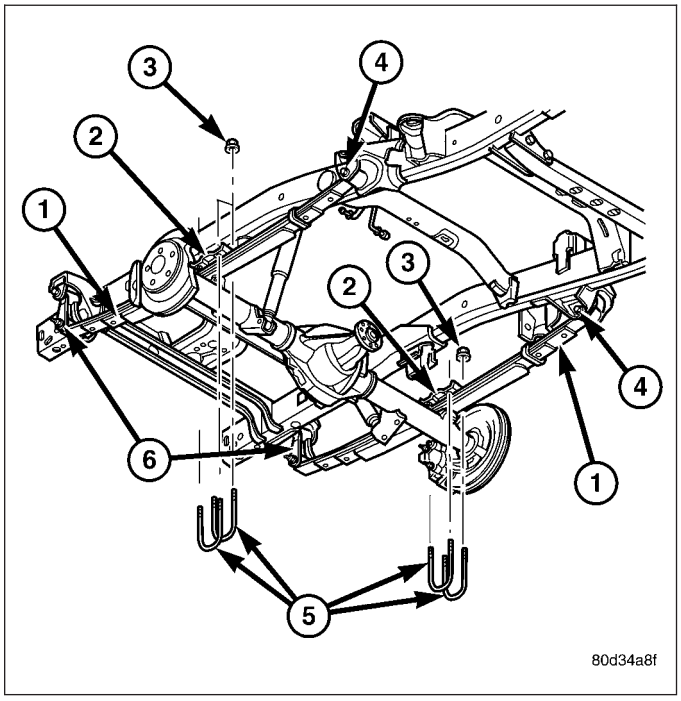
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REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Position a lift under axle and secure axle to lift.
3. Remove all brake components.
4. Remove axle vent hose.
5. Mark propeller shaft and companion flange for installation alignment reference.
6. Remove propeller shaft.
7. Remove shock absorbers (3) from axle (2).



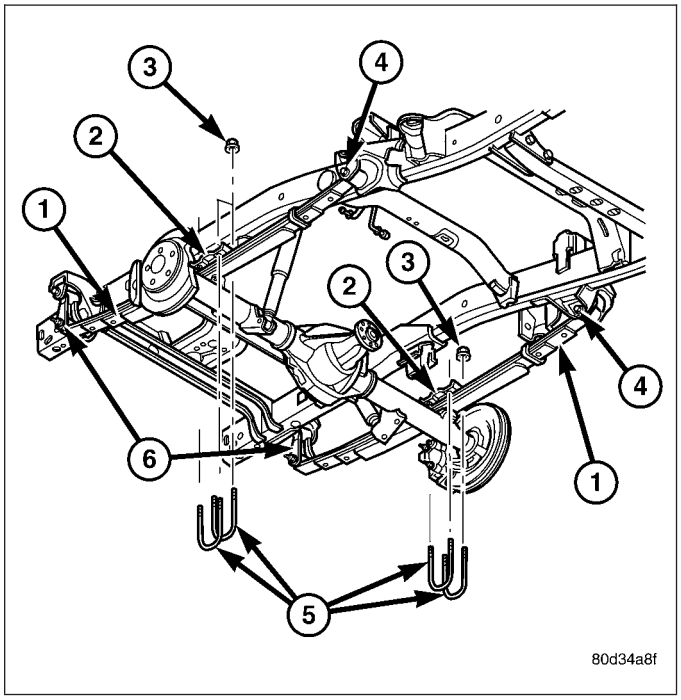
8. Remove U-bolts (5) from axle.
9. Remove axle from the vehicle.



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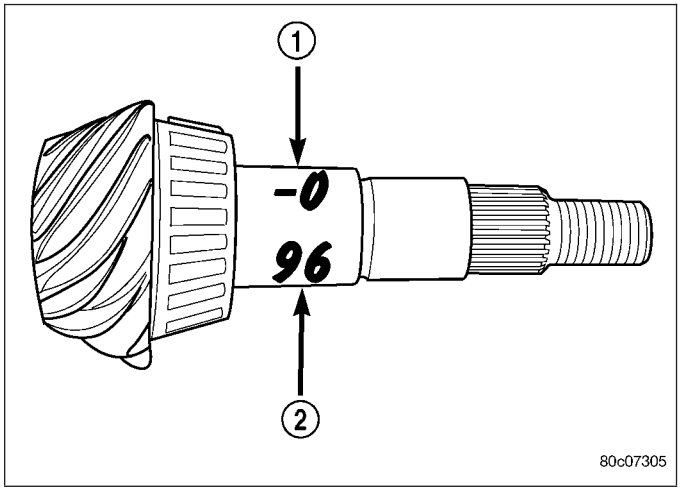
INSTALLATION

1. Raise axle with lift and align to the leaf spring centering bolts.
2. Install axle U-bolts (5) and tighten to 149 N·m (110 ft. lbs.).
3. Install shock absorbers to axle and tighten to specification.
4. Install all brake comonents.
5. Install axle vent hose.
6. Install propeller shaft with reference marks aligned and tighten to specification.
7. Fill differential to specifications.



ADJUSTMENTS

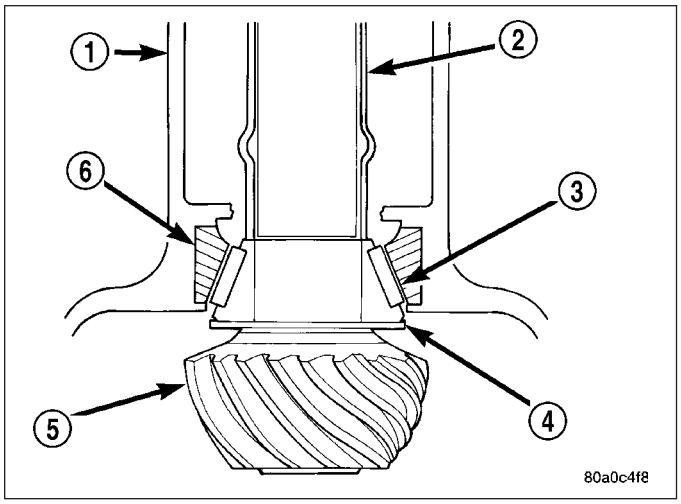
Ring gear and pinion are supplied as matched sets. Identifying numbers for the ring gear and pinion are painted onto the pinion gear shaft and the side of the ring gear. A plus (+) number, minus (–) number or zero (0) along with the gear set sequence number (2) (01 to 99) is on each gear. This first number is the amount (in thousandths of an inch) the depth varies (1) from the standard depth setting of a pinion marked with a (0). The next two numbers are the sequence number of the gear set. The standard depth provides the best teeth contact pattern.



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Compensation for pinion gear (5) depth variance is achieved with select shims (4). The shims are placed behind the rear pinion bearing (3).

If installing a new gear, note the depth variance number of the original and replacement pinion. Add or subtract this number from the original depth shim/oil slinger to compensate for the difference in the depth variances. The numbers represent thousands of an inch deviation from the standard. If the number is negative, add that value to the required thickness of the depth shims. If the number is positive, subtract that value from the thickness of the depth shim.



Pinion Gear Depth Variance Chart: Note where Old and New Pinion Marking columns intersect. Intersecting figure represents plus or minus the amount needed.

PINION GEAR DEPTH VARIANCE

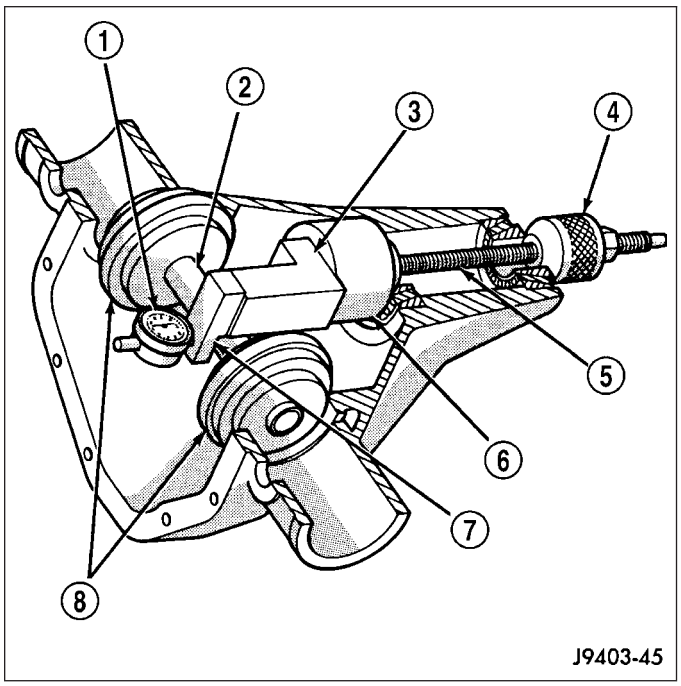
Original Pinion Gear Depth Variance	Replacement Pinion Gear Depth Variance								
	−4	−3	−2	−1	0	+1	+2	+3	+4
+4	+0.008	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0
+3	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001
+2	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002
+1	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003
0	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004
−1	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005
−2	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006
−3	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006	−0.007
−4	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006	−0.007	−0.008

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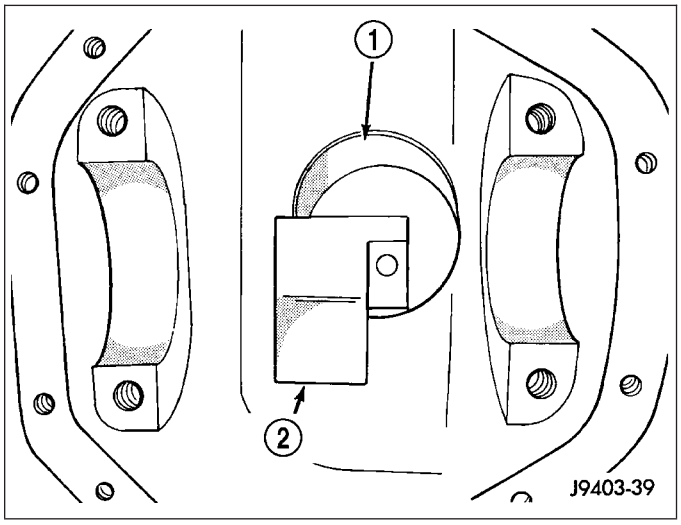
PINION DEPTH MEASUREMENT

Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take measurements with Pinion Gauge Set and Dial Indicator C-3339.

1. Assemble Pinion Height Block 6739 (3), Pinion Block 8542 (6) and rear pinion bearing onto Screw 6741 (5).

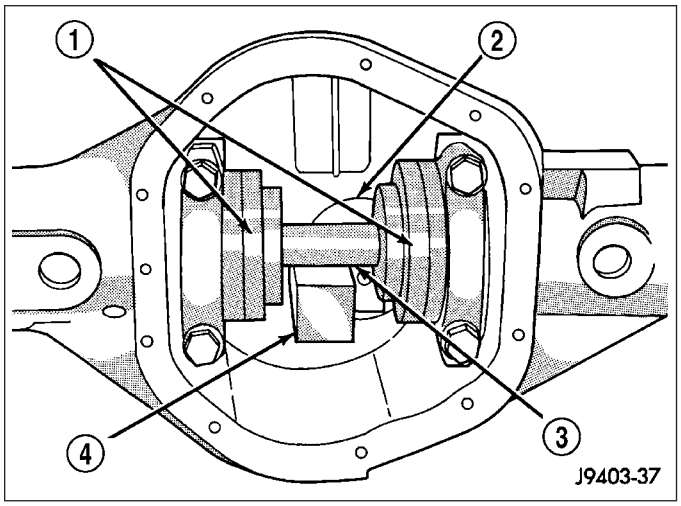


2. Insert pinion block (1), pinion height block (2), rear bearing, and screw into the housing through pinion bearing cups.
3. Install front pinion bearing and Cone-Nut 6740 onto the screw. Tighten cone-nut until Torque To Rotate the screw is 1.7 N·m (15 in. lbs.).

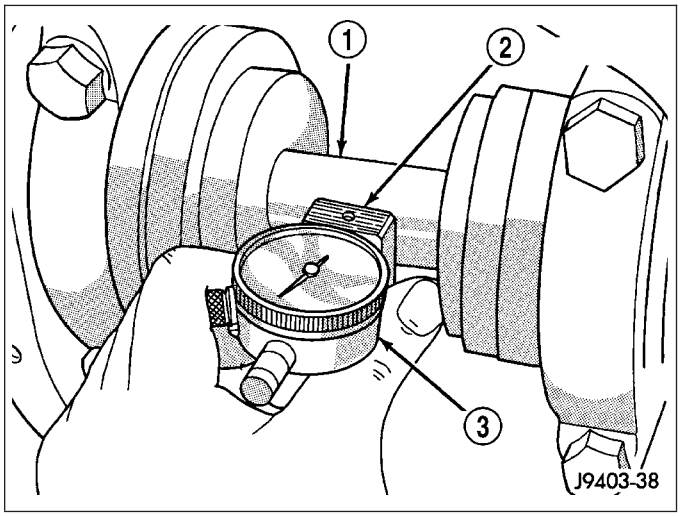


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4. Place Arbor Disc 8541 (1) on Arbor D-115-3 (3) in position in the housing side bearing cradles. Install differential bearing caps on arbor discs and tighten cap bolts to 41 N·m (30 ft. lbs.).



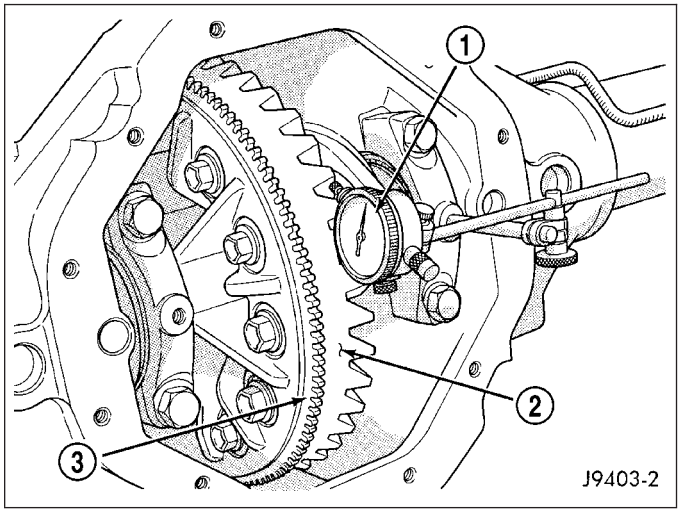
5. Assemble Dial Indicator C-3339 (3) into Scooter Block D-115-2 (2) and secure set screw.
6. Place Scooter Block/Dial Indicator in position in axle housing so dial probe and scooter block are flush against the rearward surface of the pinion height block. Hold scooter block in place and zero the dial indicator. Tighten dial indicator face lock screw.
7. Slide the dial indicator probe across the gap between the pinion height block and the arbor bar (1) with the scooter block against the pinion height block. Continue moving the dial probe to the crest of the arbor bar and record the highest reading.
8. Select a shim equal to the dial indicator reading plus the drive pinion gear depth variance number marked on the shaft of the pinion. For example, if the depth variance is –2, add +0.002 in. to the dial indicator reading.



DIFFERENTIAL BEARING PRELOAD AND GEAR BACKLASH

The following must be considered when adjusting bearing preload and gear backlash:

- The maximum ring gear backlash variation is 0.076 mm (0.003 in.).
- Mark the gears so the same teeth are meshed during all backlash measurements.
- Maintain the torque while adjusting the bearing preload and ring gear backlash.
- Excessive adjuster torque will introduce a high bearing load and cause premature bearing failure. Insufficient adjuster torque can result in excessive differential case free-play and ring gear noise.
- Insufficient adjuster torque will not support the ring gear correctly and can cause excessive differential case free-play and ring gear noise.



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NOTE: The differential bearing cups will not always immediately follow the threaded adjusters as they are moved during adjustment. To ensure accurate bearing cup responses to the adjustments:

- **Maintain the gear teeth engaged (meshed) as marked.**
- **The bearings must be seated by rapidly rotating the pinion gear a half turn back and forth.**
- **Do this five to ten times each time the threaded adjusters are adjusted.**

1. Through the axle tube use Wrench C-4164 to adjust each threaded adjuster inward until the differential bearing free-play is eliminated. Allow some ring gear backlash approximately 0.25 mm (0.01 in.) between the ring and pinion gear. Seat the bearing cups with the procedure described above.
2. Install dial indicator (1) and position the plunger against the drive side of a ring gear tooth. Measure the backlash at 4 positions, 90 degrees apart around the ring gear. Locate and mark the area of minimum backlash.
3. Rotate the ring gear to the position of the least backlash. Mark the gear so that all future backlash measurements will be taken with the same gear teeth meshed.
4. Loosen the right-side, tighten the left-side threaded adjuster. Obtain backlash of 0.076 to 0.102 mm (0.003-0.004 in.) with each adjuster tightened to 14 N·m (10 ft. lbs.). Seat the bearing cups with the procedure described above.
5. Tighten the differential bearing cap bolts 136 N·m (100 ft. lbs.).
6. Tighten the right-side threaded adjuster to 102 N·m (75 ft. lbs.). Seat the bearing cups with the procedure described above. Continue to tighten the right-side adjuster and seat bearing cups until the torque remains constant at 102 N·m (75 ft. lbs.)
7. Measure the ring gear (2) backlash. The range of backlash is 0.15 to 0.203 mm (0.006 to 0.008 in.).
8. Continue increasing the torque at the right-side threaded adjuster until the specified backlash is obtained.

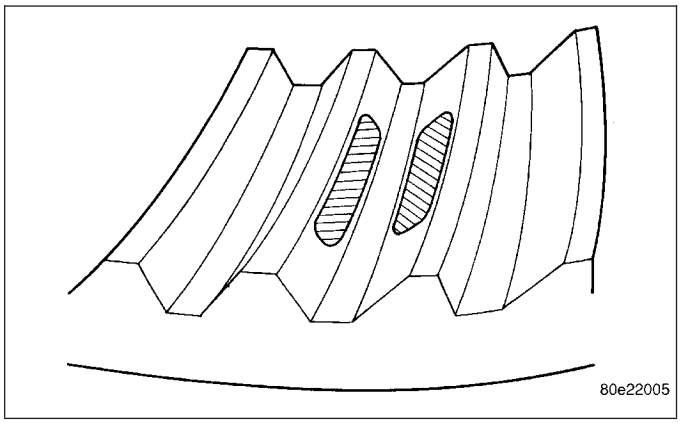
NOTE: The left-side threaded adjuster torque should have approximately 102 N·m (75 ft. lbs.). If the torque is considerably less, the complete adjustment procedure must be repeated.

9. Tighten the left-side threaded adjuster until 102 N·m (75 ft. lbs.) torque is indicated. Seat the bearing rollers with the procedure described above. Do this until the torque remains constant.
10. Install the threaded adjuster locks and tighten the lock screws to 10 N·m (90 in. lbs.).

GEAR CONTACT PATTERN

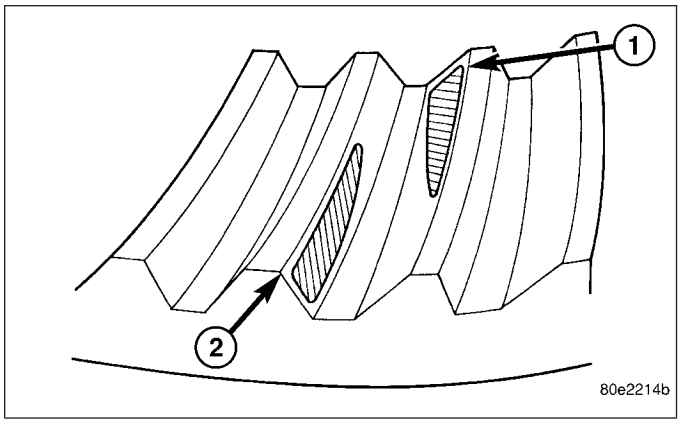
1. Wipe clean each tooth of the ring gear.
2. Apply gear marking compound to all of the ring gear teeth.
3. Verify bearing cap bolts are torque specification.
4. Apply parking brakes lightly to create at 14 N·m (10 ft. lbs.) pinion rotating torque.
5. Rotate the pinion/pinion yoke 4 full revolutions in each directions.
6. Read gear tooth contact pattern.

Gear contact pattern is correct. Backlash and pinion depth is correct.

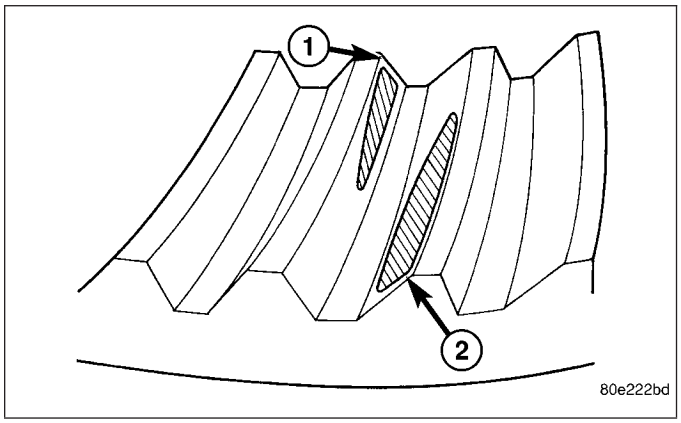


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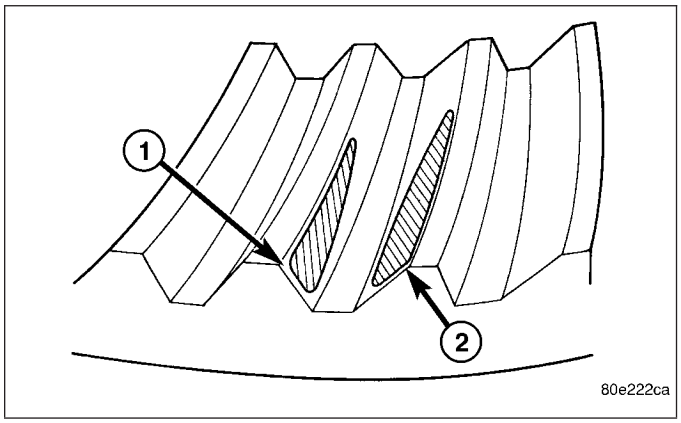
Ring gear too far away from pinion gear, coast side toe (1) and drive side heel (2). Decrease backlash, by moving the ring closer to the pinion gear using the adjusters.



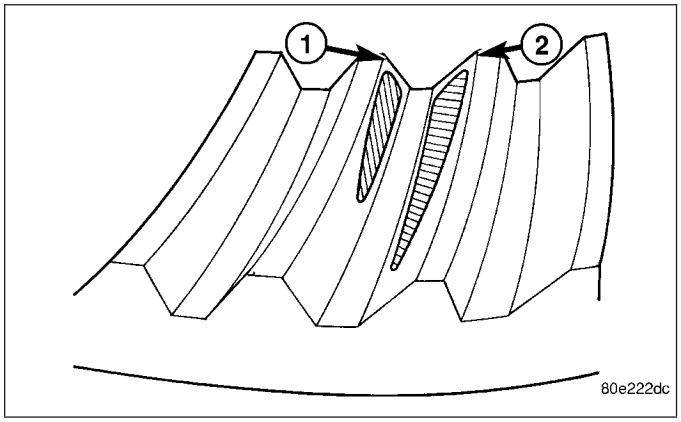
Ring gear too close to pinion gear, drive side toe (1) and coast side heel (2). Increase backlash, by moving the ring away from the pinion gear using the adjusters.



Ring gear too far away from pinion gear, drive side heel (1) and coast side heel (2). Decrease backlash, by moving the ring closer to the pinion gear using the adjusters.

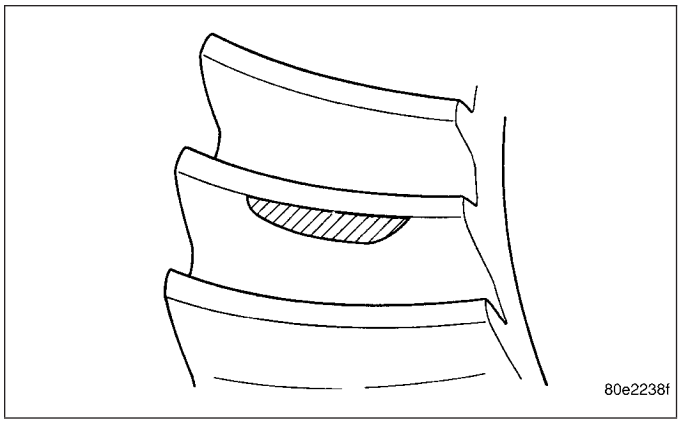


Ring gear too close to pinion gear, drive side toe (1) and coast side toe (2). Increase backlash, by moving the ring away from the pinion gear using the adjusters.

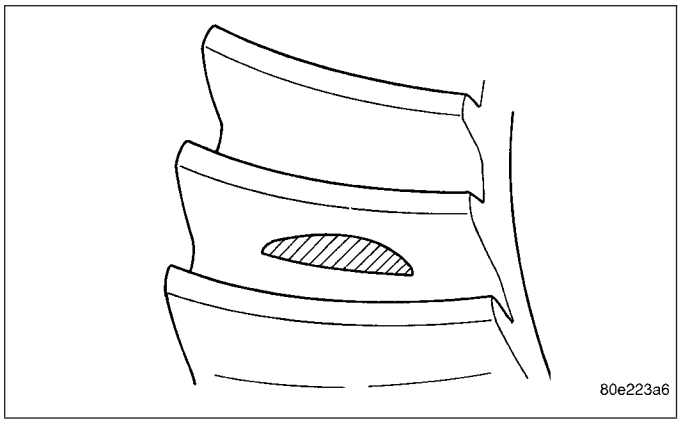


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Pinion gear set too low. Increase pinion gear height, by increasing the pinion depth shim thickness.



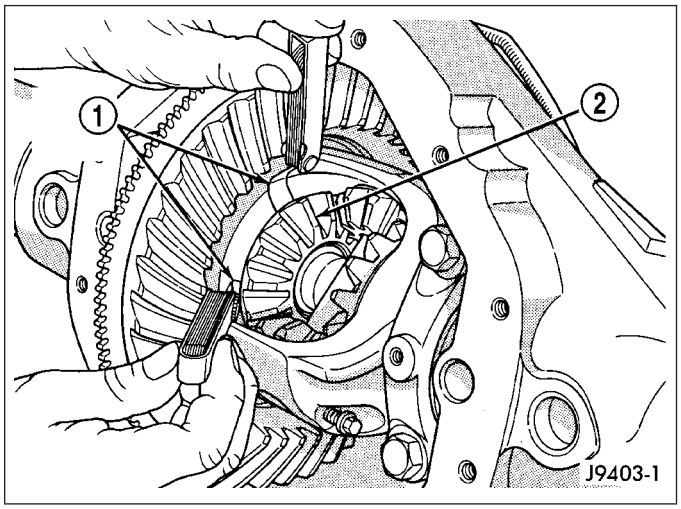
Pinion gear set too high. Decrease pinion depth, by decreasing the pinion depth shim thickness.



SIDE GEAR CLEARANCE

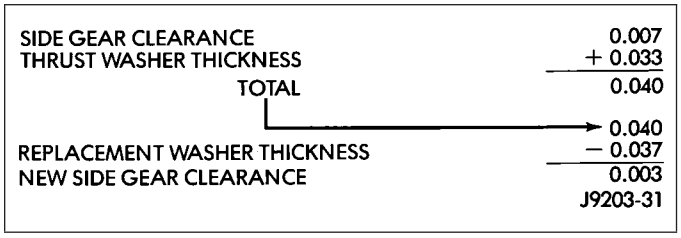
When measuring side gear (2) clearance, check each gear independently. If it necessary to replace a side gear, replace both gears as a matched set.

1. Install the axle shafts and C-locks and pinion mate shaft.
2. Measure each side gear clearance. Insert a matched pair of feeler gauge (1) blades between the gear and differential housing on opposite sides of the hub.
3. If side gear clearances is no more than 0.005 inch. Determine if the axle shaft is contacting the pinion mate shaft. **Do not remove the feeler gauges, inspect the axle shaft with the feeler gauge inserted behind the side gear.** If the end of the axle shaft is not contacting the pinion mate shaft, the side gear clearance is acceptable.



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4. If clearance is more than 0.005 inch (axle shaft not contacting mate shaft), record the side gear clearance. Remove the thrust washer and measure its thickness with a micrometer. Add the washer thickness to the recorded side gear clearance. The sum of gear clearance and washer thickness will determine required thickness of replacement thrust washer.



In some cases, the end of the axle shaft will move and contact the mate shaft when the feeler gauge is inserted. The C-lock is preventing the side gear from sliding on the axle shaft.

5. If there is no side gear clearance, remove the C-lock from the axle shaft. Use a micrometer to measure the thrust washer thickness. Record the thickness and re-install the thrust washer. Assemble the differential case without the C-lock installed and re-measure the side gear clearance.
6. Compare both clearance measurements. If the difference is less than 0.012 inch (0.305 mm), add clearance recorded when the C-lock was installed to thrust washer thickness measured. The sum will determine the required thickness of the replacement thrust washer.
7. If clearance is 0.012 inch (0.305 mm) or greater, both side gears must be replaced (matched set) and the clearance measurements repeated.
8. If clearance (above) continues to be 0.012 inch (0.305 mm) or greater, the case must be replaced.

SPECIFICATIONS

AXLE SPECIFICATIONS

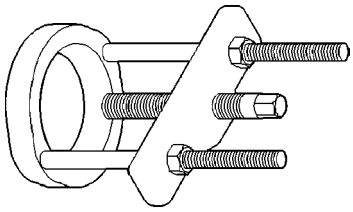
DESCRIPTION	SPECIFICATION
Axle Ratio	3.21, 3.55, 3.92
Differential Case Flange Runout	0.076 mm (0.003 in.)
Differential Case Clearance	0.12 mm (0.005 in.)
Ring Gear Diameter	235 mm (9.25 in.)
Ring Gear Backlash	0.12-0.20 mm (0.005-0.008 in.)
Ring Gear Runout	0.12 mm (0.005 in.)
Pinion Bearing Preload - New Bearings	1.7-4 N·m (15-35 in. lbs.)
Pinion Bearing Preload - Original Bearings	1-2 N·m (10-20 in. lbs.)

TORQUE SPECIFICATIONS

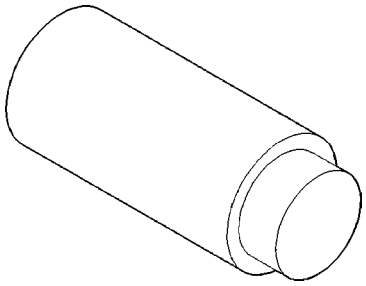
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Differential Cover Bolts	41	30	-
Bearing Cap Bolts	136	100	-
Ring Gear Bolts	157	115	-
Pinion Nut Minimum	285	210	-
Adjuster Lock Screw	10	7.5	90
Backing Plate Bolts	65	48	-
Pinion Mate Shaft Lock Screw	11	8	-
Axle U-Bolt Nuts	149	110	-

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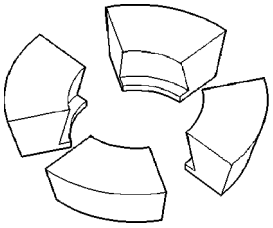
SPECIAL TOOLS



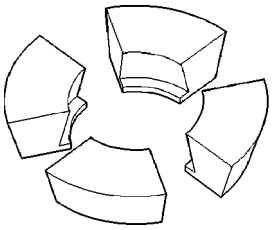
PULLER C-293-PA



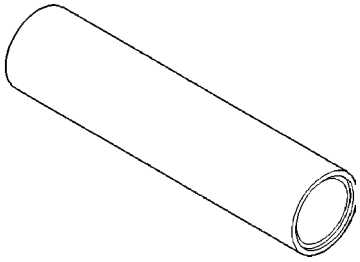
PLUG C-293-3



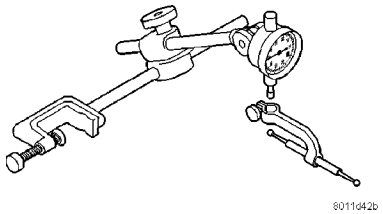
ADAPTERS C-293-37



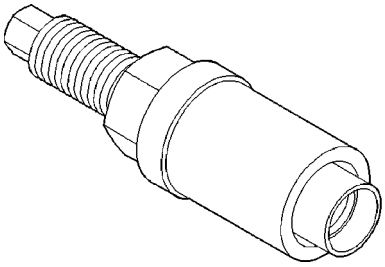
ADAPTERS C-293-47



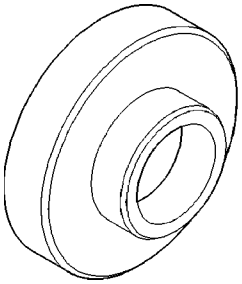
INSTALLER C-3095-A



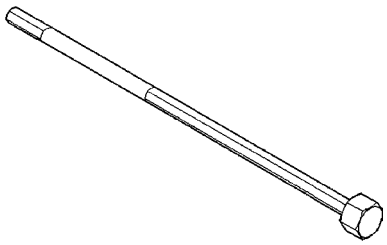
DIAL INDICATOR SET C-3339



INSTALLER C-3718

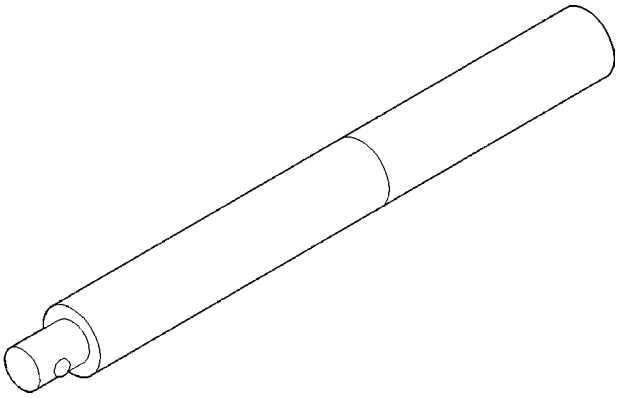


INSTALLER C-4076-B

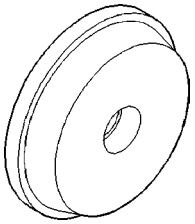


WRENCH C-4164

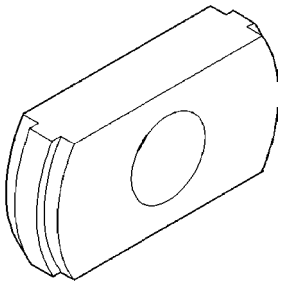
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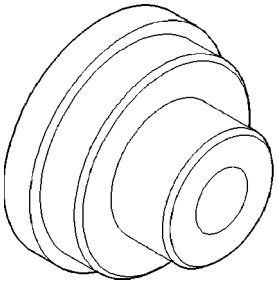
HANDLE C-4171



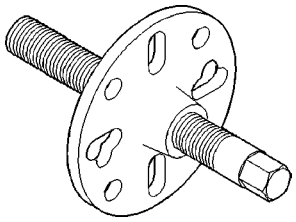
INSTALLER C-4308



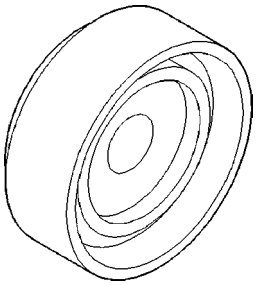
INSTALLER C-4345



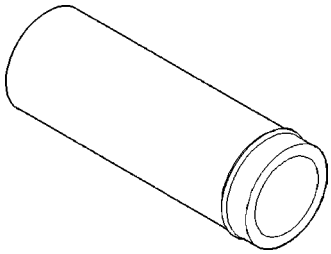
INSTALLER C-4198



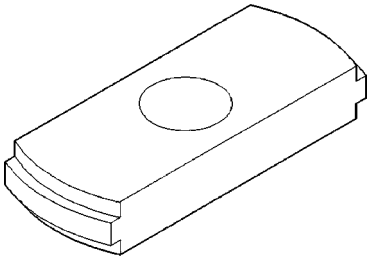
PULLER C-452



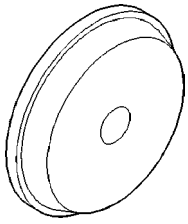
INSTALLER C-4213



HANDLE C-4735

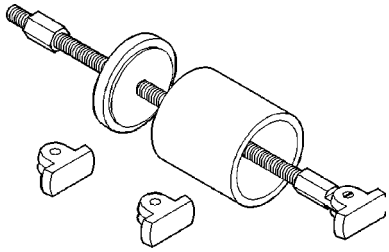


REMOVER C-4307

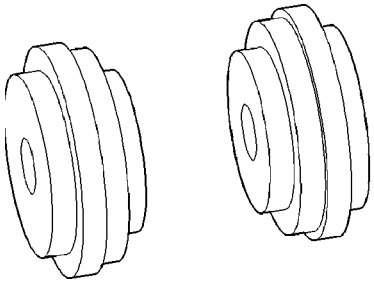


INSTALLER D-130

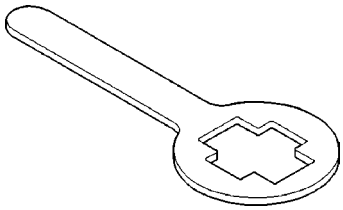
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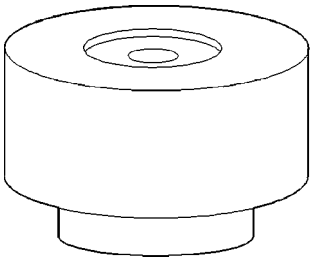
REMOVER 6310



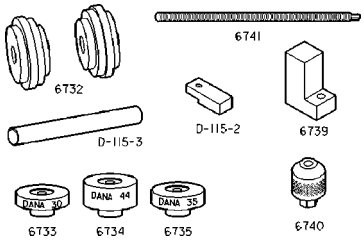
ARBOR DISCS 8541



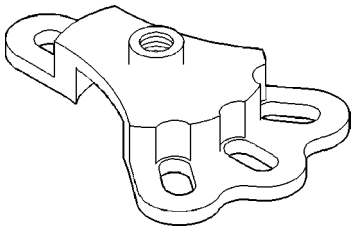
HOLDER 6719A



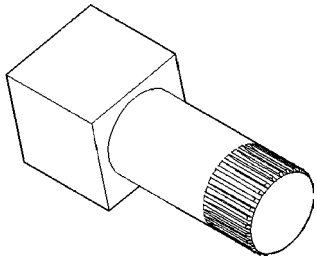
PINION BLOCK 8542



PINION GAUGE SET 6730/6774/6775



TRAC-LOK TORQUE FIXTURE 6790



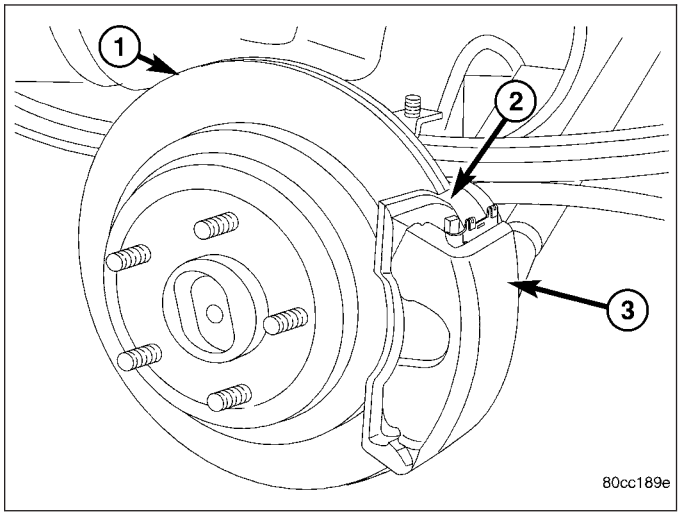
FIXTURE 8136

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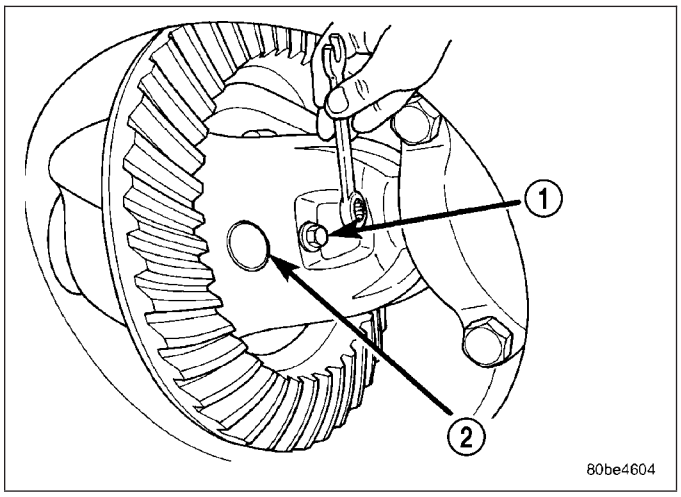
SHAFT-AXLE

REMOVAL

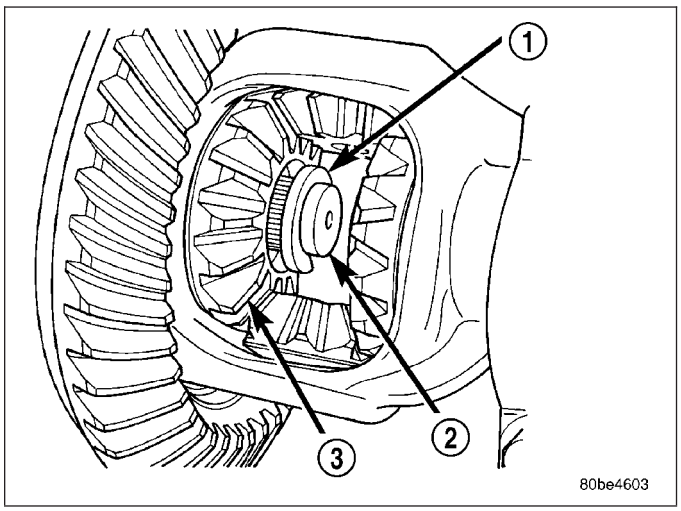
1. With vehicle in neutral, position vehicle on hoist.
2. Remove wheel and tire assembly.
3. Remove brake caliper (3), adapter (2) and rotor (1).



4. Remove differential housing cover and drain lubricant.
5. Rotate differential case so pinion mate shaft lock screw is accessible. Remove lock screw (1) and pinion mate shaft (2) from differential case.

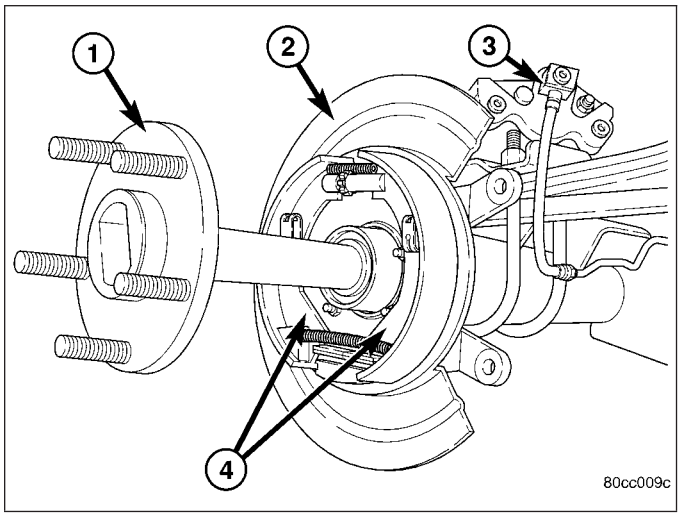


6. Push axle shaft (2) inward and remove C-lock (1) from the axle shaft.



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7. Remove axle shaft (1) carefully to prevent damage to the shaft bearing and seal in the axle tube.

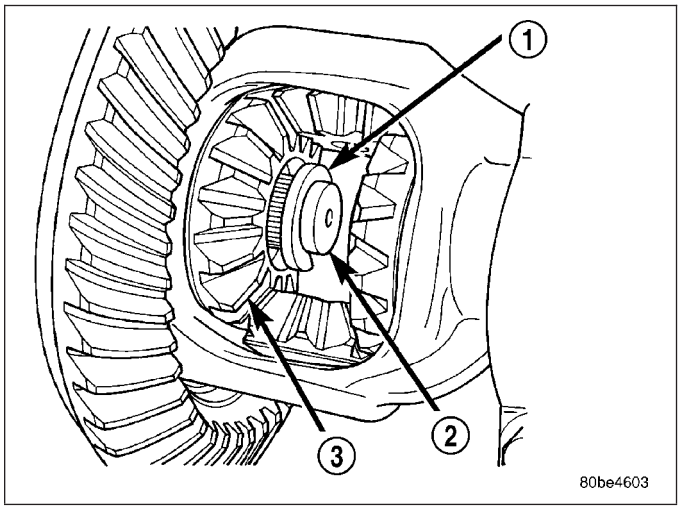


INSTALLATION

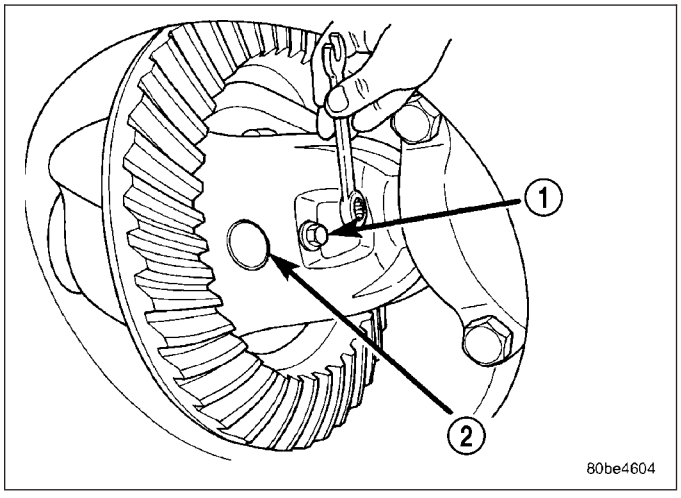
1. Lubricate bearing bore and seal lip with gear lubricant.
2. Insall axle shaft and engage into side gear splines.

NOTE: Use care to prevent shaft splines from damaging axle shaft seal.

3. Insert C-lock (1) in end of axle shaft (2) then push axle shaft outward to seat C-lock in side gear (3).



4. Insert pinion shaft into differential case and through thrust washers and differential pinions.
5. Align hole in pinion mate shaft (2) with hole in the differential case and install lock screw (1) with Loctite® on the threads. Tighten lock screw to 11 N·m (8 ft. lbs.).
6. Install differential cover and fill with gear lubricant to the bottom of the fill plug hole.
7. Install brake rotor, caliper adapter and caliper.
8. Install wheel and tire.

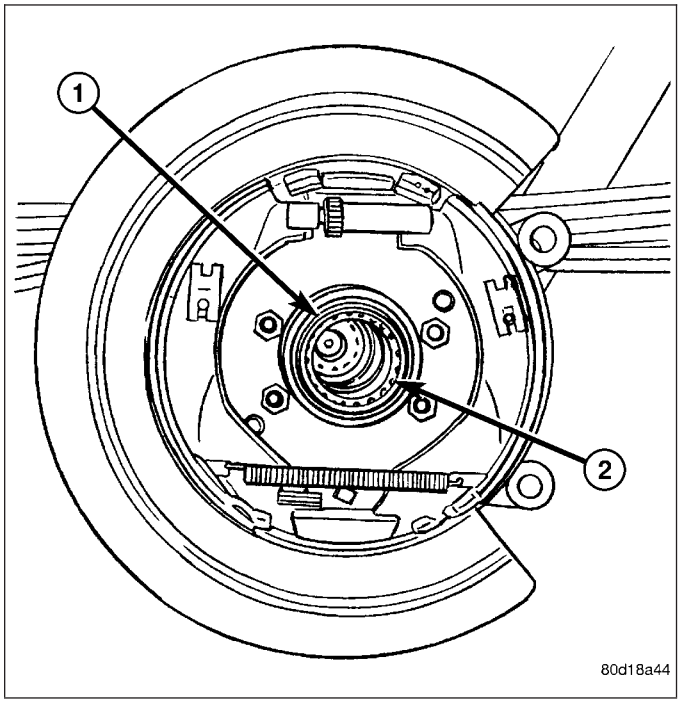


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SEAL-AXLE SHAFT

REMOVAL

1. Remove axle shaft.
2. Remove axle shaft seal (1) from the axle tube with a small pry bar.

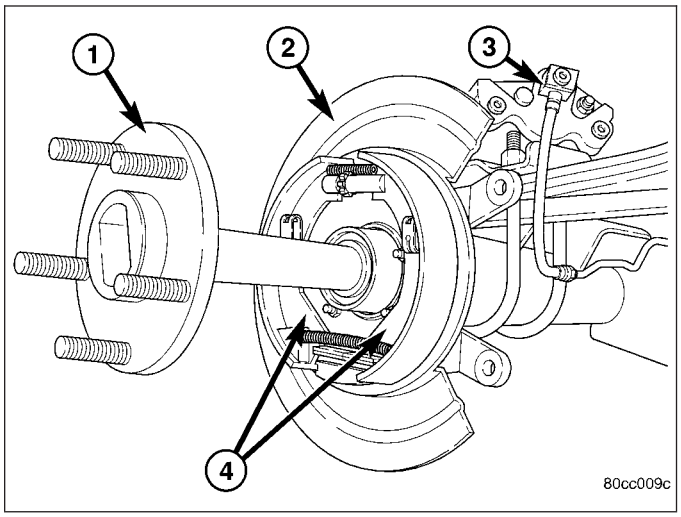


INSTALLATION

1. Wipe the axle tube bore clean. Remove any old sealer or burrs from the tube.
2. Coat the lip of the **new** seal with axle lubricant and install a seal with Installer C-4076-B and Handle C-4735-1.

NOTE: When tool contacts the axle tube, the seal is installed to the correct depth.

3. Install the axle shaft (1).
4. Install differential cover and fill with gear lubricant to the bottom of the fill plug hole.



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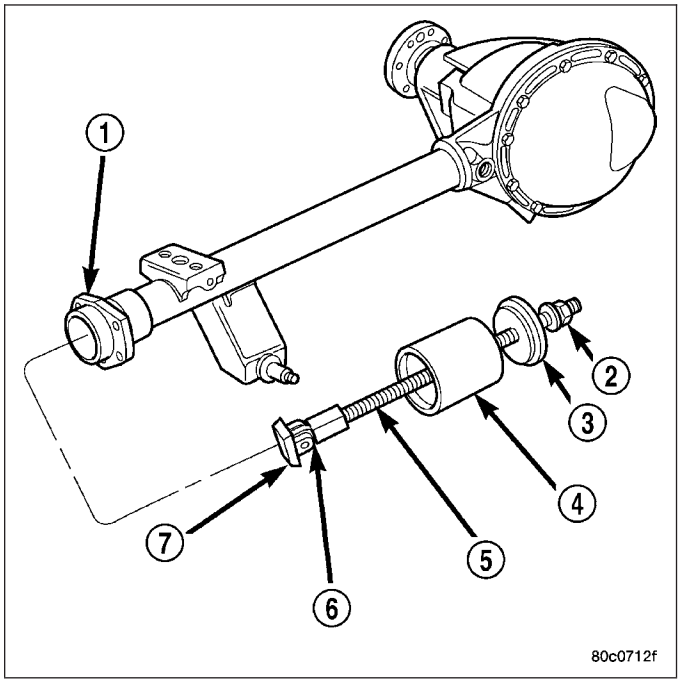
BEARING-AXLE

REMOVAL

1. Remove axle shaft.
2. Remove axle shaft seal from axle tube with a small pry bar.

NOTE: The seal and bearing can be removed at the same time with the bearing removal tool.

3. Remove axle shaft bearing with Bearing Remover 6310 (2) (3) (4) (5) and Foot 6310-9 (7).

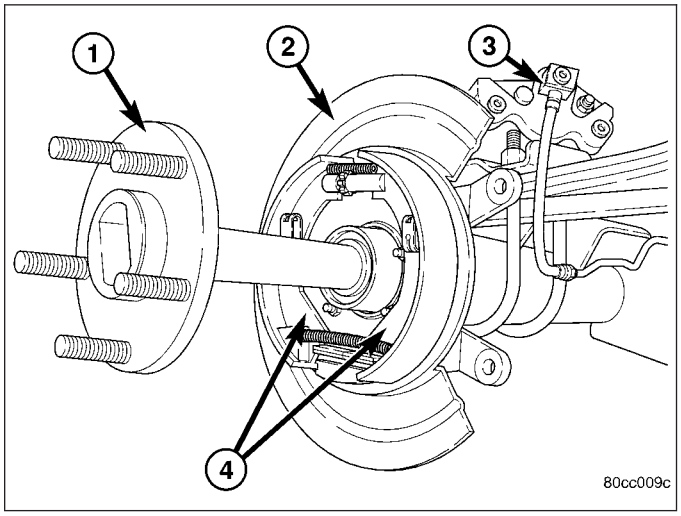


INSTALLATION

1. Wipe axle tube bore clean and remove any old sealer or burrs from the tube.
2. Install axle shaft bearing with Installer C-4198 and Handle C-4171. Drive bearing in until tool contacts the axle tube.

NOTE: Bearing is installed with the bearing part number against the installer.

3. Coat lip of the **new** axle seal with axle lubricant and install with Installer C-4076-B and Handle C-4735-1.
4. Install the axle shaft (1).
5. Install differential cover and fill with gear lubricant to the bottom of the fill plug hole.

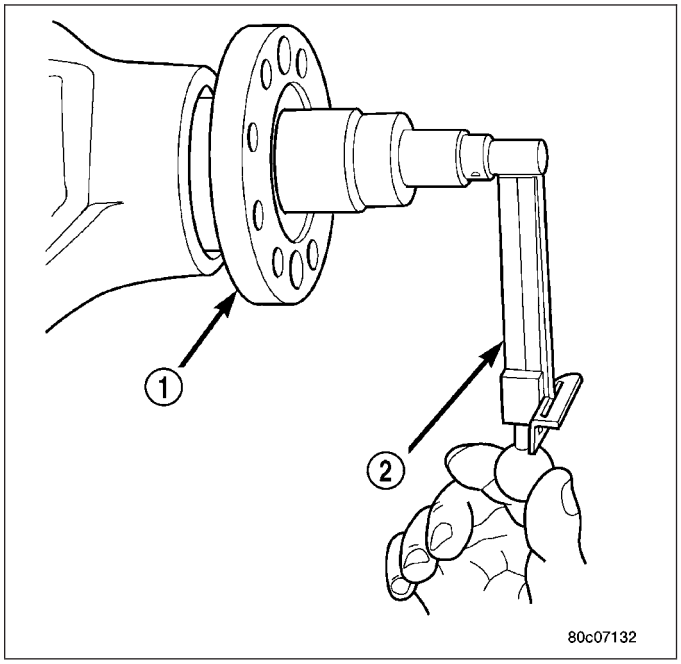


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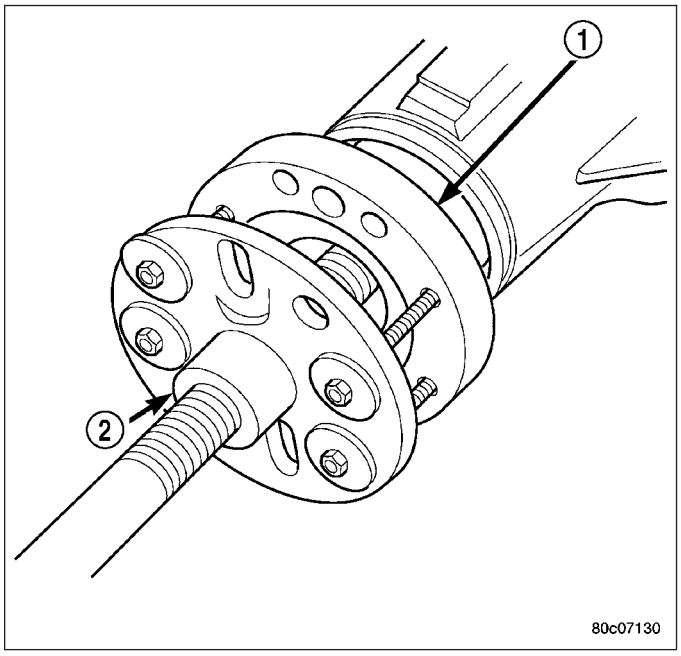
SEAL-PINION

REMOVAL

1. Mark universal joint, companion flange and pinion shaft for installation reference.
2. Remove propeller shaft from the companion flange.
3. Remove the brake rotors to prevent any drag.
4. Rotate companion flange (1) three or four times and record pinion rotating torque with an inch pound torque wrench (2).



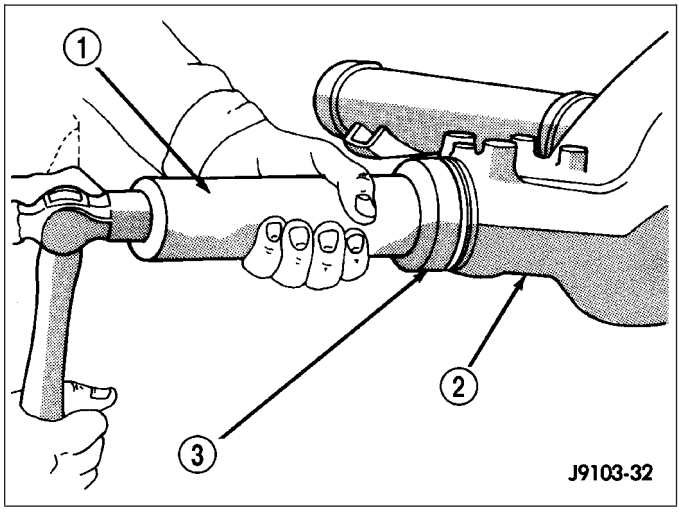
5. Install two bolts into the companion flange threaded holes, 180° apart. Position Holder 6719A against the companion flange and install and tighten two bolts and washers into the remaining holes.
6. Hold the companion flange with Holder 6719A and remove pinion nut and washer.
7. Remove companion flange with Remover C-452 (2).
8. Remove pinion seal with pry tool or slide-hammer mounted screw.



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INSTALLATION

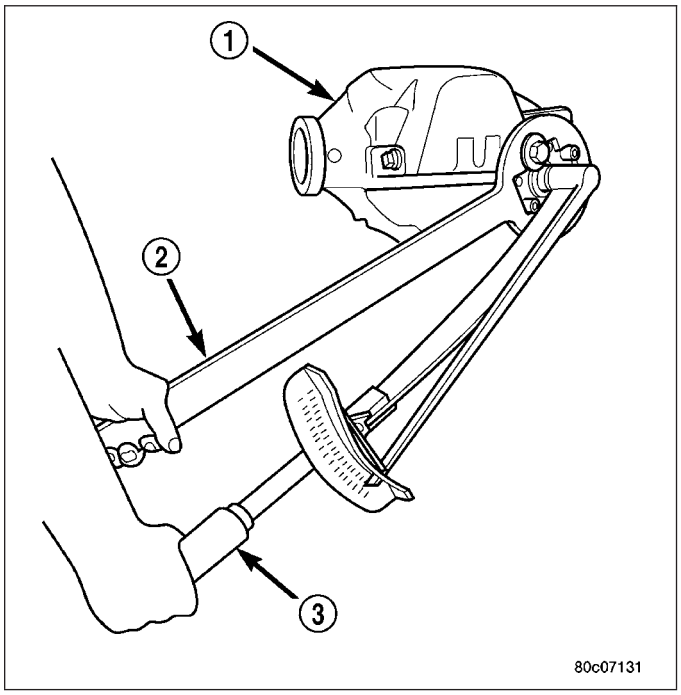
1. Apply a light coating of gear lubricant on the lip of pinion seal.
2. Install **new** pinion seal with Installer C-3860-A (2) and Handle C-4171 (1).



3. Install companion flange on the end of the shaft with the reference marks aligned.
4. Install two bolts into the threaded holes in the companion flange, 180° apart.
5. Position Holder 6719 (2) against the companion flange and install a bolt and washer into one of the remaining threaded holes. Tighten the bolts so holder is held to the flange.
6. Install companion flange on pinion shaft with Installer C-3718 and Holder 6719 (2).
7. Install pinion washer and a **new** pinion nut. The convex side of the washer must face outward.

CAUTION: Never exceed the minimum tightening torque 285 N·m (210 ft. lbs.) when installing the companion flange retaining nut at this point. Failure to follow these instructions will damage the collapsible spacer.

8. Hold companion flange with Holder 6719 (2) and tighten the pinion nut with a torque set to 285 N·m (210 ft. lbs.). Rotate pinion several revolutions to ensure the bearing rollers are seated.



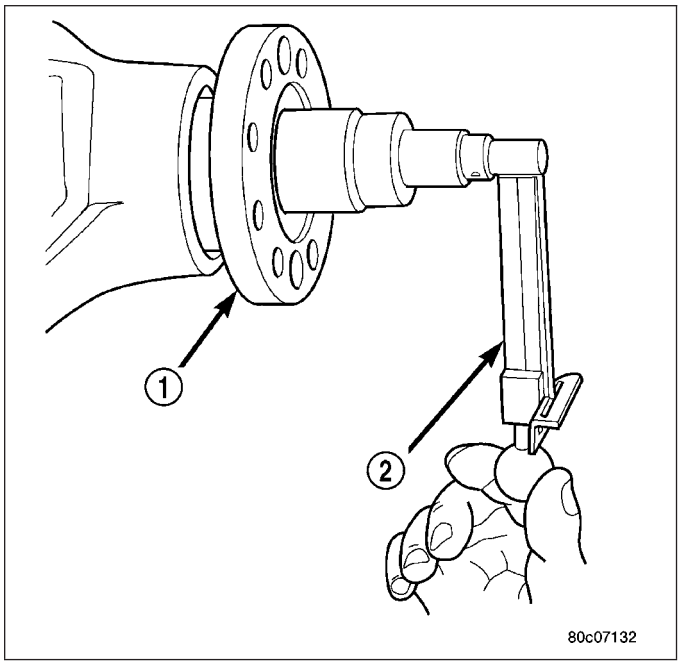
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9. Rotate pinion with an inch pound torque wrench (2). Rotating torque should be equal to the reading recorded during removal plus an additional 0.56 N·m (5 in. lbs.).

CAUTION: Never loosen pinion nut to decrease pinion bearing rotating torque and never exceed specified preload torque. If rotating torque is exceeded, a new collapsible spacer must be installed.

10. If rotating torque is low, use Holder 6719 to hold the companion flange (1) and tighten pinion nut in 6.8 N·m (5 ft. lbs.) increments until proper rotating torque is achieved.

NOTE: The bearing rotating torque should be constant during a complete revolution of the pinion. If the rotating torque varies, this indicates a binding condition.



NOTE: The seal replacement is unacceptable if the final pinion nut torque is less than 285 N·m (210 ft. lbs.).

11. Install propeller shaft with the installation reference marks aligned.
12. Tighten the companion flange bolts to 108 N·m (80 ft. lbs.).
13. Install brake rotors.
14. Check the differential lubricant level.

COVER-DIFFERENTIAL

REMOVAL

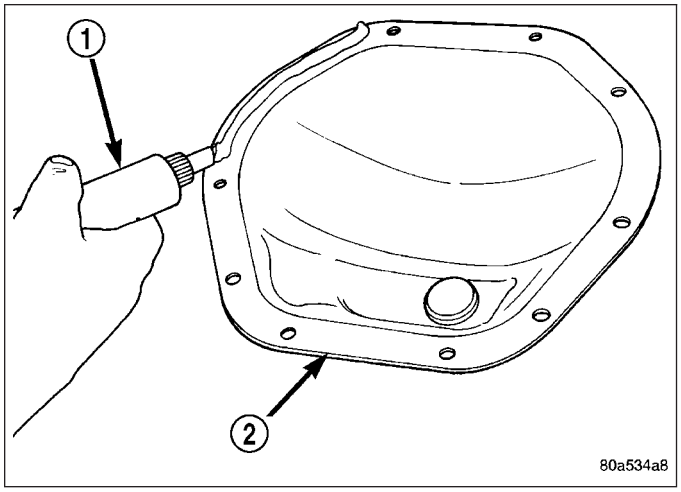
1. With vehicle in neutral, position vehicle on hoist.
2. Remove drain plug.
3. Remove cover bolts.
4. Remove cover and drain lubricant.

INSTALLATION

1. Apply a 6.35mm (1/4 in.) bead of Mopar Silicone Rubber Sealant (1) or equivalent to the cover (2).

CAUTION: If housing cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instructions will result in a leak.

2. Install cover and identification tag. Tighten cover bolts in a criss-cross pattern to 41 N·m (30 ft. lbs.).
3. Fill differential to specifications.
4. Install fill plug.



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DIFFERENTIAL

REMOVAL

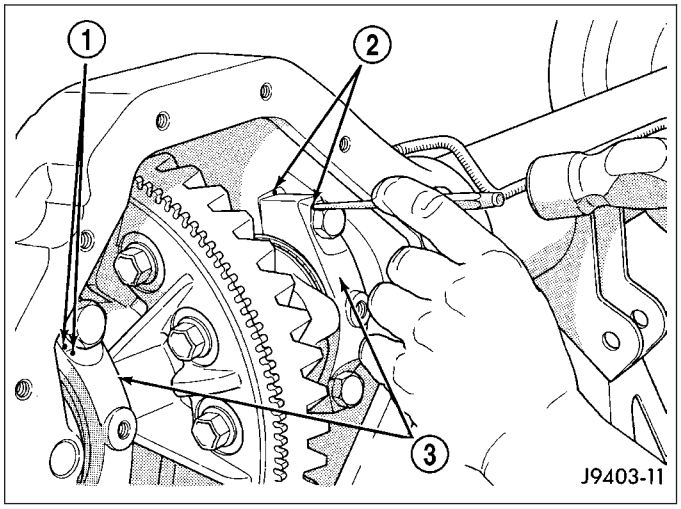
1. Remove filler plug from the differential cover.
2. Remove differential cover and drain the lubricant.
3. Clean housing cavity with flushing oil, light engine oil or a lint free cloth.

NOTE: Do not use steam, kerosene or gasoline to clean the housing.

4. Remove axle shafts.
5. Remove RWAL/ABS sensor from housing.

NOTE: Side play resulting from bearing races being loose on case hubs requires replacement of the differential case.

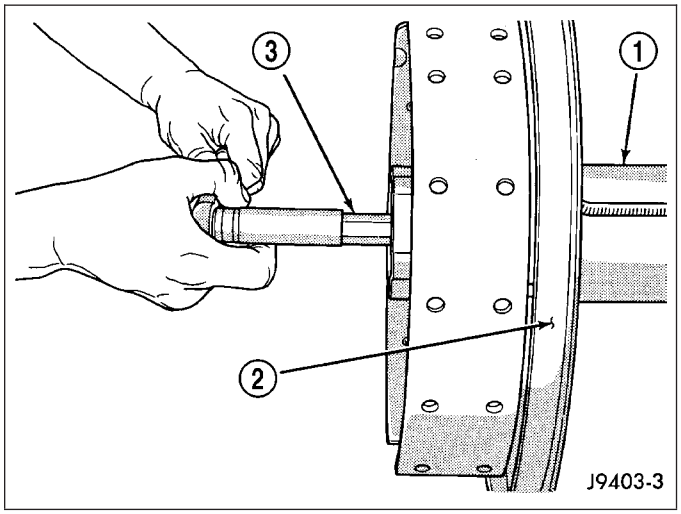
6. Mark differential housing and bearing caps (3) for installation reference.



7. Remove bearing threaded adjuster lock from each bearing cap.
8. Loosen differential bearing cap bolts.
9. Loosen differential bearing adjusters through the axle tubes (1) with Wrench C-4164 (3).
10. Hold differential case while removing bearing caps and adjusters.

NOTE: Tag the differential bearing cups and threaded adjusters to indicate their location.

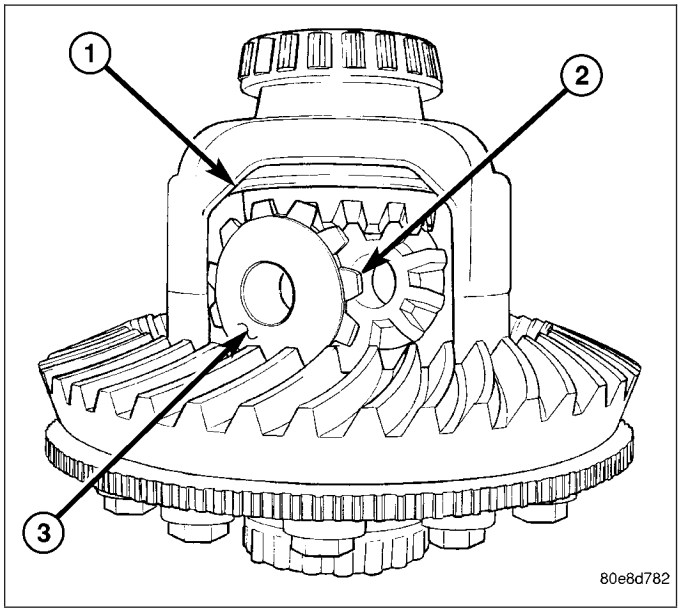
11. Remove differential case.



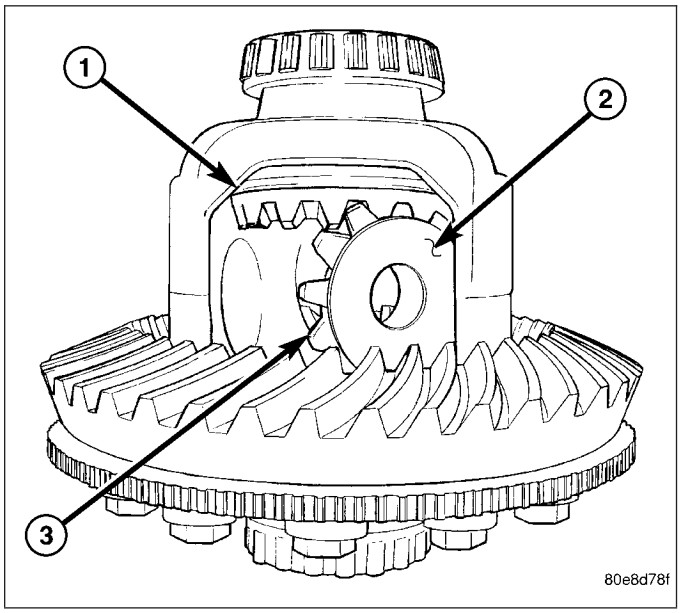
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DISASSEMBLY

1. Rotate one pinion gear (2) with thrust washer (3) to the differential window (1) and remove gear and thrust washer.

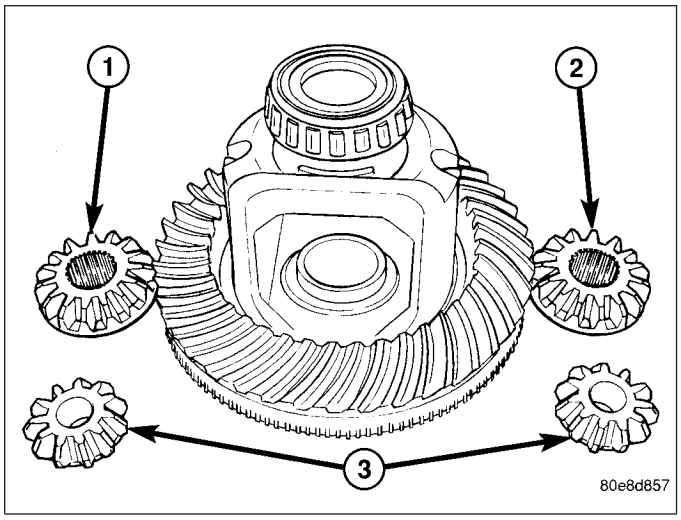


2. Rotate remaining pinion gear (3) with thrust washer (2) to the differential window (1) and remove gear and washer.



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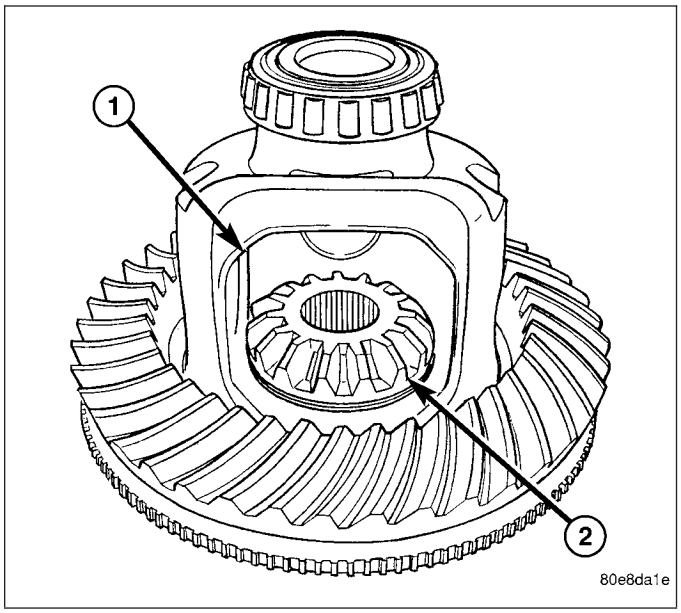
3. Remove differential side gears (1) (2) and thrust washers.



ASSEMBLY

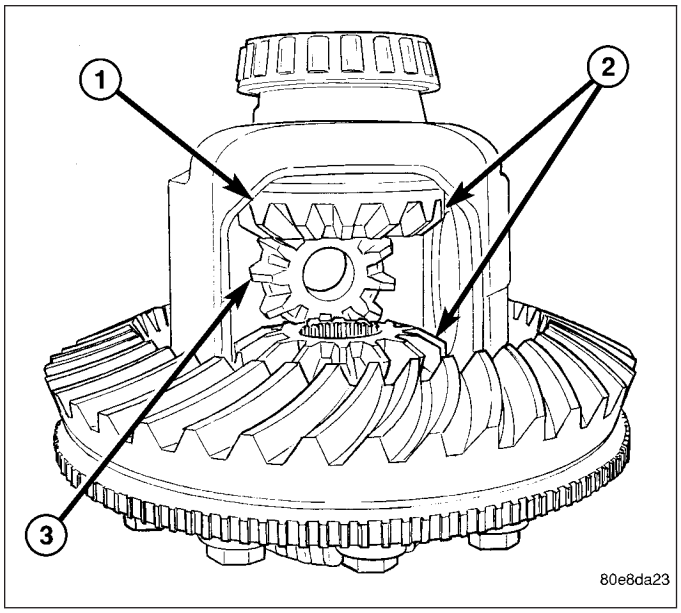
NOTE: If same gears and thrust washers are being used, install them into their original locations.

1. Lubricate all differential components with axle lubricant.
2. Install differential side gears (2) and thrust washers.

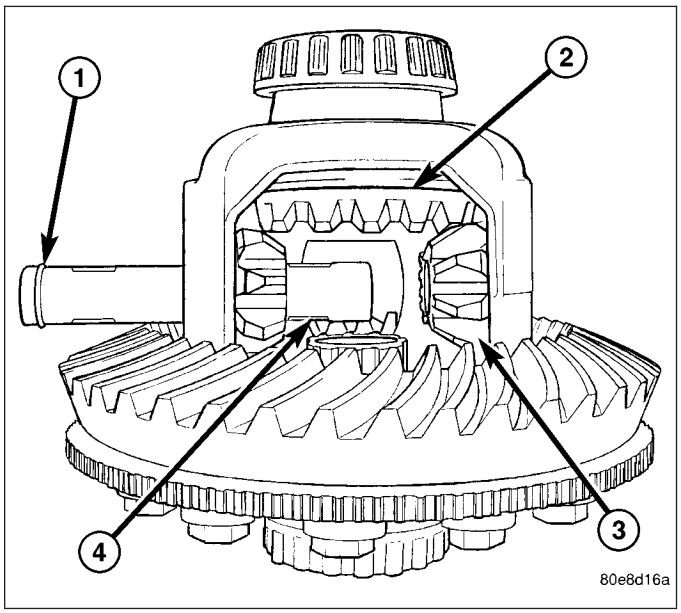


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3. Install first pinion gear (3) with thrust washer into differential window (1) and side gears (2). Rotate pinion gear into the case.



4. Install remaining pinion gear and thrust washer. Rotate gears to align hole in the pinion gears with hole in the differential case.
5. Slide pinion shaft (4) into the case and through the pinion gears (3) to align the gears.

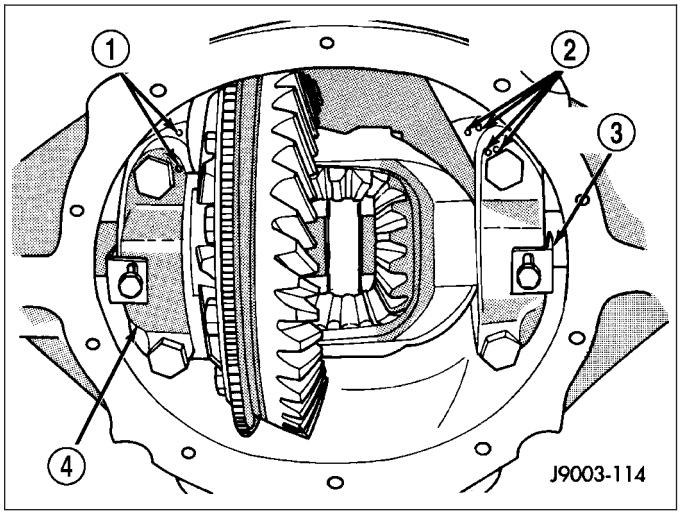


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INSTALLATION

1. Apply a coating of hypoid gear lubricant to the differential bearings, bearing cups, and threaded adjusters. A dab of grease can be used to keep the adjusters in position.
2. Install differential assembly into the housing.
3. Install differential bearing caps (4) in their original locations.
4. Install bearing cap bolts and tighten the upper bolts to 14 N·m (10 ft. lbs.). Tighten lower bolts finger-tight until the bolt head is seated. Then perform the differential bearing preload and adjustment procedure.

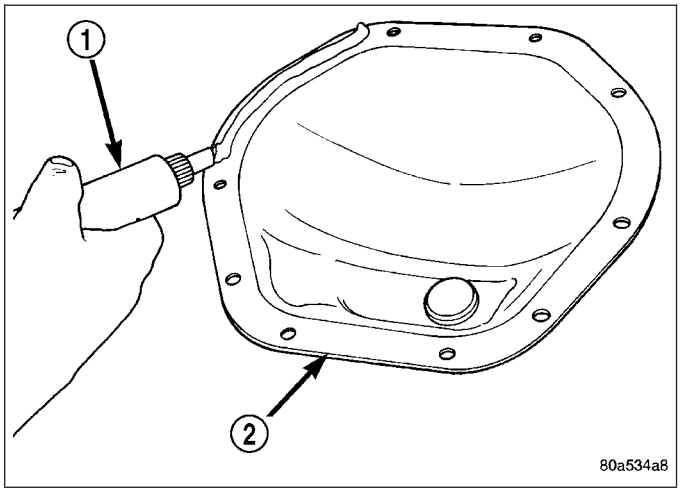
NOTE: Be sure that all bearing cap bolts are tightened to their final torque of 136 N·m (100 ft.lbs.) before proceeding.



5. Install axle shafts.

6. Apply a bead of orange Mopar Axle RTV Sealant (1) or equivalent to the cover (2).

CAUTION: If cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instruction will result in a leak.



7. Install cover and any identification tag and tighten cover bolts to 41 N·m (30 ft. lbs.).
8. Fill differential with lubricant to bottom of the fill plug hole.

NOTE: Trac-lok™ differential equipped vehicles should be road tested by making 10 to 12 slow figure-eight turns. This maneuver will pump the lubricant through the clutch discs to eliminate a possible chatter noise complaint.

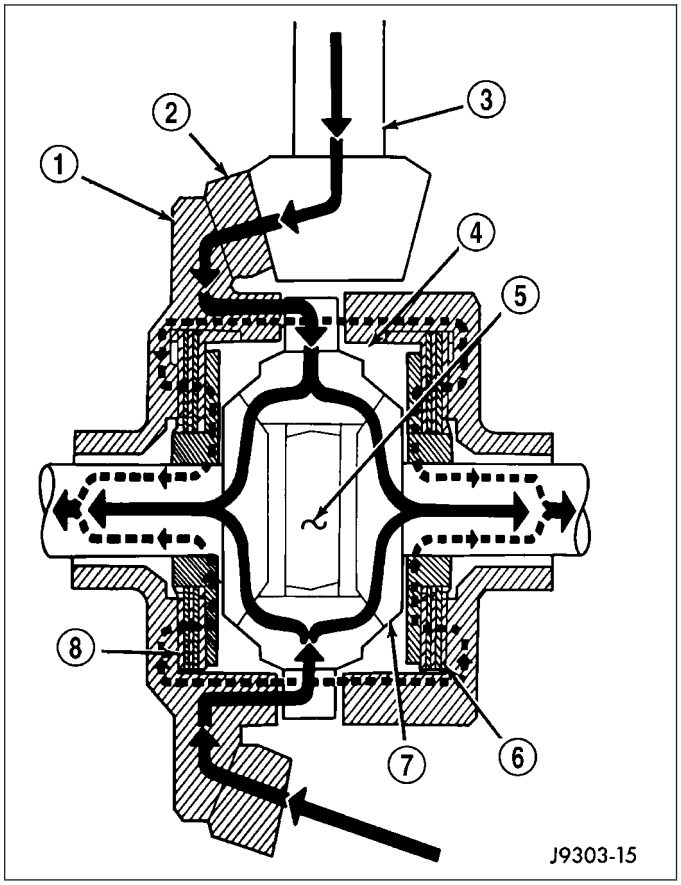
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DIFFERENTIAL-TRAC-LOK

OPERATION

This differential clutches are engaged by two concurrent forces. The first being the preload force exerted through Belleville spring washers within the clutch packs (6) (8). The second is the separating forces generated by the side gears (7) as torque is applied through the ring gear (2).

This design provides the differential action needed for turning corners and for driving straight ahead during periods of unequal traction. When one wheel looses traction, the clutch packs transfer additional torque to the wheel having the most traction. This differential resist wheel spin on bumpy roads and provide more pulling power when one wheel looses traction. Pulling power is provided continuously until both wheels loose traction. If both wheels slip due to unequal traction, Trac-lok® operation is normal. In extreme cases of differences of traction, the wheel with the least traction may spin.



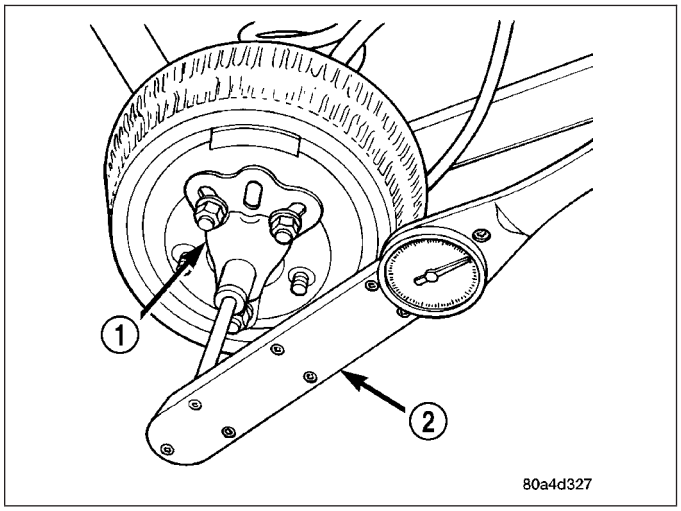
DIAGNOSIS AND TESTING

DIFFERENTIAL-TRAC-LOK

The most common problem is a chatter noise when turning corners. Before removing the unit for repair, drain, flush and refill the axle with the specified lubricant. Add a container of Mopar Limited Slip Additive after repair service or during a lubricant change.

After changing the lubricant, drive the vehicle and make 10 to 12 slow, figure-eight turns. This maneuver will pump lubricant through the clutches. This will correct the condition in most instances. If the chatter persists, clutch damage could have occurred.

The differential can be tested without removing the differential case by measuring rotating torque. Make sure brakes are not dragging during this measurement.



1. Place blocks in front and rear of both front wheels.
2. Raise one rear wheel until it is completely off the ground.
3. Engine off, transmission in neutral, and parking brake off.
4. Remove wheel and bolt Torque Check Tool 6790 (1) or equivalent tool to studs.
5. Use torque wrench (2) on Torque Check Tool (1) to rotate wheel and read rotating torque.

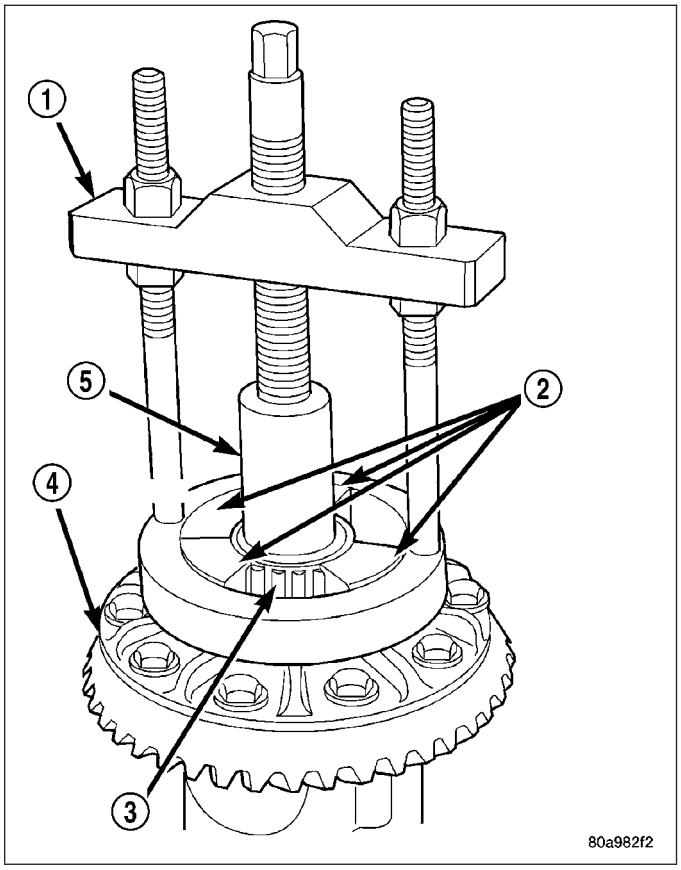
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6. If rotating torque is less than 41 N·m (30 ft. lbs.) or more than 271 N·m (200 ft. lbs.) on either wheel the unit must be replaced.

BEARING-DIFFERENTIAL CASE

REMOVAL

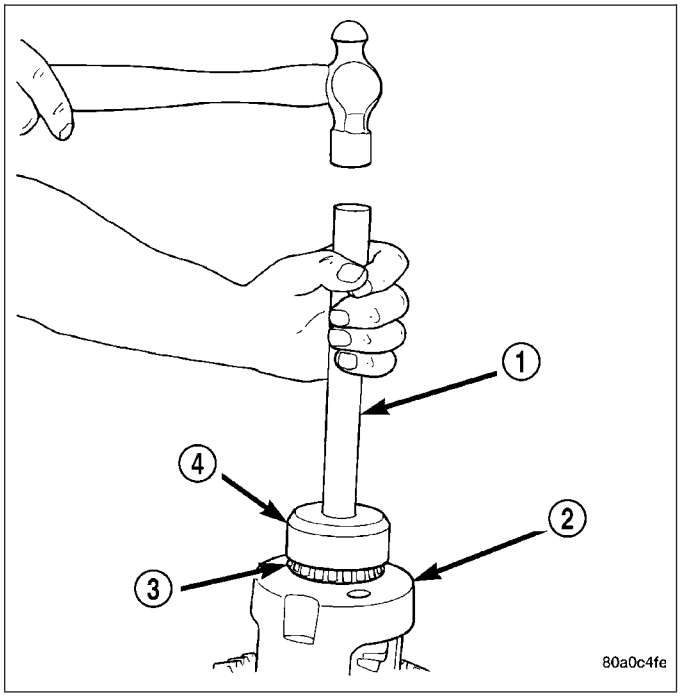
1. Remove differential case from axle housing.
2. Remove differential bearings (3) from the case with Puller/Press C-293-PA (1) and Adapters C-293-47 (2) and Plug C-293-3 (5).



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INSTALLATION

1. Install differential side bearings (3) with Installer C-4213 (4) and Handle C-4171 (1).
2. Install differential case into housing.

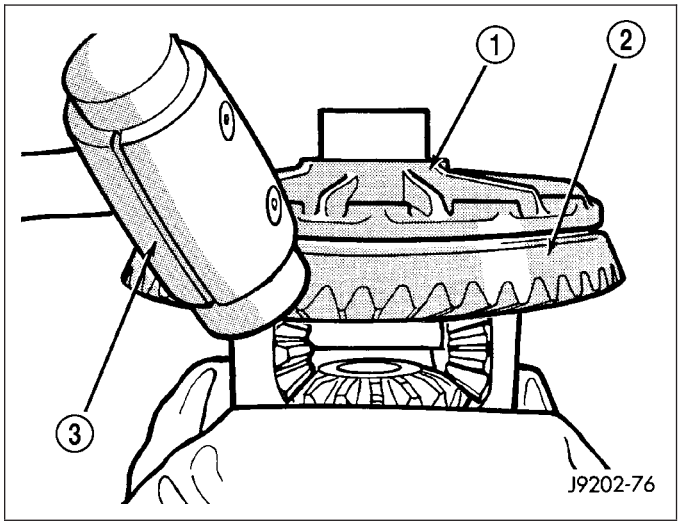


GEAR-PINION/RING

REMOVAL

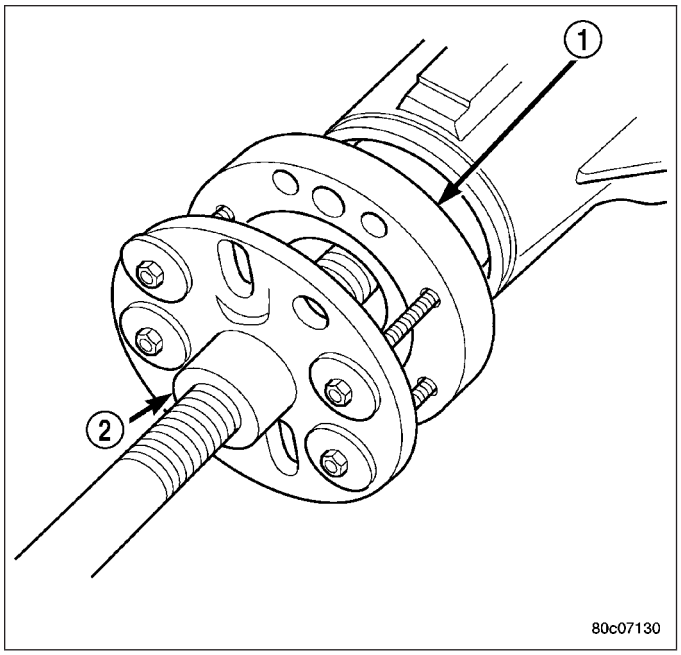
NOTE: The ring gear and pinion are serviced in a matched set. Never replace one gear without replacing the other matching gear.

1. Mark companion flange and propeller shaft for installation reference.
2. Remove propeller shaft.
3. Remove axle shafts.
4. Remove differential from the differential housing.
5. Place differential case (1) in a vise with soft metal jaw protectors.
6. Remove ring gear bolts from the differential case.
7. Drive ring gear (2) off the differential case (2) with a soft hammer (3).

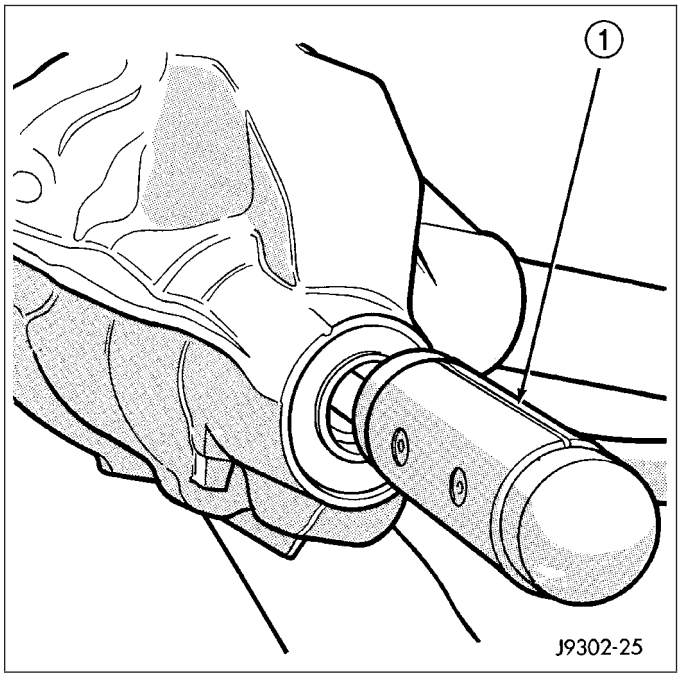


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8. Install bolts into two of the threaded holes in the companion flange 180° apart.
9. Position Holder 6719 against the companion flange and install a bolt and washer into one of the remaining threaded holes. Tighten the bolts so the Holder 6719 is held to the flange.
10. Use Holder 6719 to hold companion flange and remove the companion flange nut and washer.
11. Remove companion flange (1) with Remover C-452 (2).

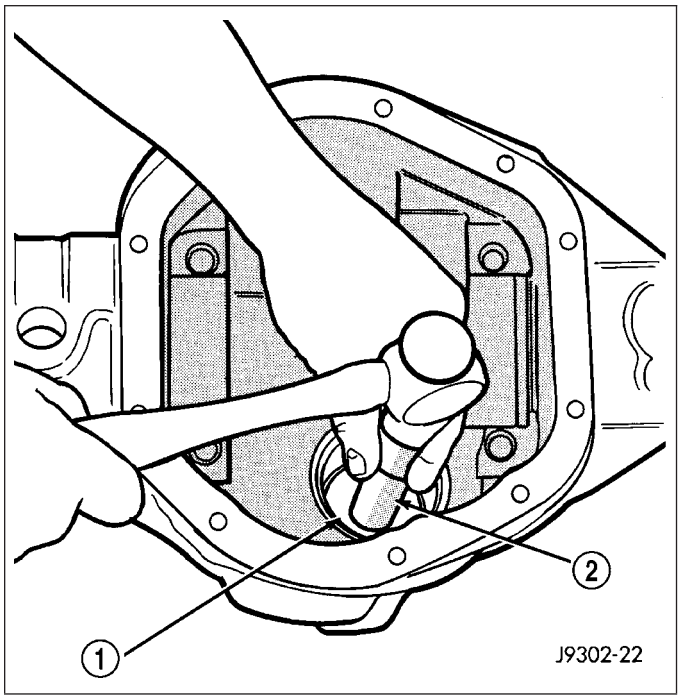


12. Remove pinion gear from the housing with a soft hammer (1).
13. Remove pinion seal with a pry tool or slide-hammer mounted screw.
14. Remove front pinion bearing and oil slinger if equipped.

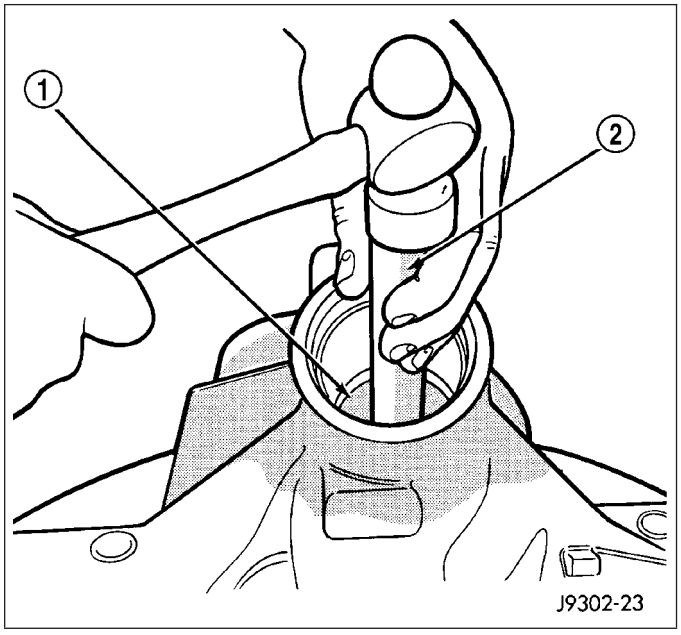


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15. Remove front pinion bearing cup with Remover C-4345 (1) and Handle C-4171 (2).

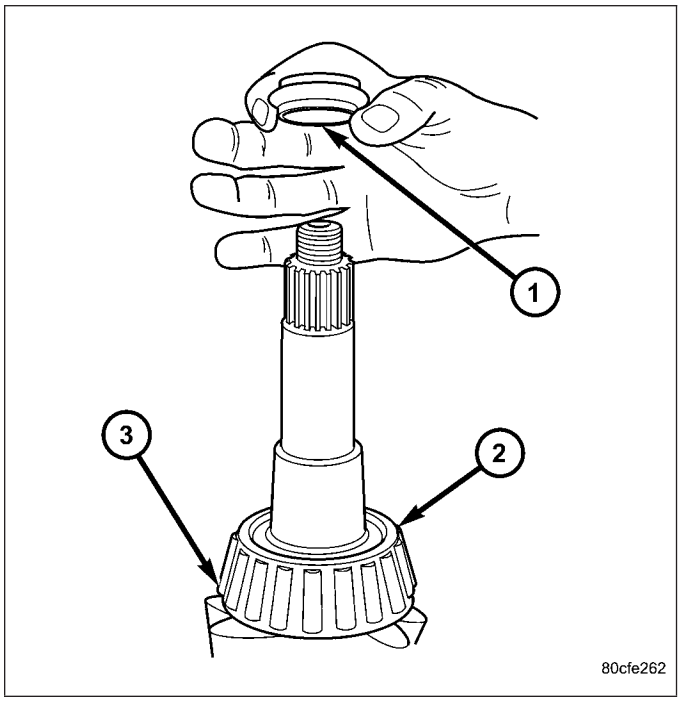


16. Remove rear pinion bearing cup from housing with Remover C-4307 (1) and Handle C-4171 (2).

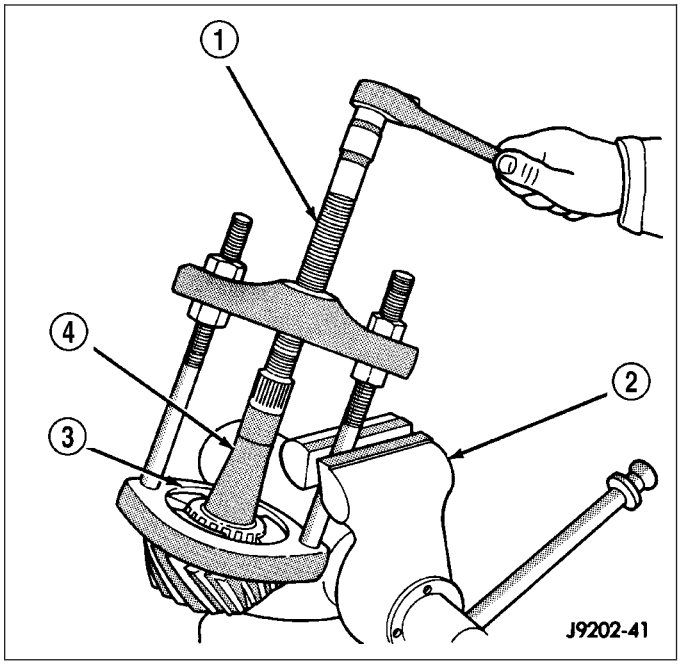


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17. Remove collapsible spacer (1) from the pinion shaft.

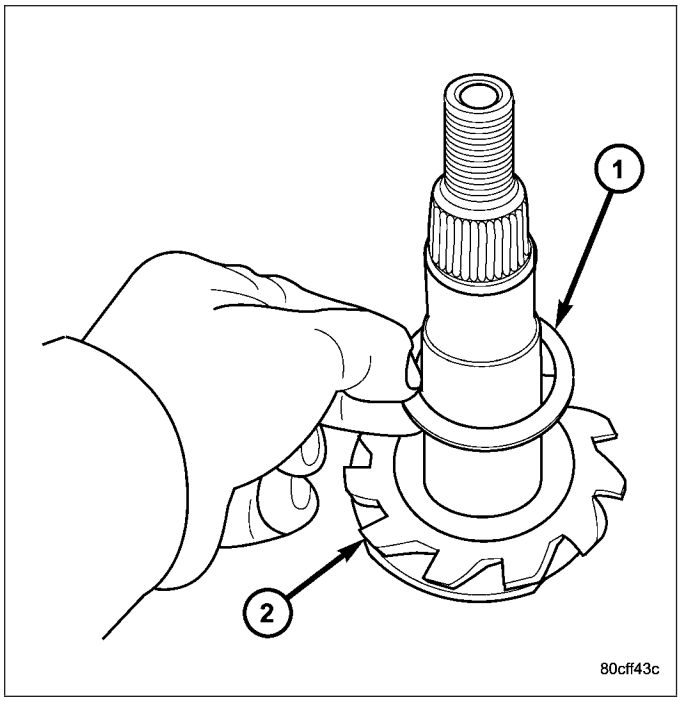


18. Remove rear pinion bearing from the pinion shaft (4) with Puller C-293-PA (1) and Adapters C-293-37 (3).



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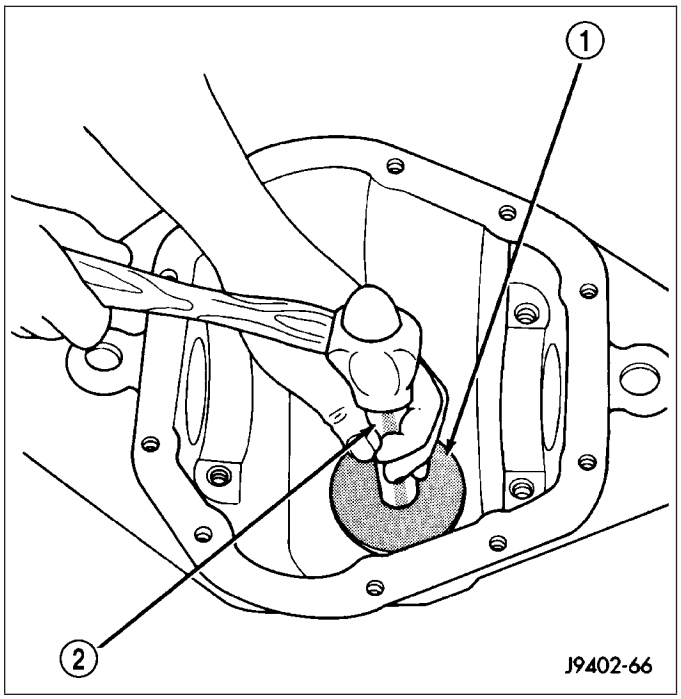
19. Remove pinion depth shim (1) from the pinion shaft (2) and record shim thickness.



INSTALLATION

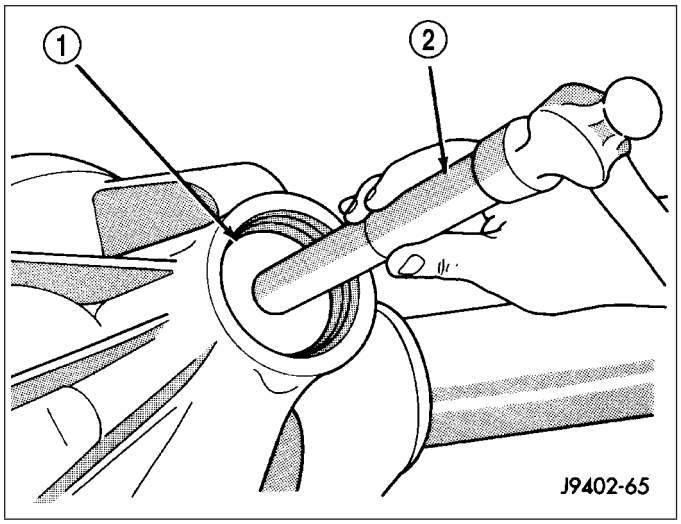
NOTE: The ring gear and pinion are serviced in a matched set. Do not replace one gear without replacing the other matching gear. If ring and pinion gears or bearings are replaced, Refer to Adjustments for Pinion Gear Depth Setting.

1. Apply Mopar Door Ease or equivalent stick lubricant to outside surface of the pinion bearing cups.
2. Install rear pinion bearing cup with Installer C-4308 (1) and Handle C-4171 (2) and verify cup is seated.

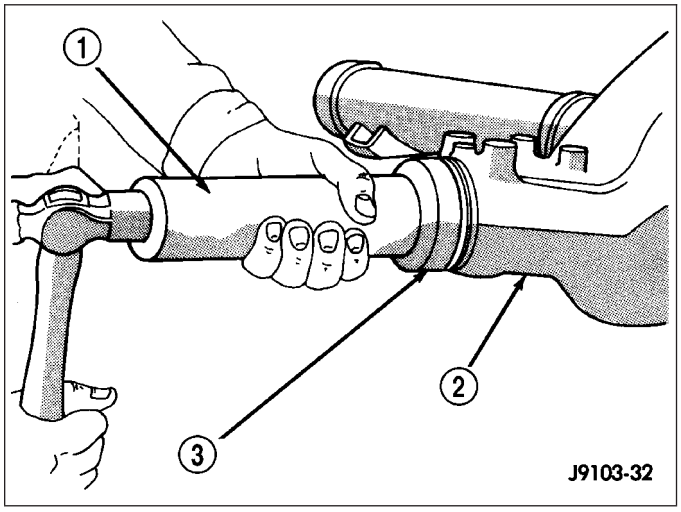


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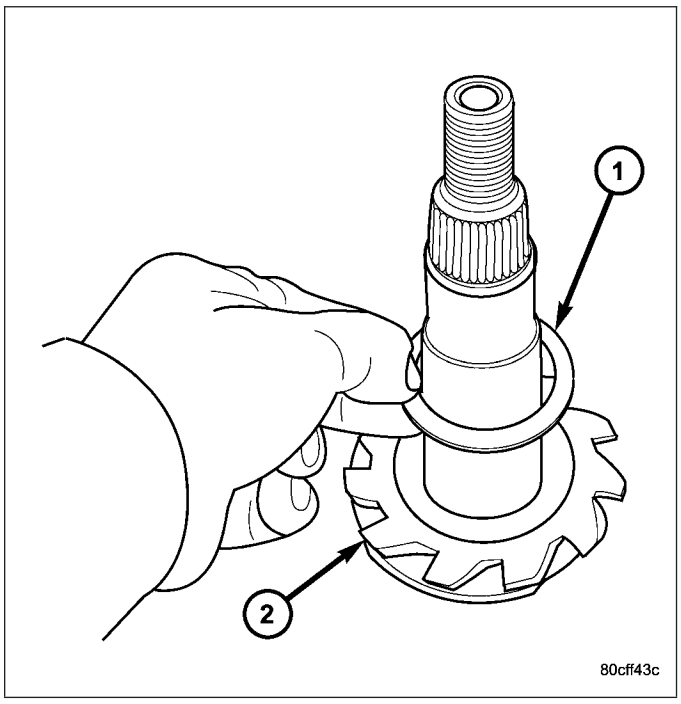
3. Install front pinion bearing cup with Installer D-129 (1) and Handle C-4171 (2) and verify cup is seated.
4. Lubricate and install front pinion bearing into the housing.



5. Apply a light coating of gear lubricant on the lip of pinion seal. Install seal with Installer C-4076-B (3) and Handle C-4735-1(1).

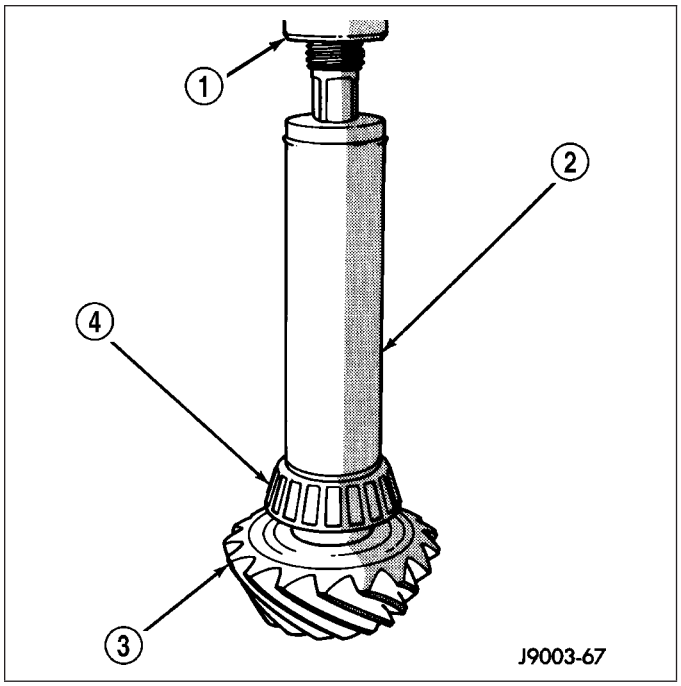


6. Install pinion depth shim (1) on the pinion gear shaft (2).

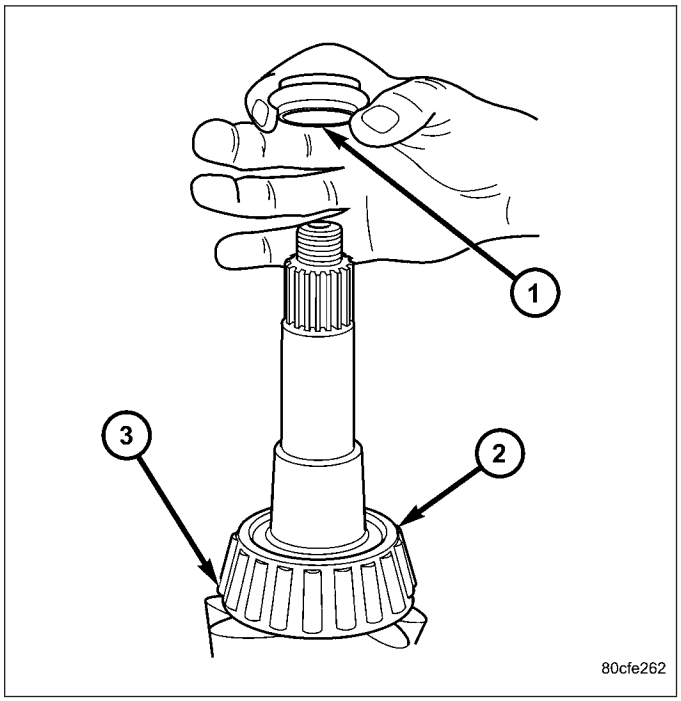


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7. Install rear bearing (4) on the pinion (3) with Installer C-3095-A (2) and a press (1).



8. Install a **new** collapsible spacer (1) on the pinion shaft.
9. Lubricate rear pinion bearing and install pinion gear into the housing.
10. Install companion flange with Installer C-3718 and Holder 6719.

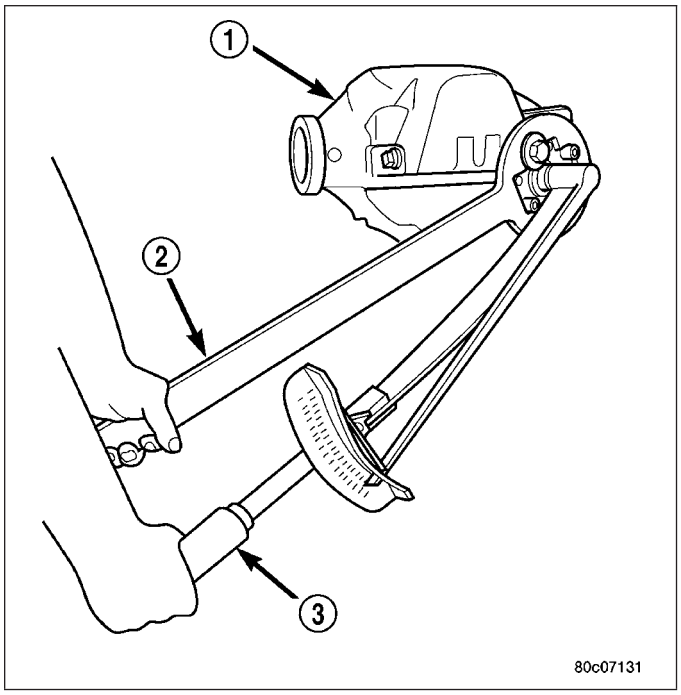


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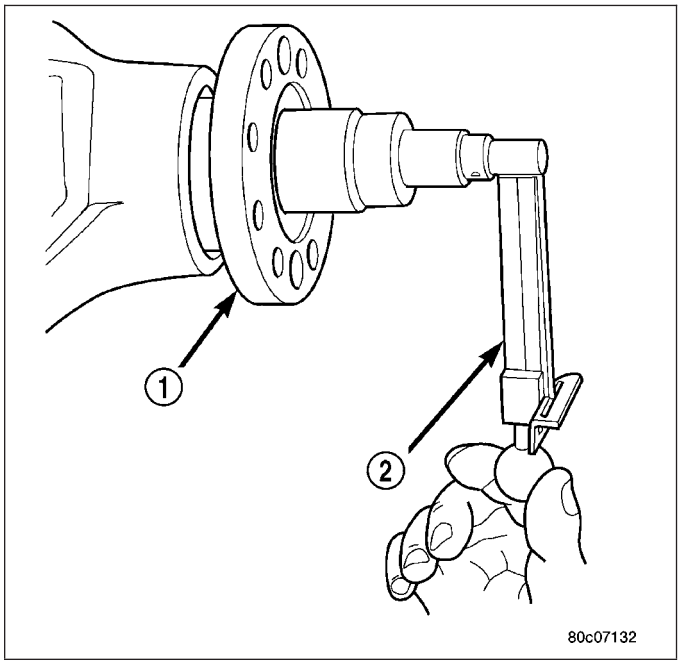
11. Install bolts into two of the threaded holes in the companion flange 180° apart.
12. Position Holder 6719 (2) against the companion flange and install a bolt and washer into one of the remaining threaded holes. Tighten the bolts so the Holder 6719 is held to the flange.
13. Install companion flange washer and a **new** nut on the pinion and tighten the nut until there is zero bearing end-play.
14. With a torque wrench (3) tighten the nut to 285 N·m (210 ft. lbs.).

CAUTION: Never loosen pinion nut to decrease pinion rotating torque and never exceed specified preload torque. Failure to follow these instruction will damage the collapsible spacer.

15. Slowly tighten the nut in 6.8 N·m (5 ft. lbs.) increments until the desired rotating torque is achieved. Measure pinion rotating torque frequently to avoid over crushing the collapsible spacer.



16. Check pinion rotating torque with an inch pound torque wrench (2). The pinion rotating torque should be:
    - Original Bearings: 1 to 3 N·m (10 to 20 in. lbs.).
    - New Bearings: 1.7 to 5 N·m (15 to 35 in. lbs.).
17. Position exciter ring on differential case. With a brass drift, slowly and evenly tap the exciter ring into position.

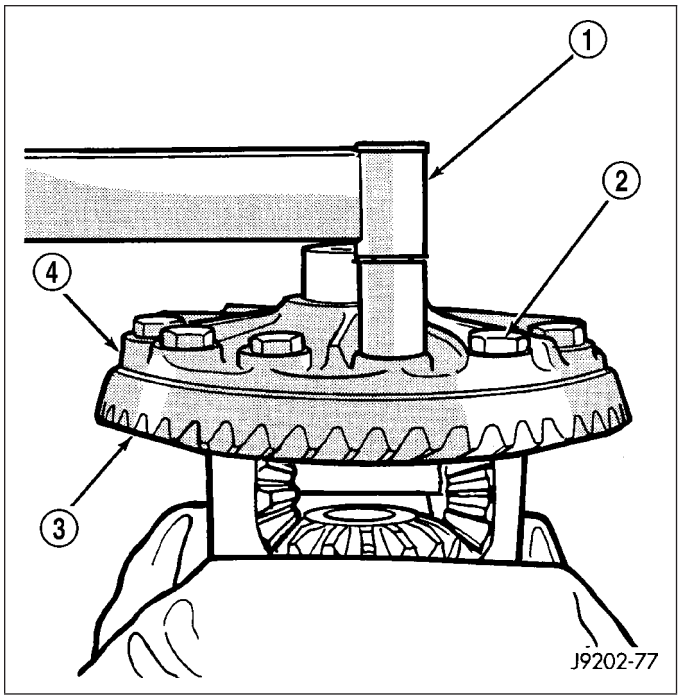


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18. Position ring gear (3) on the differential case (4) and start two ring gear bolts (2). This will provide case-to-ring gear bolt hole alignment.
19. Invert the differential case in the vise.
20. Install **new** ring gear bolts and alternately tighten to 156 N·m (115 ft. lbs.).

CAUTION: Never reuse the ring gear bolts. Failure to follow these instruction will damage will damage the bolts.

21. Install differential in housing and verify gear mesh, backlash and contact pattern.
22. Install axle shafts.
23. Install differential cover and fill with gear lubricant.
24. Install propeller shaft with reference marks aligned.



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REAR AXLE - 10 1/2 AA

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REAR AXLE - 10 1/2 AA

DIAGNOSIS AND TESTING

REAR AXLE-10 1/2 AA

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, incorrect pinion depth, tooth contact, worn/damaged gears, or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant.
- Incorrect ring gear backlash.
- Gear damage.

Differential side gears and pinions can be checked by turning the vehicle. The side gears are loaded during turns. They usually do not cause noise during straight-ahead driving when the gears are unloaded. A worn pinion shaft can also cause a snapping or a knocking noise.

BEARING NOISE

The axle shaft, differential and pinion bearings can all produce noise when worn or damaged. Bearing noise can be either a whining, or a growling sound.

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Pinion bearings have a constant-pitch noise. This noise changes only with vehicle speed. Pinion bearing noise will be higher pitched because it rotates at a faster rate. Drive the vehicle and load the differential. If bearing noise occurs, the rear pinion bearing is the source of the noise. If the bearing noise is heard during a coast, the front pinion bearing is the source.

Differential bearings usually produce a low pitch noise. Differential bearing noise is similar to pinion bearing noise. The pitch of differential bearing noise is also constant and varies only with vehicle speed.

Axle shaft bearings produce noise and vibration when worn or damaged. The noise generally changes when the bearings are loaded. Road test the vehicle. Turn the vehicle sharply to the left and to the right. This will load the bearings and change the noise level. Where axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 m.p.h.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joint(s).
- Worn side-gear thrust washers.
- Worn pinion shaft bore.

VIBRATION

Vibration at the rear of the vehicle is usually caused by:

- Damaged drive shaft.
- Missing drive shaft balance weight(s).
- Worn or out-of-balance wheels.
- Loose wheel lug nuts.
- Worn U-joint(s).
- Loose/broken springs.
- Damaged axle shaft bearing(s).
- Loose pinion gear nut.
- Excessive pinion yoke run out.
- Bent axle shaft(s).

Check for loose or damaged front-end components or engine/transmission mounts. These components can contribute to what appears to be a rear end vibration. Do not overlook engine accessories, brackets and drive belts.

NOTE: All driveline components should be examined before starting any repair.

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear (or the clutch engaged), can be caused by:

- High engine idle speed.
- Transmission shift operation.
- Loose engine/transmission/transfer case mounts.
- Worn U-joints.
- Loose spring mounts.
- Loose pinion gear nut and yoke.
- Excessive ring gear backlash.
- Excessive side gear to case clearance.

The source of a snap or a clunk noise can be determined with the assistance of a helper. Raise the vehicle on a hoist with the wheels free to rotate. Instruct the helper to shift the transmission into gear and listen for the noise. A mechanics stethoscope is helpful in isolating the source of a noise.

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DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose.	1. Tighten loose nuts.
	2. Faulty, brinelled wheel bearing.	2. Replace bearing.
Axle Shaft Noise	1. Misaligned axle tube.	1. Inspect axle tube alignment. Correct as necessary.
	2. Bent or sprung axle shaft.	2. Inspect and correct as necessary.
Axle Shaft Broke	1. Misaligned axle tube.	1. Replace the broken shaft after correcting tube mis-alignment.
	2 Vehicle overloaded.	2. Replace broken shaft and avoid excessive weight on vehicle.
	3. Erratic clutch operation.	3. Replace broken shaft and avoid or correct erratic clutch operation.
	4. Grabbing clutch.	4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	1. Improper adjustment of the differential bearings.	1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly.
	2. Excessive ring gear backlash.	2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly.
	3. Vehicle overloaded.	3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight.
	4. Erratic clutch operation.	4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.
Differential Gears Scored	1. Insufficient lubrication.	1. Replace scored gears. Fill differential with the correct fluid type and quantity.
	2. Improper grade of lubricant.	2. Replace scored gears. Fill differential with the correct fluid type and quantity.
	3. Excessive spinning of one wheel/tire.	3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	1. Lubricant level too high.	1. Drain lubricant to the correct level.
	2. Worn axle shaft seals.	2. Replace seals.
	3. Cracked differential housing.	3. Repair as necessary.
	4. Worn pinion seal.	4. Replace seal.
	5. Worn/scored yoke.	5. Replace yoke and seal.
	6. Axle cover not properly sealed.	6. Remove, clean, and re-seal cover.

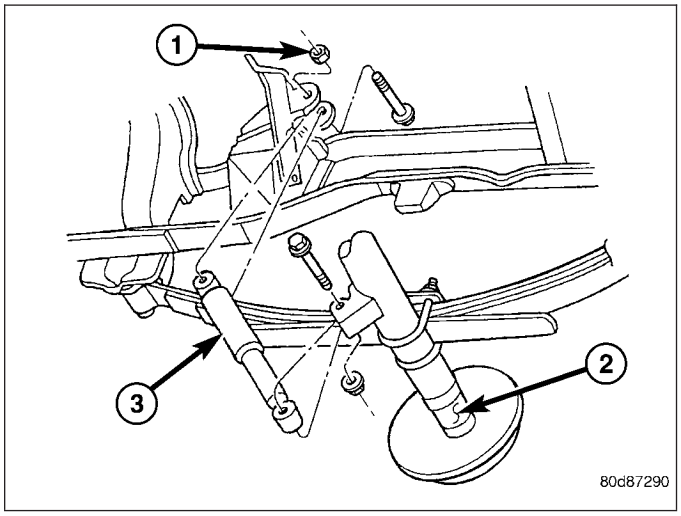
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Condition	Possible Causes	Correction
Axle Overheating	1. Lubricant level low.	1. Fill differential to correct level.
	2. Improper grade of lubricant.	2. Fill differential with the correct fluid type and quantity.
	3. Bearing pre-loads too high.	3. Re-adjust bearing pre-loads.
	4. Insufficient ring gear backlash.	4. Re-adjust ring gear backlash.
Gear Teeth Broke	1. Overloading.	1. Replace gears. Examine other gears and bearings for possible damage.
	2. Erratic clutch operation.	2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation.
	3. Ice-spotted pavement.	3. Replace gears and examine remaining parts for damage.
	4. Improper adjustments.	4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.
Axle Noise	1. Insufficient lubricant.	1. Fill differential with the correct fluid type and quantity.
	2. Improper ring gear and pinion adjustment.	2. Check ring gear and pinion contact pattern. Adjust backlash or pinion depth.
	3. Unmatched ring gear and pinion.	3. Replace gears with a matched ring gear and pinion.
	4. Worn teeth on ring gear and/or pinion.	4. Replace ring gear and pinion.
	5. Loose pinion bearings.	5. Adjust pinion bearing pre-load.
	6. Loose differential bearings.	6. Adjust differential bearing pre-load.
	7. Mis-aligned or sprung ring gear.	7. Measure ring gear run-out. Replace components as necessary.
	8. Loose differential bearing cap bolts.	8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued tot he proper specification.
	9. Housing not machined properly.	9. Replace housing.

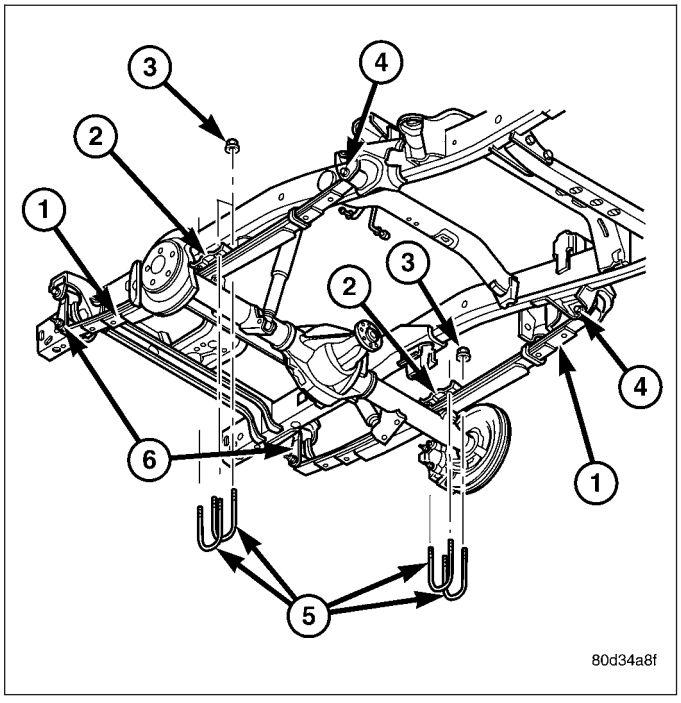
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REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Position a lift under axle and secure lift to the axle.
3. Remove all brake components.
4. Remove axle vent hose.
5. Mark propeller shaft and companion flange for installation alignment reference.
6. Remove propeller shaft.
7. Remove shock absorbers (3) from axle (2).



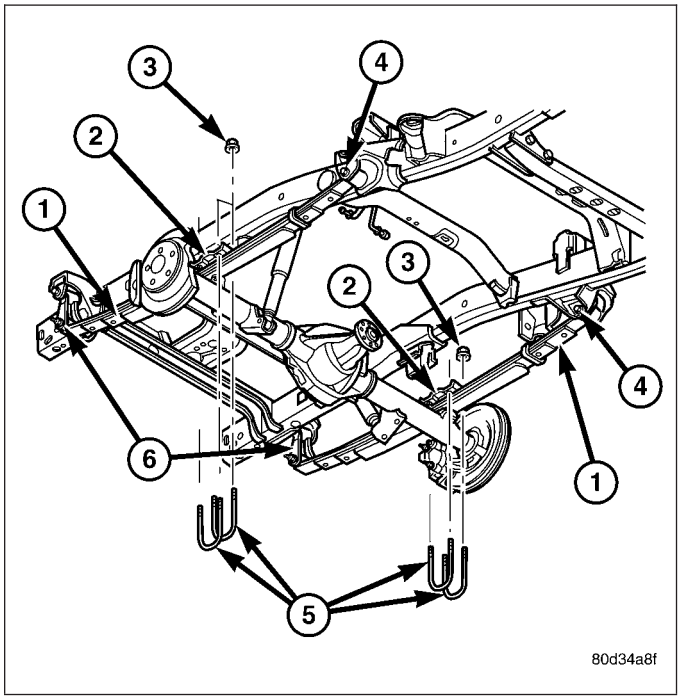
8. Remove U-bolts (5) from axle.
9. Remove axle from the vehicle.



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INSTALLATION

1. Raise axle with lift and align to the leaf spring centering bolts.
2. Install axle U-bolts (5) and tighten to 149 N·m (110 ft. lbs.).
3. Install shock absorbers to axle and tighten to specification.
4. Install all brake components.
5. Install axle vent hose.
6. Install propeller shaft with reference marks aligned and tighten to specification.
7. Fill differential to specifications.



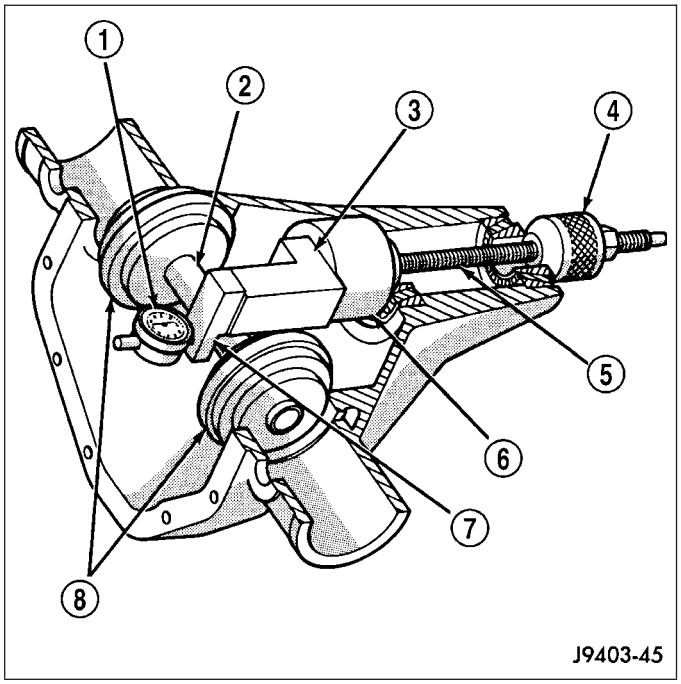
ADJUSTMENTS

PINION DEPTH MEASUREMENT

Ring and pinion gears are supplied as matched sets. Compensation for pinion depth variance is achieved with a select shim. The shim is located between the rear pinion bearing and the pinion gear head.

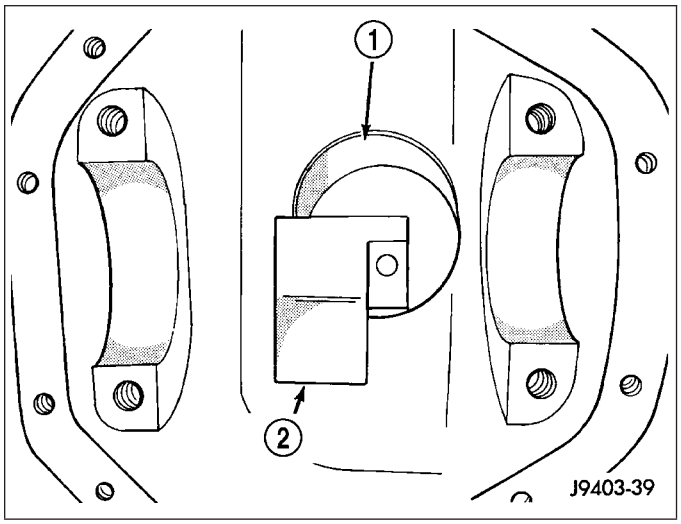
Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take measurements with Pinion Gauge Set and Dial Indicator C-3339.

1. Assemble Pinion Height Block 6739 (3), Pinion Block 8899 (6) and rear pinion bearing onto Screw 6741 (5).



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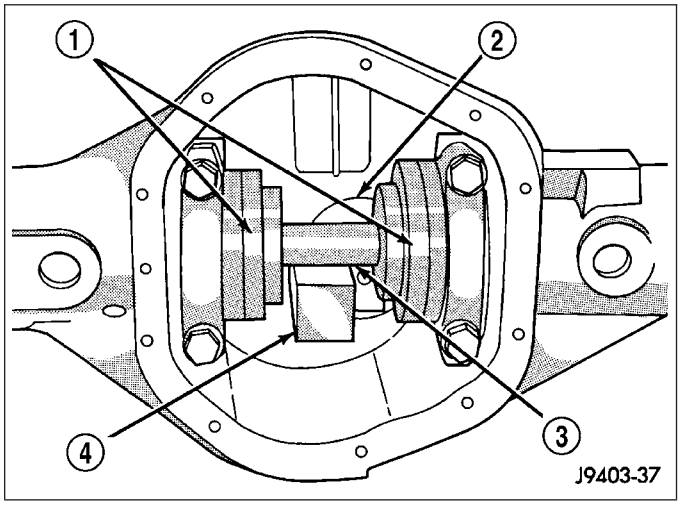
2. Insert pinion block (1), pinion height block (2), rear bearing and screw into the housing through pinion bearing cups.
3. Install front pinion bearing and Cone-nut 6740 onto the screw. Tighten cone-nut until Torque To Rotate the screw is 1.7-2.26 N·m (15-20 in. lbs.).



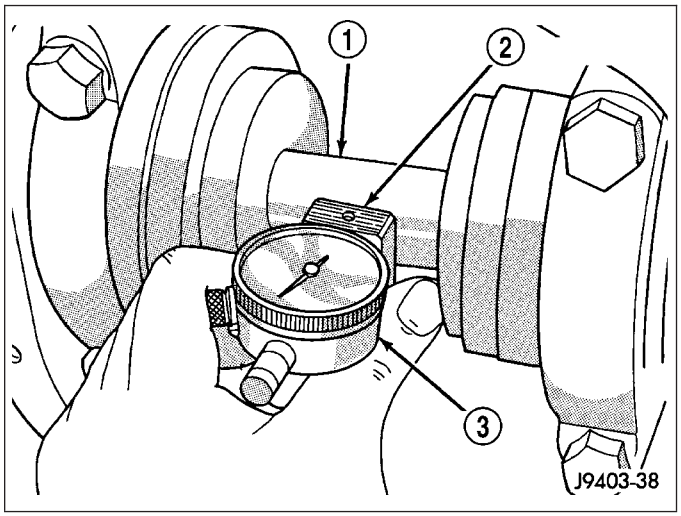
4. Place Arbor Disc 6732 (1) on Arbor D-115-3 (3) in position in the housing side bearing cradles.
5. Install differential bearing caps on arbor discs (1) and snug the bearing cap bolts. Then cross tighten cap bolts to 165 N·m (122 ft. lbs.).

NOTE: Arbor should rotate freely in the arbor discs.

6. Assemble Dial Indicator C-3339 into Scooter Block D-115-2 and secure set screw.



7. Position scooter block (2) with dial indicator (3) flush on the pinion height block. Hold scooter block and zero the dial indicator.
8. Slowly slide the scooter block (2) across the pinion height block over to the arbor (1). Move the scooter block till dial indicator crests the arbor, then record the highest reading.
9. Select a shim equal to the dial indicator reading.
10. Install the select shim between the rear pinion bearing and the pinion gear head.

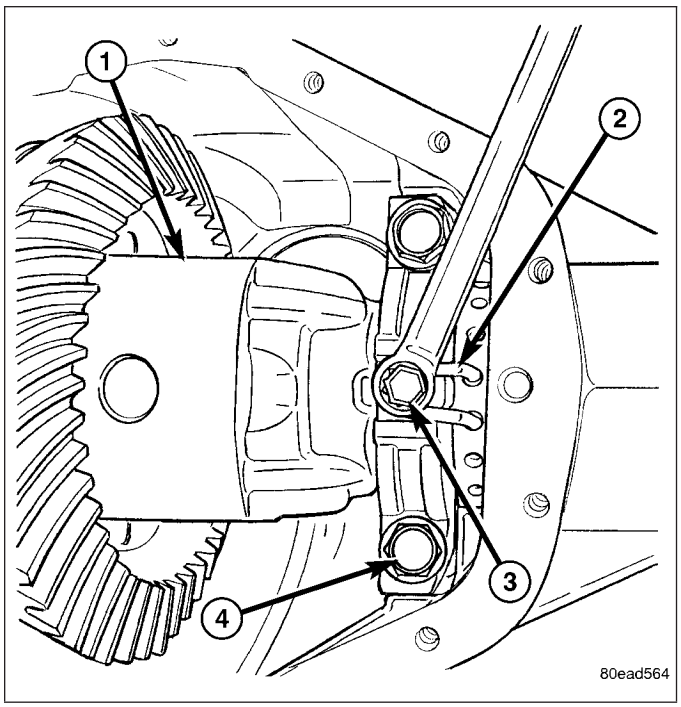


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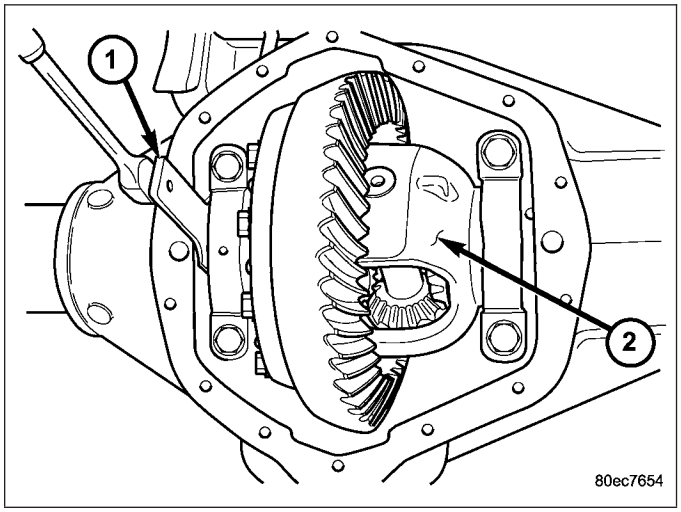
DIFFERENTIAL CASE BEARING PRELOAD AND GEAR BACKLASH

Backlash is adjusted by moving the adjusters in and out or both. By moving the adjusters the case/ring gear will move closer or further away from the pinion. In most cases this adjustment can be used to achieve the correct gear tooth pattern and set the case bearing preload.

1. Remove adjuster lock bolts (3) and adjuster locks (2).
2. Loosen the differential bearing cap bolts (4).
3. Slide differential case (1) toward the pinion gear until the gears make contact/zero backlash. If zero backlash cannot be obtained, turn the pinion side adjuster until zero backlash is obtained.



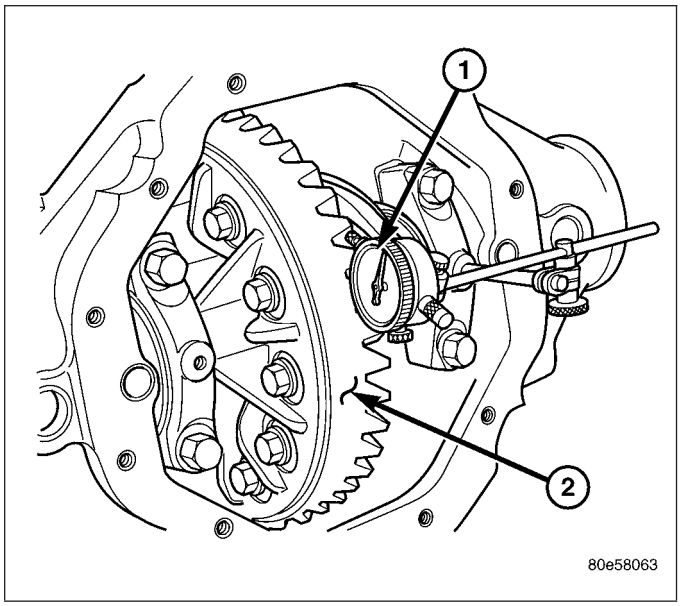
4. Holding the differential case (2) toward the pinion gear, turn bearing adjusters with Spanner Wrench 8883 (1) until they make contact with the differential bearings/cups.
5. Back off the ring gear side adjuster 4 holes, to obtain initial ring gear backlash.
6. Install ring gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
7. Tighten pinion gear side adjuster firmly against the differential case bearing cup.
8. Rotate the pinion several times to seat the deferential bearings.
9. Loosen pinion gear side adjuster until it is no longer in contact with the bearing cup, then tighten it until it makes contact.



10. Tighten pinion gear side adjuster an additional:
    - **New Bearings:** 6 Adjuster Holes
    - **Original Bearings:** 4 Adjuster Holes
11. Install pinion gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
12. Tighten bearing cap bolts to 165 N·m (122 ft. lbs.).
13. Tighten adjuster lock bolts to 33 N·m (24 ft. lbs.).

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14. Measure ring gear (2) backlash with a Dial Indicator C-3339 (1) and Dial Indicator Stud L-4438 at eight points around the drive side of the ring gear. The backlash should be 0.08-0.25 mm (0.003-0.010 in) with a preferred backlash of 0.13-0.18 mm (0.005-0.007 in).

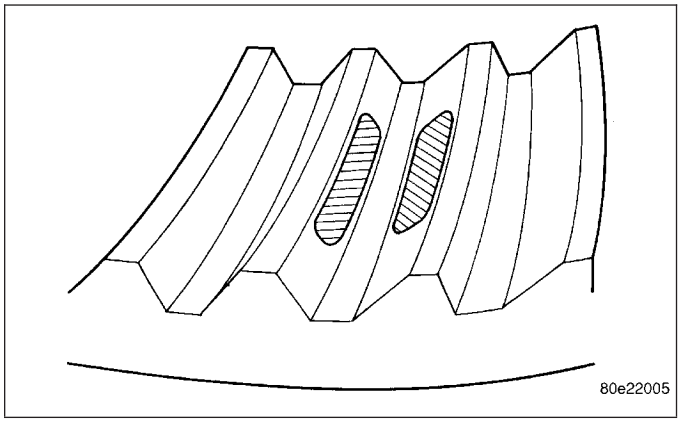


NOTE: Backlash measurement should not vary more than 0.05 mm (0.002 in) between measuring points. If measurement does vary inspect the gears for burrs, the differential case flange and ring gear mounting.

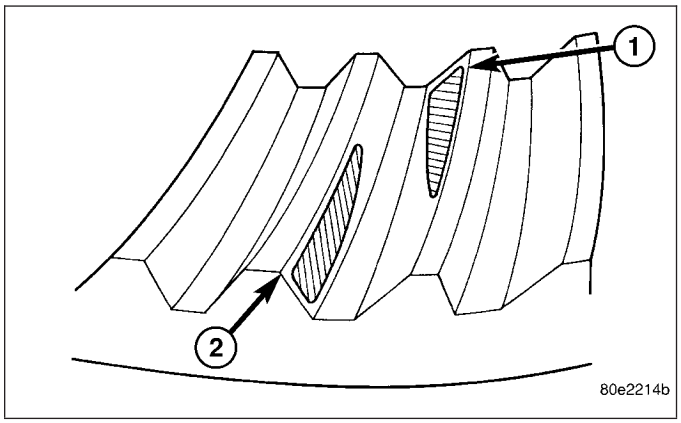
GEAR TOOTH CONTACT PATTERN

1. Wipe clean each tooth of the ring gear.
2. Apply gear marking compound to all of the ring gear teeth.
3. Verify bearing cap bolts are torque to specification.
4. Apply parking brakes lightly to create at 14 N·m (10 ft. lbs.) pinion rotating torque.
5. Rotate the pinion/pinion yoke 4 full revolutions in each directions.
6. Read gear tooth contact pattern.

Gear contact pattern correct. Backlash and pinion depth is correct.

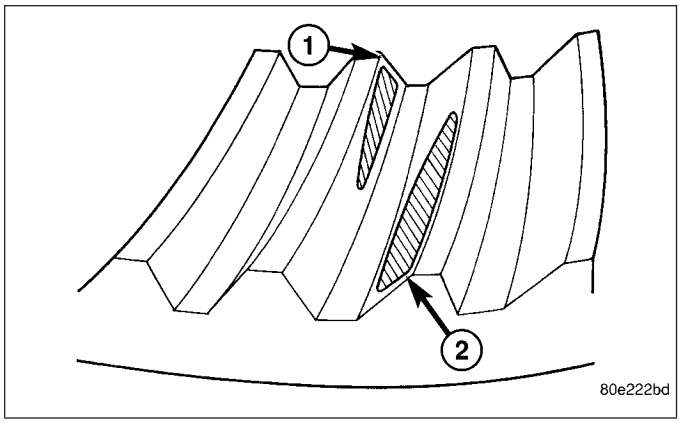


Ring gear too far away from pinion gear, coast side toe (1) and drive side heel (2). Decrease the backlash, by moving the ring closer to the pinion gear using the adjusters.

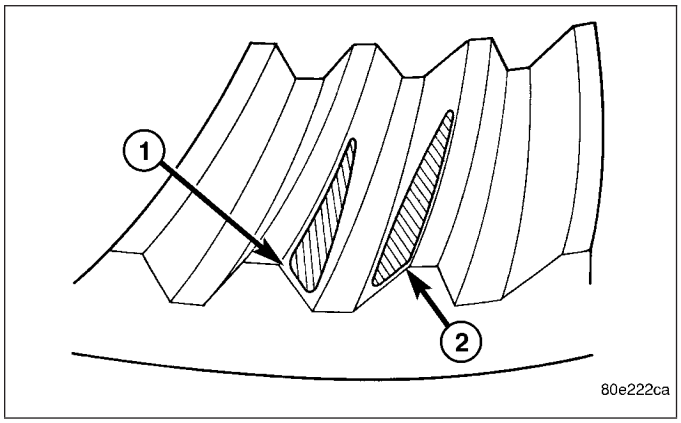


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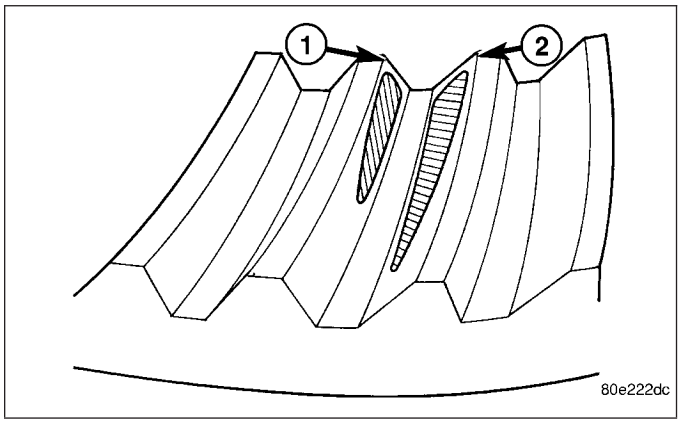
Ring gear too close to pinion gear, drive side toe (1) and coast side heel (2). Increase the backlash, by moving the ring away from the pinion gear using the adjusters.



Ring gear too far away from pinion gear, drive side heel (1) and coast side heel (2). Decrease the backlash, by moving the ring closer to the pinion gear using the adjusters.

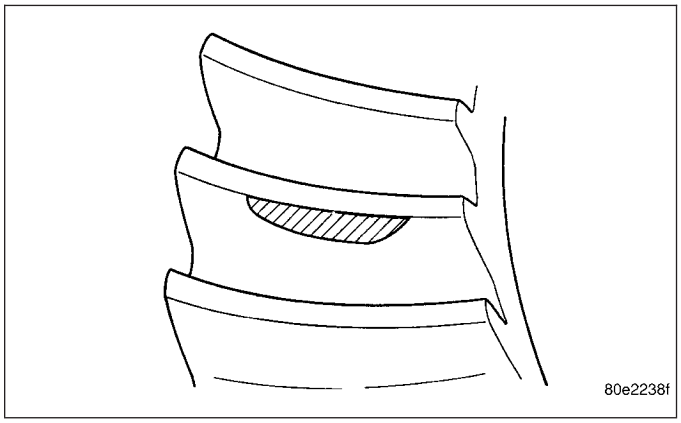


Ring gear too close to pinion gear, drive side toe (1) and coast side toe (2). Increase the backlash, by moving the ring away from the pinion gear using the adjusters.

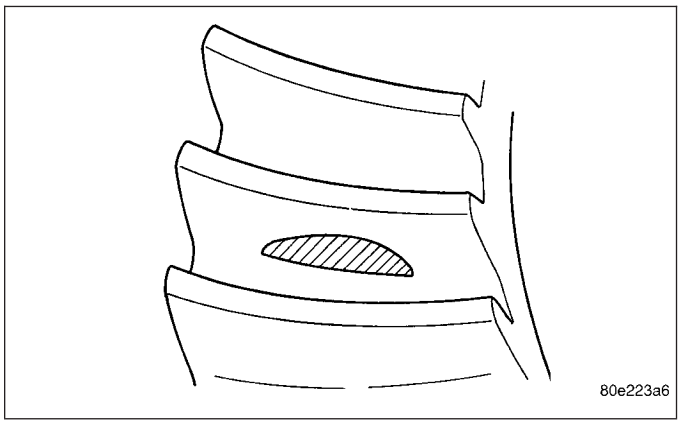


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Pinion gear is set too low. Increase the pinion gear height, by increasing the pinion depth shim thickness.



Pinion gear is set too high. Decrease the pinion depth, by decreasing the pinion depth shim thickness.



SPECIFICATIONS

AXLE SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Axle Ratio	3.73, 4.10, 4.56
Ring Gear Diameter	266 mm (10.5 in.)
Ring Gear Backlash	0.13-0.18 mm (0.005-0.007 in.)
Pinion Bearing Preload - New Bearings	1.69-2.82 N·m (15-25 in. lbs.)
Pinion Bearing Preload - Original Bearings	1-2 N·m (10-20 in. lbs.)
Pinion Bearing Preload + Diff Case Bearing Preload - New Bearings	3.4-5.6 N·m (30-50 in. lbs.)
Pinion Bearing Preload + Diff Case Bearing Preload - Original Bearings	2.8-5.1 N·m (25-45 in. lbs.)

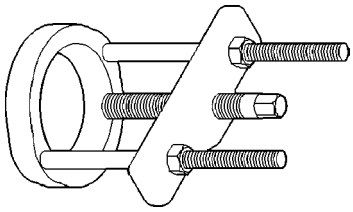
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TORQUE SPECIFICATIONS

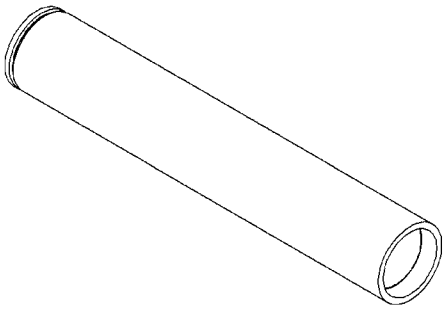
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Fill Hole Plug	32	24	-
Differential Cover Bolts	40	30	-
Bearing Cap Bolts	165	122	-
Ring Gear Bolts	237	175	-
Axle Flange Bolts	129	95	-
Adjuster Lock Bolt	25	18	-

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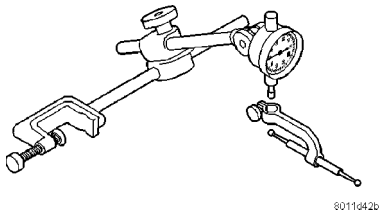
SPECIAL TOOLS



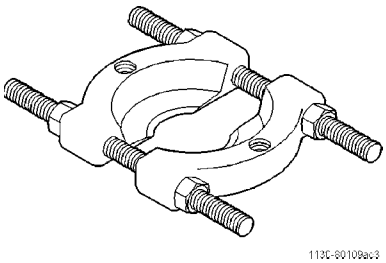
PULLER C-293-PA



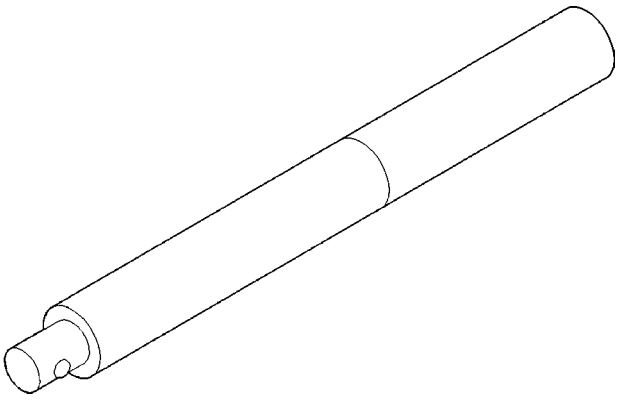
BEARING INSTALLER MD-998805



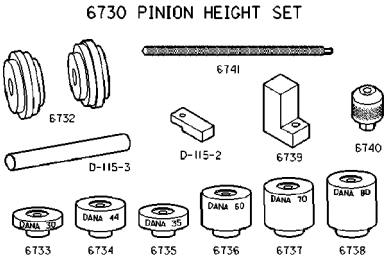
DIAL INDICATOR C-3339



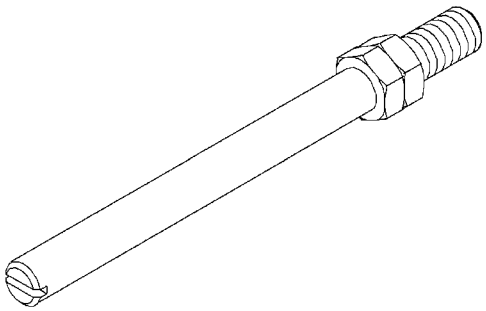
SPLITTER 1130



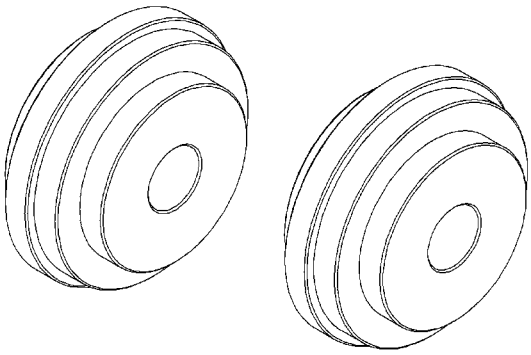
HANDLE C-4171



PINION DEPTH GAUGE 6730

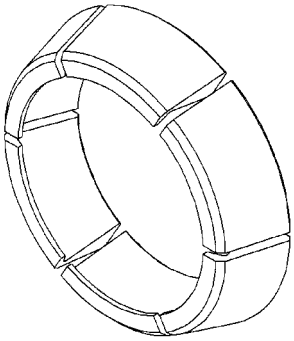


PILOT STUD L-4438

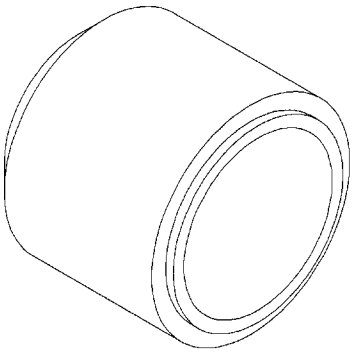


ARBOR DISCS 6732

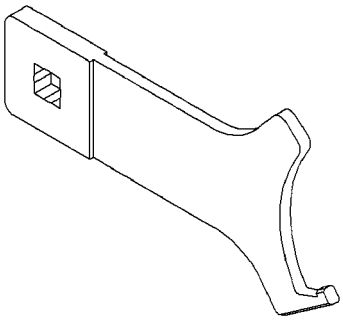
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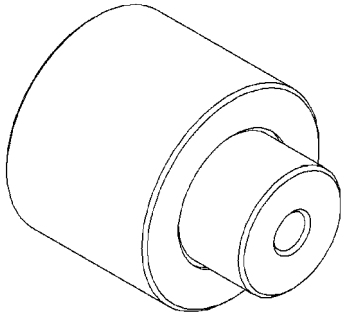
ADAPTERS 8879



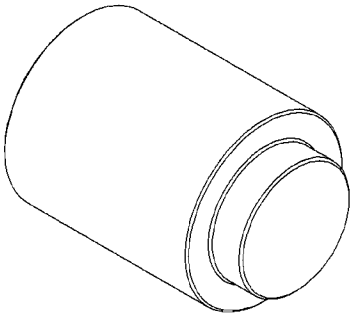
SEAL INSTALLER 8896



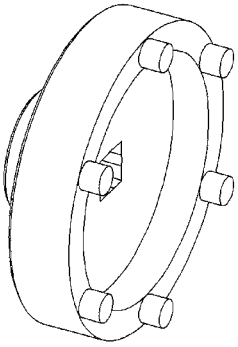
ADJUSTER WRENCH 8883



GAUGE BLOCK 8899

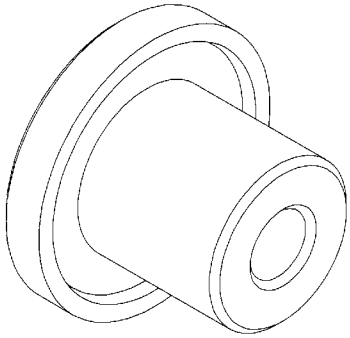


PLUG 8888

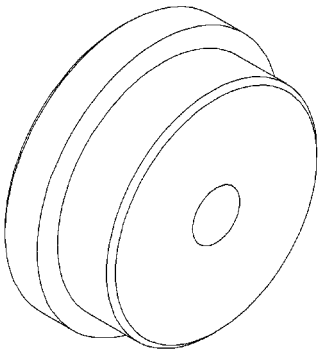


SOCKET 8954

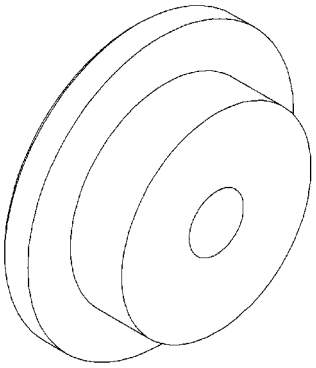
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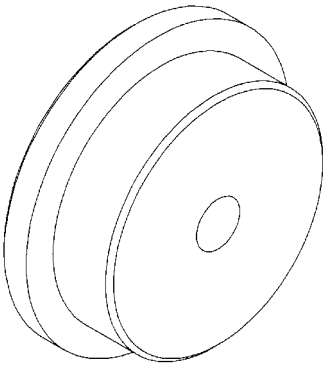
BEARING INSTALLER 8956



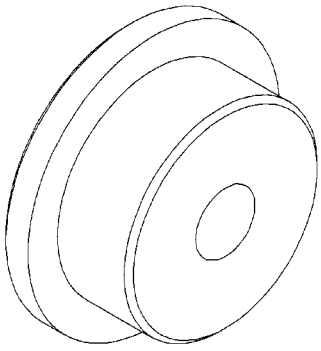
CUP INSTALLER 8961



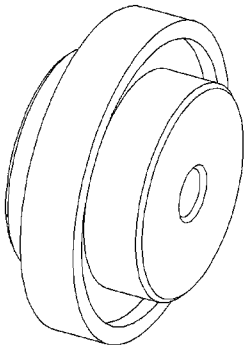
CUP INSTALLER 8959



CUP INSTALLER 8962

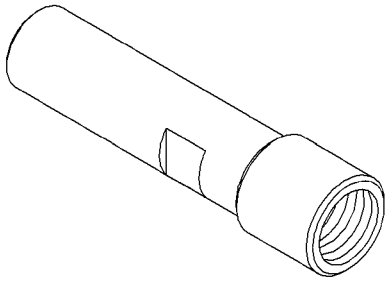


CUP INSTALLER 8960

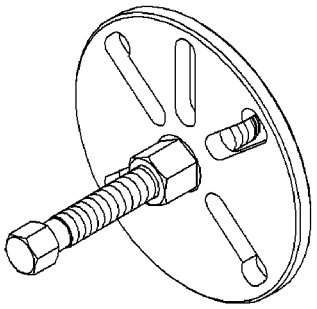


SEAL INSTALLER 8963

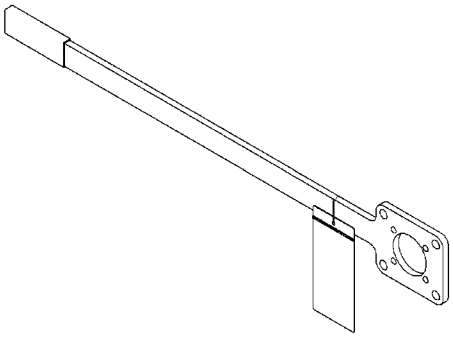
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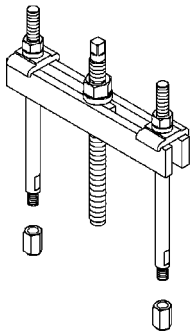
PINION DRIVER 8977



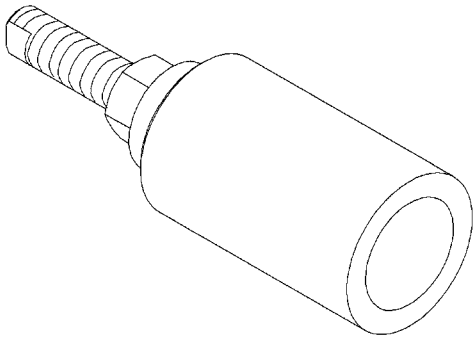
FLANGE PULLER 8992



FLANGE WRENCH 8979



BRIDGE 938



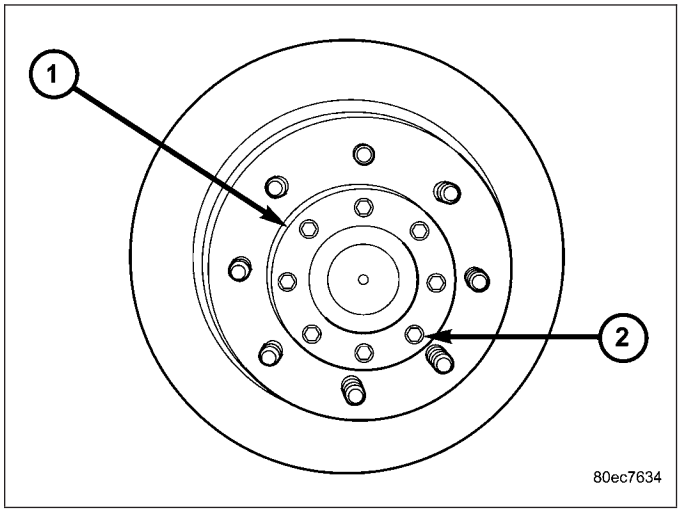
BEARING INSTALLER 8981

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SHAFT-AXLE

REMOVAL

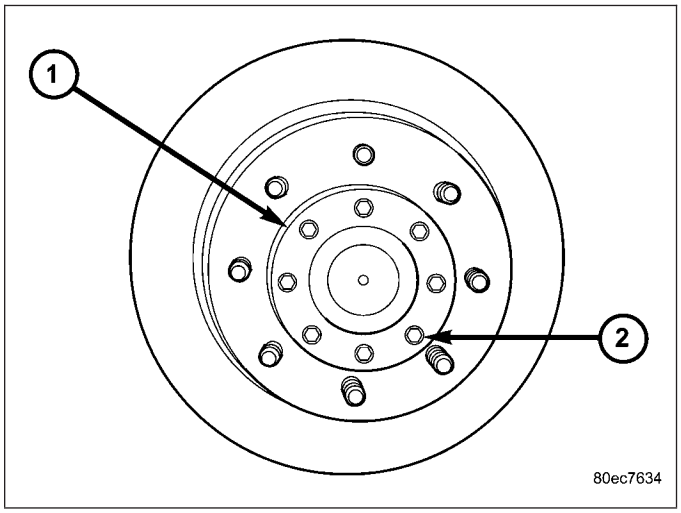
1. Remove axle shaft flange (1) bolts (2).
2. Slide axle shaft out of the axle tube.
3. Remove axle shaft gasket.



INSTALLATION

NOTE: Axle flange bolts must be replaced or cleaned existing bolts apply Mopar Lock N' Seal or Loctite® 242 on the threads.

1. Clean axle flange and hub.
2. Install new axle shaft gasket.
3. Slide axle shaft into the axle tube.
4. Install axle shaft flange (1) bolts (2) and tighten to 129 N·m (95 ft. lbs.).

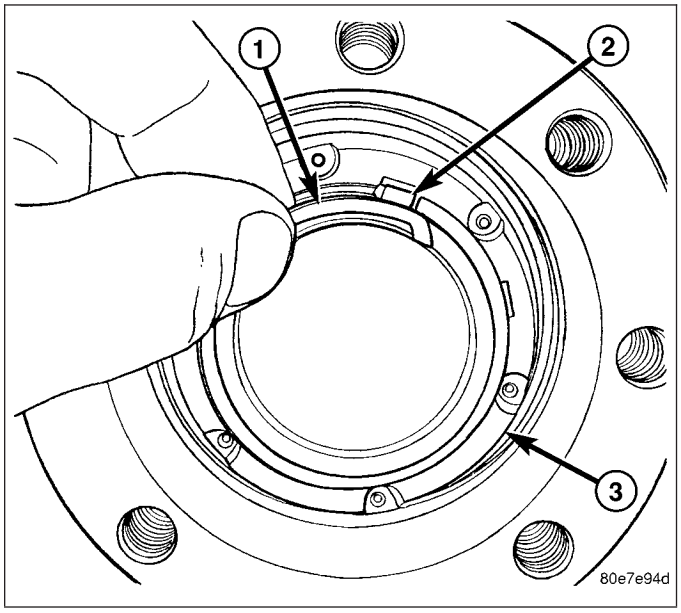


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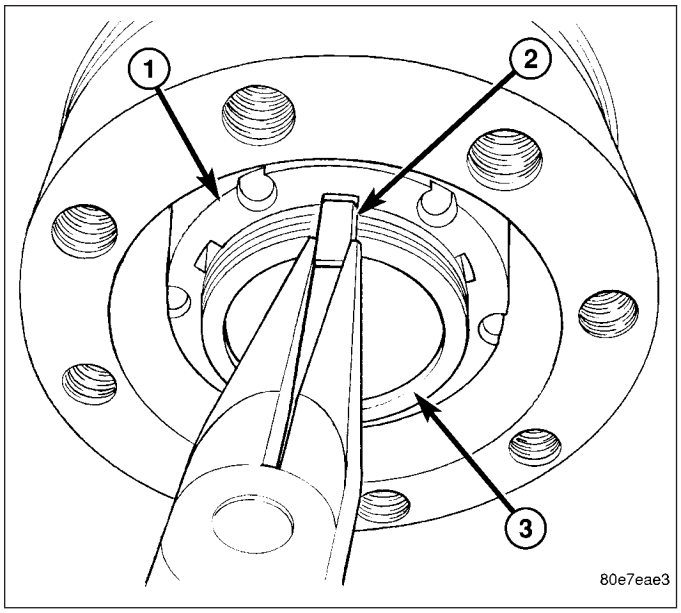
BEARING-AXLE HUB

REMOVAL

1. Remove axle shaft flange bolts and remove axle shaft.
2. Remove retianer ring (1) from the axle shaft tube.



3. Remove hub bearing nut (1) locking key (2).
4. Remove hub bearing nut with Socket 8954.
5. Remove hub and bearings from the axle.

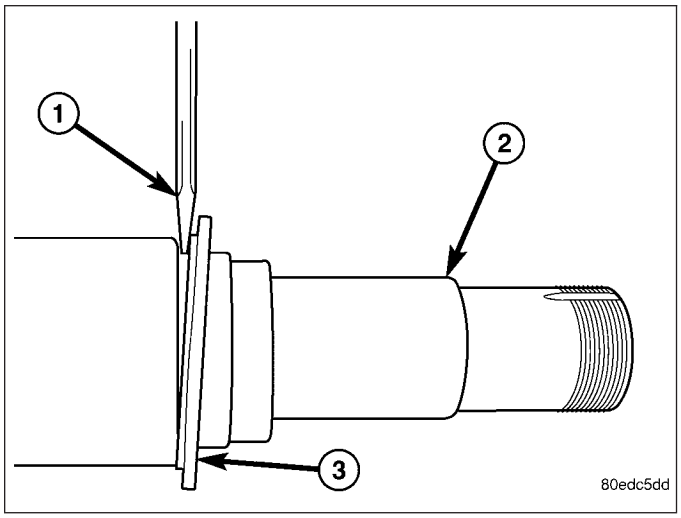


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6. Pry out hub bearing seal from the back of the hub.

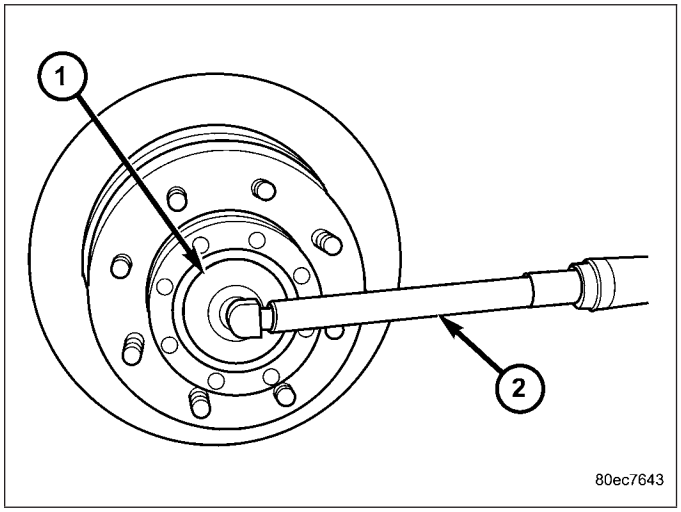
NOTE: The inner part of the seal (3) may stay on the axle tube (2). This part must also be removed.

7. Remove rear bearing.
8. Remove hub bearing cups with a hammer and drift.

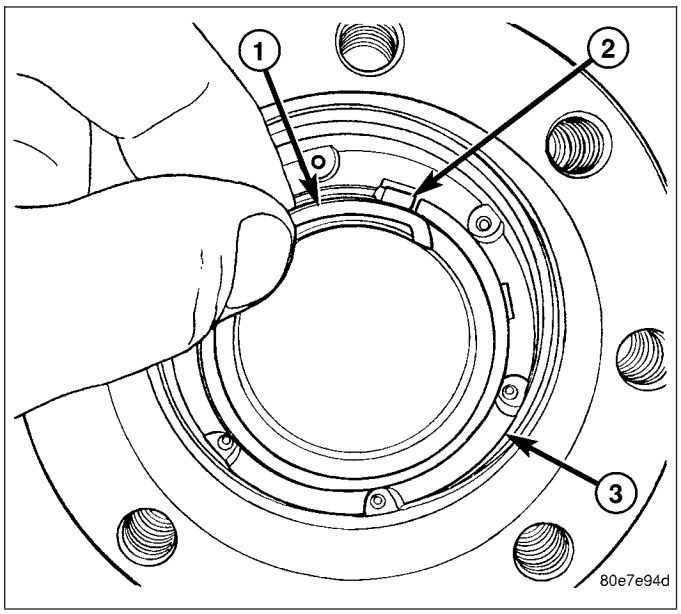


INSTALLATION

1. Install outer hub bearing cup with Installer 8961 and Handle C-4171.
2. Install inner hub bearing cup with Installer 8962 and Handle C-4171.
3. Pack bearings with the appropriate grease.
4. Install rear bearing and install **new** grease seal with Installer 8963 and Handle C-4171.
5. Slide hub on the axle tube and install front bearing into the hub.
6. Install hub bearing nut with Socket 8954 (1) and tighten to 30 N·m (22 ft. lbs.) while rotating the hub.
7. Back off nut about 30° and align next hub nut key slot with axle tube key slot and install locking key. End play should be 0.025-0.25 mm (0.001-0.010 in.).



8. Install retainer ring (1) with ring end in the key slot.
9. Install new axle shaft gasket and install axle shaft.

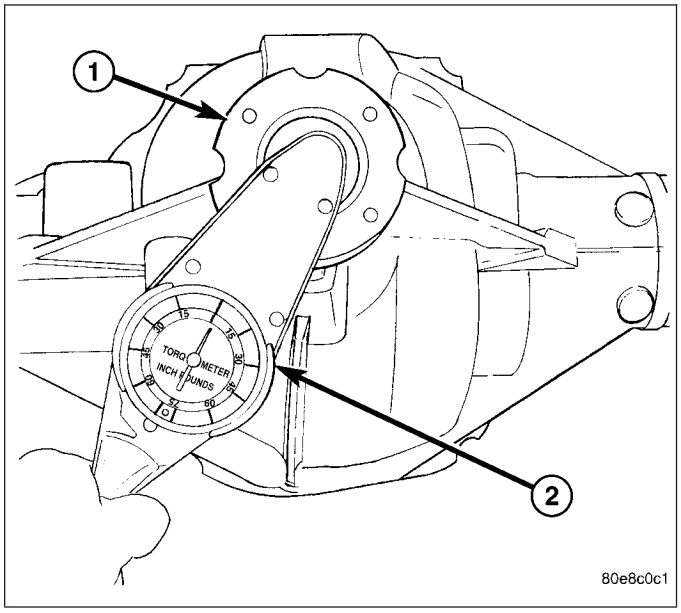


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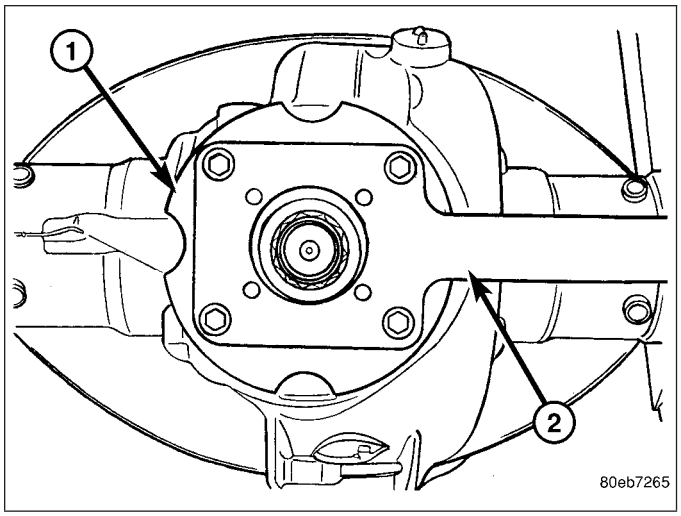
SEAL-PINION

REMOVAL

1. Remove axle shafts.
2. Mark propeller shaft and pinion flange for installation reference and remove shaft.
3. Rotate pinion gear three or four times.
4. Measure and record the amount of torque necessary to rotate the pinion gear (1) with an inch pound torque wrench (2).

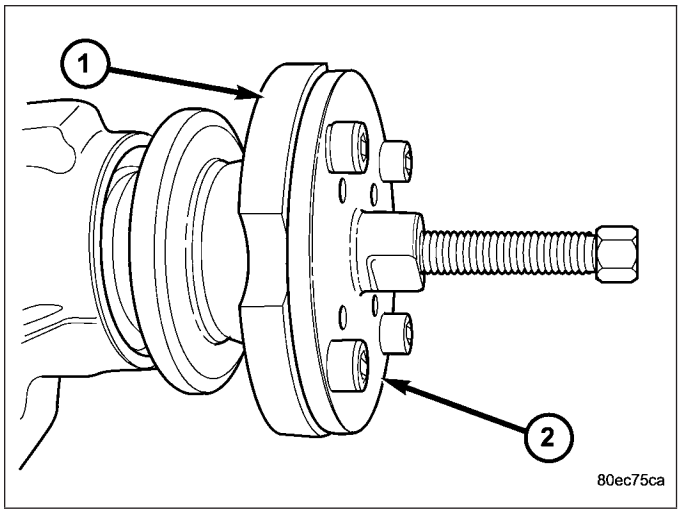


5. Hold pinion flange (1) with Flange Wrench 8979 (2) and remove pinion flange nut and washer.



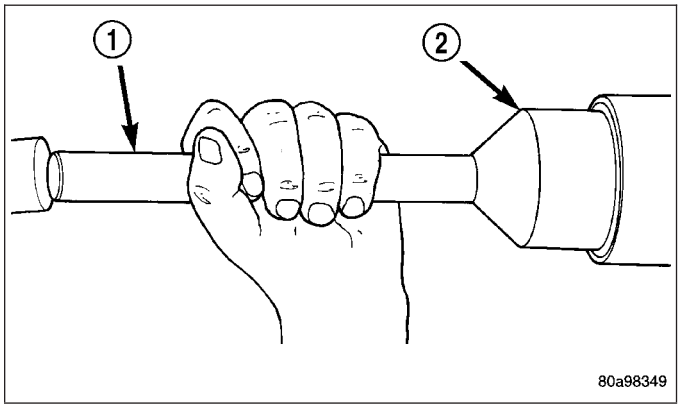
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6. Remove pinion flange (1) with Flange Puller 8992 (2).
7. Remove pinion shaft seal with a pry tool or slide hammer mounted screw.

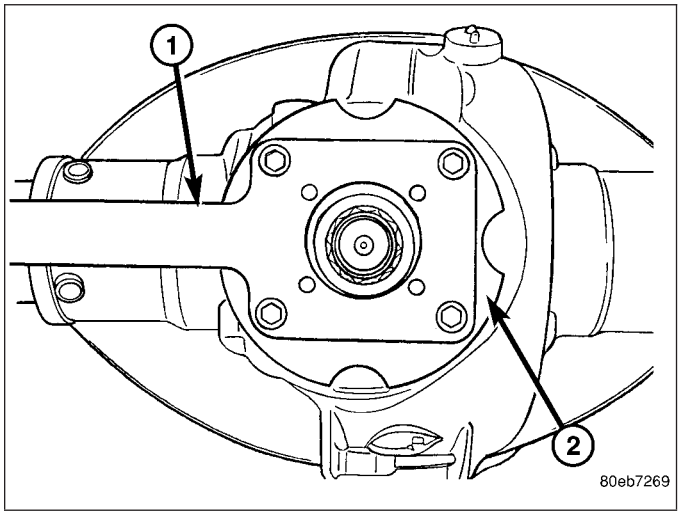


INSTALLATION

1. Install **new** pinion seal with Installer 8896 (2) and Handle C-4171 (1)
   .

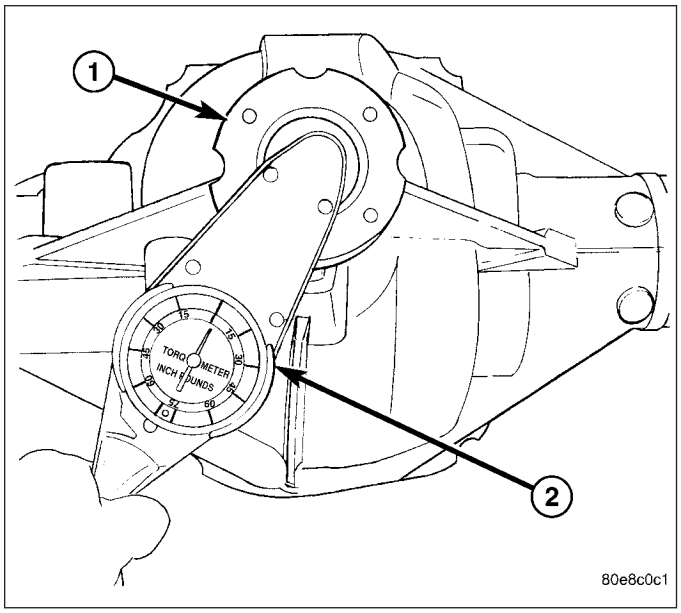


2. Apply a light coat of teflon sealant to the pinion flange splines.
3. Lightly tap the pinion flange onto the pinion until a few threads are showing.
4. Install flange washer and **new** pinion nut.
5. Hold flange (2) with Flange Wrench 8979 (1) and tighten pinion nut until pinion end play is taken up.



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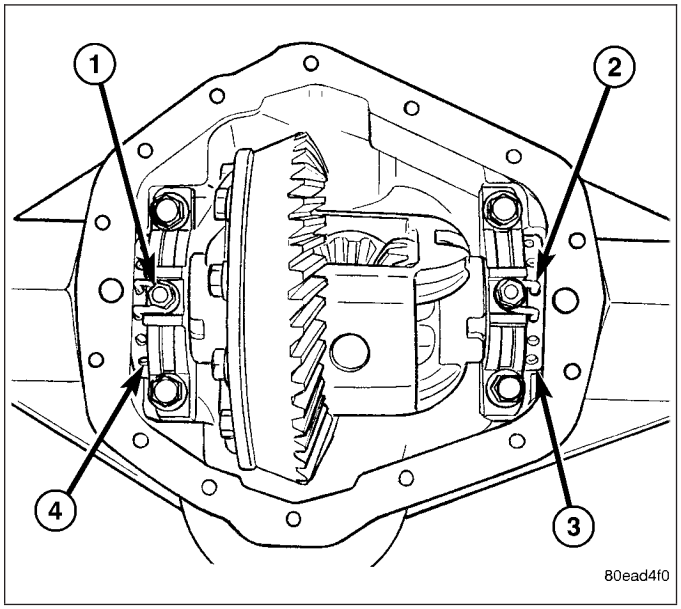
6. Rotate pinion several times to seat bearings.
7. Measure pinion (1) rotating torque with an inch pound torque wrench (2) and compare it to recorded measurement.
8. Tighten pinion nut in small increments, until pinion rotating torque is 0.40-0.57 N·m (3-5 in. lbs.) greater than recorded measurement.
9. Rotate pinion several times then verify pinion rotating torque again.
10. Install axle shafts.
11. Install propeller shaft with reference marks aligned.
12. Check and fill differential if necessary.



DIFFERENTIAL

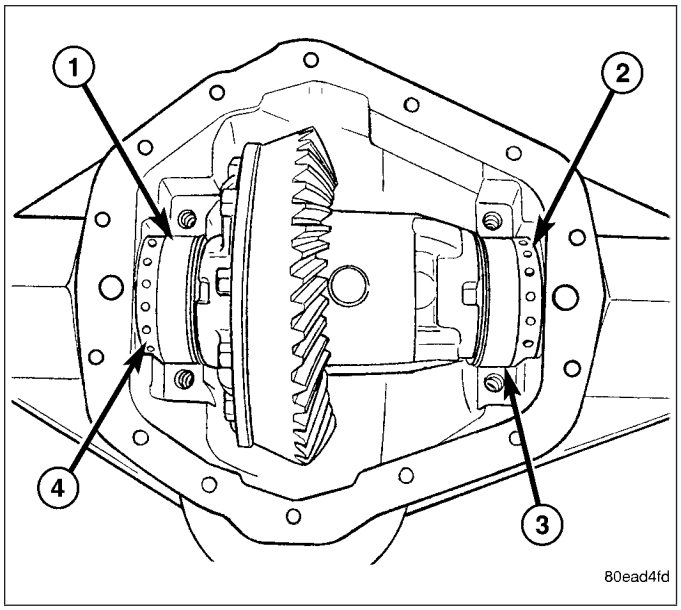
REMOVAL

1. Remove lubricant fill hole plug from the differential housing cover.
2. Remove differential housing cover and drain the lubricant from housing.
3. Remove axle shafts.
4. Remove adjuster lock bolts (1) and adjuster locks (2).
5. Mark bearing caps (4) left and right for installation reference.
6. Remove bearing cap bolts and remove bearing caps.



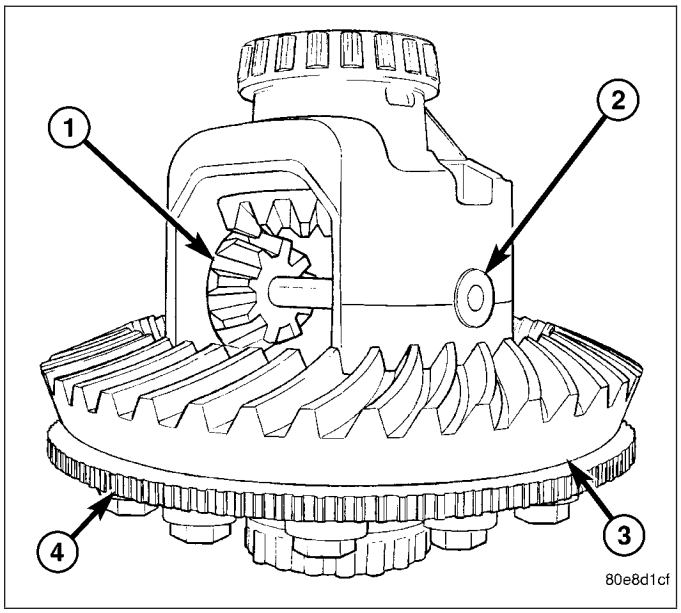
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7. Loosen differential bearing adjusters (2) (4) with Spanner Wrench 8883.
8. Remove differential case from the housing.
9. Remove bearing cups and tag them left and right for installation reference.



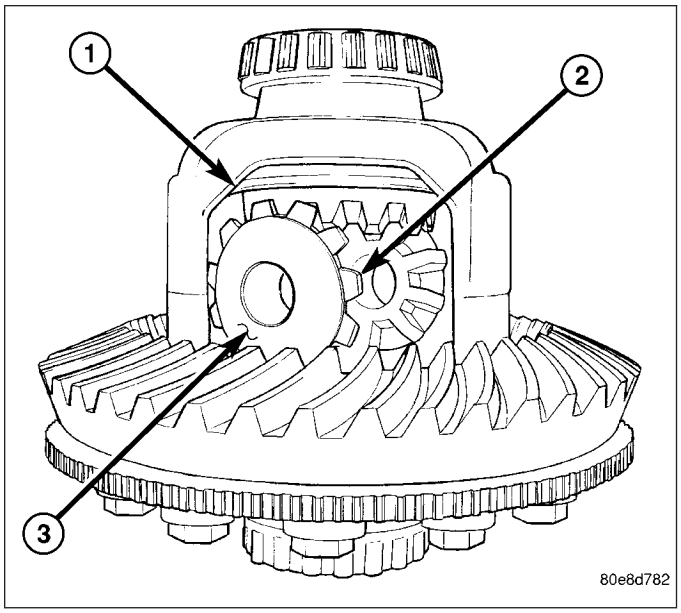
DISASSEMBLY

1. Remove pinion shaft (2) with a hammer and punch from the side with the hole in the pinion shaft.

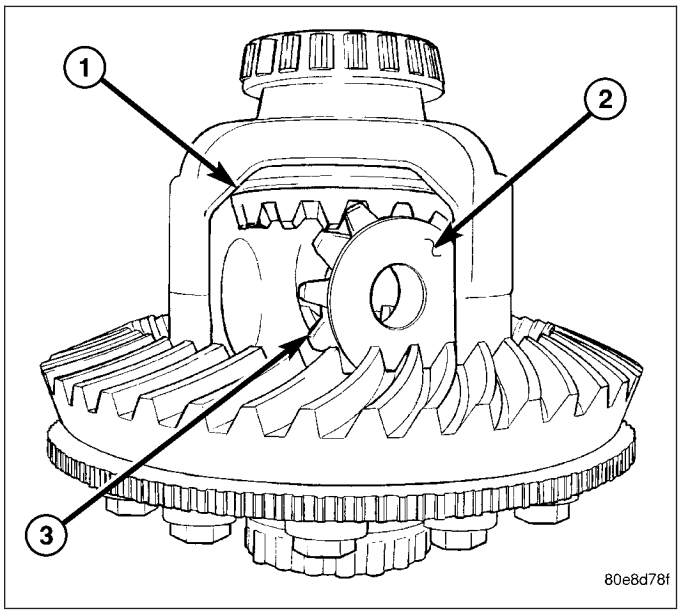


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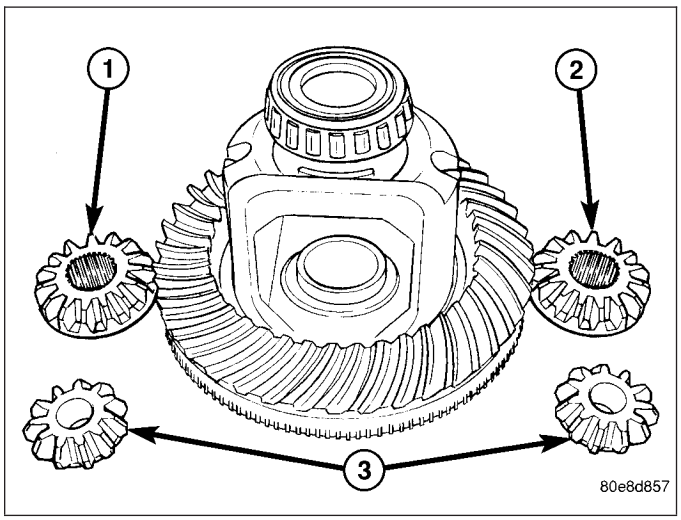
2. Rotate one pinion gear (2) with thrust washer (3) to the differential window (1) and remove the gear.



3. Rotate other pinion gear (3) with thrust washer (2) to the differential window (1) and remove the gear.



4. Remove differential side gears (1) (2) and thrust washers.

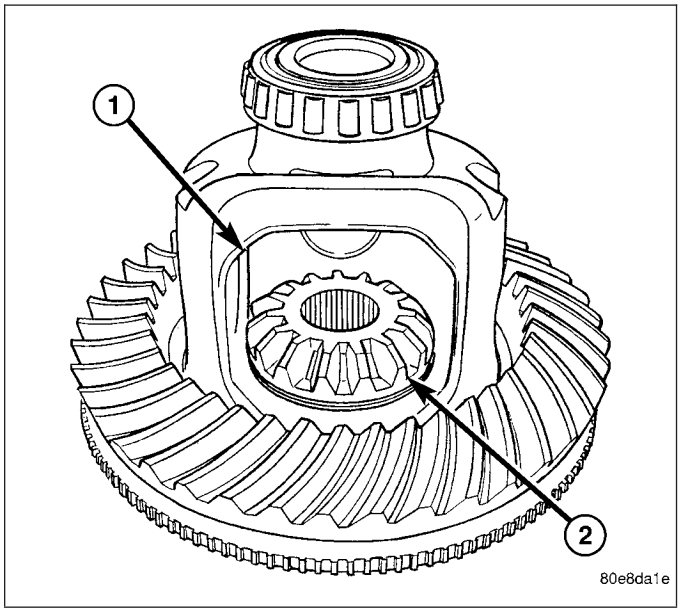


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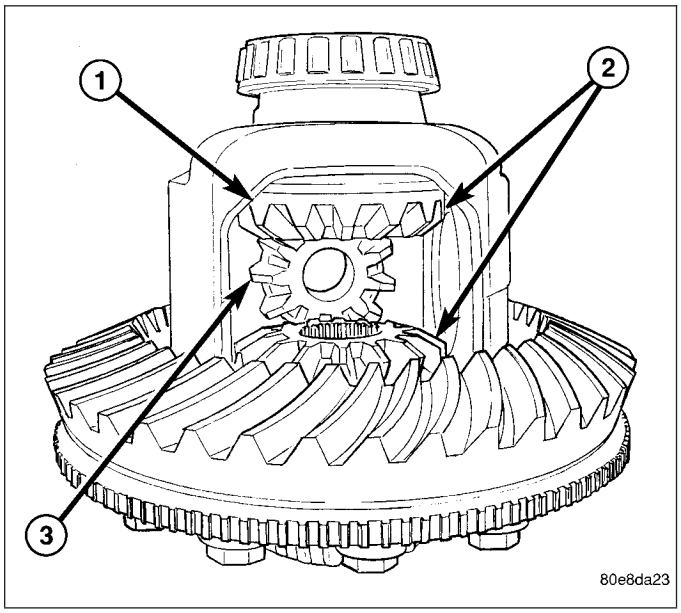
ASSEMBLY

NOTE: If the same gears and thrust washers are being used, install them into their original locations.

1. Lubricate all differential components with axle lubricant.
2. Install differential side gears (2) and thrust washers.

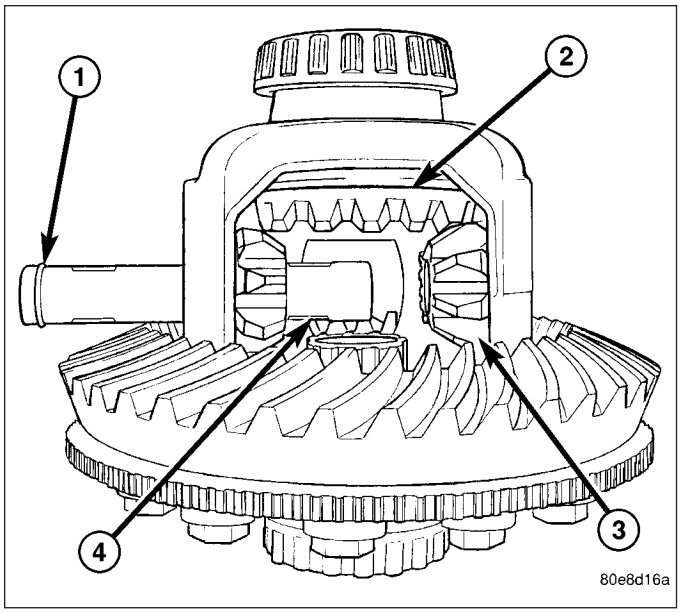


3. Install first pinion gear (3) into the differential window (1) and side gears (2). Rotate the pinion gear to the back of the case.
4. Install other pinion gear and thrust washer. Rotate the gears to align hole in the pinion gears with hole in the differential case.



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5. Slide pinion shaft (4) into the case and through the pinion gears (3). Tap the shaft to seat the pinion shaft snap-ring (1) into the case.



INSTALLATION

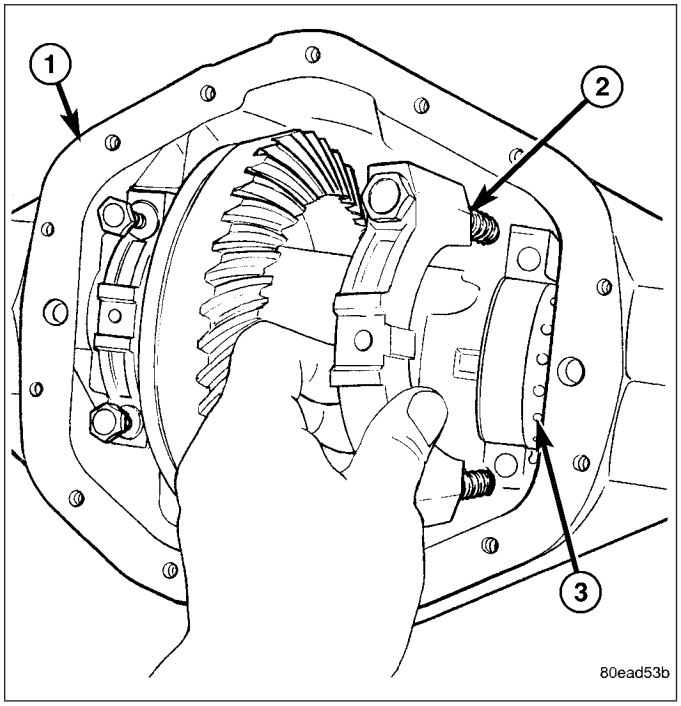
1. Clean the housing (1) cavity with a flushing oil, light engine oil or lint free cloth.

CAUTION: Do not use water, steam, kerosene or gasoline for cleaning.

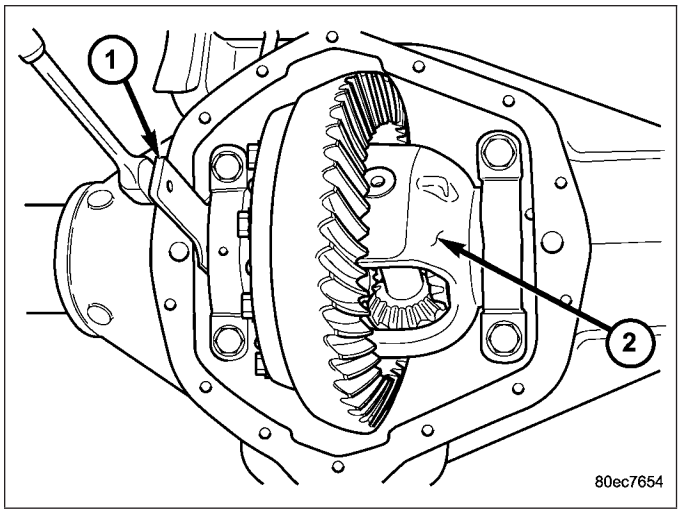
2. Lubricate differential case bearing.
3. Install differential case with bearings cups into the housing.

NOTE: A light coat of grease on the cups will hold them in place during installation.

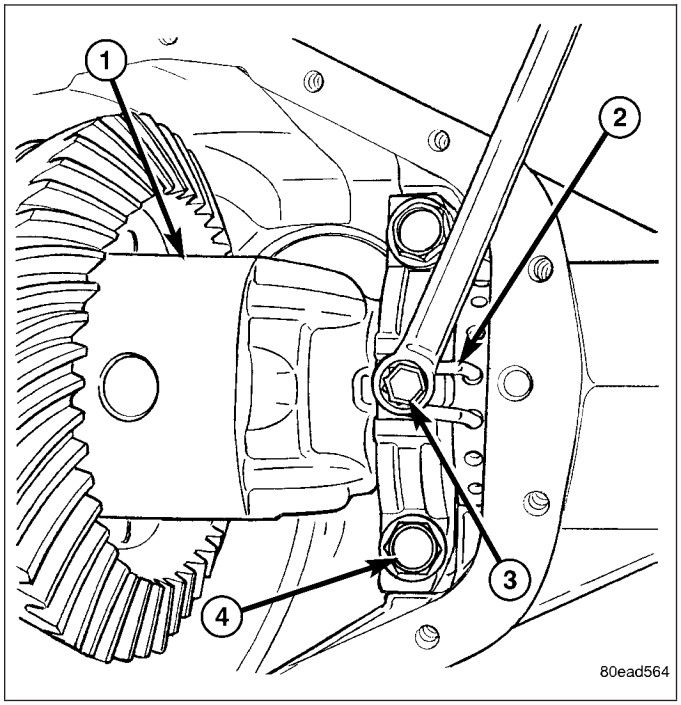
4. Install bearing caps (2) and bolts. Tighten the bearing cap bolts finger-tight.



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5. Slide differential case toward the pinion gear until the gears make contact/zero backlash. If zero backlash cannot be obtained, turn the pinion side adjuster until zero backlash is obtained.
6. Holding the differential case toward the pinion gear, turn bearing adjusters with Spanner Wrench 8883 (1) until they make contact with the differential bearings/cups.
7. Back off the ring gear side adjuster 4 holes, to obtain initial ring gear backlash.
8. Install ring gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
9. Tighten pinion gear side adjuster firmly against the differential case bearing cup.
10. Rotate the pinion several times to seat the differential bearings.
11. Loosen pinion gear side adjuster until it is no longer in contact with the bearing cup.
12. Tighten pinion gear side adjuster until it just makes contact with the bearing cup.
13. Tighten pinion gear side adjuster an additional:
    - **New Bearings** 6 Adjuster Holes
    - **Original Bearings** 4 Adjuster Holes
14. Install pinion gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.



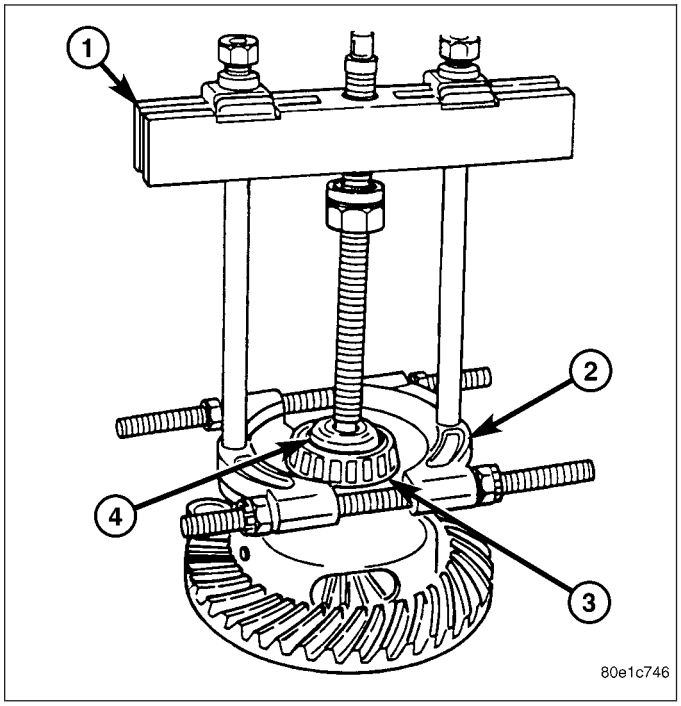
15. Tighten bearing cap bolts to 165 N·m (122 ft. lbs.).
16. Tighten adjuster (2) lock bolts (3) to 25 N·m (18 ft. lbs.).
17. Measure ring gear backlash and check gear tooth contact pattern. Refer to Adjustments for procedure.
18. Install axle shafts.
19. Install differential housing gasket and cover. Tighten cover bolts to 40 N·m (30 ft. lbs.).
20. Fill axle with lubricant, refer to Lubrication & Maintenance for capacity and lubricant type.
21. Install fill plug and tighten to 32 N·m (24 ft. lbs.).

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BEARING-DIFFERENTIAL CASE

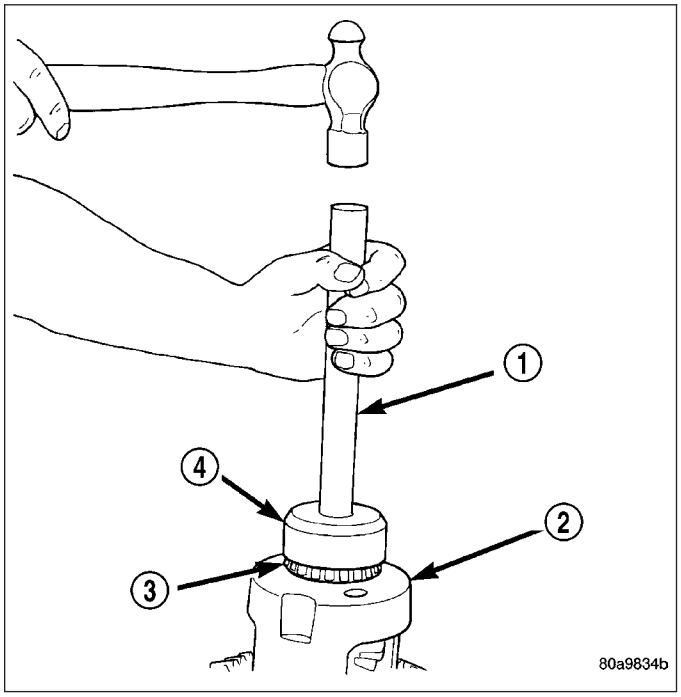
REMOVAL

1. Remove differential case from the housing.
2. Install Plug 8888 (4) into the end of the case.
3. Remove differental case bearings with Bearing Splitter 1130 (2) and Bridge 938 (1).



INSTALLATION

1. Install differenial case (2) bearings (3) with Installer 8956 (4) and Handle C-4171 (1).
2. Install differentail case into housing.



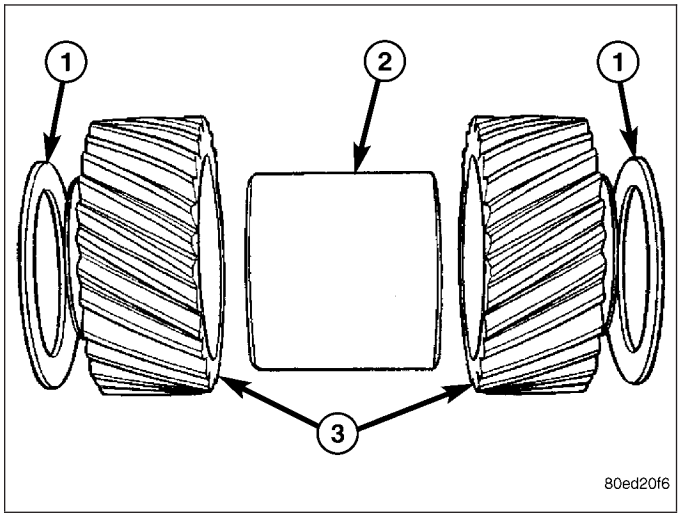
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DIFFERENTIAL-TRAC-RITE

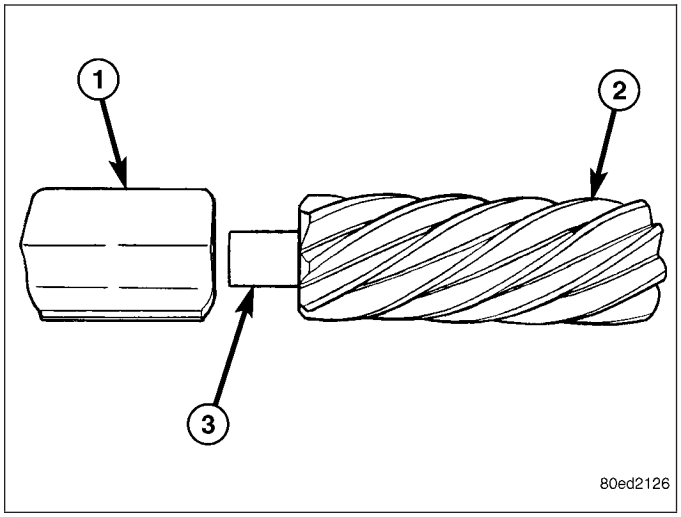
DESCRIPTION

CAUTION: The differential is serviced as an assembly only do not attempt to disassemble. Failure to follow these instruction will result in damage to the differential.

The Trac-Rite™ differential is a helical gear differential. The differential has two side gears (3), two thrust washers (1) and one spacer (2).



It also has six pinion brake shoes (1) which pivot on the six pinion gear (2) shafts (3).

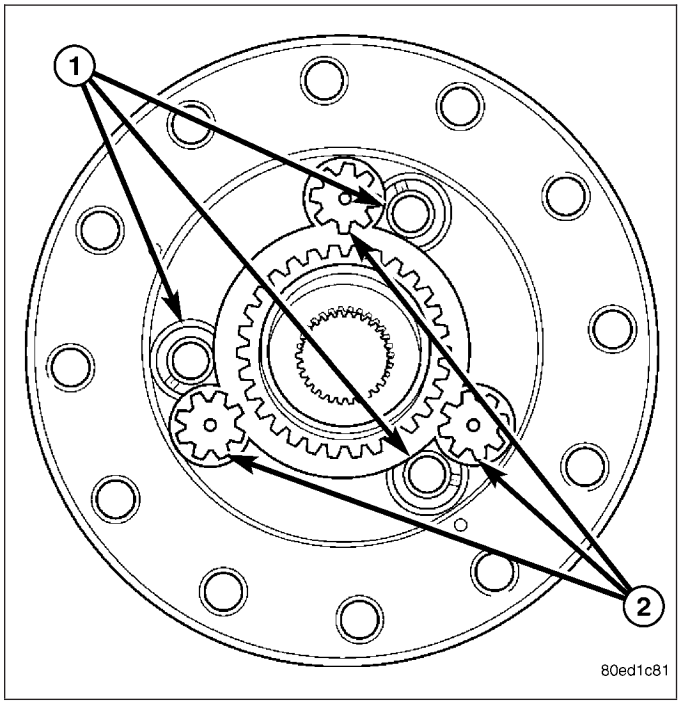


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OPERATION

CAUTION: The differential is serviced as an assembly only do not attempt to disassemble. Failure to follow these instruction will result in damage to the differential.

When one wheel begins to spin the pinion gears (2) on that side, are forced toward the pinion brake shoes (1). The pinion brake shoes then cause frictional drag on the opposite pinion gears and the side gear. These friction forces transfer the power to the opposite wheel. Once the frictional forces are overcome, differentiation will occur. The torque will be continually biased by the frictional forces to the high traction wheel.



CLEANING

CAUTION: The differential is serviced as an assembly only do not attempt to disassemble. Failure to follow these instruction will result in damage to the differential.

Flush the differential case and gears through openings in the case with light oil.

DIFFERENTIAL-ELECTRIC LOCKER

DIAGNOSIS AND TESTING

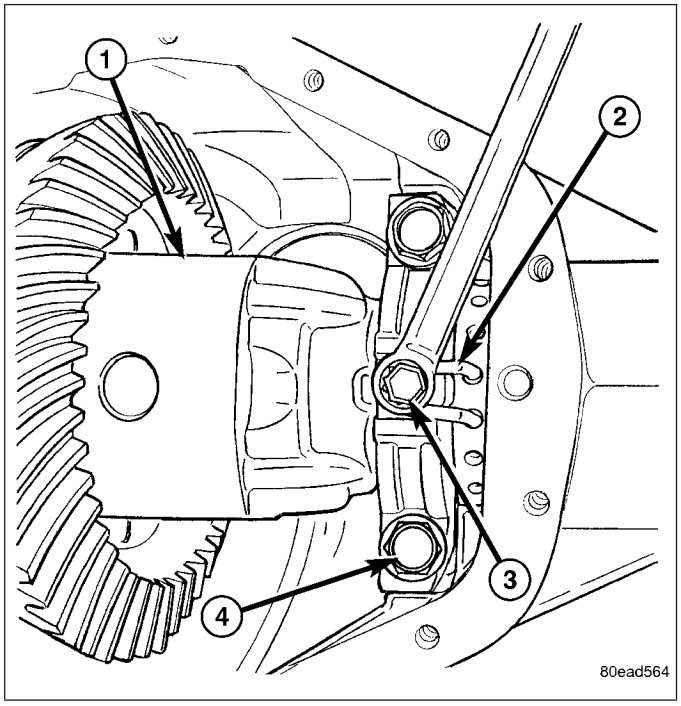
1. Lift one rear wheel of the ground.
2. Turn key to the on position.
3. Place vehicle in drive/first gear and transfer case in LOW LOCK.
4. Activate locker switch.
5. Manually rotate the wheel that is off the ground. The wheel should lock once the dog clutch is aligned.
6. Turn off locker switch.
7. Manually rotate the wheel that is off the ground. The wheel should turn.

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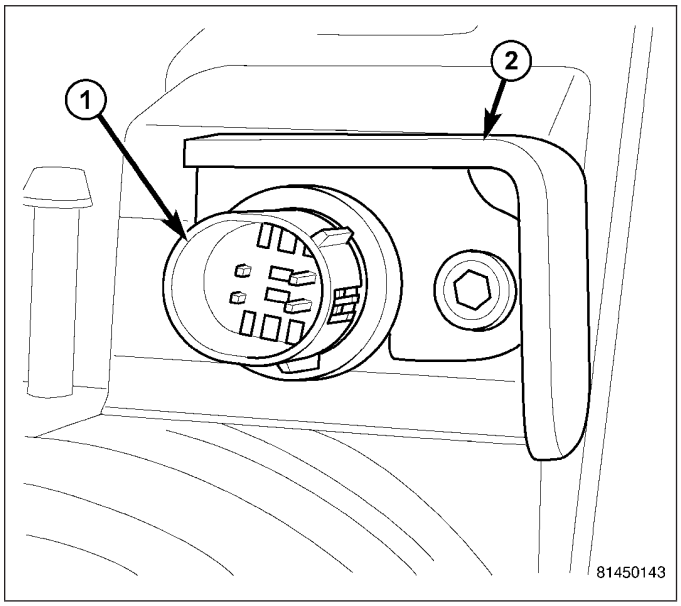
NOTE: Only the locker actuator with sensor are serviced. Internal differential components are serviced as a differential case assembly.

REMOVAL

1. Remove lubricant fill hole plug from the differential housing cover.
2. Remove differential housing cover and drain the lubricant from housing.
3. Remove axle shafts.
4. Remove adjuster lock bolts (3) and adjuster locks (2).

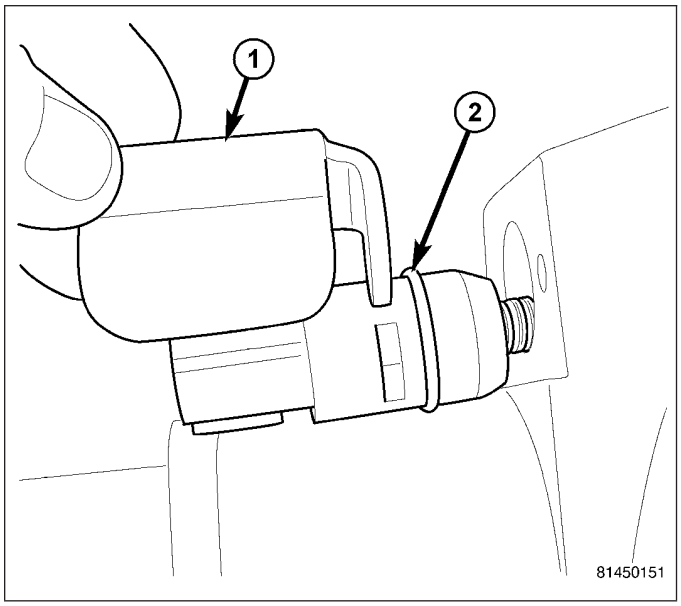


5. Remove electric locker connector (1) retainer (2) bolt from differential housing.
6. Remove connector (1) and retainer (2) from differential housing.

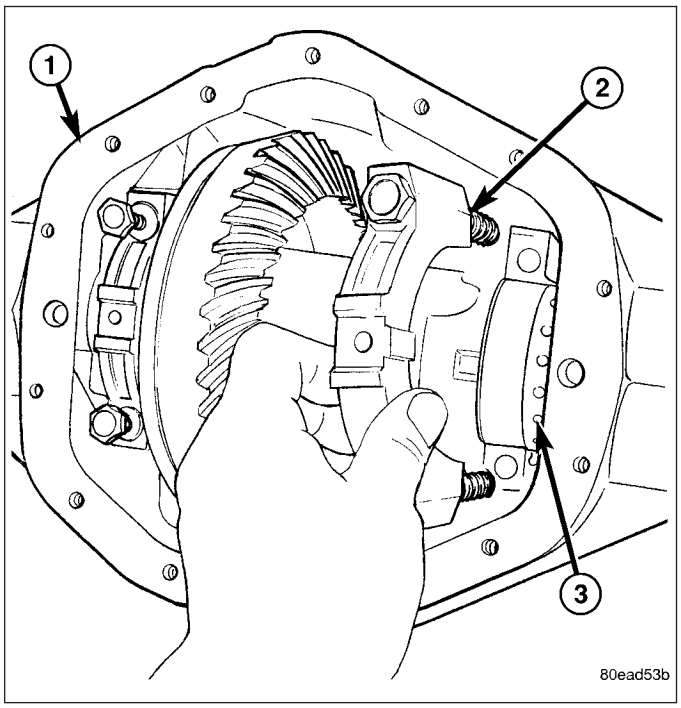


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7. Remove retainer (1) from connector and remove o-ring (2) from connector.



8. Mark bearing caps (2) left and right for installation reference.
9. Remove bearing cap bolts, anti rotation bracket and remove bearing caps (2).
10. Loosen differential bearing adjusters (3) with Spanner Wrench 8883.
11. Slid electric locker connector through differential housing.
12. Remove differential case with bearing cups from the housing.
13. Tag bearing cups left and right for installation reference.

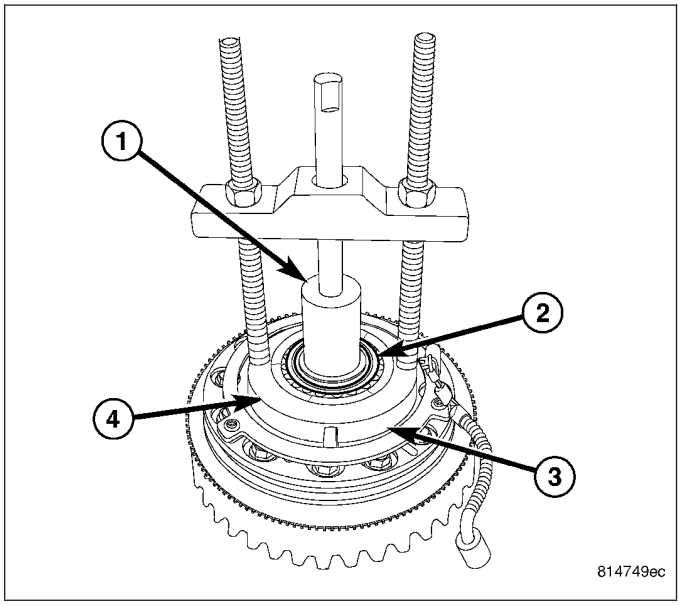


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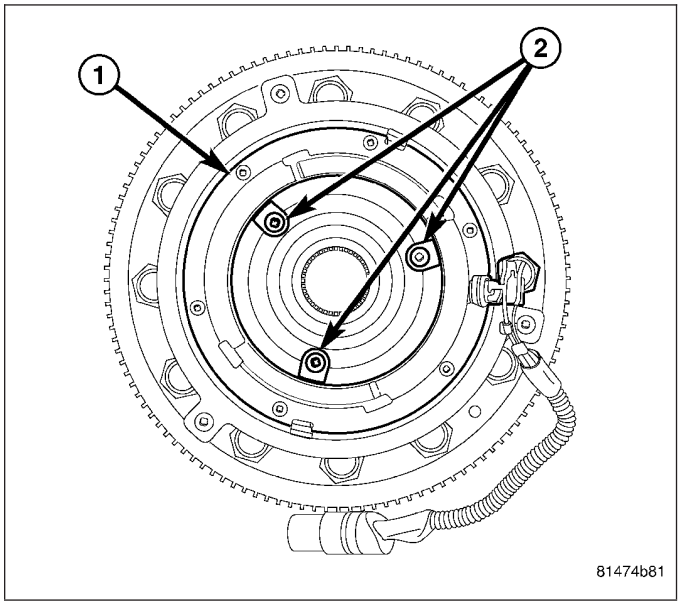
DISASSEMBLY

NOTE: Internal differential components are serviced with the case.

1. Install Plug 8888 (1) into coil side of the case.
2. Remove differential case bearing (2) with Puller C-293-PA (3) and Adapters 9614 (4).

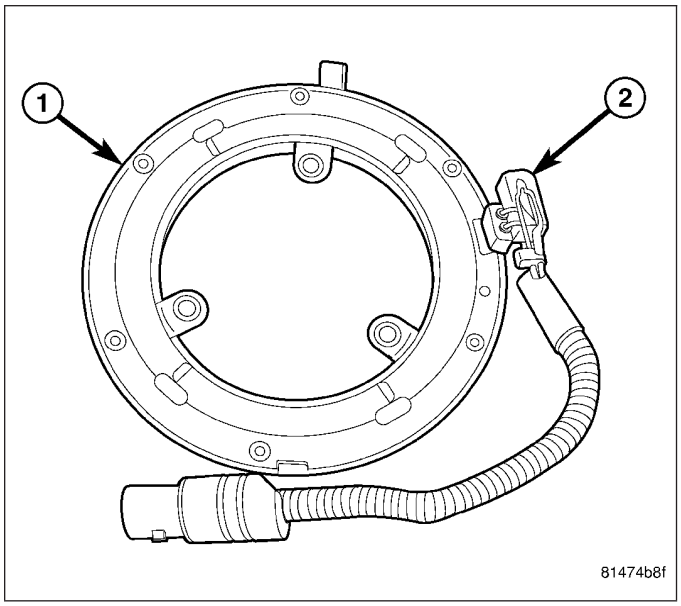


3. Remove coil (1) mounting bolts (2).



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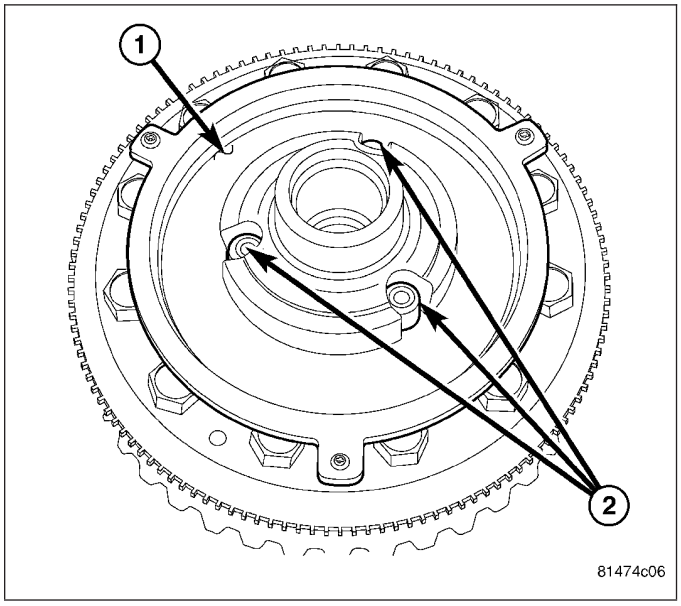
4. Remove coil (1) with sensor (2) and harness.



ASSEMBLY

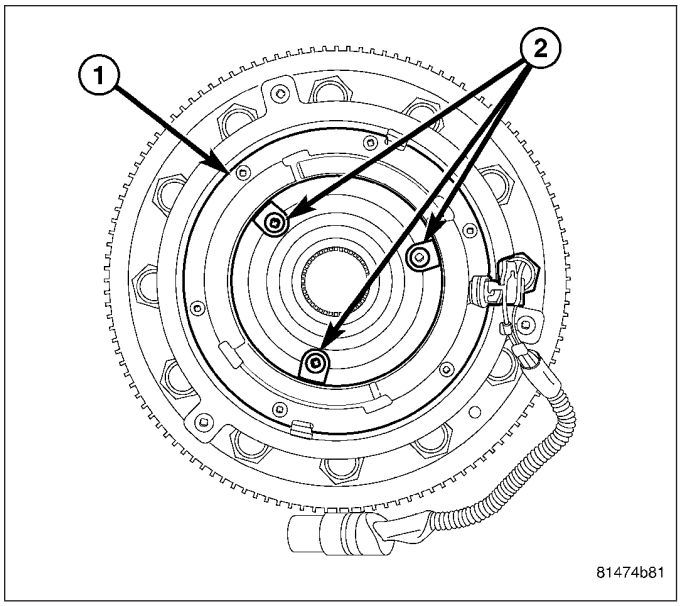
NOTE: Internal differential components are serviced with the case.

1. Position coil on differential case (1) mounting location (2).

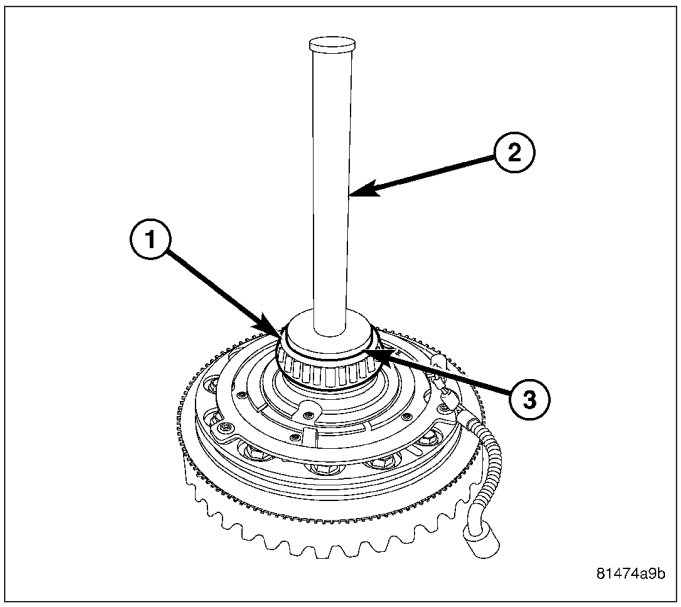


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2. Clean coil bolts then apply Mopar® Lock & Seal adhesive to the threads
3. Install coil (1) and bolts (2).



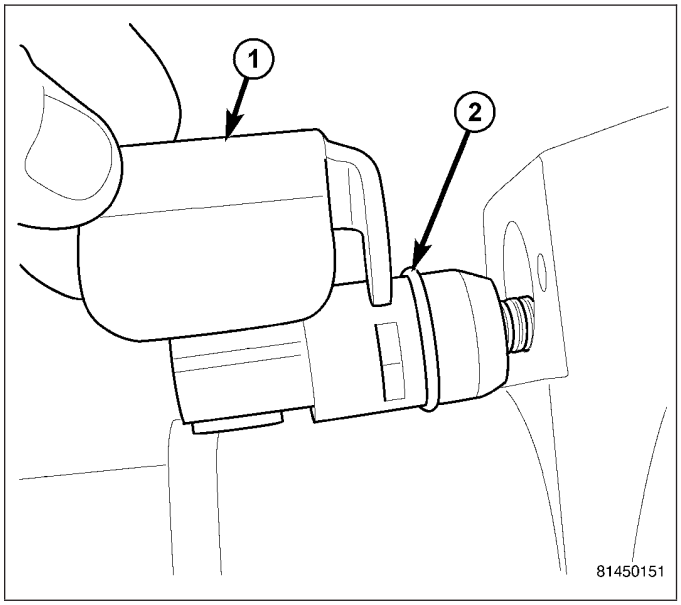
4. Install differential bearing (1) with Handle C-4171 (2) and Installer 8956 (3).



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INSTALLATION

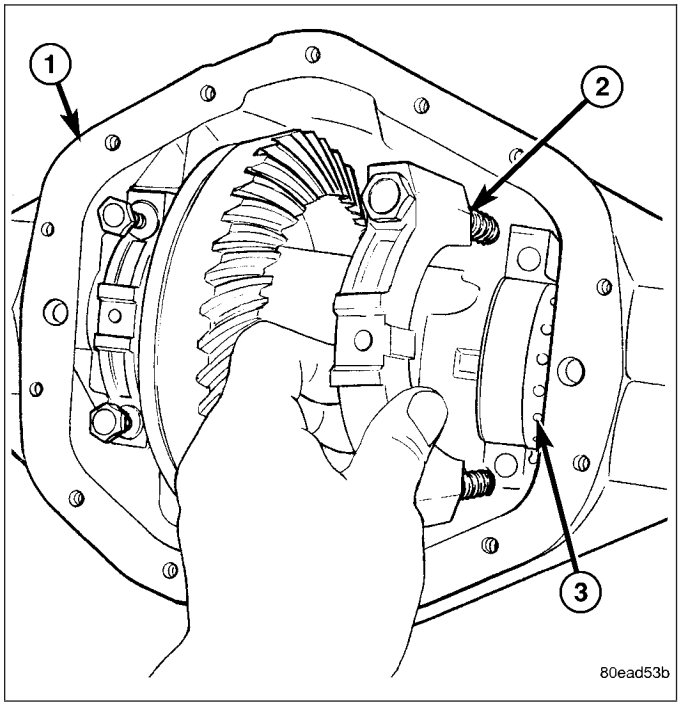
1. Clean the housing cavity with a flushing oil, light engine oil or lint free cloth.
2. Lubricate differential case bearing.
3. Install differential case with bearings cups into the housing.
4. Slid electric locker connector through differential housing.
5. Install o-ring (2) on electric locker connector.
6. Install electric locker connector retainer (1) and install connector with retainer in differential housing.
7. Install connector retainer bolt.



8. Install bearing caps (2), anti rotation bracket and bolts. Tighten bearing cap bolts finger-tight.

NOTE: Do not torque bearing cap and bolts at this time.

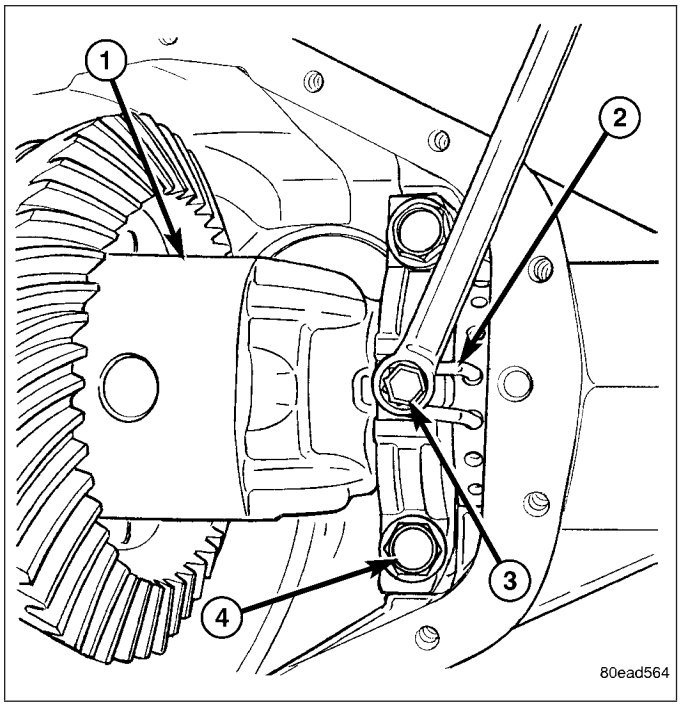
9. Slide differential case toward the pinion gear until the gears make contact/zero backlash. If zero backlash cannot be obtained, turn the pinion side adjuster until zero backlash is obtained.
10. Holding the differential case toward the pinion gear, turn bearing adjusters with Spanner Wrench 8883 until they make contact with the differential bearings/cups.
11. Back off the ring gear side adjuster 4 holes, to obtain initial ring gear backlash.
12. Install ring gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
13. Tighten pinion gear side adjuster firmly against the differential case bearing cup.
14. Rotate the pinion several times to seat the differential bearings.



15. Loosen pinion gear side adjuster until it is no longer in contact with the bearing cup.
16. Tighten pinion gear side adjuster until it just makes contact with the bearing cup.
17. Tighten pinion gear side adjuster an additional:
    - **New Bearings:** 6 Adjuster Holes
    - **Original Bearings:** 4 Adjuster Holes
18. Install pinion gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.

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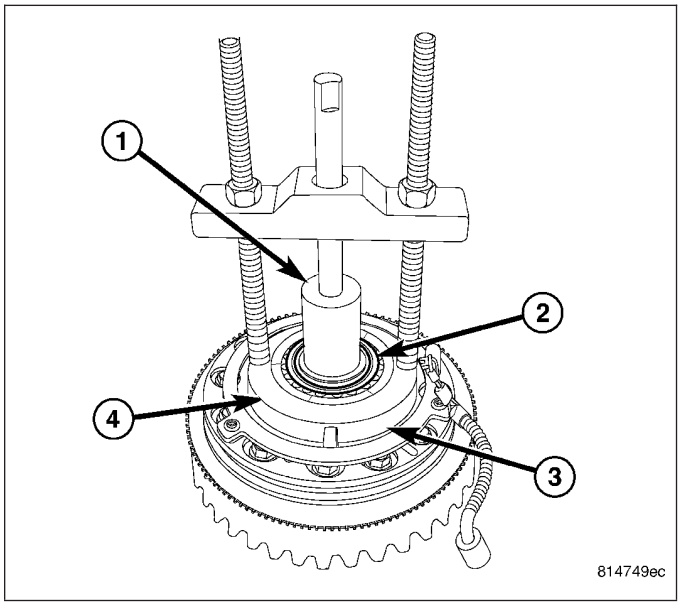
19. Tighten bearing cap bolts (4) to 165 N·m (122 ft. lbs.).
20. Tighten adjuster (2) lock bolts (3) to 25 N·m (18 ft. lbs.).
21. Measure ring gear backlash and check gear tooth contact pattern. Refer to Adjustments for procedure.
22. Install axle shafts.
23. Install differential housing gasket and cover. Tighten cover bolts to 40 N·m (30 ft. lbs.).
24. Fill axle with lubricant, refer to Lubrication & Maintenance for capacity and lubricant type.
25. Install fill plug and tighten to 32 N·m (24 ft. lbs.).



BEARINGS-EL DIFFERENTIAL CASE

REMOVAL

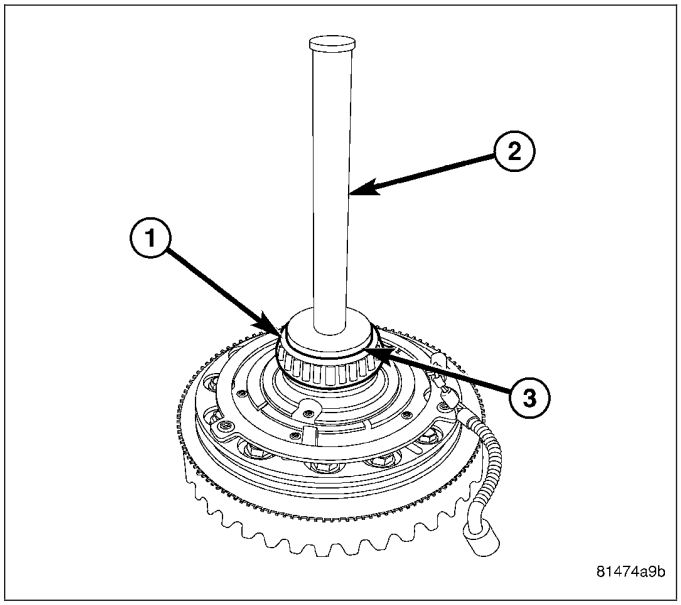
1. Remove the differential case from the housing.
2. Install Plug 8888 (1) into the end of the case.
3. Remove differential case bearings (2) with Puller C-293-PA (3) and Adapters 9614 (4).



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INSTALLATION

1. Install differential bearings (1) with Handle C-4171 (2) and Installer 8956 (3).



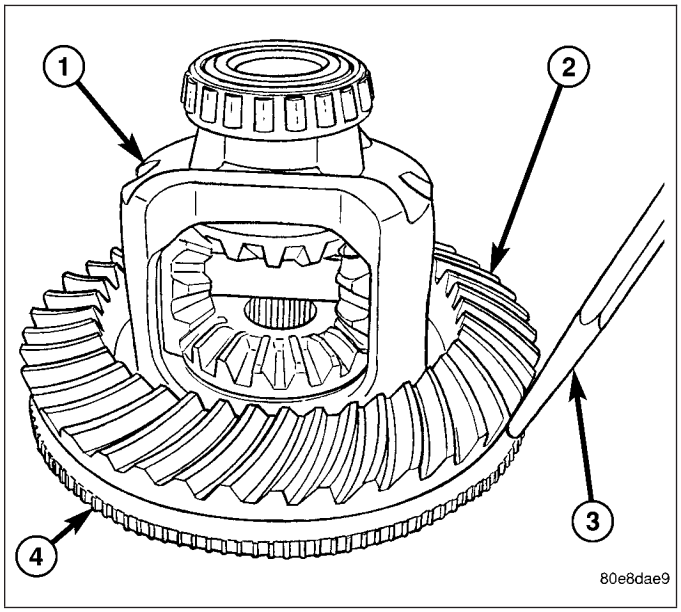
GEAR-PINION/RING

REMOVAL

NOTE: The ring and pinion gears are service in a matched set. Never replace the ring gear/pinion gear without replacing the other matching gear.

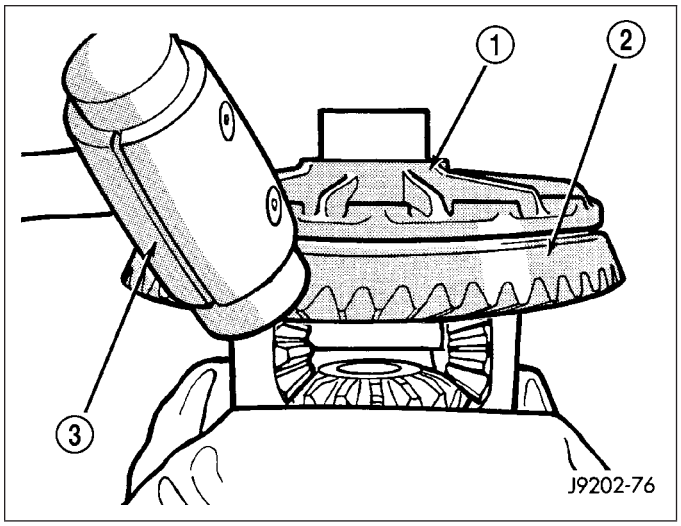
1. Mark pinion flange and propeller shaft for installation alignment.
2. Disconnect propeller shaft from pinion flange and remove propeller shaft.
3. Remove differential from axle housing.
4. Place differential on Plug 8888 and drive exciter ring (4) off the differential case (1) with a hammer and punch (3).

NOTE: Do not remove the exciter ring if it is not being replaced.

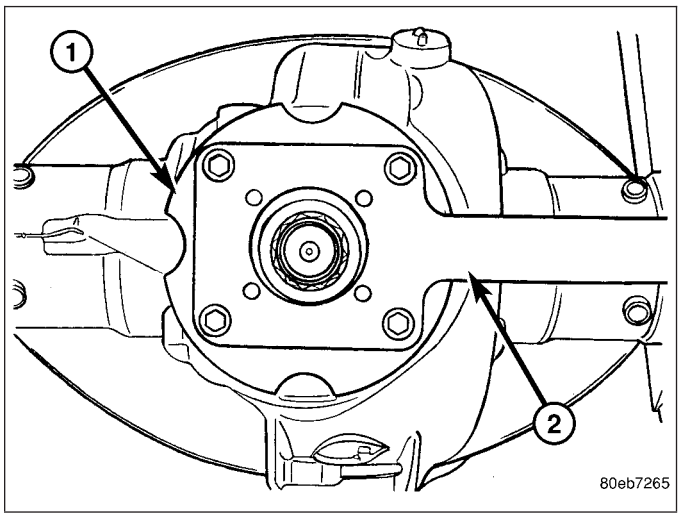


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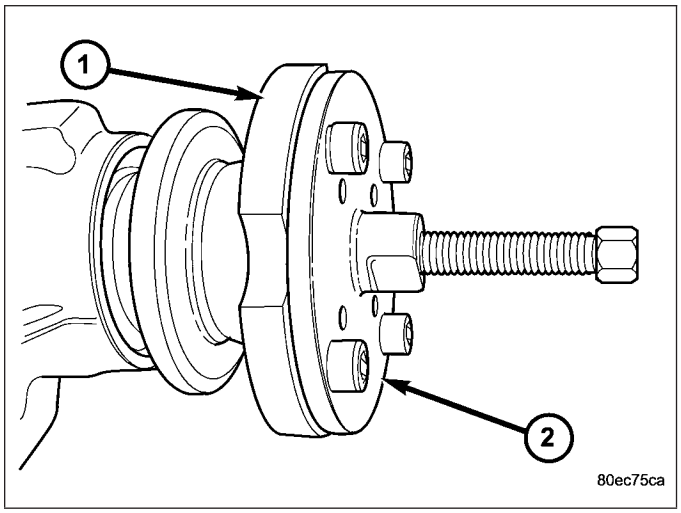
5. Place differential case in a vise with soft metal jaw protectors
6. Remove bolts holding ring gear to differential case.
7. Drive ring gear (2) from differential case (1) with a soft hammer (3).



8. Hold pinion flange (1) with Flange Wrench 8979 (2) and remove pinion flnage nut and washer.



9. Remove pinion flange (1) from the pinion with Flange Puller 8992 (2).



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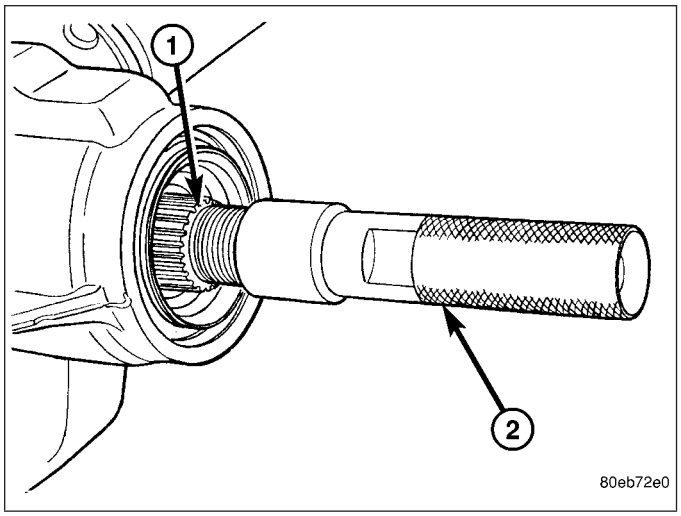
10. Remove pinion gear (1) from housing, with Pinion Driver 8977 (2) and a hammer.

NOTE: Thread the driver on the pinion shaft till it bottoms out.

11. Remove pinion seal with a slide hammer or pry bar.
12. Remove and discard front pinion bearing.

CAUTION: Do not reuse front pinion bearing/cup.

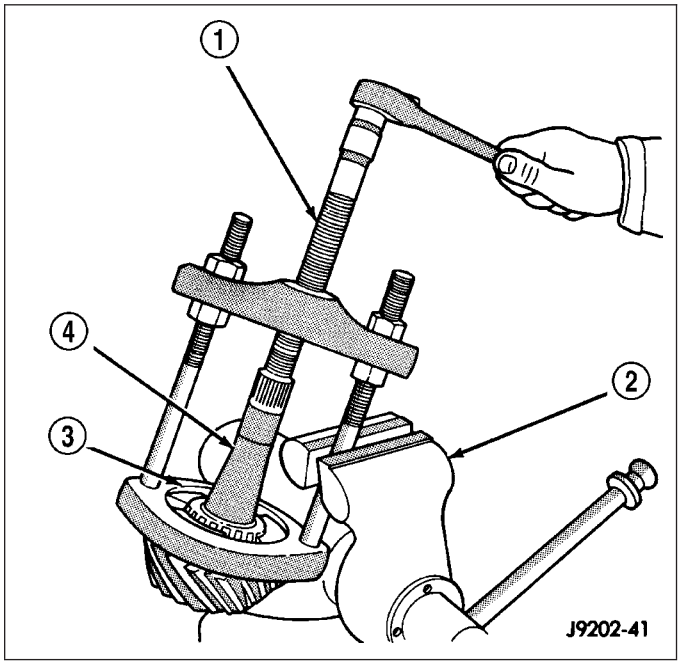
13. Remove collapsible spacer from the pinion shaft.



14. Remove rear pinion bearing with Puller C-293-PA (1) and Adapter Blocks 8879 (4).
15. Remove pinion depth shim from the pinion gear shaft and record thickness of the shims.
16. Remove front pinion bearing cup from the housing with a punch and hammer and discard cup.

CAUTION: Do not reuse front pinion bearing/cup.

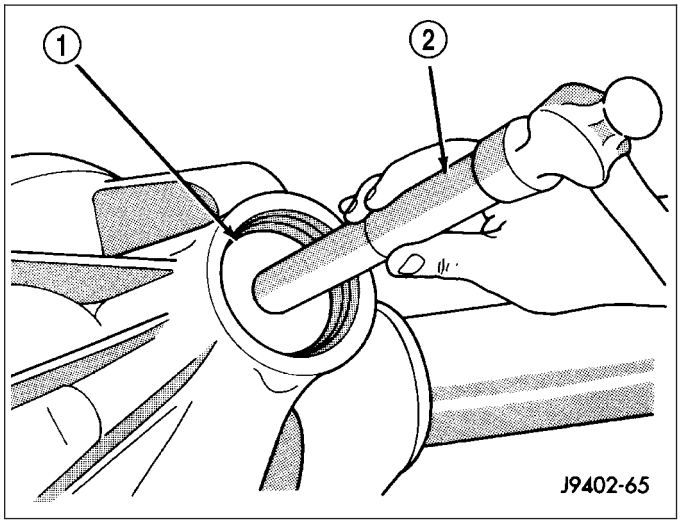
17. Remove rear pinion bearing cup from the housing with a punch and hammer, if bearing is going to be replaced.



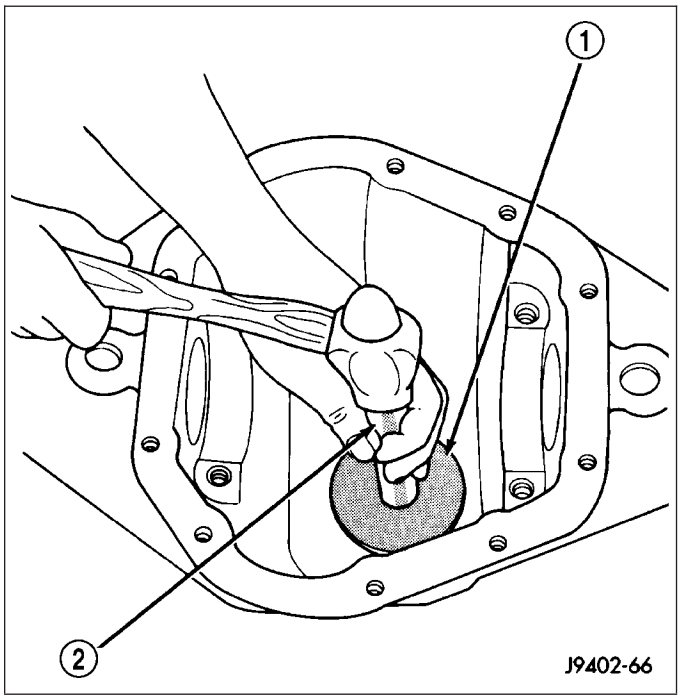
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INSTALLATION

1. Install new front pinion bearing cup with Installer 8960 (1) and Handle C-4171 (2).

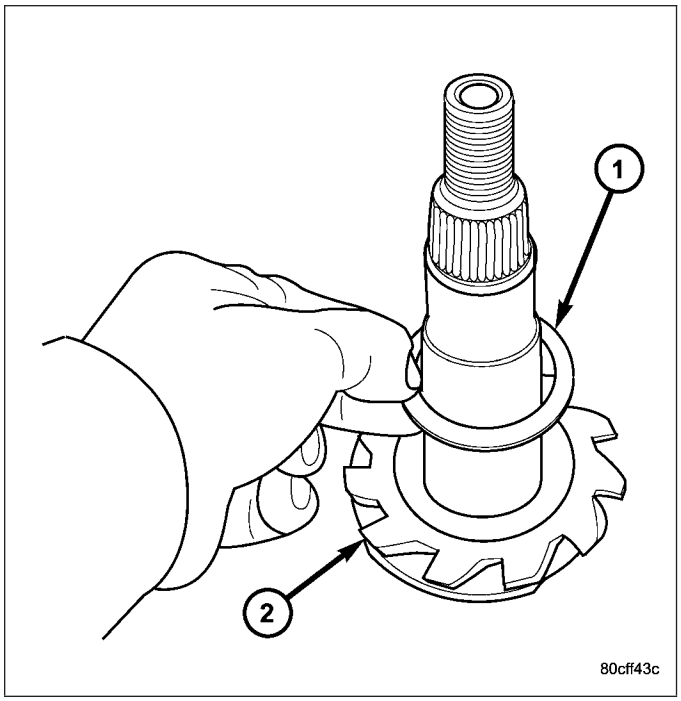


2. Install new rear pinion bearing cup with Installer 8959 (1) and Handle C-4171 (2).

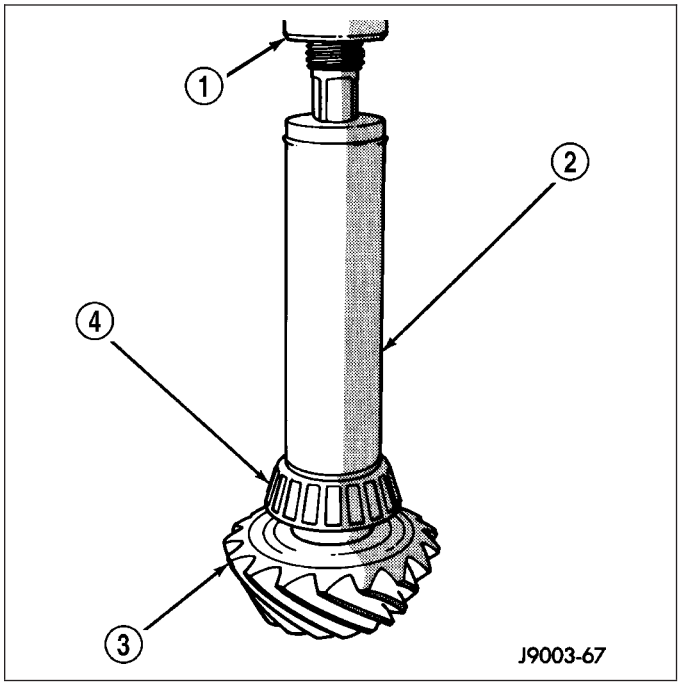


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3. Install pinion depth shim (1) on the pinion gear shaft (2).

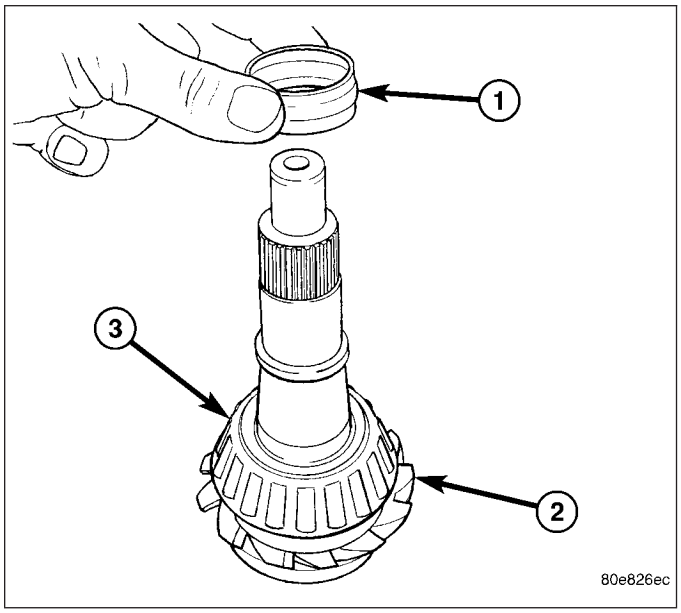


4. Install rear pinion bearing (4) with Installer MD-998805 (2) and a press (1).

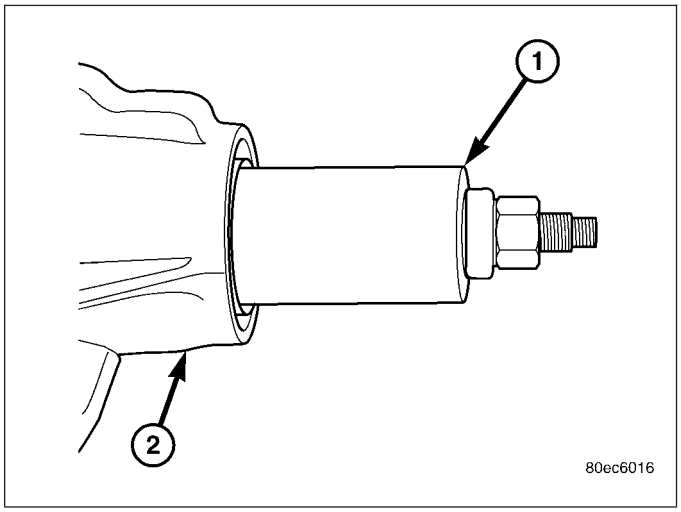


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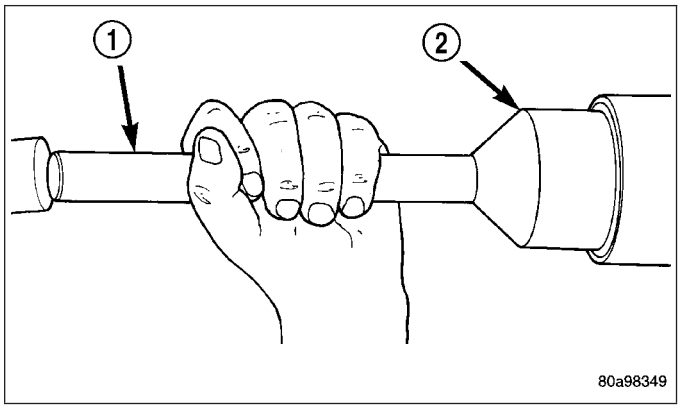
5. Install **new** collapsible spacer (1) on pinion gear (2).



6. Lubricate pinion and bearings.
7. Install pinion into the housing (2) and place front pinion bearing onto the pinion shaft. Draw the pinion shaft into the front bearing with Installer 8981 (1).

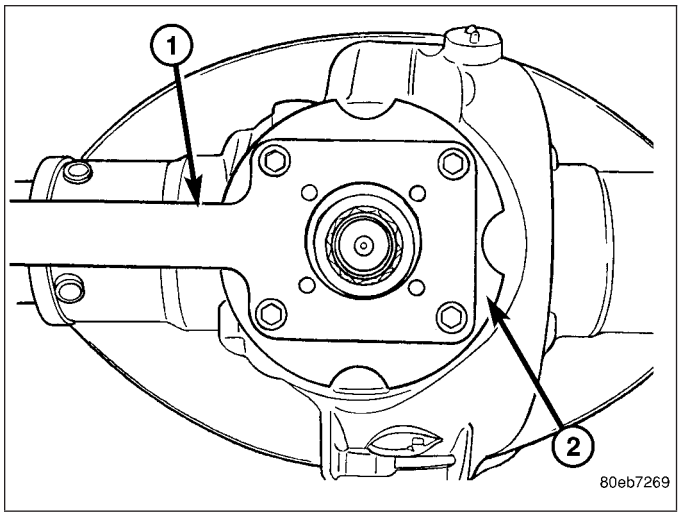


8. Install **new** pinion seal with Installer 8896 (2) and Handle C-4171 (1).

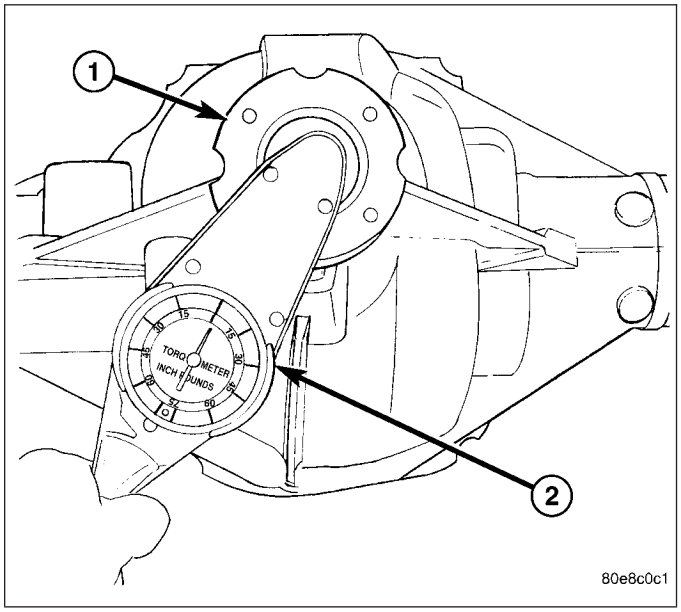


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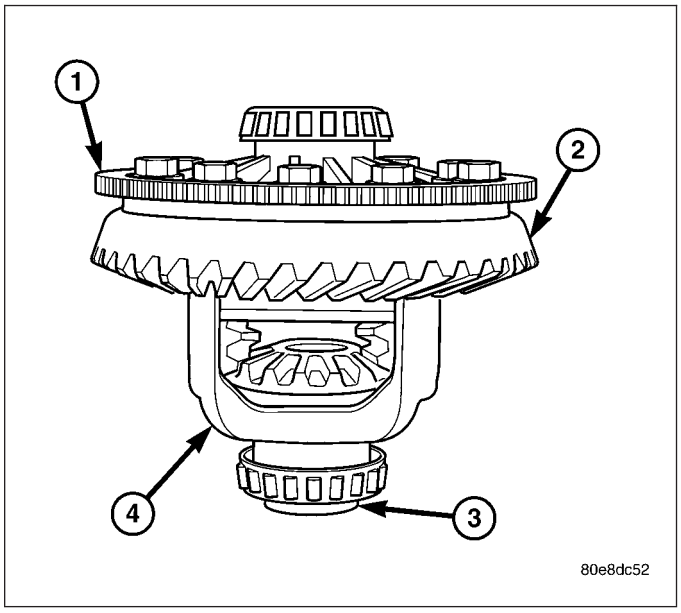
9. Apply a light coat of teflon sealant to the pinion flange splines.
10. Hold the pinion and lightly tap the pinion flange onto the pinion, until a few threads are showing.
11. Install pinion flange washer and **new** pinion nut.
12. Hold pinion flange (2) with Flange Wrench 8979 (1) and tighten pinion nut until pinion end play is taken up.



13. Rotate pinion several times to seat bearings.
14. Measure pinion (1) rotating torque with an inch pound torque wrench (2). Tighten pinion nut in small increments until pinion rotating torque is:
    - **New Pinion Bearings:** 1.7-2.8 N·m (15-25 in. lbs.)
    - **Original Pinion Bearings:** 1.1-2.2 N·m (10-20 in. lbs.)
15. Rotate pinion several times then verify pinion rotating torque again.

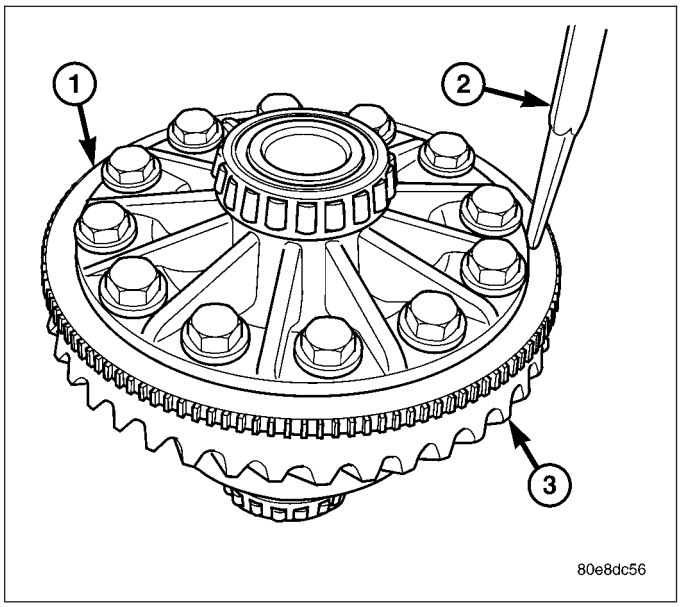


16. Position the ring gear (2) on differential case (4) and start two **new** ring gear bolts.
17. Install the rest of the **new** ring gear bolts and tighten them alternately to seat the ring gear.



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18. Torque ring gear bolts to 237 N·m (175 ft. lbs.).
19. If exciter ring was removed, position differential assembly on differential Plug 8888 and place exciter ring on the differential case.
20. Install exciter ring (1) on the differential case evenly with a hammer and brass punch (2). Drive the ring down until it is seated against the ring gear (3).



CAUTION: Do not damage exciter ring teeth during installation.

21. Install differential into the housing.
22. Verify ring gear backlash and gear contact pattern.
23. Measure final rotating torque with an inch pound torque wrench. The final pinion rotating torque plus differential case bearing preload is:
    - **New Bearings:** 3.4-5.6 N·m (30-50 in. lbs.)
    - **Original Bearings:** 2.8-5.1 N·m (25-45 in. lbs.)
24. Install axle shafts.
25. Install the propeller shaft with the reference marks aligned.
26. Install differential cover with gasket and tighten bolts to 40 N·m (30 ft. lbs.).
27. Fill differential with fluid and tighten fill plug to 32 N·m (24 ft. lbs.).

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REAR AXLE - 11 1/2 AA

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REAR AXLE - 11 1/2 AA

DIAGNOSIS AND TESTING

REAR AXLE-11 1/2 AA

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, incorrect pinion depth, tooth contact, worn/damaged gears, or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant.
- Incorrect ring gear backlash.
- Gear damage.

Differential side gears and pinions can be checked by turning the vehicle. The side gears are loaded during turns. They usually do not cause noise during straight-ahead driving when the gears are unloaded. A worn pinion shaft can also cause a snapping or a knocking noise.

BEARING NOISE

The axle shaft, differential and pinion bearings can all produce noise when worn or damaged. Bearing noise can be either a whining, or a growling sound.

Pinion bearings have a constant-pitch noise. This noise changes only with vehicle speed. Pinion bearing noise will be higher pitched because it rotates at a faster rate. Drive the vehicle and load the differential. If bearing noise occurs, the rear pinion bearing is the source of the noise. If the bearing noise is heard during a coast, the front pinion bearing is the source.

Differential bearings usually produce a low pitch noise. Differential bearing noise is similar to pinion bearing noise. The pitch of differential bearing noise is also constant and varies only with vehicle speed.

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Axle shaft bearings produce noise and vibration when worn or damaged. The noise generally changes when the bearings are loaded. Road test the vehicle. Turn the vehicle sharply to the left and to the right. This will load the bearings and change the noise level. Where axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 mph.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joint(s).
- Worn side gear thrust washers.
- Worn pinion shaft bore.

VIBRATION

Vibration at the rear of the vehicle is usually caused by:

- Damaged drive shaft.
- Missing drive shaft balance weight(s).
- Worn or out-of-balance wheels.
- Loose wheel lug nuts.
- Worn U-joint(s).
- Loose/broken springs.
- Damaged axle shaft bearing(s).
- Loose pinion gear nut.
- Excessive pinion yoke run out.
- Bent axle shaft(s).

Check for loose or damaged front-end components or engine/transmission mounts. These components can contribute to what appears to be a rear end vibration. Do not overlook engine accessories, brackets and drive belts.

NOTE: All driveline components should be examined before starting any repair.

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear (or the clutch engaged), can be caused by:

- High engine idle speed.
- Transmission shift operation.
- Loose engine/transmission/transfer case mounts.
- Worn U-joints.
- Loose spring mounts.
- Loose pinion gear nut and yoke.
- Excessive ring gear backlash.
- Excessive side gear to case clearance.

The source of a snap or a clunk noise can be determined with the assistance of a helper. Raise the vehicle on a hoist with the wheels free to rotate. Instruct the helper to shift the transmission into gear and listen for the noise. A mechanics stethoscope is helpful in isolating the source of a noise.

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DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose.	1. Tighten loose nuts.
	2. Faulty, brinelled wheel bearing.	2. Replace bearing.
Axle Shaft Noise	1. Misaligned axle tube.	1. Inspect axle tube alignment. Correct as necessary.
	2. Bent or sprung axle shaft.	2. Inspect and correct as necessary.
Axle Shaft Broke	1. Misaligned axle tube.	1. Replace the broken shaft after correcting tube mis-alignment.
	2 Vehicle overloaded.	2. Replace broken shaft and avoid excessive weight on vehicle.
	3. Erratic clutch operation.	3. Replace broken shaft and avoid or correct erratic clutch operation.
	4. Grabbing clutch.	4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	1. Improper adjustment of the differential bearings.	1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly.
	2. Excessive ring gear backlash.	2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly.
	3. Vehicle overloaded.	3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight.
	4. Erratic clutch operation.	4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.
Differential Gears Scored	1. Insufficient lubrication.	1. Replace scored gears. Fill differential with the correct fluid type and quantity.
	2. Improper grade of lubricant.	2. Replace scored gears. Fill differential with the correct fluid type and quantity.
	3. Excessive spinning of one wheel/tire.	3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	1. Lubricant level too high.	1. Drain lubricant to the correct level.
	2. Worn axle shaft seals.	2. Replace seals.
	3. Cracked differential housing.	3. Repair as necessary.
	4. Worn pinion seal.	4. Replace seal.
	5. Worn/scored yoke.	5. Replace yoke and seal.
	6. Axle cover not properly sealed.	6. Remove, clean, and re-seal cover.

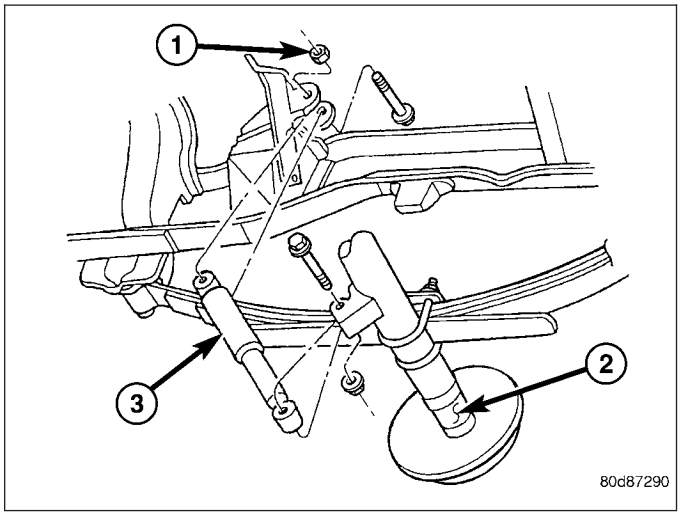
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Condition	Possible Causes	Correction
Axle Overheating	1. Lubricant level low.	1. Fill differential to correct level.
	2. Improper grade of lubricant.	2. Fill differential with the correct fluid type and quantity.
	3. Bearing pre-loads too high.	3. Re-adjust bearing pre-loads.
	4. Insufficient ring gear backlash.	4. Re-adjust ring gear backlash.
Gear Teeth Broke	1. Overloading.	1. Replace gears. Examine other gears and bearings for possible damage.
	2. Erratic clutch operation.	2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation.
	3. Ice-spotted pavement.	3. Replace gears and examine remaining parts for damage.
	4. Improper adjustments.	4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.
Axle Noise	1. Insufficient lubricant.	1. Fill differential with the correct fluid type and quantity.
	2. Improper ring gear and pinion adjustment.	2. Check ring gear and pinion contact pattern. Adjust backlash or pinion depth.
	3. Unmatched ring gear and pinion.	3. Replace gears with a matched ring gear and pinion.
	4. Worn teeth on ring gear and/or pinion.	4. Replace ring gear and pinion.
	5. Loose pinion bearings.	5. Adjust pinion bearing pre-load.
	6. Loose differential bearings.	6. Adjust differential bearing pre-load.
	7. Mis-aligned or sprung ring gear.	7. Measure ring gear run-out. Replace components as necessary.
	8. Loose differential bearing cap bolts.	8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued tot he proper specification.
	9. Housing not machined properly.	9. Replace housing.

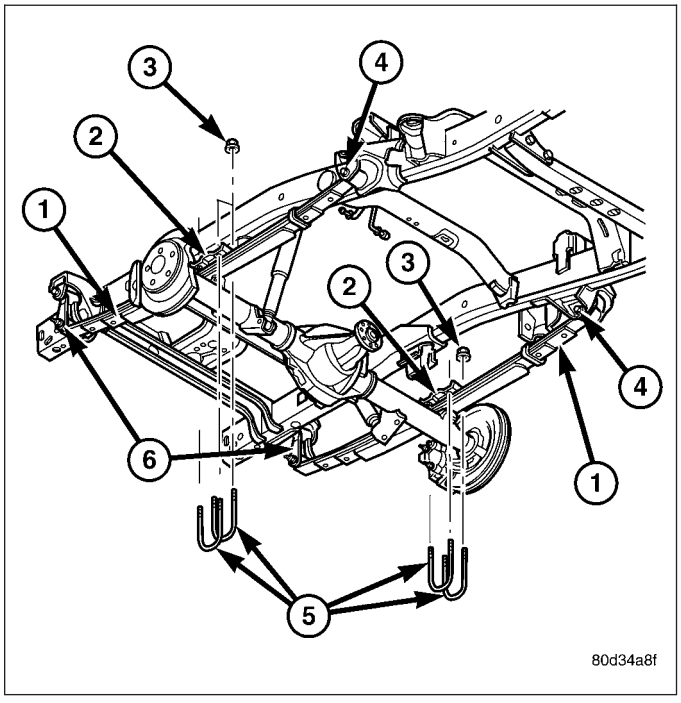
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REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Position a lift under axle and secure lift to the axle.
3. Remove all brake components.
4. Mark propeller shaft and companion flange for installation alignment reference.
5. Remove propeller shaft.
6. Remove axle vent hose.
7. Remove shock absorbers (3) from axle (2).



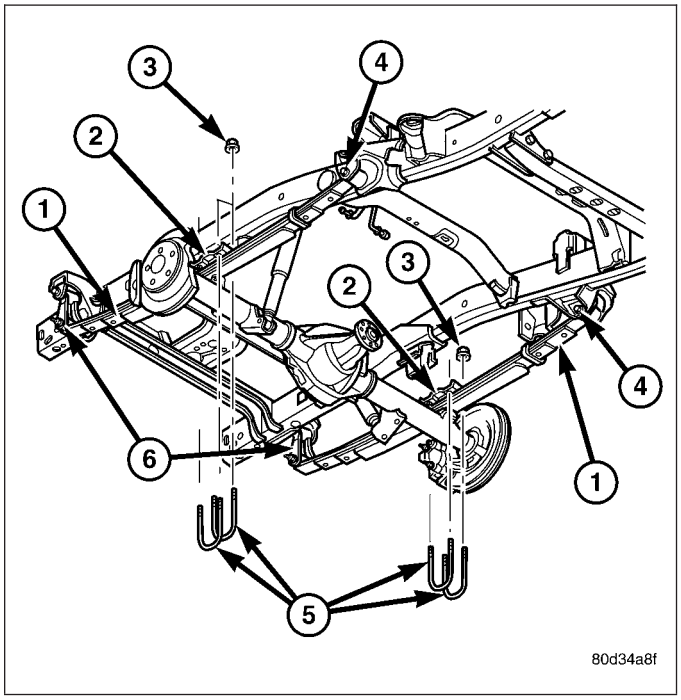
8. Remove U-bolts (4) from axle.
9. Remove axle from the vehicle.



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INSTALLATION

1. Raise axle with lift and align to the leaf spring (1) centering bolts.
2. Install axle U-bolts (5) and tighten to 149 N·m (110 ft. lbs.).
3. Install shock absorbers to axle and tighten to specification.
4. Install all brake components.
5. Install propeller shaft with reference marks aligned and tighten to specification.
6. Install axle vent hose.
7. Fill differential to specifications.
8. Remove lift from axle and lower the vehicle.



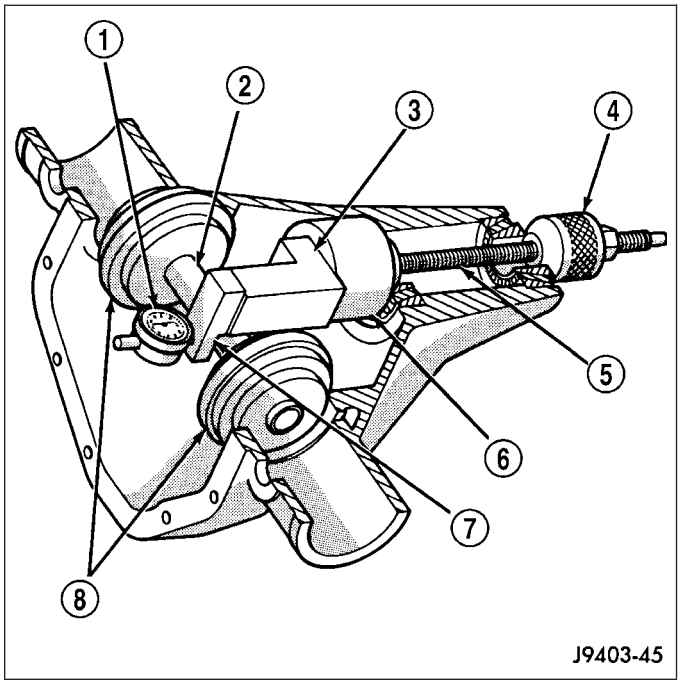
ADJUSTMENTS

PINION DEPTH MEASUREMENT

Ring and pinion gears are supplied as matched sets. Compensation for pinion depth variance is achieved with a select shim, located between the rear pinion bearing and pinion gear head.

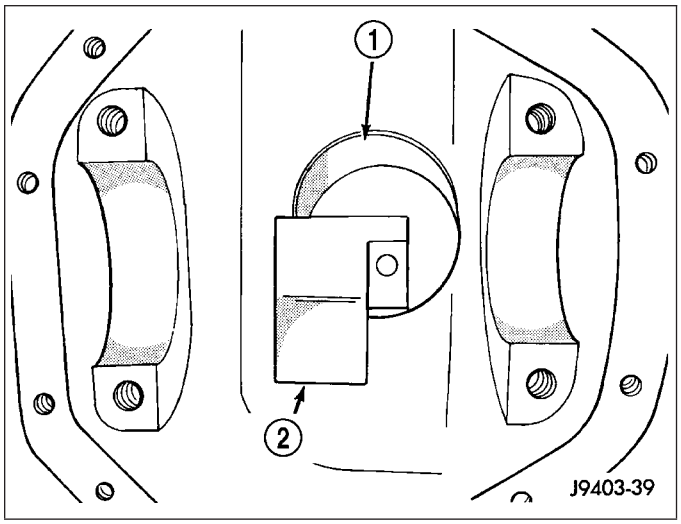
Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take measurements with Pinion Gauge Set and Dial Indicator C-3339 (1).

1. Assemble Pinion Height Block 6739 (3), Pinion Block 8897 (6) and rear pinion bearing onto Screw 6741(5).



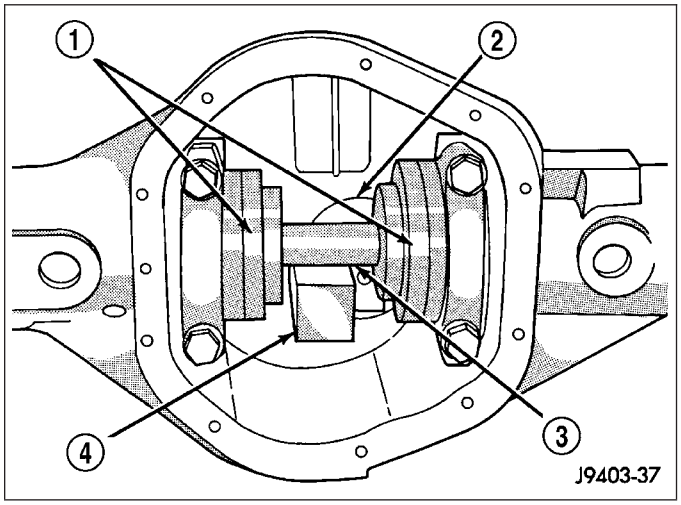
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2. Insert assembled pinion block (1), pinion height block (2), rear bearing and screw into the housing through pinion bearing cups.
3. Install front pinion bearing and Cone-nut 6740 onto the screw. Tighten cone-nut until Torque To Rotate the screw is 1.7-2.26 N·m (15-20 in. lbs.).

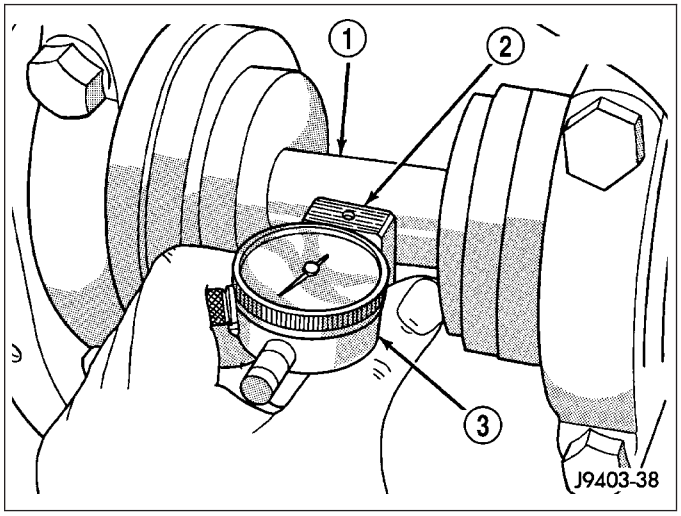


4. Place Arbor Discs 8289 (1) on Arbor D-115-3 (3) in position in the housing side bearing cradles.
5. Install differential bearing caps on arbor discs and snug the bearing cap bolts. Then cross tighten cap bolts to 281 N·m (207 ft. lbs.).

NOTE: Arbor should rotate freely in the arbor discs.



6. Assemble Dial Indicator C-3339 (3) into Scooter Block D-115-2 (2) and secure set screw.
7. Position Scooter Block/Dial Indicator flush on the pinion height block. Hold scooter block and zero the dial indicator.
8. Slowly slide the scooter block across the pinion height block over to the arbor. Move the scooter block till dial indicator crests the arbor (1), then record the highest reading.
9. Select a shim equal to the dial indicator reading.
10. Install the select shim between the rear pinion bearing and the pinion gear head.

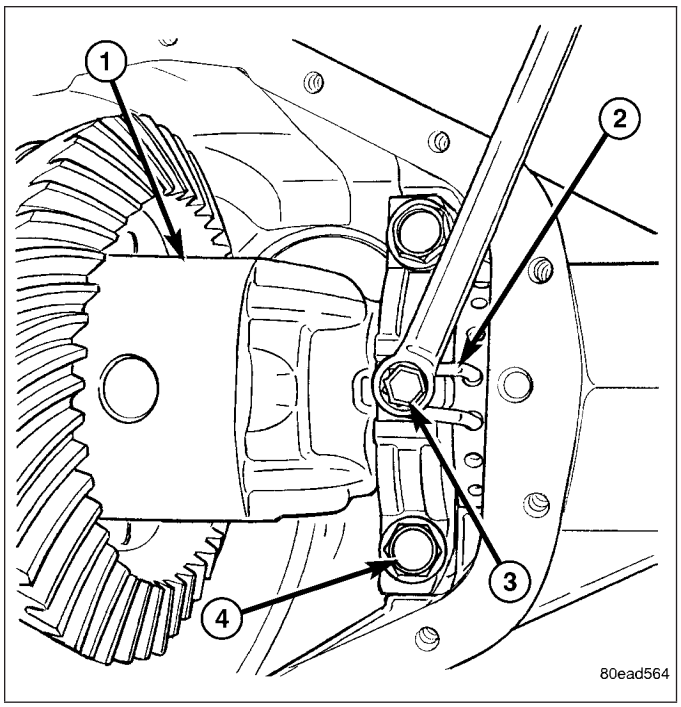


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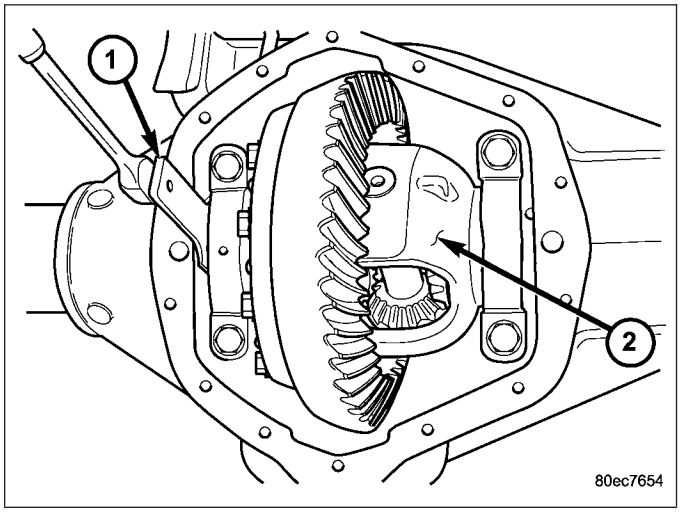
DIFFERENTIAL CASE BEARING PRELOAD AND GEAR BACKLASH

Backlash is adjusted by moving the adjusters in and out or both. By moving the adjusters the case/ring gear will move closer or further away from the pinion. In most cases this adjustment can be used to achieve the correct gear tooth pattern and set the case bearing preload.

1. Remove adjuster lock bolts (3) and adjuster locks (2).
2. Loosen the differential bearing caps (4).
3. Slide differential case toward the pinion gear until the gears make contact/zero backlash. If zero backlash cannot be obtained, turn the pinion side adjuster until zero backlash is obtained.



4. Holding the differential case (2) toward the pinion gear, turn bearing adjusters with Adjuster Wrench 8883 (1) until they make contact with the differential bearings/cups.
5. Back off the ring gear side adjuster 4 holes, to obtain initial ring gear backlash.
6. Install ring gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
7. Tighten pinion gear side adjuster firmly against the differential case bearing cup.
8. Rotate the pinion several times to seat the deferential bearings.
9. Loosen pinion gear side adjuster until it is no longer in contact with the bearing cup, then tighten it until it makes contact.

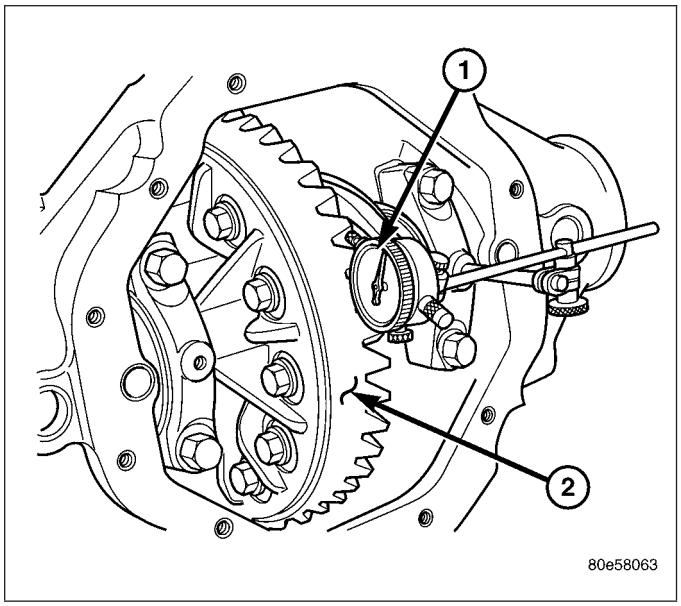


10. Tighten pinion gear side adjuster an additional:
    - **New Bearings:** 6 Adjuster Holes
    - **Original Bearings:** 4 Adjuster Holes
11. Install pinion gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
12. Tighten bearing cap bolts to 115 N·m (85 ft. lbs.).
13. Tighten adjuster lock bolts to 33 N·m (24 ft. lbs.).

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14. Measure ring gear backlash with a Dial Indicator C-3339 (1) and Dial Indicator Stud L-4438 at eight points around the drive side of the ring gear (2). The backlash should be 0.08-0.25 mm (0.003-0.010 in) with a preferred backlash of 0.13-0.18 mm (0.005-0.007 in).

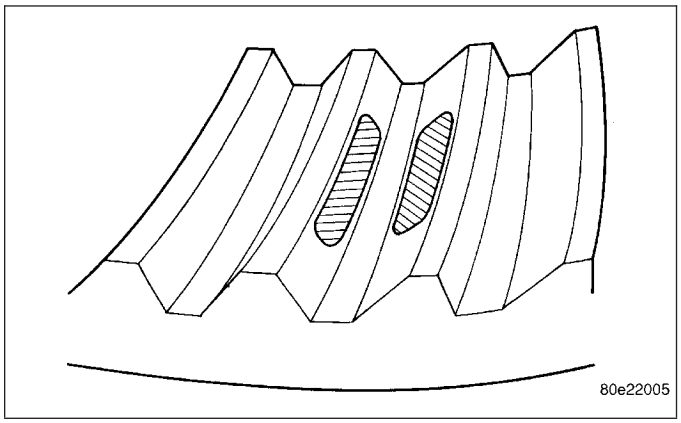
NOTE: Backlash measurement should not vary more than 0.05 mm (0.002 in) between measuring points. If measurement does vary inspect the gears for burrs, the differential case flange and ring gear mounting.



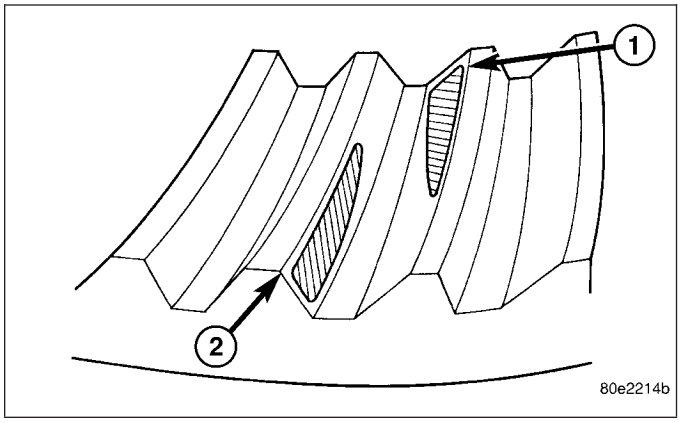
GEAR TOOTH CONTACT PATTERN

1. Wipe clean each tooth of the ring gear.
2. Apply gear marking compound to all of the ring gear teeth.
3. Verify bearing cap bolts are torque specification.
4. Apply parking brakes lightly to create at 14 N·m (10 ft. lbs.) pinion rotating torque.
5. Rotate the pinion/pinion yoke 4 full revolutions in each directions.
6. Read gear tooth contact pattern.

Gear contact pattern correct. Backlash and pinion depth is correct.

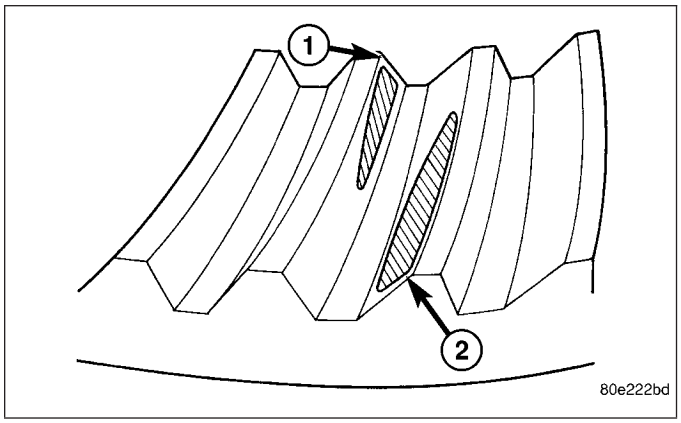


Ring gear too far away from pinion gear, coast side toe (1) and drive side heel (2). Decrease backlash, by moving the ring closer to the pinion gear using the adjusters.

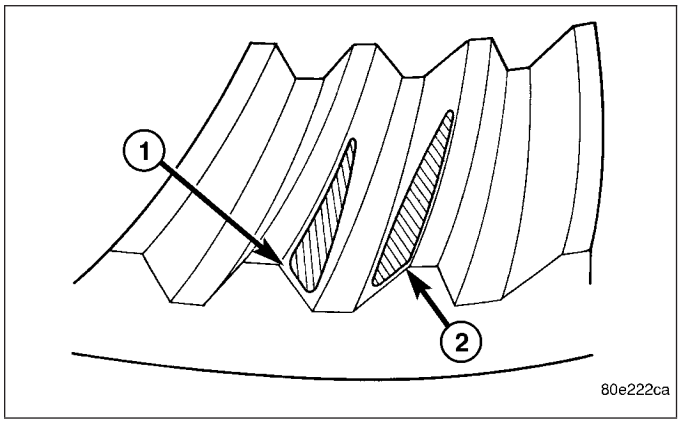


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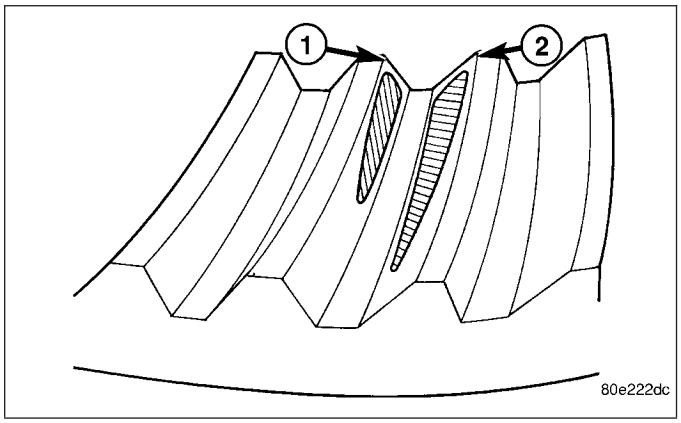
Ring gear too close to pinion gear, drive side toe (1) and coast side heel (2). Increase backlash, by moving the ring away from the pinion gear using the adjusters.



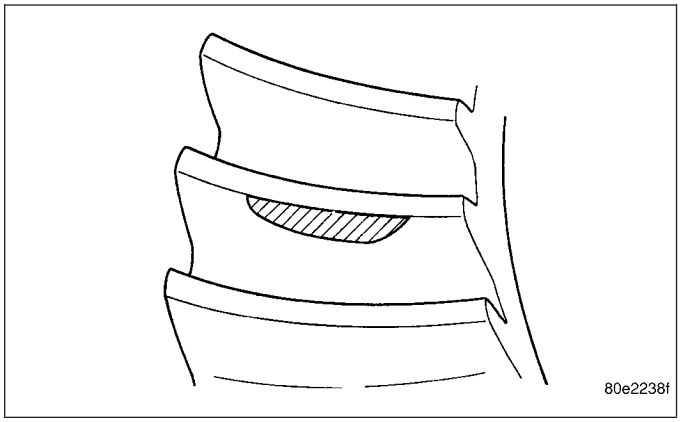
Ring gear too far away from pinion gear, drive side heel (1) and coast side heel (2). Decrease backlash, by moving the ring closer to the pinion gear using the adjusters.



Ring gear too close to pinion gear, drive side toe (1) coast side toe (2). Increase backlash, by moving the ring away from the pinion gear using the adjusters.

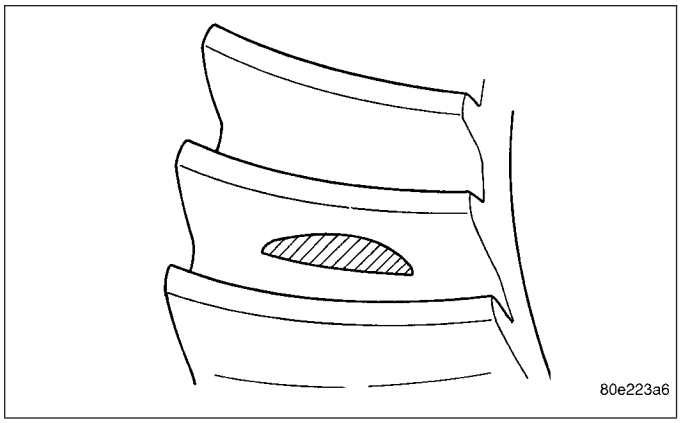


Pinion gear is set too low. Increase pinion gear height, by increasing the pinion depth shim thickness.



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Pinion gear is set too high. Decrease pinion depth, by decreasing the pinion depth shim thickness.



SPECIFICATIONS

AXLE SPECIFICATIONS

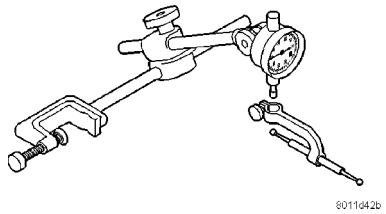
DESCRIPTION	SPECIFICATION
Axle Ratio	3.73, 4.10
Ring Gear Diameter	292 mm (11.5 in.)
Ring Gear Backlash	0.13-0.18 mm (0.005-0.007 in.)
Pinion Bearing Preload - New Bearings	1.69-2.82 N·m (15-25 in. lbs.)
Pinion Bearing Preload - Original Bearings	1-2 N·m (10-20 in. lbs.)
Pinion Bearing Preload + Differential Case Bearing Preload - New Bearing	3.4-5.6 N·m (30-50 in. lbs.)
Pinion Bearing Preload + Differential Case Bearing Preload - Original Bearing	2.8-5.1 N·m (25-45 in. lbs.)

TORQUE SPECIFICATIONS

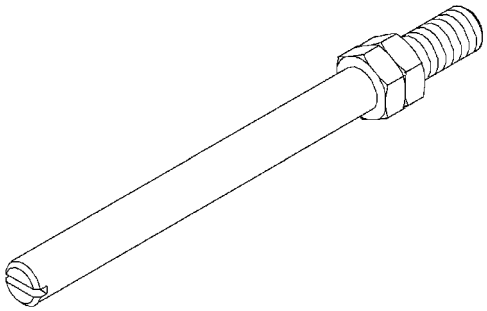
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Fill Hole Plug	32	24	-
Differential Cover Bolts	40	30	-
Bearing Cap Bolts	281	207	-
Ring Gear Bolts	237	175	-
Axle Flange Bolts	129	95	-
Adjuster Lock Bolt	25	18	-

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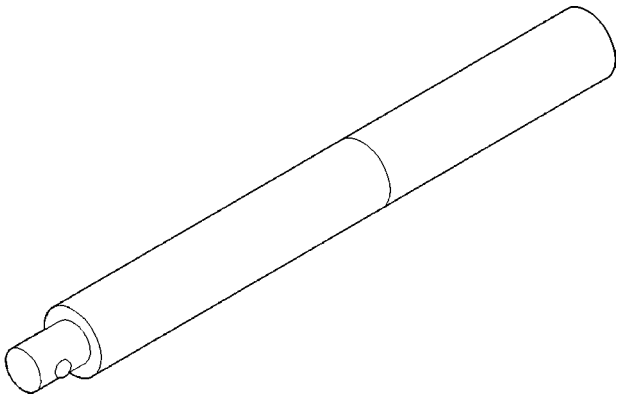
SPECIAL TOOLS



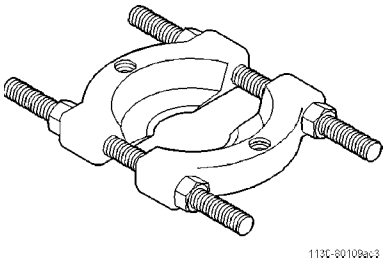
DIAL INDICATOR C-3339



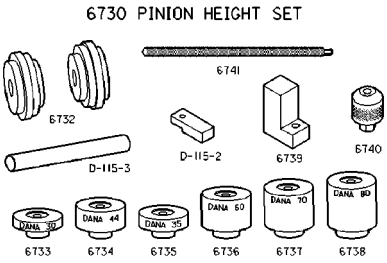
PILOT STUD L-4438



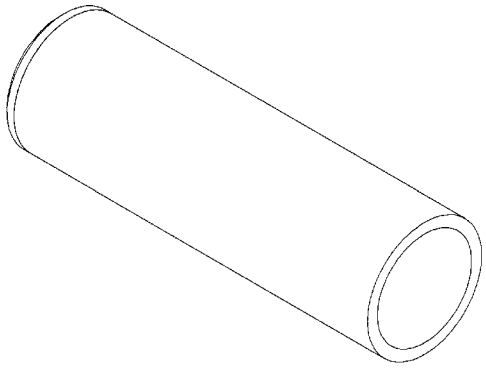
HANDLE C-4171



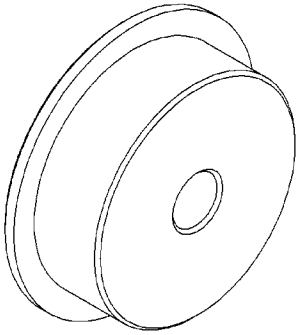
SPLITTER 1130



PINION DEPTH GAUGE 6730

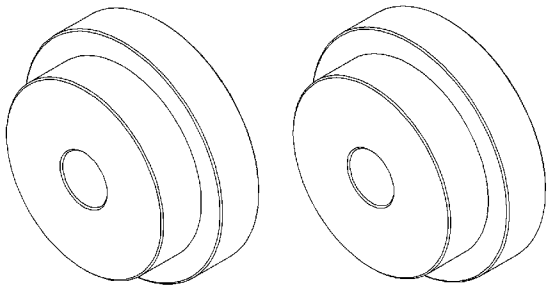


BEARING INSTALLER D-389

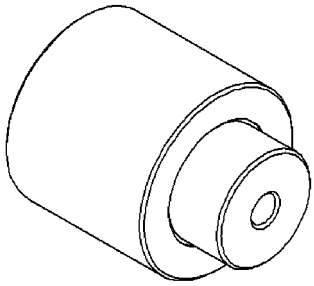


CUP INSTALLER 8153

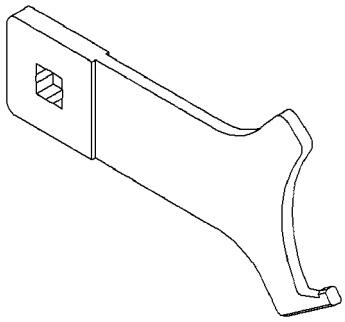
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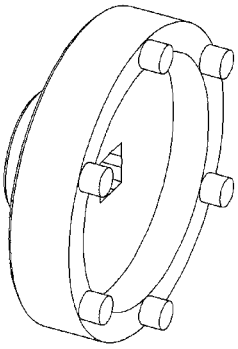
ARBOR DISCS 8289



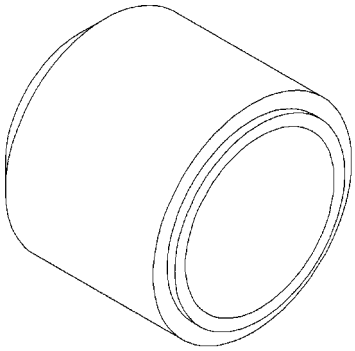
PINION BLOCK 8897



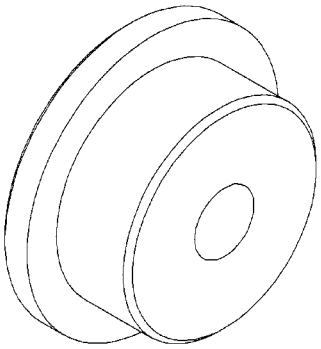
ADJUSTER WRENCH 8883



SOCKET 8954

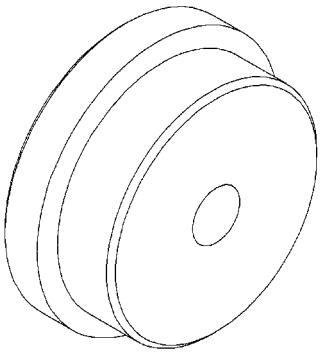


SEAL INSTALLER 8896

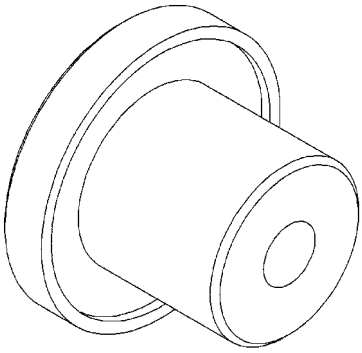


CUP INSTALLER 8960

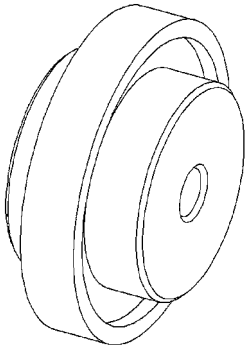
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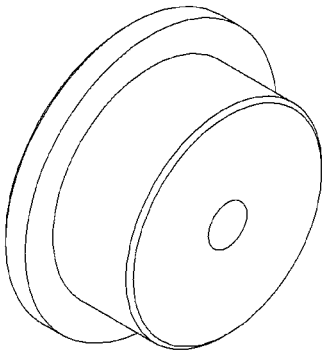
CUP INSTALLER 8961



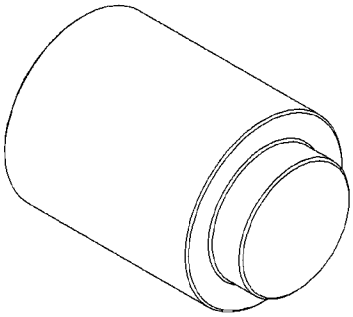
BEARING INSTALLER 8965



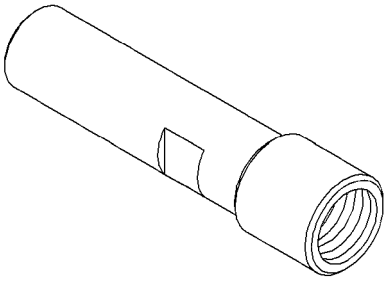
SEAL INSTALLER 8963



CUP INSTALLER 8968

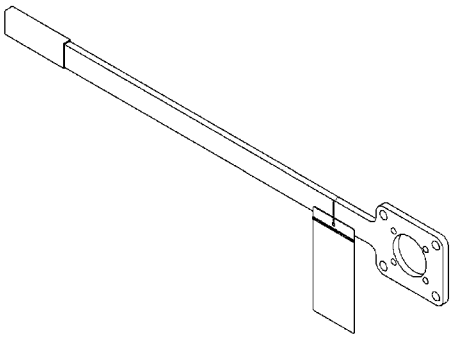


PLUG 8964

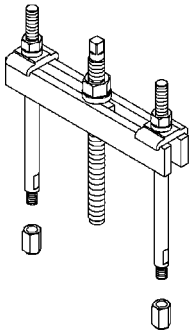


PINION DRIVER 8977

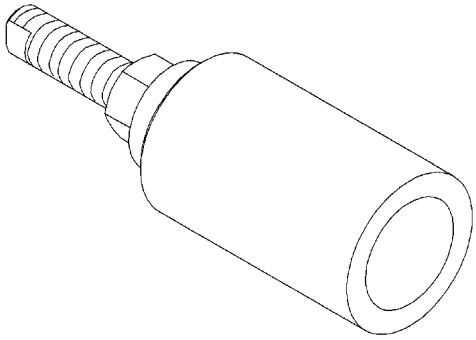
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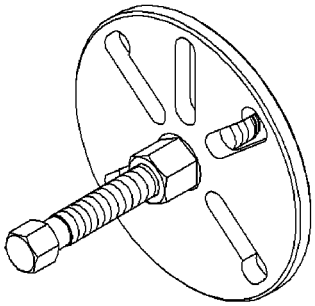
FLANGE WRENCH 8979



BRIDGE 938



PINION INSTALLER 8981



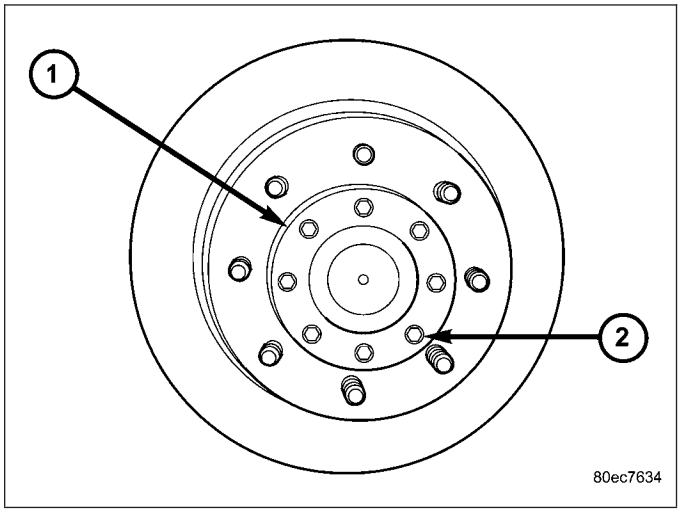
FLANGE PULLER 8992

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SHAFT-AXLE

REMOVAL

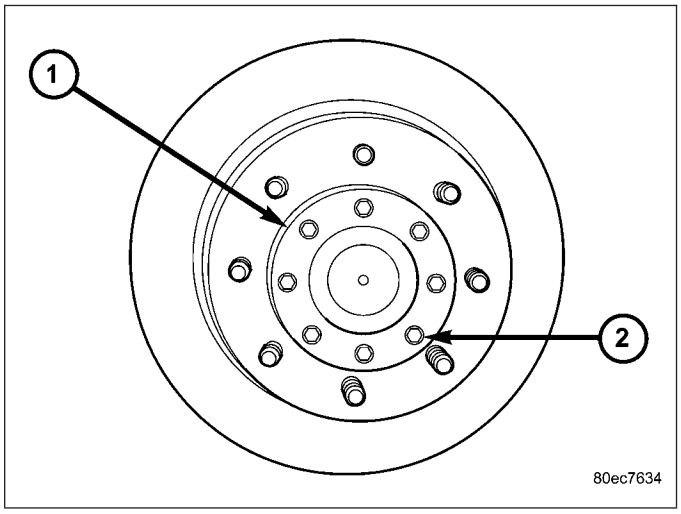
1. Remove axle shaft flange (1) bolts (2).
2. Slide axle shaft out of the axle tube.
3. Remove axle shaft gasket.



INSTALLATION

NOTE: Axle flange bolts must be replaced or use Mopar Lock N' Seal or Loctite® 242 on cleaned existing bolts.

1. Clean axle flange and hub.
2. Install new axle shaft gasket.
3. Slide axle shaft into the axle tube.
4. Install axle shaft flange (1) bolts (2) and tighten to 129 N·m (95 ft. lbs.).

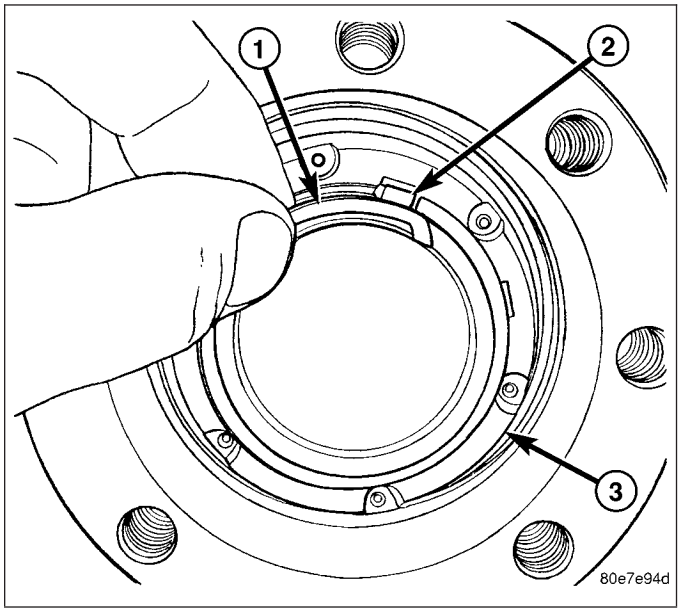


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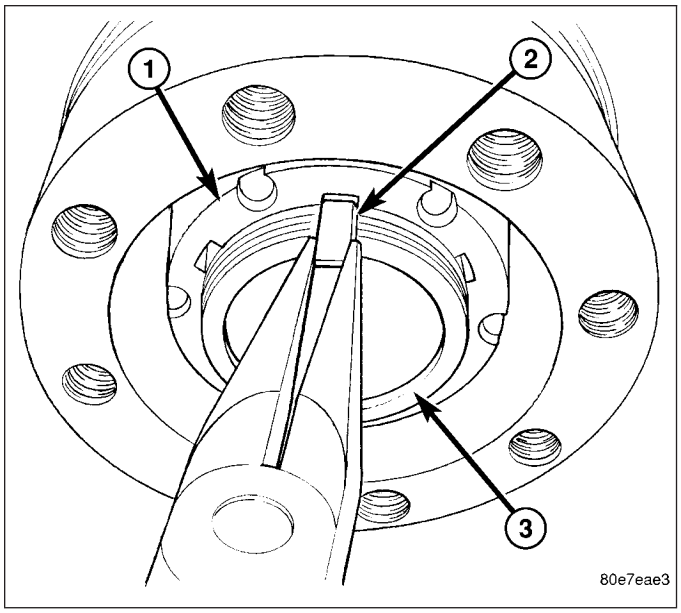
BEARING-AXLE HUB

REMOVAL

1. Remove axle shaft flange bolts and remove shaft.
2. Remove retianer ring (1) from the axle shaft tube.



3. Remove hub bearing nut (1) ocking key (2).
4. Remove hub bearing nut with Socket 8954.
5. Remove hub and bearings from the axle.

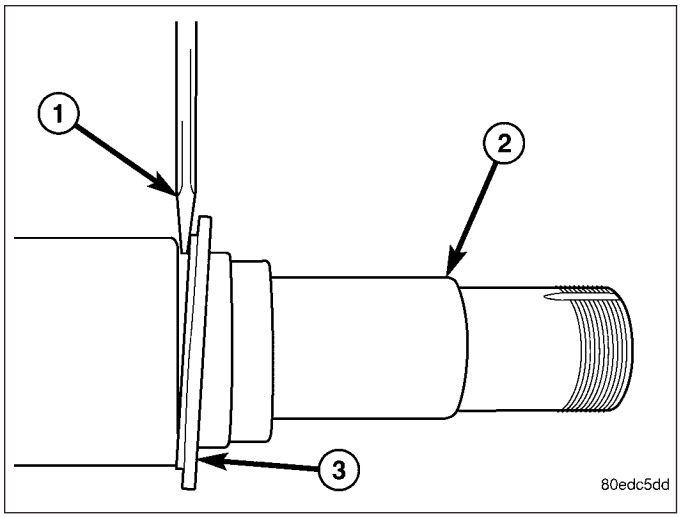


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6. Pry out hub bearing seal from the back of the hub.

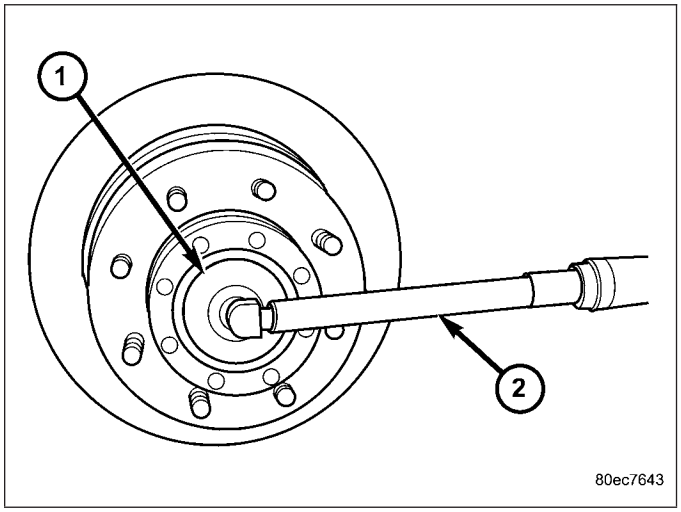
NOTE: The inner part of the seal (3) may stay on the axle tube (2). This part must also be removed.

7. Remove rear bearing.
8. Remove hub bearing cups with a hammer and drift.



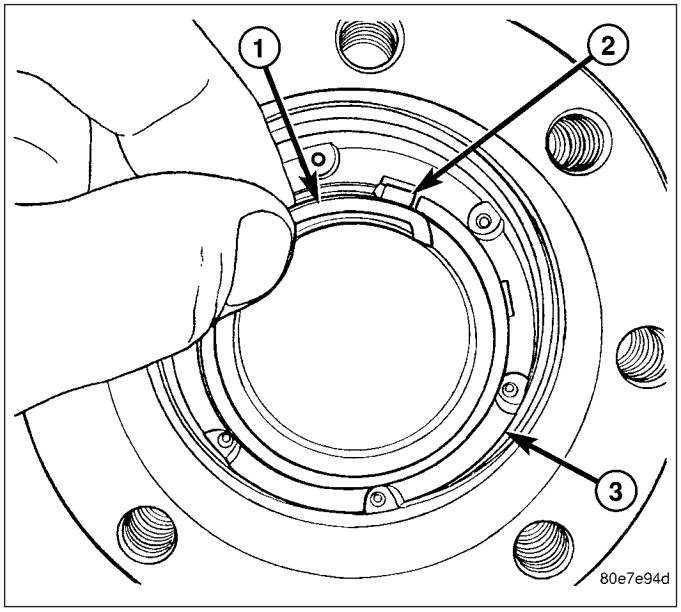
INSTALLATION

1. Install outer hub bearing cup with Installer 8961 and Handle C-4171.
2. Install inner hub bearing cup with Installer 8153 and Handle C-4171.
3. Pack bearings with the appropriate wheel bearing grease.
4. Install rear bearing and install **new** grease seal with Installer 8963 and Handle C-4171.
5. Slide hub on the axle tube and install front bearing into the hub.
6. Install hub bearing nut with Socket 8954 (1) and tighten to 30 N·m (22 ft. lbs.) while rotating the hub.
7. Back off nut about 30° and align next hub nut key slot with axle tube key slot and install locking key.



NOTE: End play should be 0.025-0.25 mm (0.01-0.001 in.)

8. Install retainer ring (1) with ring end in the key slot (2).
9. Install new axle shaft gasket and install the axle shaft.

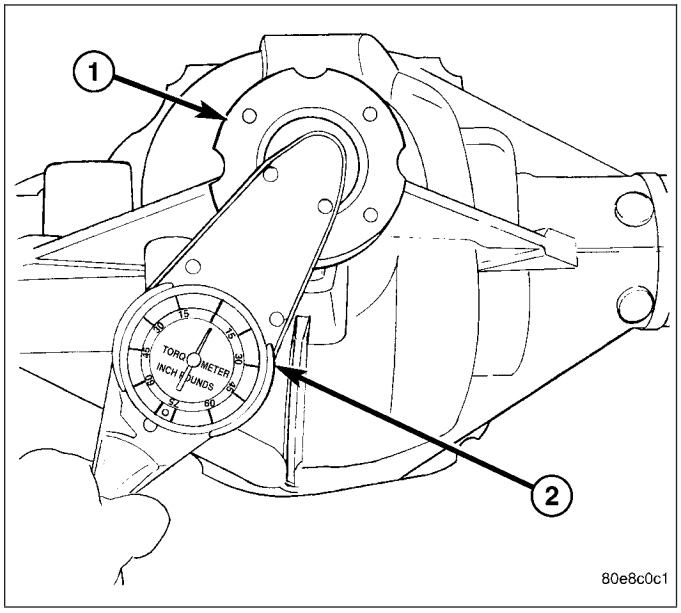


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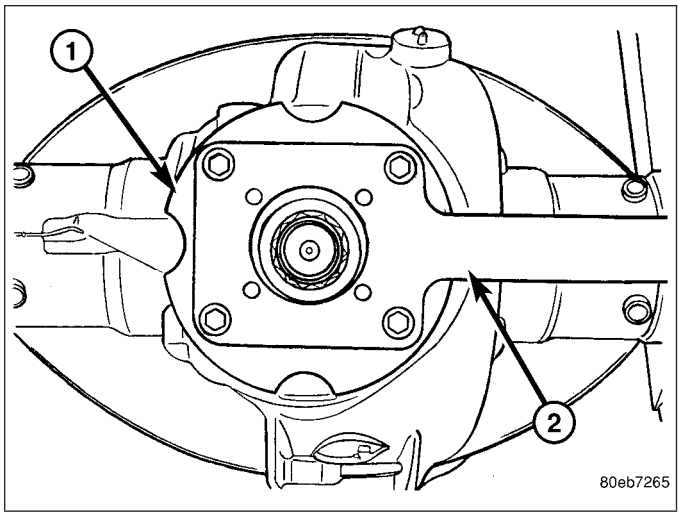
SEAL-PINION

REMOVAL

1. Remove axle shafts.
2. Mark the propeller shaft and pinion flange for installation reference.
3. Remove propeller shaft.
4. Rotate pinion gear (1) three or four times.
5. Measure and record the amount of torque necessary to rotate the pinion gear with an inch pound torque wrench (2).

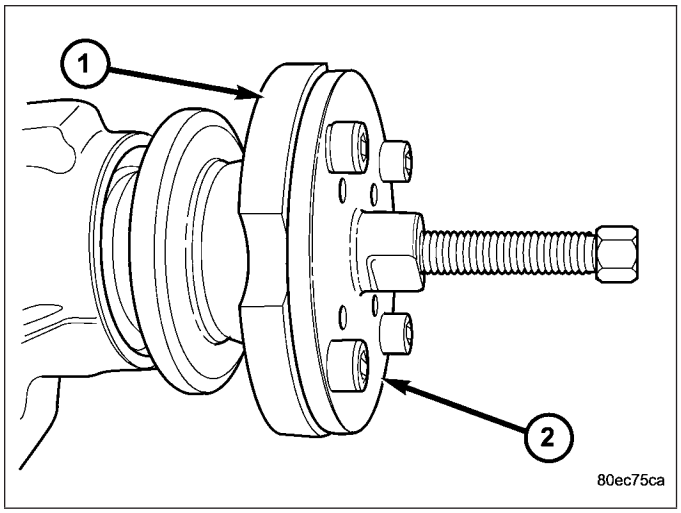


6. Hold pinion flange (1) with Flange Wrench 8979 (2) and remove pinion flange nut.



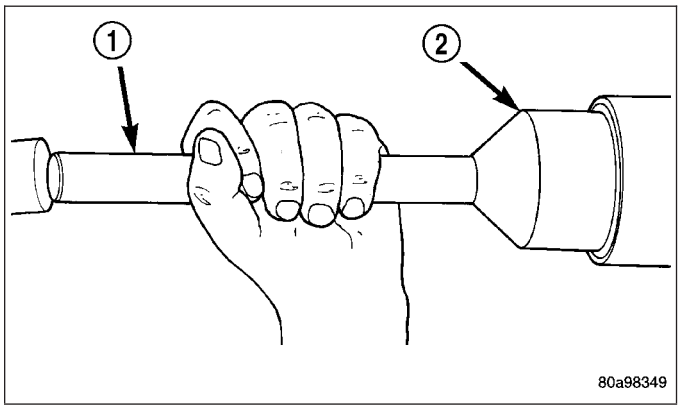
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7. Remove pinion flange (1) with Pinion Flange Puller 8992 (2).
8. Remove pinion shaft seal with a pry tool or slide hammer mounted screw.

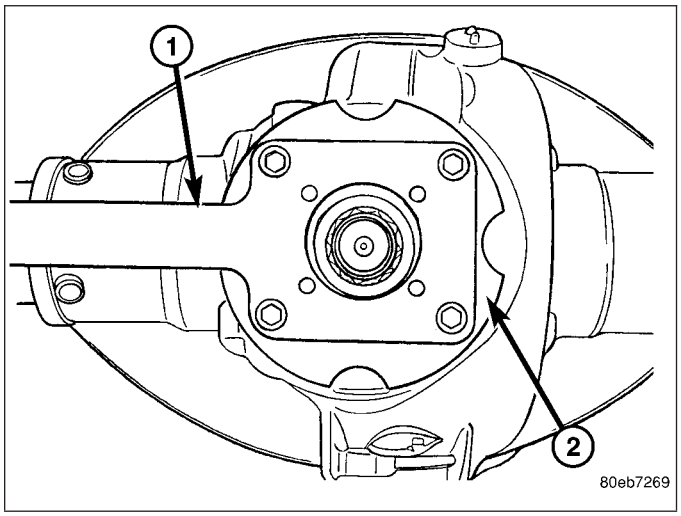


INSTALLATION

1. Install **new** pinion seal with Handle C-4171 (1) and Installer 8896 (2).
2. Apply a light coat of teflon sealant to the pinion flange splines.
3. Lightly tap the pinion flange onto the pinion until a few threads are showing.
4. Install flange washer and **new** pinion nut.

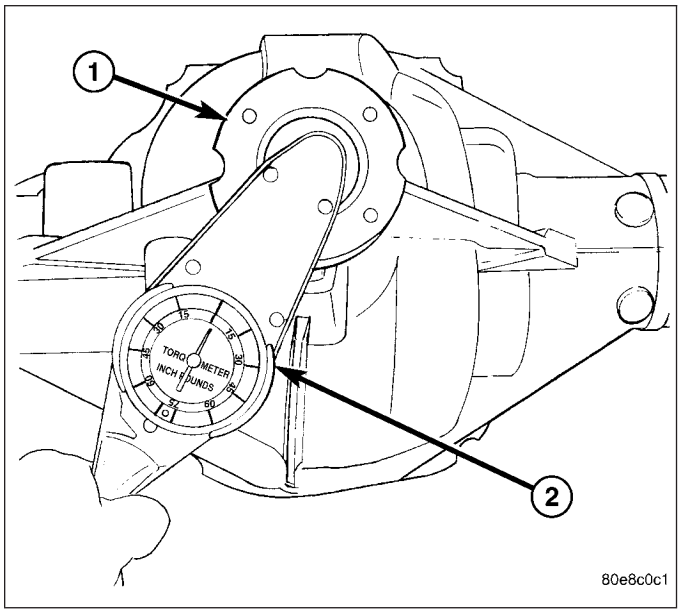


5. Hold pinion flange (2) with Flange Wrench 8979 (1) and tighten pinion nut until pinion end play is taken up.



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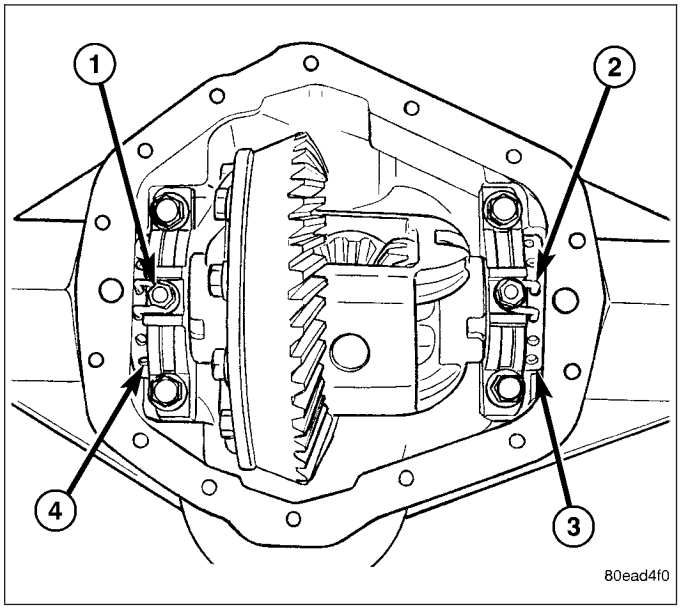
6. Rotate pinion several times to seat bearings.
7. Measure pinion (1) rotating torque with an inch pound torque wrench (2) and compare it to recorded measurement. Tighten pinion nut in small increments, until pinion rotating torque is 0.40-0.57 N·m (3-5 in. lbs.) greater than recorded measurement.
8. Rotate pinion several times then verify pinion rotating torque again.
9. Install axle shafts.
10. Install propeller shaft with reference marks aligned.
11. Check differential fluid level.



DIFFERENTIAL

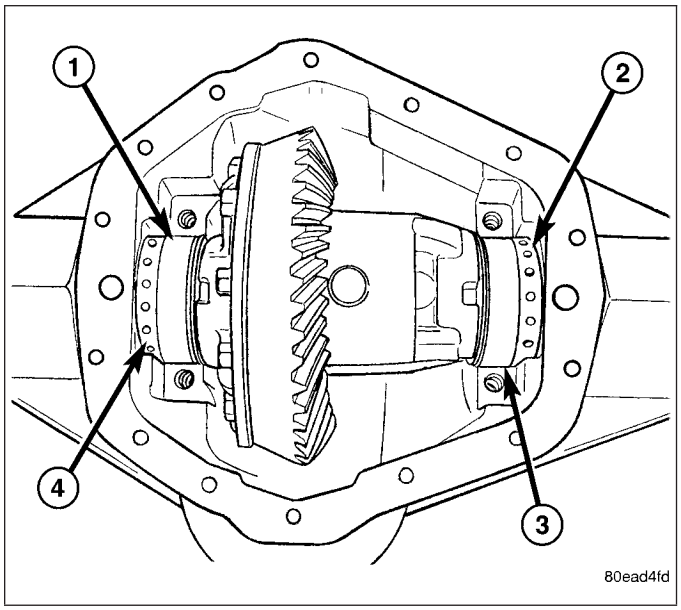
REMOVAL

1. Remove fill hole plug from the differential housing cover.
2. Remove differential housing cover and drain the lubricant.
3. Remove axle shafts.
4. Remove adjuster (3) lock bolts (1) and adjuster locks (2).



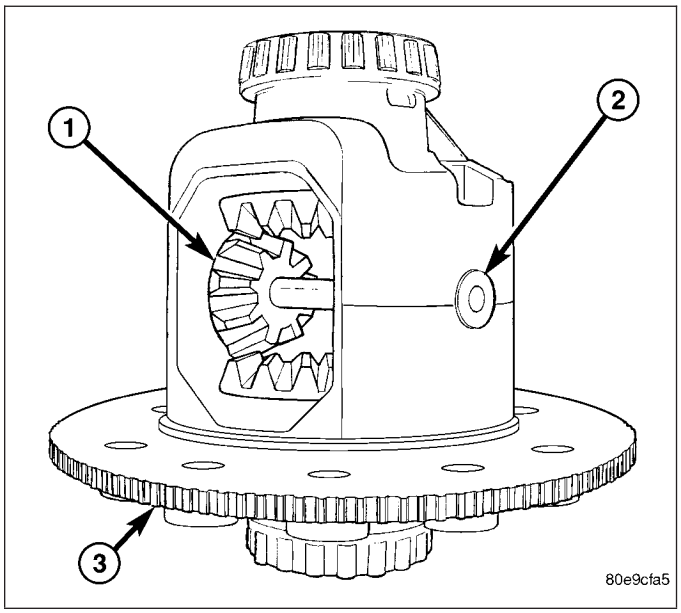
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5. Mark bearing caps left and right for installation reference.
6. Remove bearing cap bolts and remove bearing caps.
7. Loosen differential bearing adjusters (2) (4) with Spanner Wrench 8883.
8. Remove differential case from the housing.
9. Remove bearing cups (1) (3) and tag them left and right for installation reference.



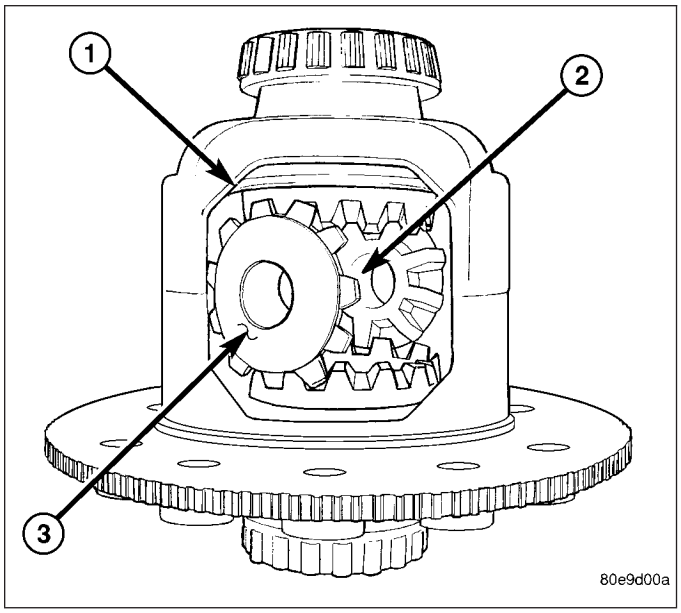
DISASSEMBLY

1. Remove ring gear.
2. Remove pinion shaft (2) with a hammer and punch from the side with the hole in the pinion shaft.

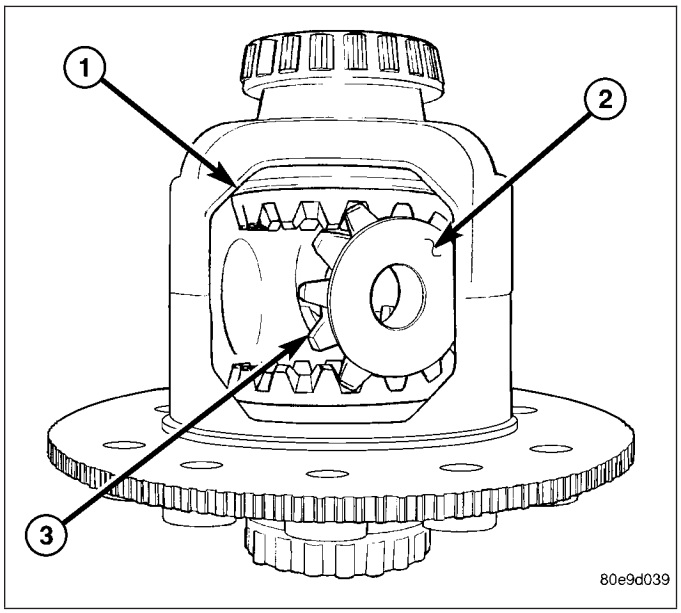


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3. Rotate one pinion gear (2) with thrust washer (3) to the differential window (1) and remove the gear.

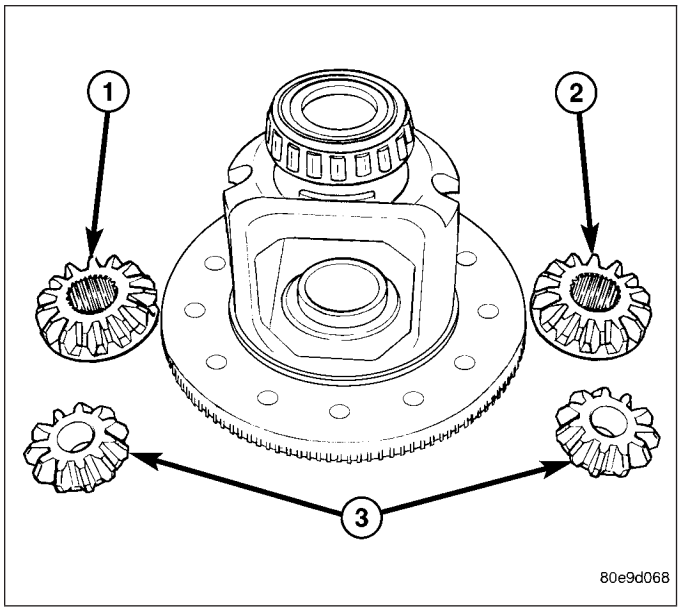


4. Rotate the other pinion gear (3) with thrust washer (2) to the differential window (1) and remove the gear.



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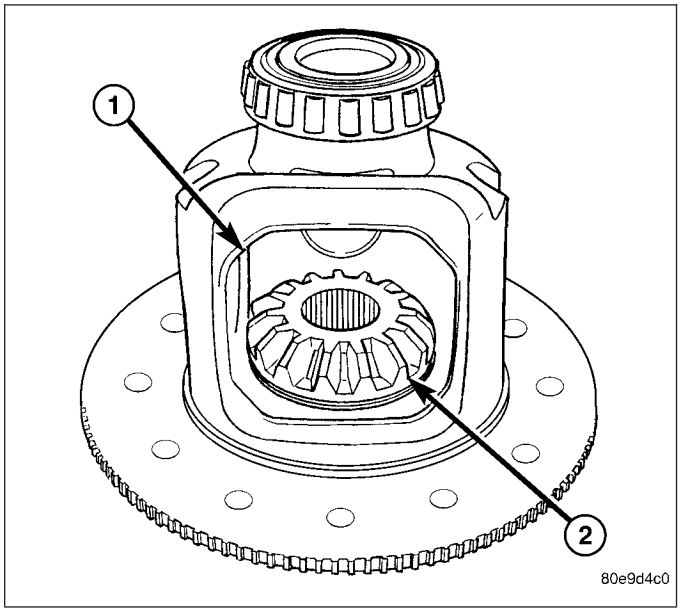
5. Remove differential side gears (1) (2) and thrust washers.



ASSEMBLY

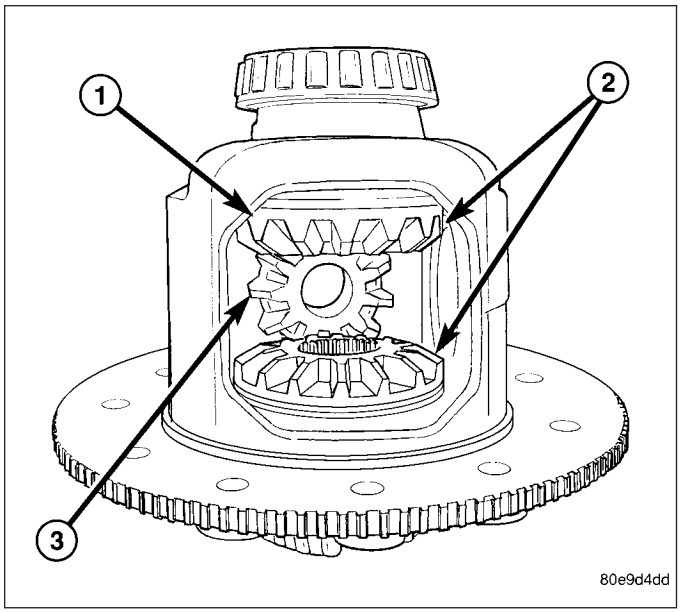
NOTE: If the same gears and thrust washers are being used, install them into their original locations.

1. Lubricate all differential components with axle lubricant.
2. Install differential side gears (2) and thrust washers through the differential window (1).

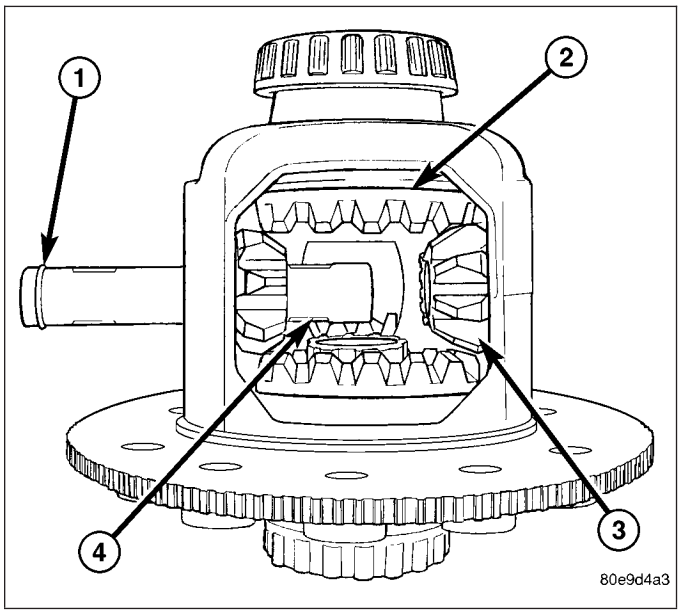


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3. Install first pinion gear (3) into the differential window (1) and side gears (2). Rotate the pinion gear to the back of the case.
4. Install the other pinion gear and thrust washer. Rotate the gears to align hole in the pinion gears with hole in the differential case.



5. Slide pinion shaft (4) into the case and through the pinion gears (3). Tap the shaft to seat the pinion shaft snap-ring (1) into the case.
6. Install ring gear.



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INSTALLATION

1. Clean the housing cavity with a flushing oil, light engine oil or lint free cloth.

NOTE: Do not use water, steam, kerosene or gasoline for cleaning.

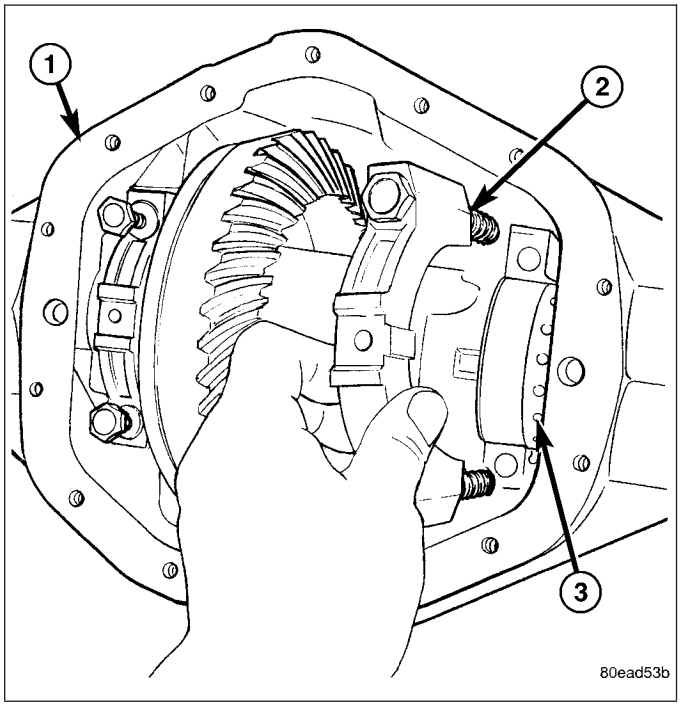
2. Lubricate differential case bearing.
3. Install differential case with bearings cups into the housing.

NOTE: A light coat of grease on the cups will hold them in place during installation.

4. Install bearing caps (2) and bolts. Tighten the bearing cap (2) bolts finger-tight.

NOTE: Do not torque bearing cap and bolts at this time.

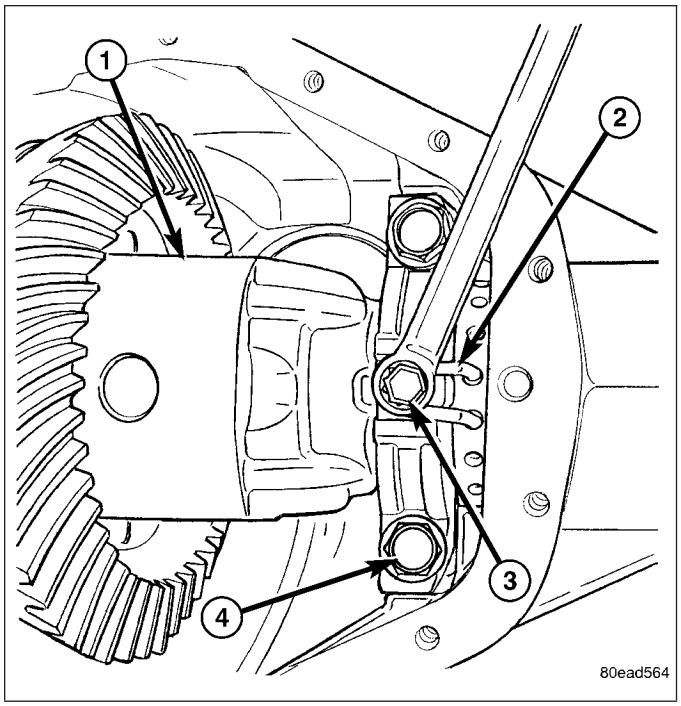
5. Slide differential case toward the pinion gear until the gears make contact/zero backlash. If zero backlash cannot be obtained, turn the pinion side adjuster until zero backlash is obtained.



6. Holding the differential case toward the pinion gear, turn bearing adjusters (3) with Spanner Wrench 8883 until they make contact with the differential bearings/cups.
7. Back off the ring gear side adjuster 4 holes, to obtain initial ring gear backlash.
8. Install ring gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.
9. Tighten pinion gear side adjuster firmly against the differential case bearing cup.
10. Rotate the pinion several times to seat the differential bearings.
11. Loosen pinion gear side adjuster until it is no longer in contact with the bearing cup.
12. Tighten pinion gear side adjuster until it just makes contact with the bearing cup.
13. Tighten pinion gear side adjuster an additional:
    - **New Bearings** 6 Adjuster Holes
    - **Original Bearings** 4 Adjuster Holes
14. Install pinion gear side adjuster lock and bolt. Do not tighten adjuster lock bolt at this time.

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15. Tighten bearing cap bolts (4) to 281 N·m (207 ft. lbs.).
16. Tighten adjuster lock bolts(3) to 25 N·m (18 ft. lbs.).
17. Measure ring gear backlash and check gear tooth contact pattern. Refer to Adjustments for procedure.
18. Install axle shaft gasket and install axle shafts.
19. Install differential housing gasket and cover. Tighten cover bolts to 40 N·m (30 ft. lbs.).
20. Fill axle with lubricant, refer to Lubrication & Maintenance for capacity and lubricant type.
21. Install fill plug and tighten to 32 N·m (24 ft. lbs.).

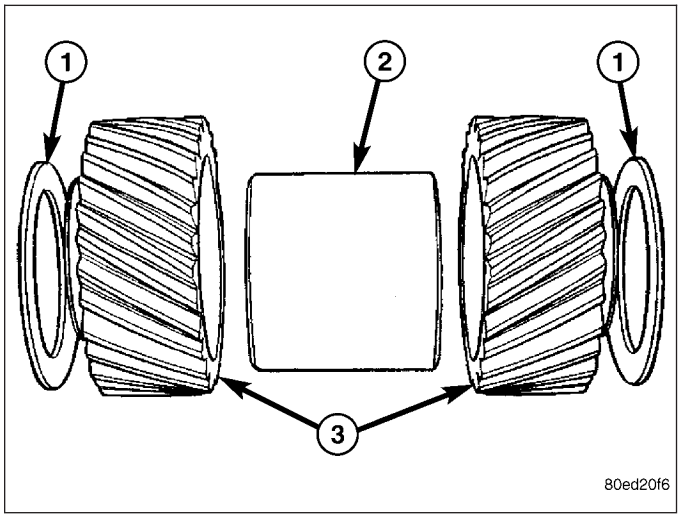


DIFFERENTIAL-TRAC-RITE

DESCRIPTION

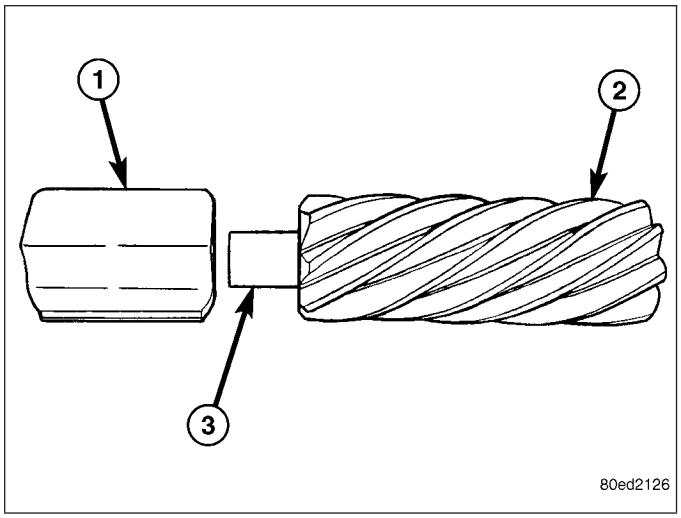
CAUTION: The differential is serviced as an assembly only do not attempt to disassemble. Failure to follow these instruction will result in damage to the differential.

The Trac-Rite™ differential is a helical gear differential. The differential has two side gears (3), two thrust washers (1) and one spacer (2).



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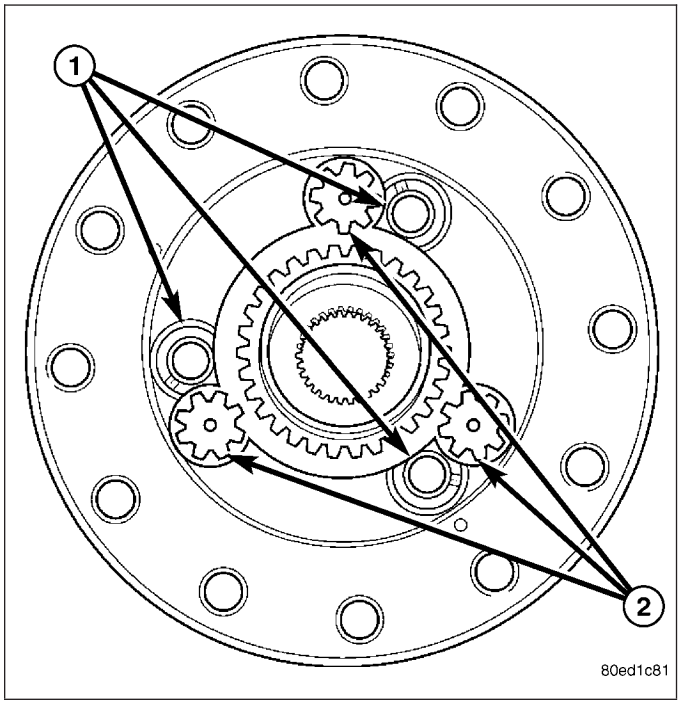
It also has six pinion brake shoes (1) which pivot on the six pinion gear (2) shafts (3).



OPERATION

CAUTION: The differential is serviced as an assembly only do not attempt to disassemble. Failure to follow these instruction will result in damage to the differential.

When one wheel begins to spin the pinion gears (2) on that side, are forced toward the pinion brake shoes (1). The pinion brake shoes then cause frictional drag on the opposite pinion gears and the side gear. These friction forces transfer the power to the opposite wheel. Once the frictional forces are overcome, differentiation will occur. The torque will be continually biased by the frictional forces to the high traction wheel.



CLEANING

CAUTION: The differential is serviced as an assembly only do not attempt to disassemble. Failure to follow these instruction will result in damage to the differential.

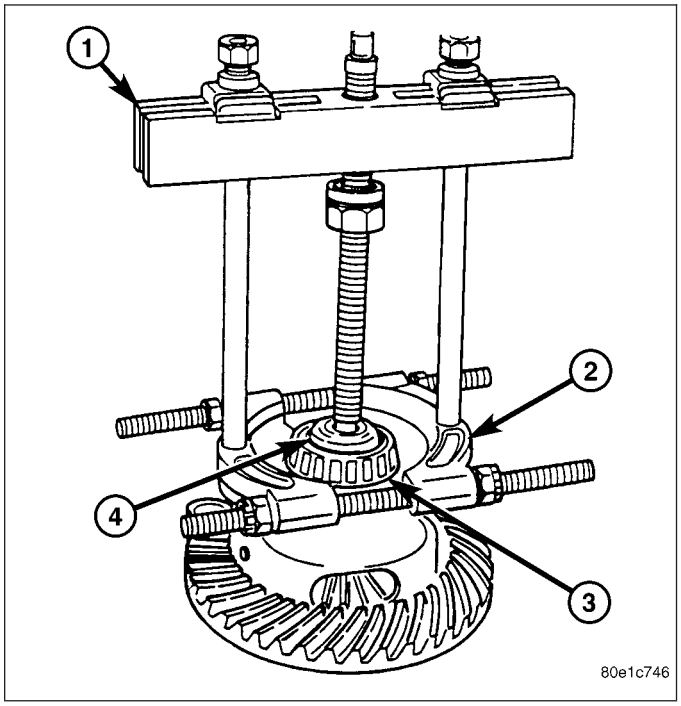
Flush the differential case and gears through openings in the case with light oil.

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BEARING-DIFFERENTIAL CASE

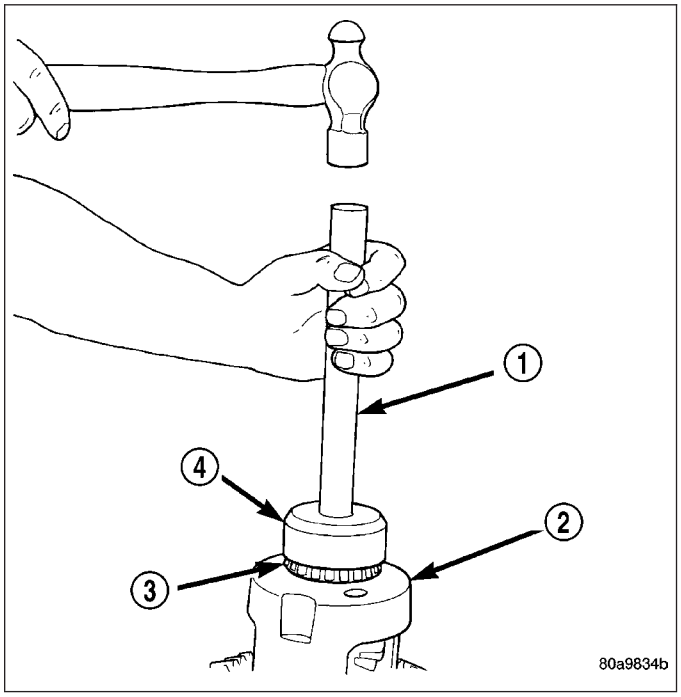
REMOVAL

1. Remove differential case from the housing.
2. Install Plug 8964 (4) into the end of the case.
3. Remove differental case bearings (3) with Bearing Splitter 1130 (2) and Bridge 938 (1).



INSTALLATION

1. Install differenial case (2) bearings (3) with Installer 8965 (4) and Handle C-4171(1).
2. Install differentail case into housing.



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GEAR-PINION/RING

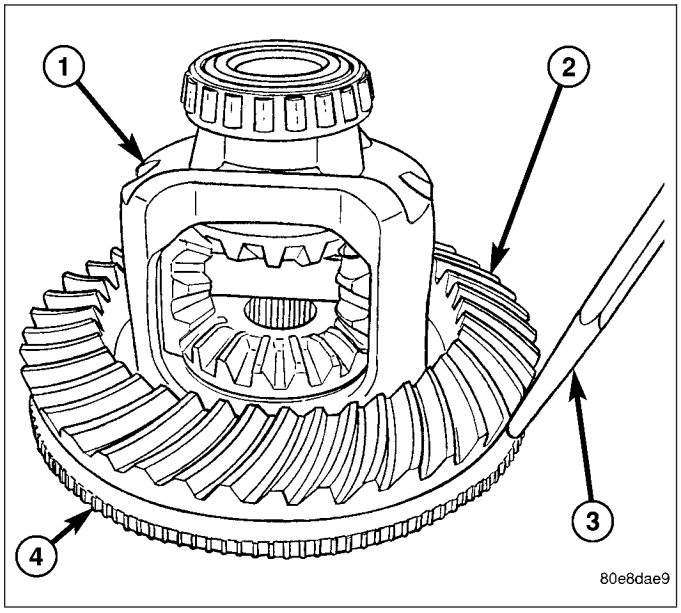
REMOVAL

NOTE: The ring and pinion gears are service in a matched set. Never replace the ring gear/pinion gear without replacing the other matching gear.

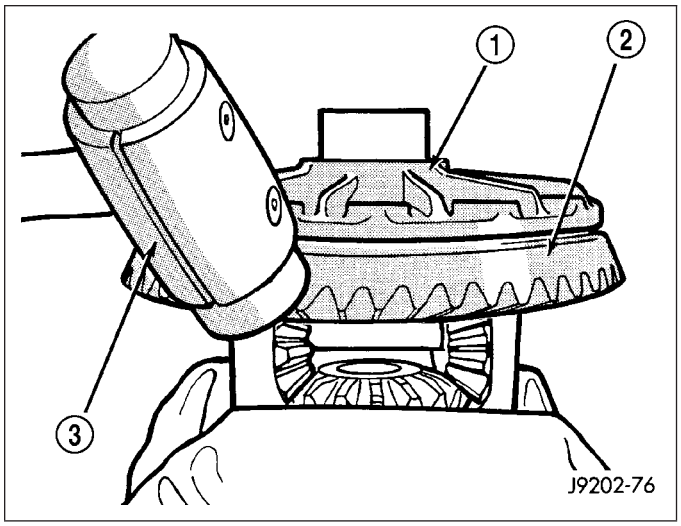
1. Mark pinion flange and propeller shaft for installation alignment.
2. Remove propeller shaft.
3. Remove differential from the housing.
4. Place differential case (1) on Plug 8964. Drive exciter ring (4) off the differential case with a hammer and punch (3).

NOTE: Do not remove the exciter ring if it is not being replaced.

5. Place differential case in a vise with soft metal jaw protectors.

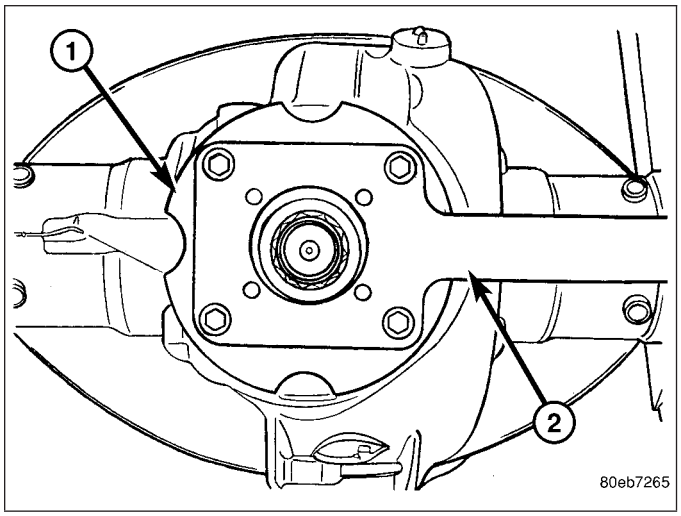


6. Remove bolts holding ring gear to differential case.
7. Drive ring gear (2) from differential case (1) with a soft hammer (3).

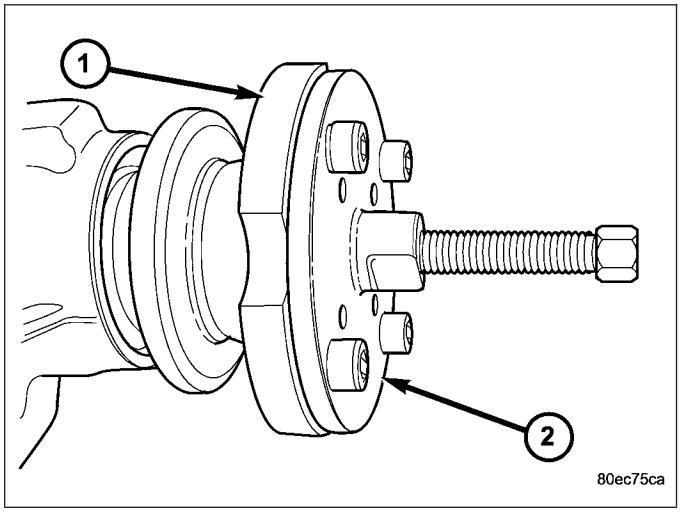


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8. Hold pinion flange (1) with Flange Wrench 8979 (2) and remove pinion flange nut.



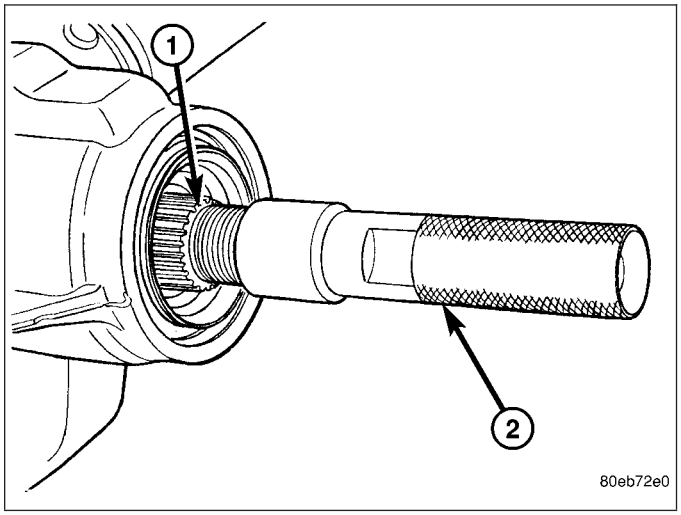
9. Remove pinion flange (1) from pinion with pinion Flange Puller 8992 (2).



10. Remove pinion gear (1) from housing with pinion Driver 8977 (2)and a hammer.

NOTE: Thread the driver on the pinion shaft till it bottoms out.

11. Remove pinion seal with a slide hammer or pry bar.



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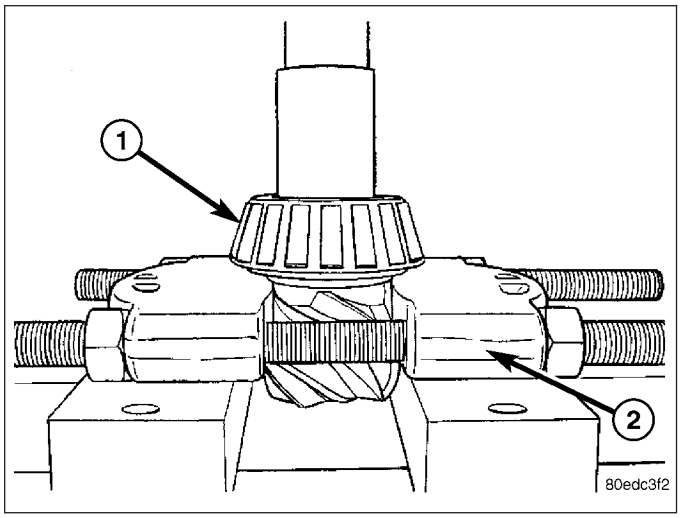
12. Remove front pinion bearing and discard bearing.

NOTE: Do not reuse front pinion bearing/cup.

13. Remove collapsible spacer from the pinion shaft.
14. Remove rear pinion bearing (1) with Bearing Splitter 1130 (2) and a press.
15. Remove pinion depth shim from the pinion gear shaft and record thickness of the shims.
16. Remove front pinion bearing cup from the housing with a punch and hammer, and discard cup.

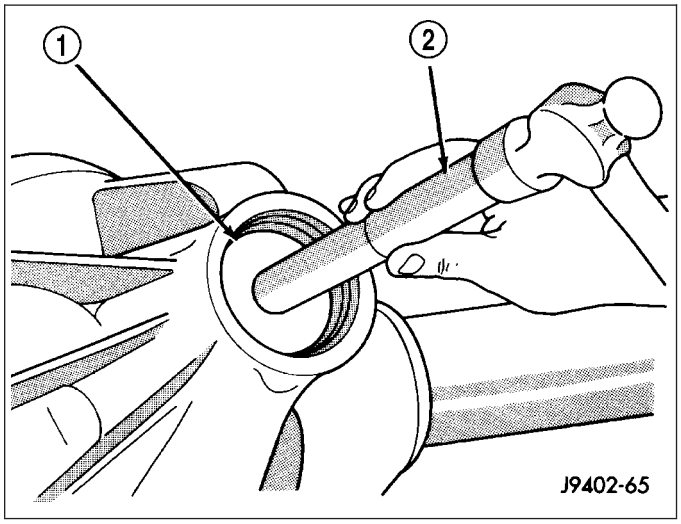
NOTE: Do not reuse front pinion bearing/cup.

17. Remove rear pinion bearing cup from the housing with a punch and hammer, if bearing is going to be replaced.



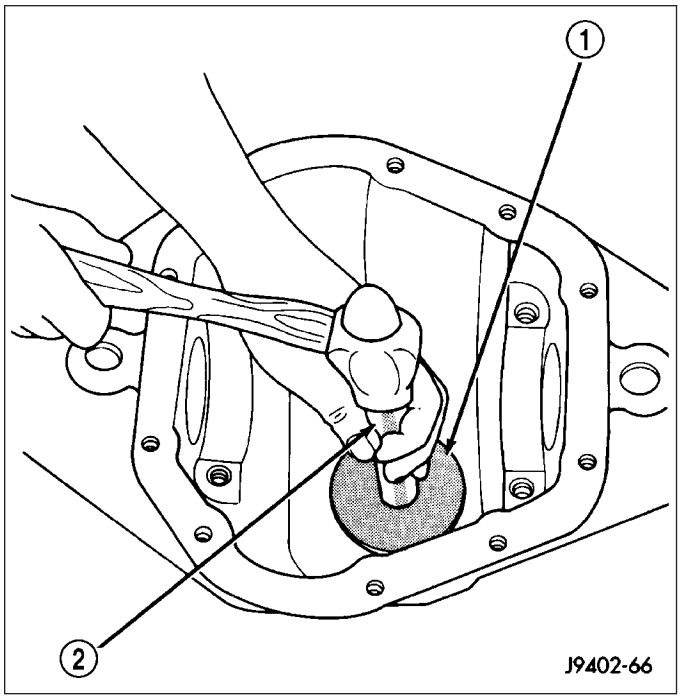
INSTALLATION

1. Install new front pinion bearing cup with Installer 8960 (1) and Handle C-4171 (2).

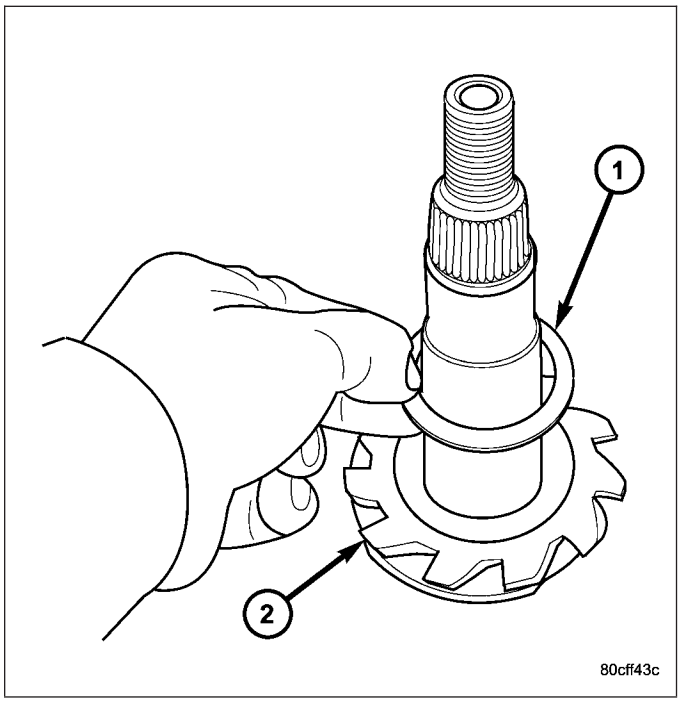


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2. Install new rear pinion bearing cup with Installer 8968 (1) and Handle C-4171(2).

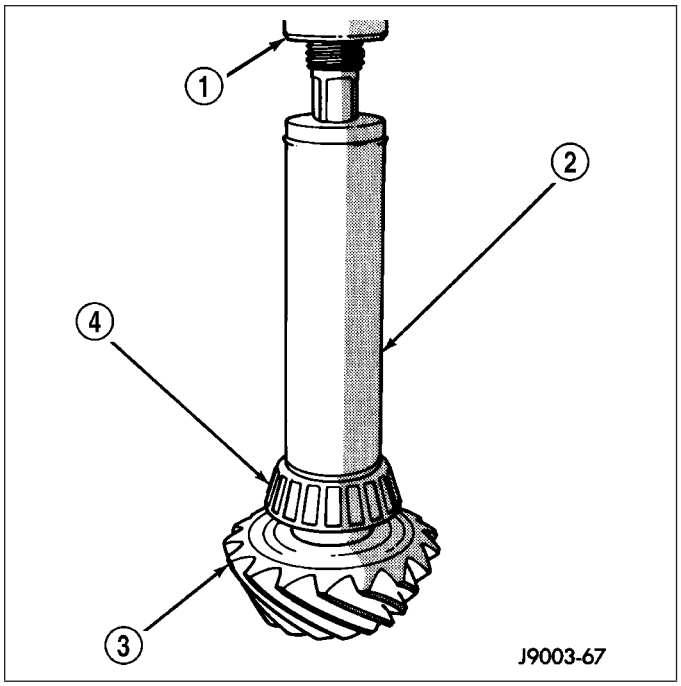


3. Install pinion depth shim (1) on the pinion gear shaft (2).

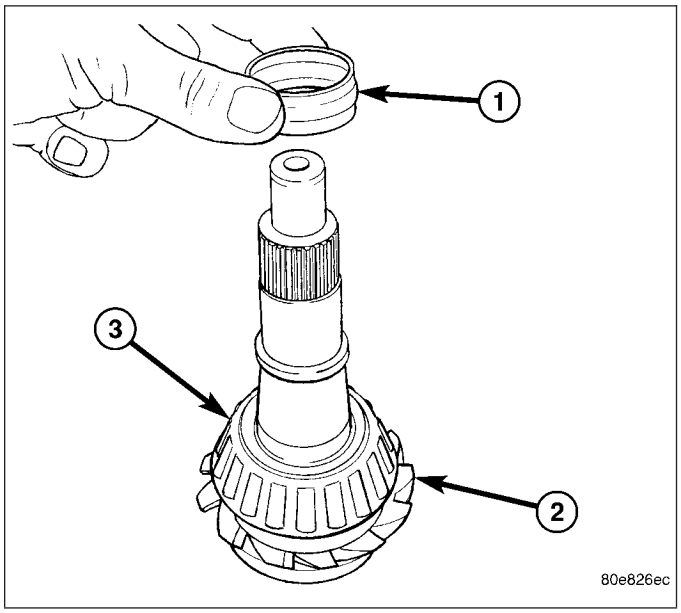


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4. Install rear pinion bearing (4) with Installer D-389 (1) and a press (1).

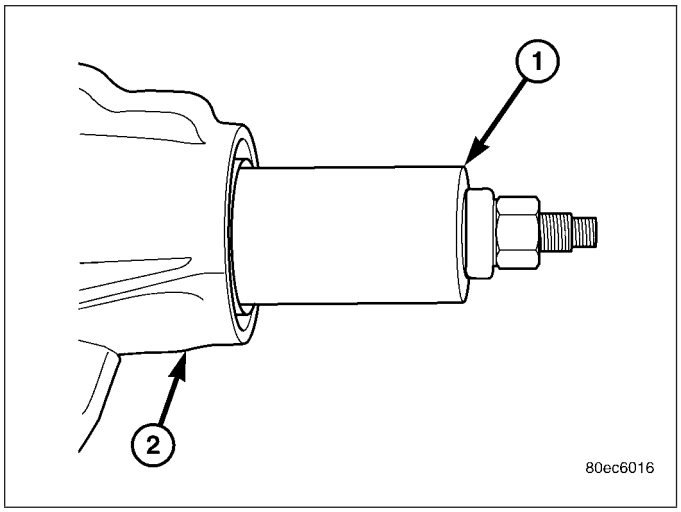


5. Install **new** collapsible spacer (1) on the pinion (2).
6. Lubricate pinion and bearings.

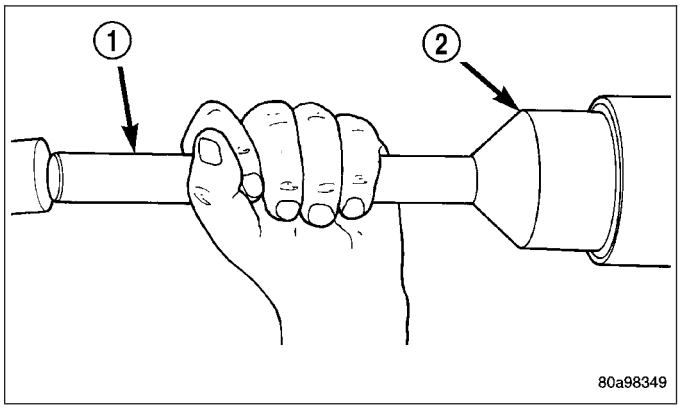


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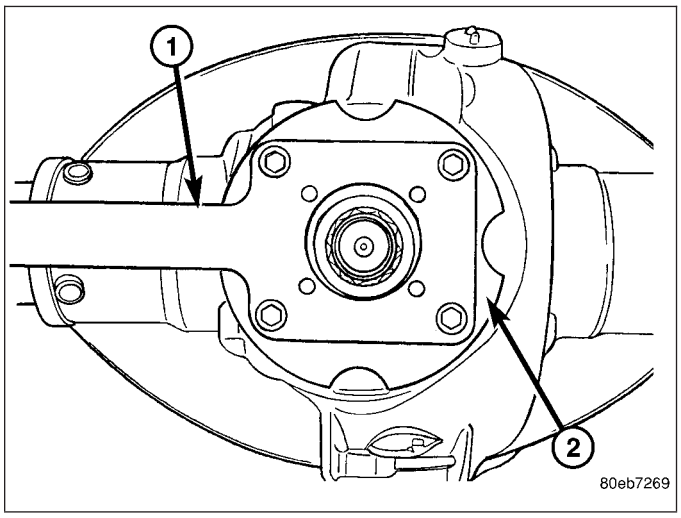
7. Install pinion into the housing (2) and place front pinion bearing onto the pinion shaft. Draw the pinion shaft into the front bearing with Installer 8981 (1).



8. Install **new** pinion seal with Installer 8896 (2) and Handle C-4171 (1).

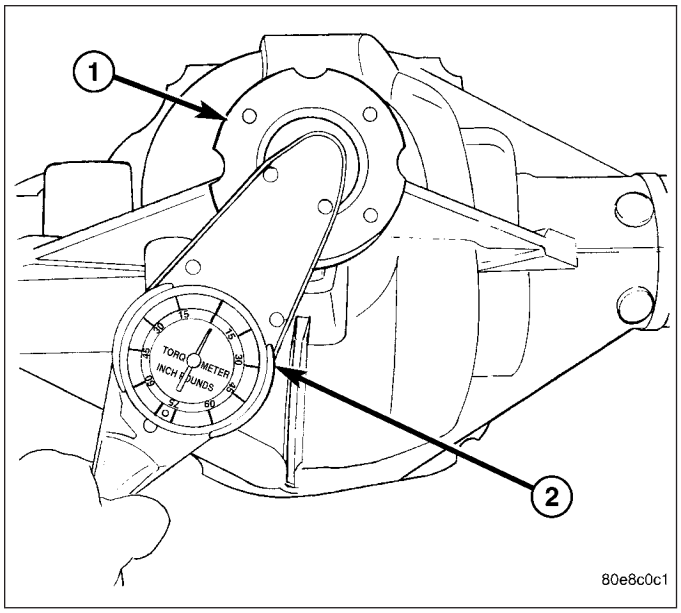


9. Rotate pinion several times to seat bearings.
10. Apply a light coat of teflon sealant to the pinion flange splines.
11. Hold pinion and lightly tap the pinion flange (2) onto the pinion, until a few threads are showing.
12. Install pinion flange washer and **new** pinion nut.
13. Hold pinion flange (2) with Flange Wrench 8979 (1) and tighten pinion nut until pinion end play is taken up.

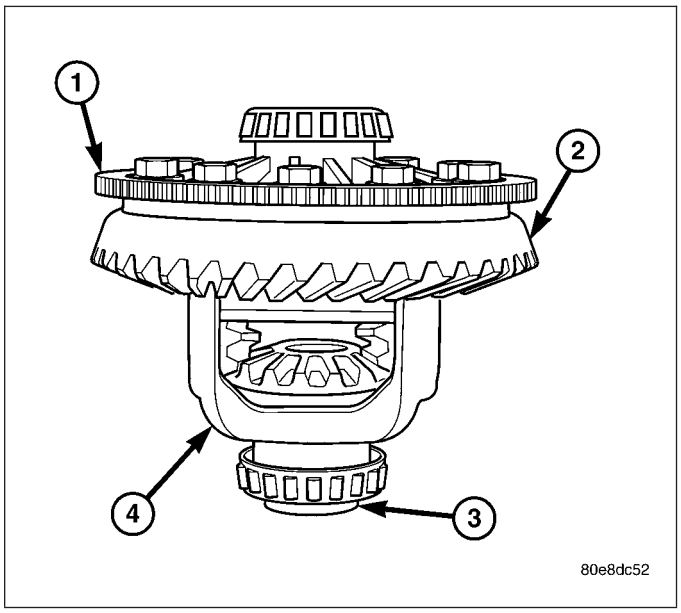


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14. Measure pinion rotating torque (1) with an inch pound torque wrench (2). Tighten pinion nut in small increments until pinion rotating torque is:
    - **New Pinion Bearings:** 1.7-2.8 N·m (15-25 in. lbs.)
    - **Original Pinion Bearings:** 1.1-2.2 N·m (10-20 in. lbs.)
15. Rotate pinion several times then verify pinion rotating torque again.

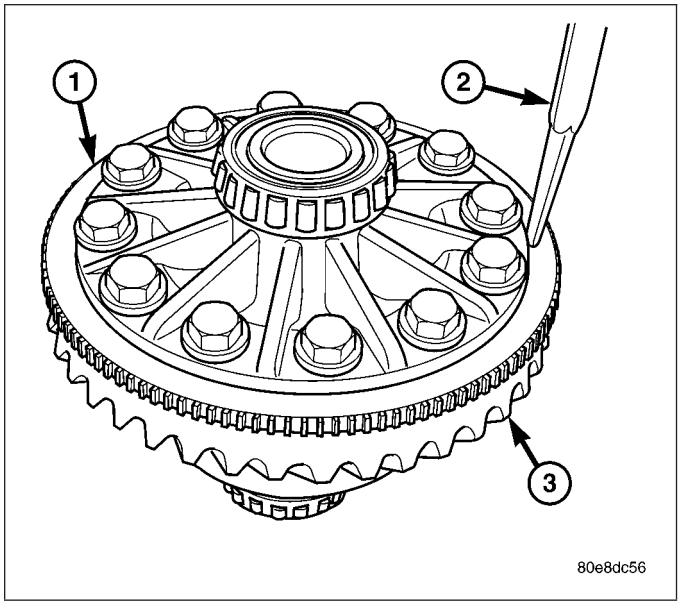


16. Position the ring gear (2) on differential case (4) and start two **new** ring gear bolts.
17. Install the rest of the **new** ring gear bolts and tighten them alternately to seat the ring gear.
18. Torque ring gear bolts to 237 N·m (175 ft. lbs.).



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19. If exciter ring was removed, position differential assembly on differential Plug 8965 and place exciter ring (1) on the differential case.
20. Install the exciter ring on the differential case evenly with a hammer and brass punch (2). Drive the ring down until it is seated against the ring gear (2).
21. Install differential in housing and verify gear backlash and gear contact pattern.
22. Measure final rotating torque with an inch pound torque wrench. The final pinion rotating torque plus differential case bearing preload is:
    - **New Bearings:** 3.4-5.6 N·m (30-50 in. lbs.)
    - **Original Bearings:** 2.8-5.1 N·m (25-45 in. lbs.)
23. Install axle shafts.
24. Install the propeller shaft with the reference marks aligned.



25. Install differential cover with gasket and tighten bolts to 40 N·m (30 ft. lbs.).
26. Fill differential with fluid and tighten fill plug to 32 N·m (24 ft. lbs.).

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REAR AXLE - 248RBI

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REAR AXLE - 248RBI

DIAGNOSIS AND TESTING

REAR AXLE - 248RBI

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, incorrect pinion depth, tooth contact, worn/damaged gears, or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly:

- Check for insufficient lubricant.
- Incorrect ring gear backlash.
- Gear damage.

Differential side gears and pinions can be checked by turning the vehicle. They usually do not cause noise during straight-ahead driving when the gears are unloaded. The side gears are loaded during vehicle turns. A worn pinion shaft can also cause a snapping or a knocking noise.

BEARING NOISE

The axle shaft, differential and pinion bearings can all produce noise when worn or damaged. Bearing noise can be either a whining, or growling sound.

Pinion bearings have a constant-pitch noise. This noise changes with vehicle speed. Pinion bearing noise will be high pitched because it rotates at a faster rate. Drive the vehicle and load the differential. If bearing noise occurs, the rear pinion bearing is the source of the noise. If bearing noise is heard during a coast, the front pinion bearing is the source.

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Differential bearings usually produce a low pitch noise. Differential bearing noise is similar to pinion bearing noise. The pitch of differential bearing noise is also constant and varies only with vehicle speed.

Axle shaft bearings produce noise and vibration when worn or damaged. The noise generally changes when the bearings are loaded. Road test the vehicle turning the vehicle sharply to the left and to the right. This will load the bearings and change the noise level. Where axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 mph.

LOW SPEED KNOCK

Low speed knock is generally caused by a worn U-joint or by worn side–gear thrust washers. A worn pinion shaft bore will also cause low speed knock.

VIBRATION

Vibration at the rear of the vehicle is usually caused by a:

- Damaged drive shaft.
- Missing drive shaft balance weight(s).
- Worn or out-of-balance wheels.
- Loose wheel lug nuts.
- Worn U-joint(s).
- Loose/broken springs.
- Damaged axle shaft bearing(s).
- Loose pinion gear nut.
- Excessive pinion yoke run out.
- Bent axle shaft(s).

Check for loose or damaged front-end components or engine/transmission mounts. These components can contribute to what appears to be a rearend vibration. Do not overlook engine accessories, brackets and drive belts.

NOTE: All driveline components should be examined before starting any repair.

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear (or the clutch engaged), can be caused by:

- High engine idle speed.
- Transmission shift operation.
- Loose engine/transmission/transfer case mounts.
- Worn U-joints.
- Loose spring mounts.
- Loose pinion gear nut and yoke.
- Excessive ring gear backlash.
- Excessive side gear to case clearance.

The source of a snap or a clunk noise can be determined with the assistance of a helper. Raise the vehicle on a hoist with the wheels free to rotate. Instruct the helper to shift the transmission into gear. Listen for the noise, a mechanics stethoscope is helpful in isolating the source of a noise.

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DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose.	1. Tighten loose nuts.
	2. Faulty, brinelled wheel bearing.	2. Replace bearing.
Axle Shaft Noise	1. Misaligned axle tube.	1. Inspect axle tube alignment. Correct as necessary.
	2. Bent or sprung axle shaft.	2. Inspect and correct as necessary.
Axle Shaft Broke	1. Misaligned axle tube.	1. Replace the broken shaft after correcting tube mis-alignment.
	2 Vehicle overloaded.	2. Replace broken shaft and avoid excessive weight on vehicle.
	3. Erratic clutch operation.	3. Replace broken shaft and avoid or correct erratic clutch operation.
	4. Grabbing clutch.	4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	1. Improper adjustment of the differential bearings.	1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly.
	2. Excessive ring gear backlash.	2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly.
	3. Vehicle overloaded.	3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight.
	4. Erratic clutch operation.	4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.
Differential Gears Scored	1. Insufficient lubrication.	1. Replace scored gears. Fill differential with the correct fluid type and quantity.
	2. Improper grade of lubricant.	2. Replace scored gears. Fill differential with the correct fluid type and quantity.
	3. Excessive spinning of one wheel/tire.	3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	1. Lubricant level too high.	1. Drain lubricant to the correct level.
	2. Worn axle shaft seals.	2. Replace seals.
	3. Cracked differential housing.	3. Repair as necessary.
	4. Worn pinion seal.	4. Replace seal.
	5. Worn/scored yoke.	5. Replace yoke and seal.
	6. Axle cover not properly sealed.	6. Remove, clean, and re-seal cover.

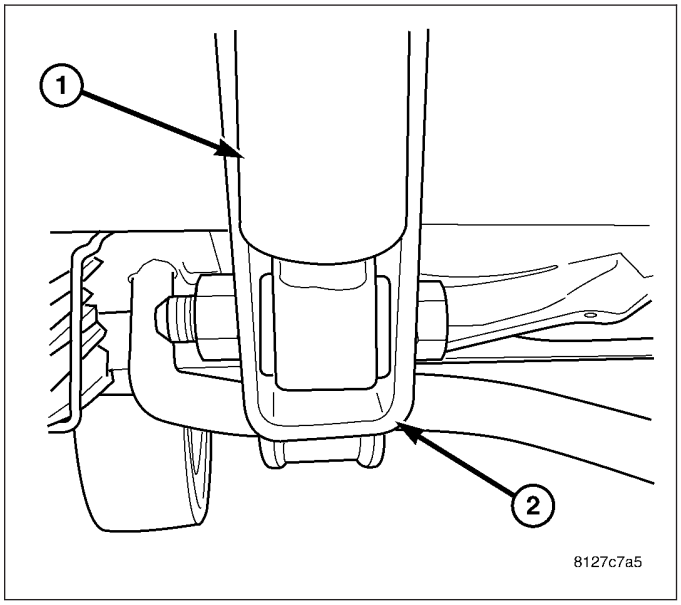
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Condition	Possible Causes	Correction
Axle Overheating	1. Lubricant level low.	1. Fill differential to correct level.
	2. Improper grade of lubricant.	2. Fill differential with the correct fluid type and quantity.
	3. Bearing pre-loads too high.	3. Re-adjust bearing pre-loads.
	4. Insufficient ring gear backlash.	4. Re-adjust ring gear backlash.
Gear Teeth Broke	1. Overloading.	1. Replace gears. Examine other gears and bearings for possible damage.
	2. Erratic clutch operation.	2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation.
	3. Ice-spotted pavement.	3. Replace gears and examine remaining parts for damage.
	4. Improper adjustments.	4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.
Axle Noise	1. Insufficient lubricant.	1. Fill differential with the correct fluid type and quantity.
	2. Improper ring gear and pinion adjustment.	2. Check ring gear and pinion contact pattern. Adjust backlash or pinion depth.
	3. Unmatched ring gear and pinion.	3. Replace gears with a matched ring gear and pinion.
	4. Worn teeth on ring gear and/or pinion.	4. Replace ring gear and pinion.
	5. Loose pinion bearings.	5. Adjust pinion bearing pre-load.
	6. Loose differential bearings.	6. Adjust differential bearing pre-load.
	7. Mis-aligned or sprung ring gear.	7. Measure ring gear run-out. Replace components as necessary.
	8. Loose differential bearing cap bolts.	8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued tot he proper specification.
	9. Housing not machined properly.	9. Replace housing.

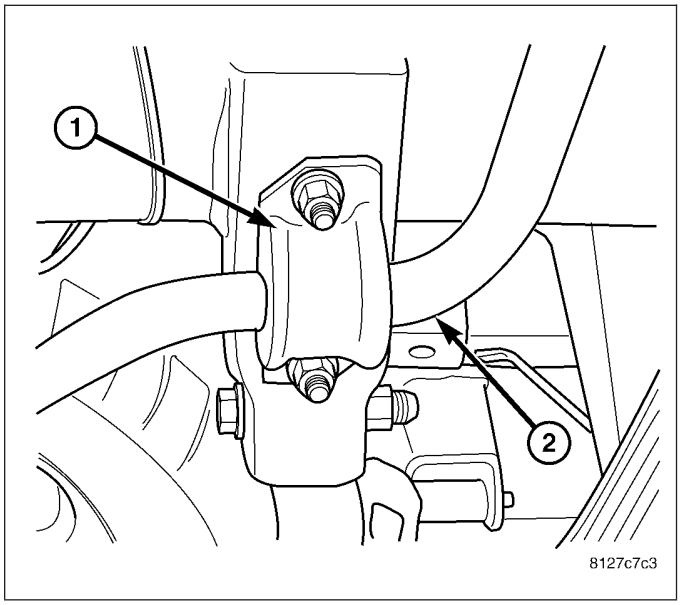
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REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Position a lift under axle and secure lift to the axle.
3. Remove all brake components.
4. Remove propeller shaft.
5. Remove power hop damper from the frame, then the differential cover bracket.
6. Remove shock absorbers (1) from axle bracket (2).

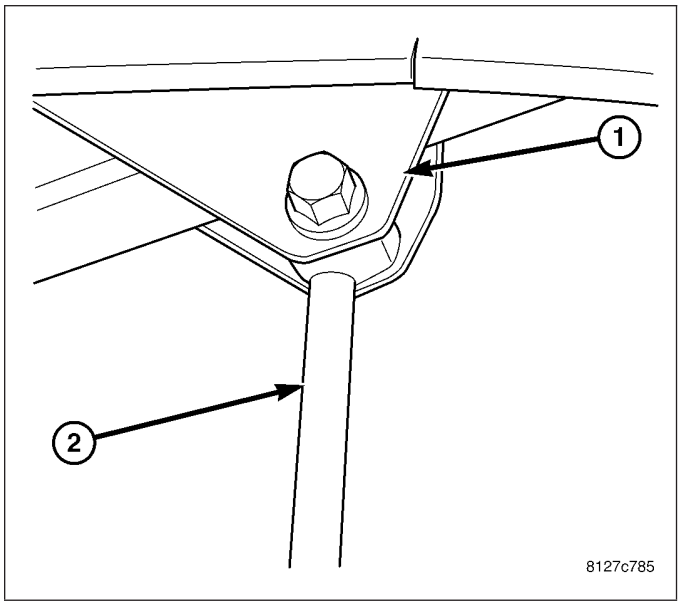


7. Remove stabilizer bar (2) clamps (1) from the axle.

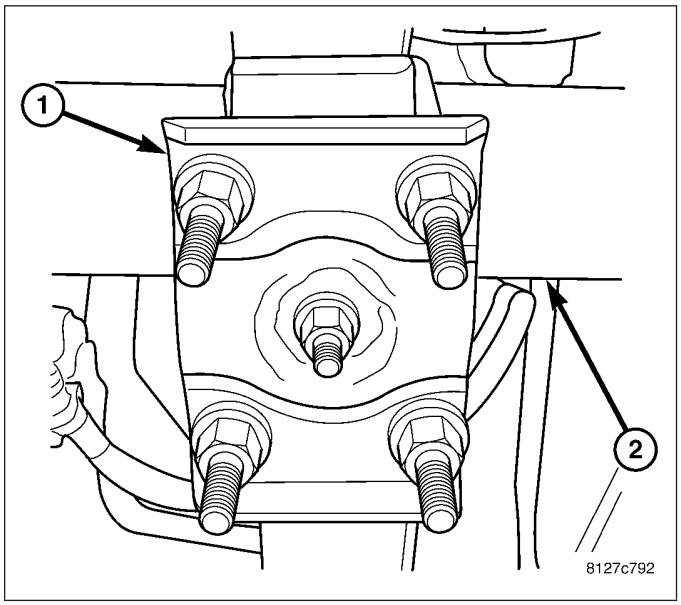


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8. Loosen stabilizer link (2) bolts and swing bar forward.

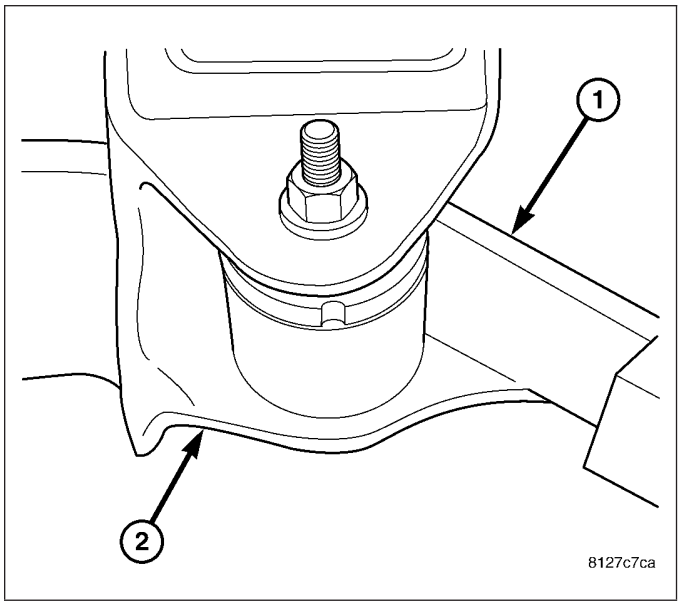


9. Remove spring plate (1) U-bolts from axle (2).

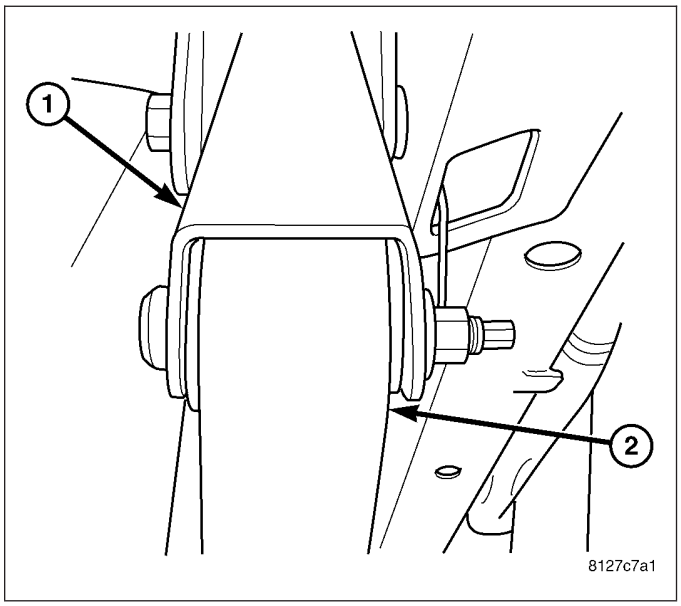


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10. Loosen spring (1) bolts at frame bracket (2).



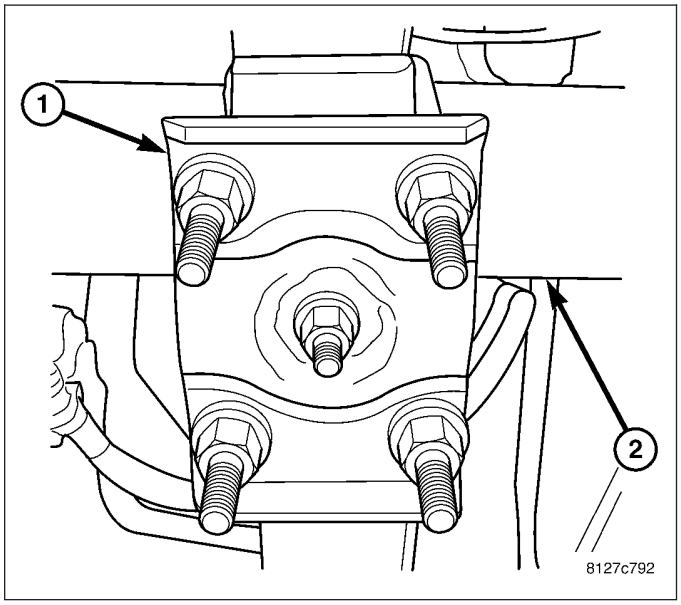
11. Remove spring (2) shackle (1) bolts and swing springs forward.
12. Lower axle from the vehicle.



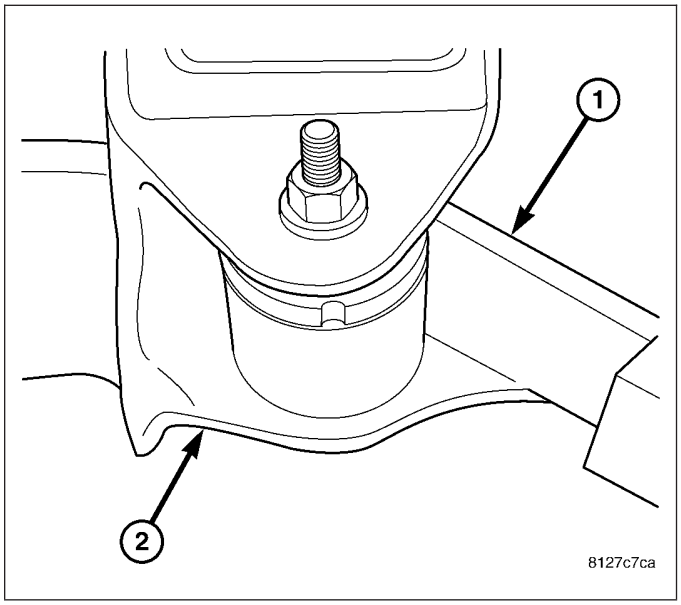
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INSTALLATION

1. Raise axle and align to the leaf spring centering bolts.
2. Raise leaf springs and install shackle bolts and nuts finger tight.
3. Install axle (2) spring plate (1) and tighten U-bolt nuts to 149 N·m (110 ft. lbs.).
4. Install shock absorbers to axle and tighten to 135 N·m (100 ft. lbs.).
5. Install power hop damper to differential cover bracket and tighten to 102 N·m (75 ft. lbs.). Then compress the damper and install it on the frame and tighten to specification.
6. Install all brake components.
7. Install stabilizer bar bolts and tighten to specification.
8. Install propeller shaft and tighten to specification.

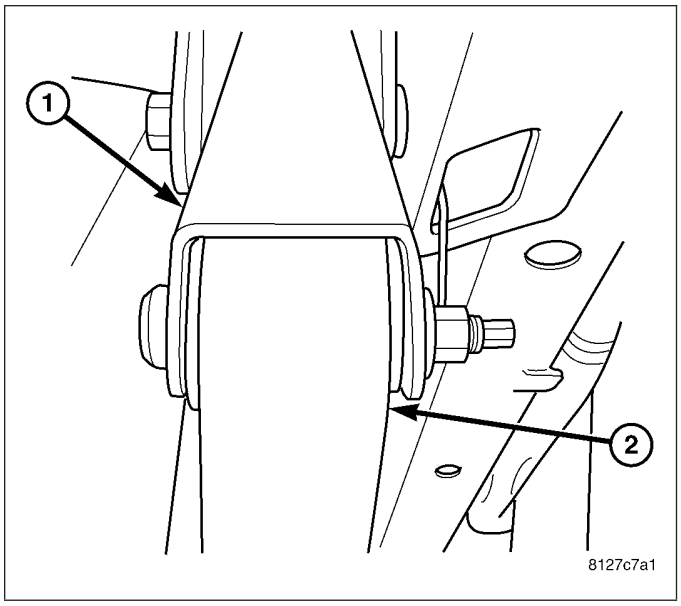


9. Remove supports and lower the vehicle so that the weight is being supported by the tires.
10. Tighten spring (1) bracket (2) nuts to 163 N·m (120 ft. lbs.).



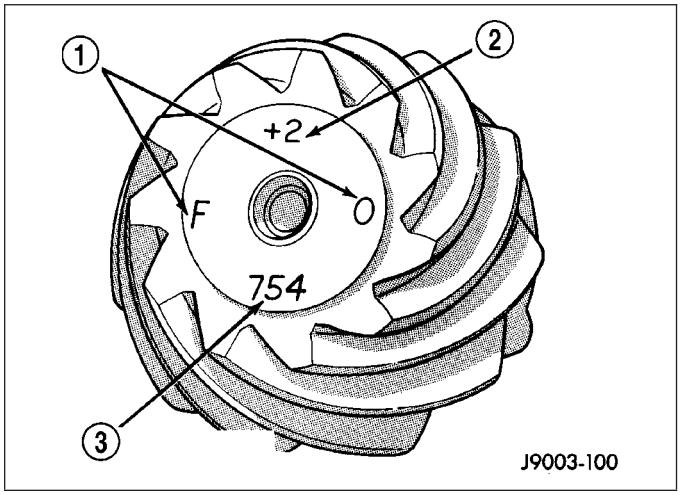
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11. Tighten spring (2) shackle (1) nuts to 163 N·m (120 ft. lbs.).



ADJUSTMENTS

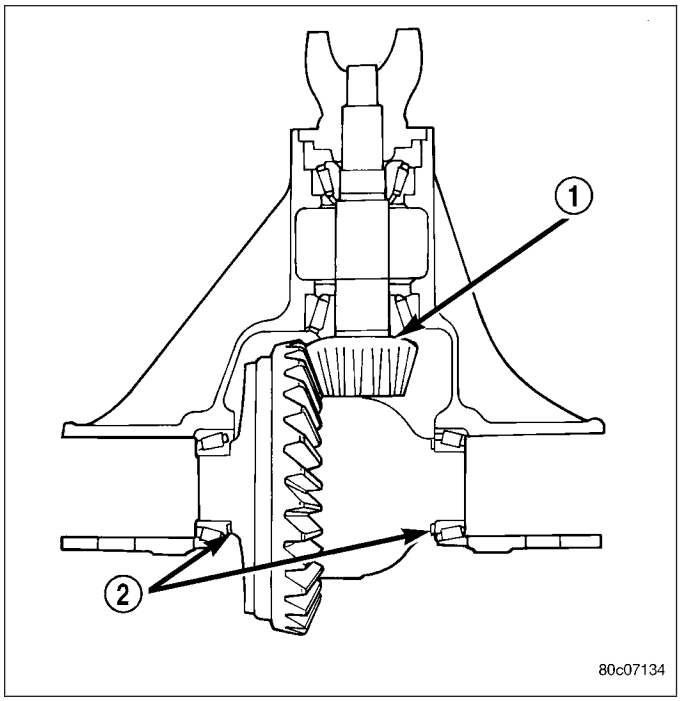
Ring and pinion gears are supplied as matched sets. Identifying numbers (3) for the ring and pinion gears are etched into the face of each gear. A plus (+) number, minus (–) number or zero (0) is etched into the face of the pinion gear (2). This number is the amount (in thousandths of an inch) the depth varies from the standard depth setting of a pinion etched with a (0). The standard depth provides the best gear tooth contact pattern.



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Compensation for pinion depth variance is achieved with a select shim (1). The shims are located between the rear pinion bearing and pinion gear head.

If installing a new gear, note the depth variance number of the original and replacement pinion. Add or subtract this number from the original depth shim/oil slinger to compensate for the difference in the depth variances. The numbers represent thousands of an inch deviation from the standard. If the number is negative, add that value to the required thickness of the depth shims. If the number is positive, subtract that value from the thickness of the depth shim.



Pinion Gear Depth Variance Chart: Note where Old and New Pinion Marking columns intersect. Intersecting figure represents plus or minus the amount needed.

PINION GEAR DEPTH VARIANCE

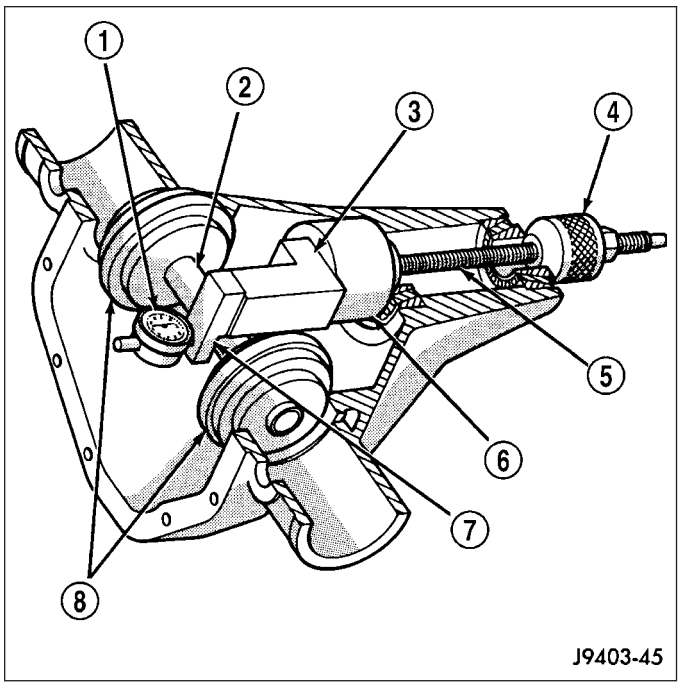
Original Pinion Gear Depth Variance	Replacement Pinion Gear Depth Variance								
	−4	−3	−2	−1	0	+1	+2	+3	+4
+4	+0.008	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0
+3	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001
+2	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002
+1	+0.005	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003
0	+0.004	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004
−1	+0.003	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005
−2	+0.002	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006
−3	+0.001	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006	−0.007
−4	0	−0.001	−0.002	−0.003	−0.004	−0.005	−0.006	−0.007	−0.008

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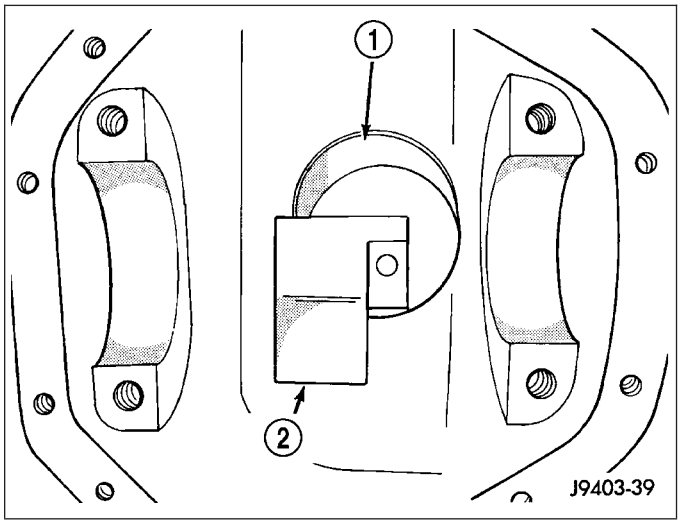
PINION DEPTH MEASUREMENT

Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take measurements with Pinion Gauge Set and Dial Indicator C-3339 (1).

1. Assemble Pinion Height Block 6739 (3), Pinion Block 6736 (6) and rear pinion bearing onto Screw 6741(5).



2. Insert assembled pinion block (1), pinion height block (2), rear bearing and screw into the housing through pinion bearing cups.
3. Install front pinion bearing and Cone-nut 6740 onto the screw. Tighten cone-nut until Torque To Rotate the screw is 2.2 N·m (20 in. lbs.).

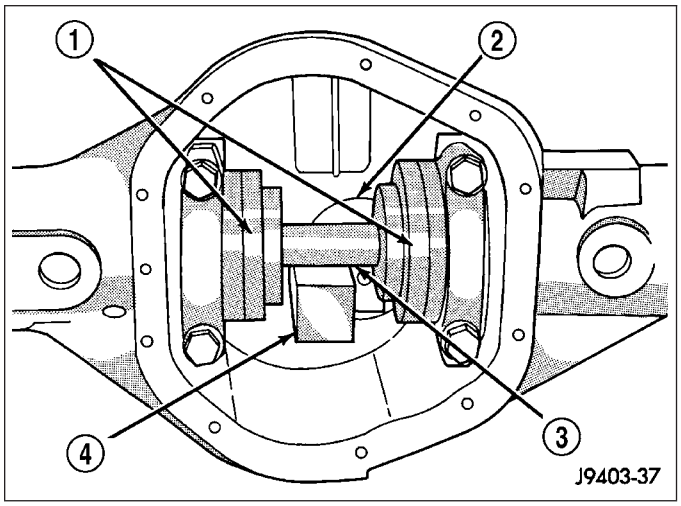


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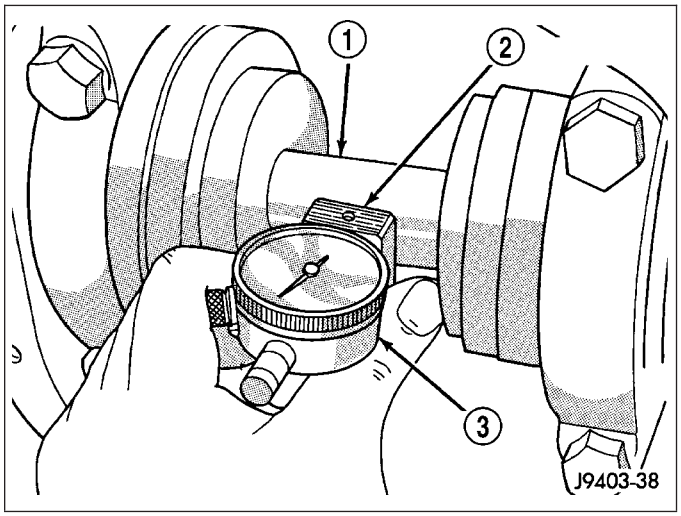
4. Place Arbor Disc 6732 (1) on Arbor D-115-3 (3) in position in the housing side bearing cradles.

NOTE: Arbor Discs 6732 (1) has different step diameters to fit other axles. Choose proper step for axle being serviced.

5. Install differential bearing caps on arbor discs and snug the bearing cap bolts. Then cross tighten cap bolts to 108 N·m (80 ft. lbs.).



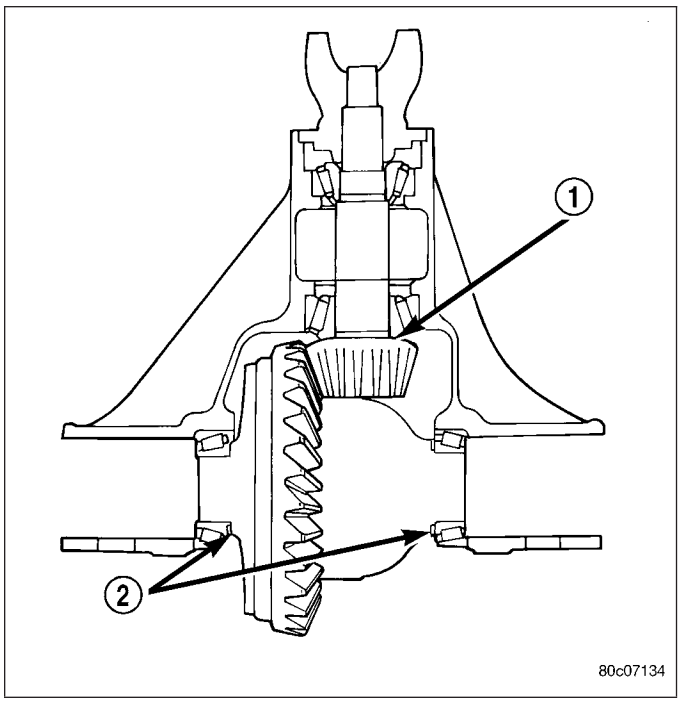
6. Assemble Dial Indicator C-3339 (3) into Scooter Block D-115-2 (2) and secure set screw.
7. Position Scooter Block/Dial Indicator flush on the pinion height block. Hold scooter block and zero the dial indicator.
8. Slowly slide the scooter block across the pinion height block over to the arbor. Move the scooter block till dial indicator crests the arbor (1), then record the highest reading.
9. Select a shim equal to the dial indicator reading plus the pinion depth variance number etched in the face of the pinion. For example, if the depth variance is –2, add +0.002 in. to the dial indicator reading.



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DIFFERENTIAL SIDE BEARING PRELOAD

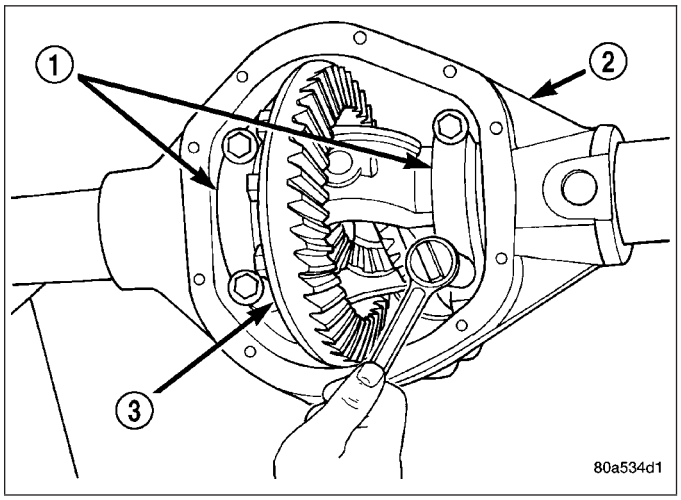
Differential side bearing preload and gear backlash is achieved by selective shims (2) positioned behind the differential side bearing cones. The proper shim thickness can be determined using slip-fit Dummy Bearings D-343 in place of the differential side bearings and a Dial Indicator C-3339. Before measuring differential bearing preload and gear backlash, measure pinion gear depth and prepare pinion for installation. Pinion gear depth is essential to establishing gear backlash and tooth contact patterns. After measuring shim thickness to take up differential side play, install pinion and measure gear backlash shim thickness. Overall shim thickness is the dial indicator reading and preload specification added together. The gear backlash measurement determines the shim thickness used on the ring gear side of the differential case. Subtract gear backlash shim thickness from overall shim thickness to determine shim thickness for pinion gear side of the differential. Differential shim measurements are performed with spreader W-129-B removed.



SHIM SELECTION

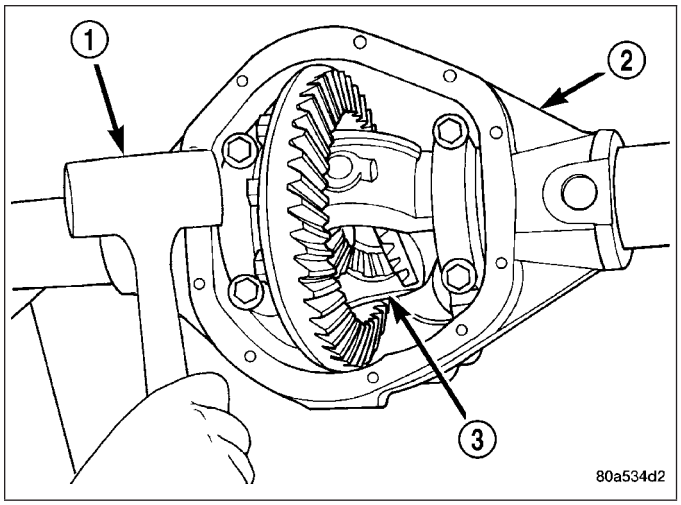
NOTE: It is difficult to salvage the differential side bearings during the removal procedure. Install replacement bearings if necessary.

1. Remove differential side bearings from differential case.
2. Remove factory installed shims from differential case.
3. Install ring gear on differential case and tighten bolts to specification.
4. Install dummy side bearings D-343 on differential case.
5. Install differential case (3) in the housing (2).
6. Install the marked bearing caps (1) in their correct positions and snug the bolts.

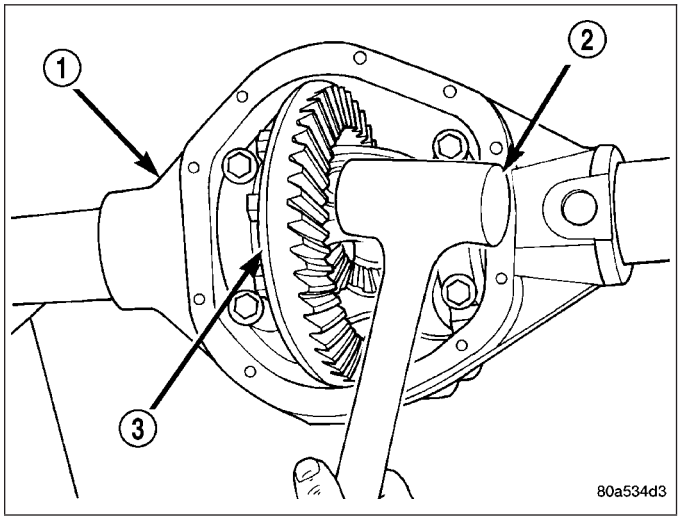


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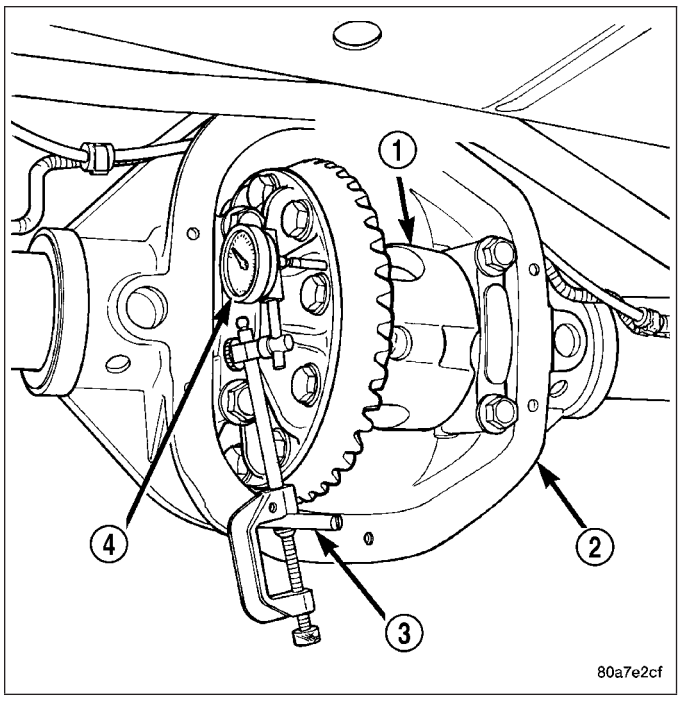
7. With a dead-blow hammer (1), seat the differential dummy bearings to the pinion side of the housing (2).



8. With a dead-blow hammer (2), seat the differential dummy bearings to the ring gear side of the housing (1).

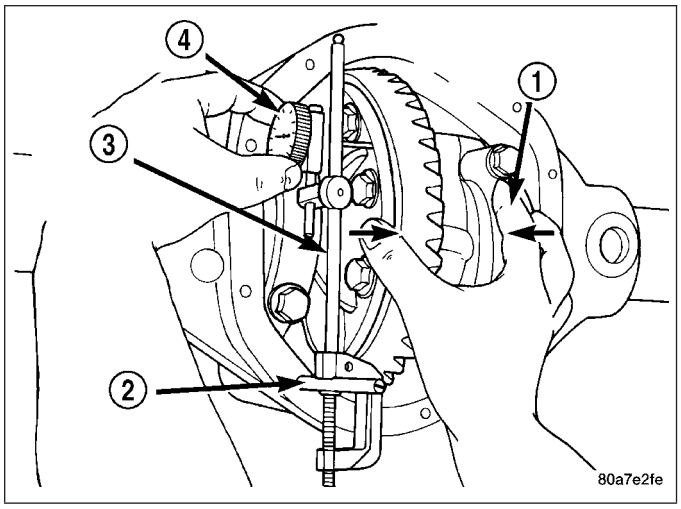


9. Thread Pilot Stud C-3288-B (3) into rear cover bolt hole below ring gear.
10. Attach the Dial Indicator C-3339 (4) to pilot stud. Position the dial indicator plunger on a flat surface between the ring gear bolt heads.

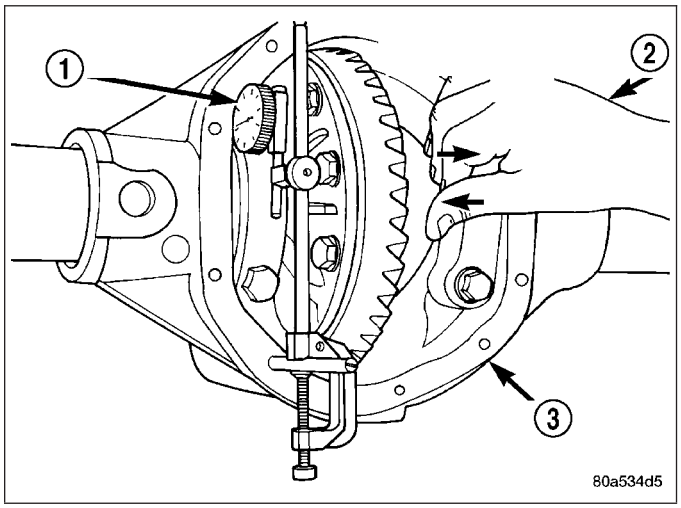


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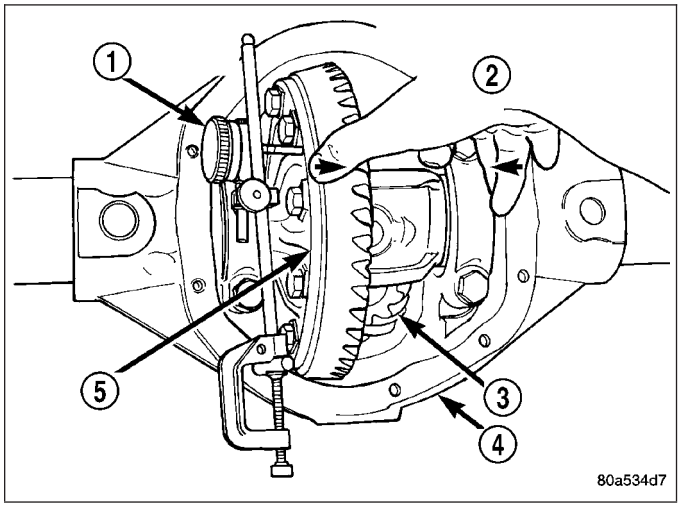
11. Push and hold differential case (1) to pinion gear side of the housing and zero dial indicator (4).



12. Push and hold differential case (2) to ring gear side of the housing (3) and record the dial indicator (1) reading.
13. Add 0.38 mm (0.015 in.) to the zero end play total. This total represents the thickness of shims needed to preload the new bearings when the differential is installed.
14. Rotate dial indicator out of the way on the pilot stud.
15. Remove differential case and dummy bearings from the housing.
16. Install the pinion gear in the housing. Install the pinion yoke and establish the correct pinion rotating torque.

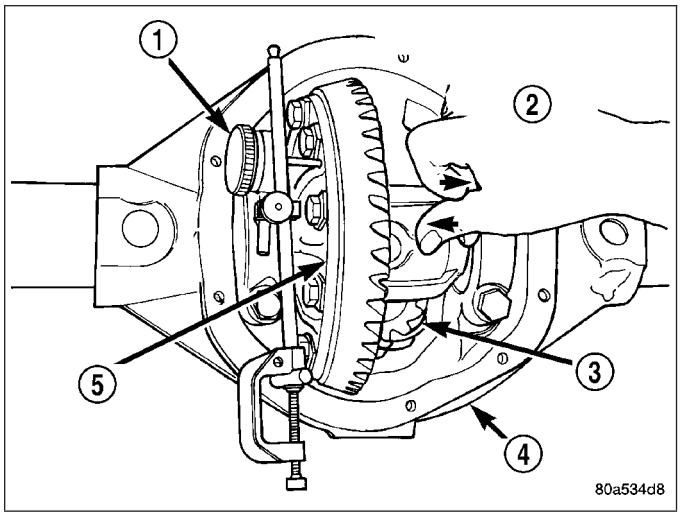


17. Install differential case (5) and dummy bearings D-343 in the housing (without shims), install bearing caps and tighten bolts snug.
18. Seat ring gear side dummy bearing.
19. Position the dial indicator plunger on a flat surface between the ring gear bolt heads.
20. Push and hold differential case (2) toward pinion gear and zero the dial indicator (1).



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21. Push and hold differential case (2) to ring gear side of the housing and record dial indicator (1) reading.
22. This is the shim thickness needed on the ring gear side of the differential case for proper backlash.
23. Subtract the backlash shim thickness from the total preload shim thickness. The remainder is the shim thickness required on the pinion side of the housing.
24. Rotate dial indicator out of the way on pilot stud.
25. Remove differential case and dummy bearings from the housing.
26. Install the selected side bearing shims onto the differential case hubs.



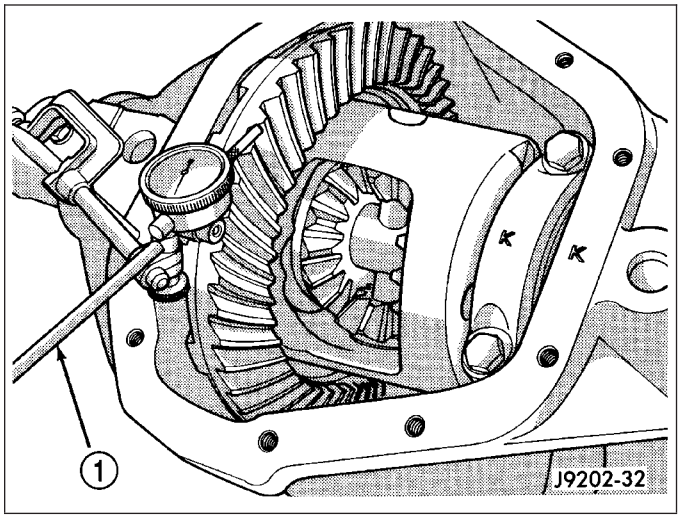
27. Install side bearings on differential case hubs with Install C-4190 and Handle C-4171.
28. Install bearing cups on differential.
29. Install Spreader W-129-B and some items from Adapter Set 6987 on the housing and spread open enough to receive differential case.

CAUTION: Never spread housing over 0.50 mm (0.020 in.). Failure to follow these instruction will damage the housing.

30. Install differential case into the housing.
31. Remove spreader from the housing.

GEAR BACKLASH

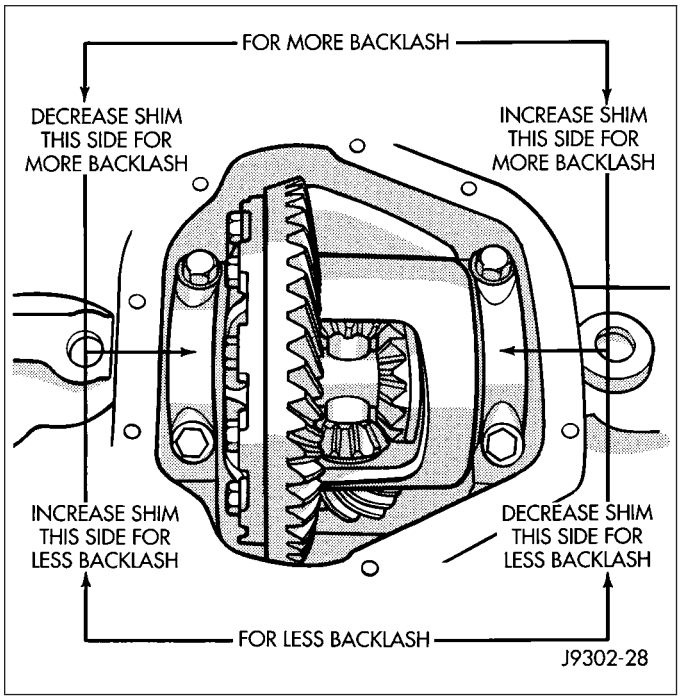
1. Rotate the differential case several times to seat the side bearings.
2. Position the indicator plunger (1) against a ring gear tooth.
3. Push and hold ring gear upward while not allowing the pinion gear to rotate.
4. Zero dial indicator face to pointer.



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5. Push and hold ring gear downward while not allowing the pinion gear to rotate. Dial indicator reading should be between 0.12 mm (0.005 in.) and 0.20 mm (0.008 in.). If backlash is not within specifications transfer the necessary amount of shim thickness from one side of the housing to the other.
6. Verify differential case and ring gear runout by measuring ring to pinion gear backlash at eight locations around the ring gear. Readings should not vary more than 0.05 mm (0.002 in.). If readings vary more than specified, the ring gear or the differential case is defective.

After the proper backlash is achieved, perform Gear Contact Pattern Analysis procedure.

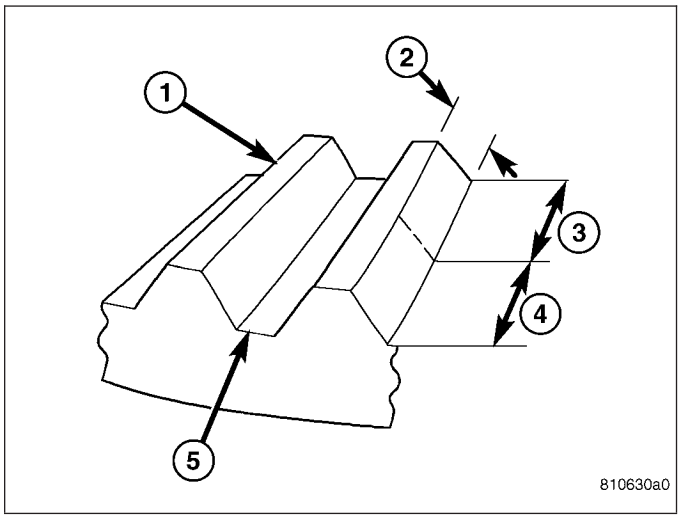


GEAR CONTACT PATTERN

The ring gear and pinion teeth contact patterns will show if the pinion depth is correct in the axle housing. It will also show if the ring gear backlash has been adjusted correctly. The backlash can be adjusted within specifications to achieve desired tooth contact patterns.

The TOP LAND (1) of the gear tooth is the top surface of the tooth. The PROFILE (2) of the gear tooth is the depth of the tooth. The TOE (3) of the gear is the portion of the tooth surface at the end towards the center. The HEEL (4) of the gear is the portion of the tooth at the outer-end. The ROOT (5) of the gear tooth is the lowest portion of the tooth.

NOTE: If the PROFILE across the gear tooth is the same it is a 3 Axis cut gear. If the PROFILE across the gear tooth is tapered it is a 2 Axis cut gear.



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DRIVE SIDE HEEL TOE	CONDITION	COAST SIDE TOE HEEL	CONDITION	ACTION REQUIRED
	**Desirable pattern.** The drive pattern should be centered on the tooth. There should be some clearance between the pattern and the top of the tooth.		**Desirable pattern.** The coast pattern should be centered on the tooth, but may be slightly toward the toe. There should be some clearance between the pattern and the top of the tooth.	None
	**Top toe contact**		**Top heel contact**	Backlash correct. Thicker pinion position shim required.
	**Root heel contact**		**Root toe contact**	Backlash correct. Thinner pinion position shim required.
	**Top heel contact**		**Top toe contact**	Pinion position shim correct. Decrease backlash.
	**Root toe contact**		**Root heel contact**	Pinion position shim correct. Increase backlash.

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1. Apply a thin coat of hydrated ferric oxide or equivalent, to the drive and coast side of the ring gear teeth.
2. Wrap, twist and hold a shop towel around the pinion yoke to increase the turning resistance of the pinion. This will provide a more distinct contact pattern.
3. Using a boxed end wrench on a ring gear bolt, Rotate the differential case one complete revolution in both directions while a load is being applied from shop towel.

The areas on the ring gear teeth with the greatest degree of contact against the pinion teeth will squeegee the compound to the areas with the least amount of contact. Note and compare patterns on the ring gear teeth to Gear Tooth Contact Patterns chart and adjust pinion depth and gear backlash as necessary.

DIFFERENTIAL BEARING PRELOAD CHECK

The final check on the differential assembly before installing the axles is torque to rotate pinion and differential combined. This will verify the correct differential bearing preload.

Torque to rotate the differential and pinion should be the torque to rotate the pinion plus 0.79-1.24 N·m (7-11 in. lbs.).

SPECIFICATIONS

AXLE SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Axle Ratio	4.56
Ring Gear Diameter	248 mm (9.75 in.)
Ring Gear Backlash	0.12-0.20 mm (0.005-0.008 in.)
Pinion Bearing Preload - Original Bearings	1-3 N·m (10-20 in. lbs.)
Pinion Bearing Preload - New Bearings	1.7-3.9 N·m (15-35 in. lbs.)

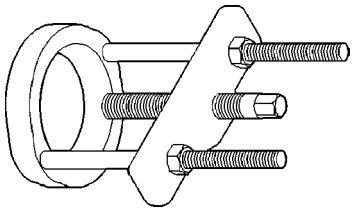
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TORQUE SPECIFICATIONS

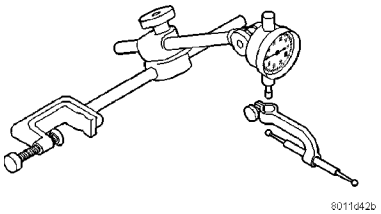
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Fill Hole Plug	27	20	-
Differential Cover Bolts	48	35	-
Bearing Cap Bolts	108	80	-
Ring Gear Bolt	177	130	-
Pinion Nut	292-447	215-330	-
Pinion Mate Shaft Bolt	27	20	-
Power Hop Bracket Bolts	41	30	-
Power Hop Damper Bolt	102	75	-

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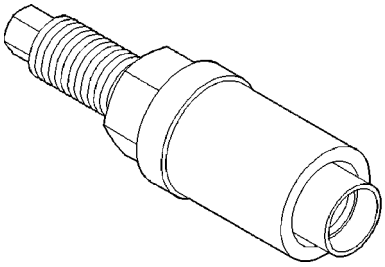
SPECIAL TOOLS



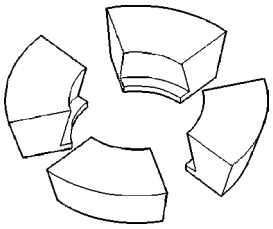
PULLER / PRESS C-293-PA



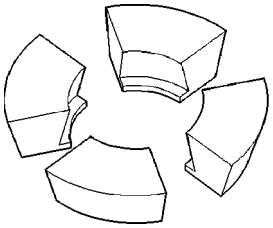
DIAL INDICATOR C-3339



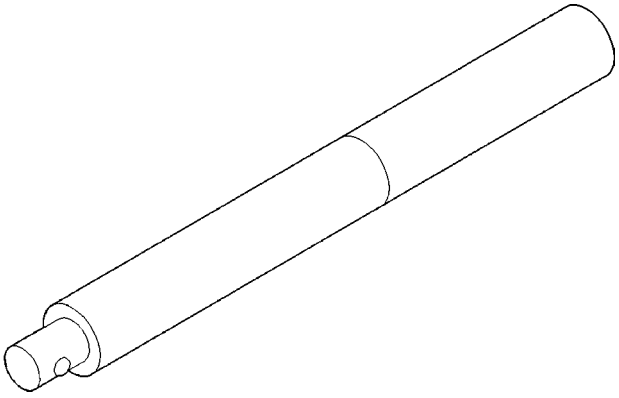
INSTALLER FLANGE C-3718



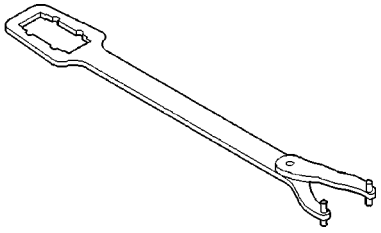
ADAPTERS C-293-37



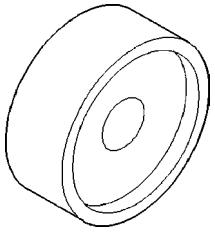
ADAPTERS C-293-62



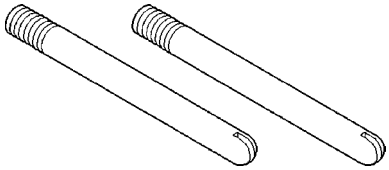
HANDLE C-4171



FLANGE WRENCH C-3281

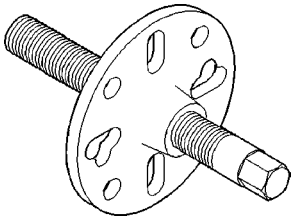


INSTALLER BEARING C-4190

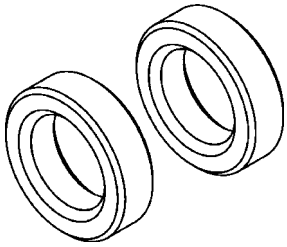


PILOT STUDS C-3288-B

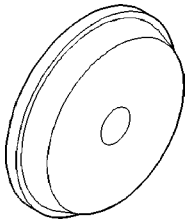
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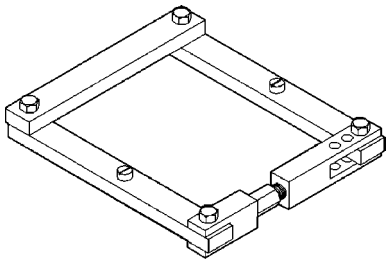
PULLER C-452



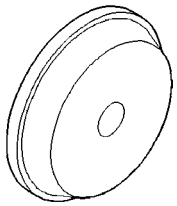
DUMMY BEARINGS D-343



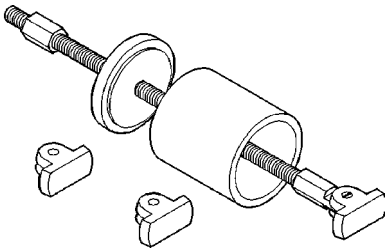
INSTALLER CUP D-111



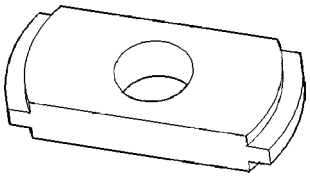
SPREADER W-129-B



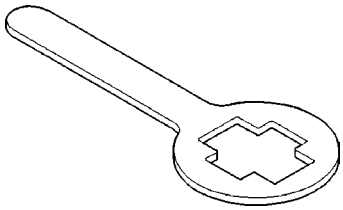
INSTALLER CUP D-146



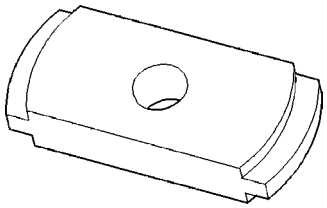
REMOVER/EXTRACTOR 6310



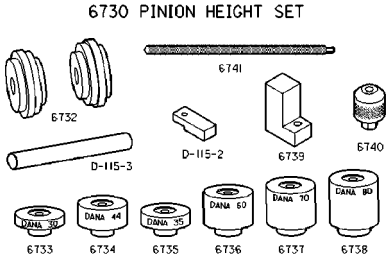
REMOVER CUP D-158



HOLDER 6719A

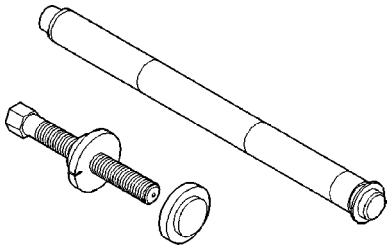


REMOVER CUP D-162

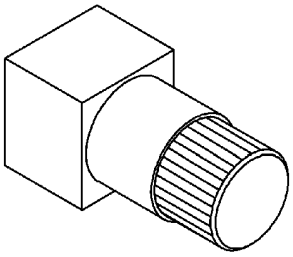


PINION DEPTH TOOLS 6730

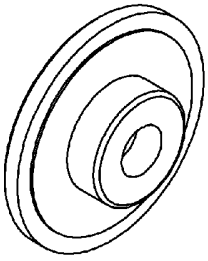
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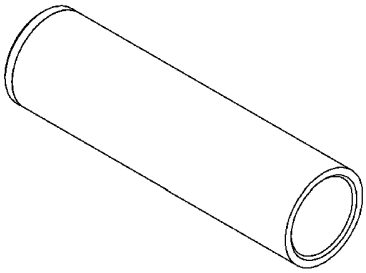
TRAC-LOK TOOLS 6960



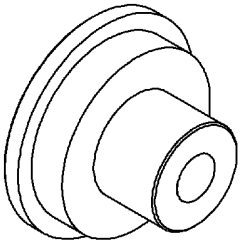
FIXTURE 9346



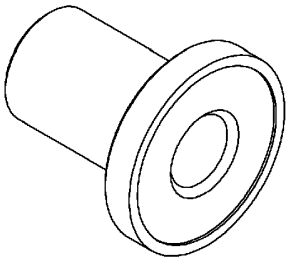
INSTALLER 9343



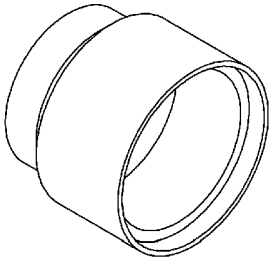
INSTALLER 9347



INSTALLER 9344



INSTALLER 9348



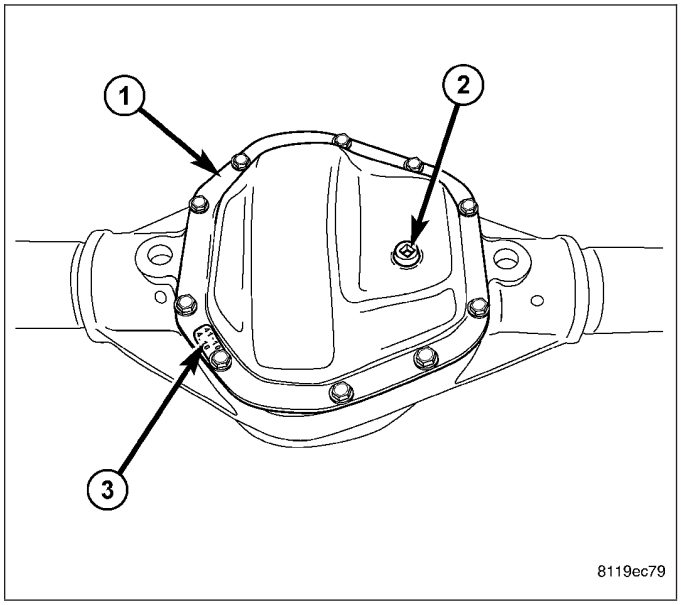
RECEIVER 9345

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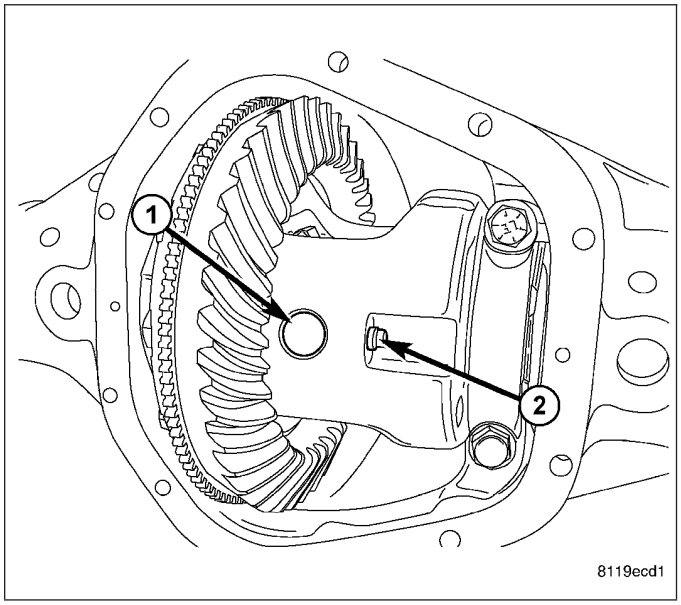
SHAFT-AXLE

REMOVAL

1. With vehicle in neutral, position vehicle on hoist.
2. Remove brake caliper adapter with caliper and remove rotor.
3. Remove differential housing cover (1) and drain lubricant.

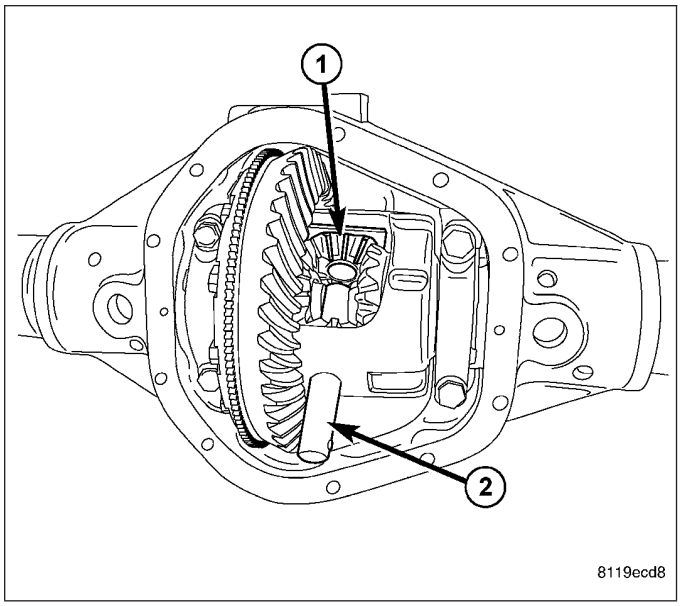


4. Remove pinion mate shaft (1) lock screw (2).

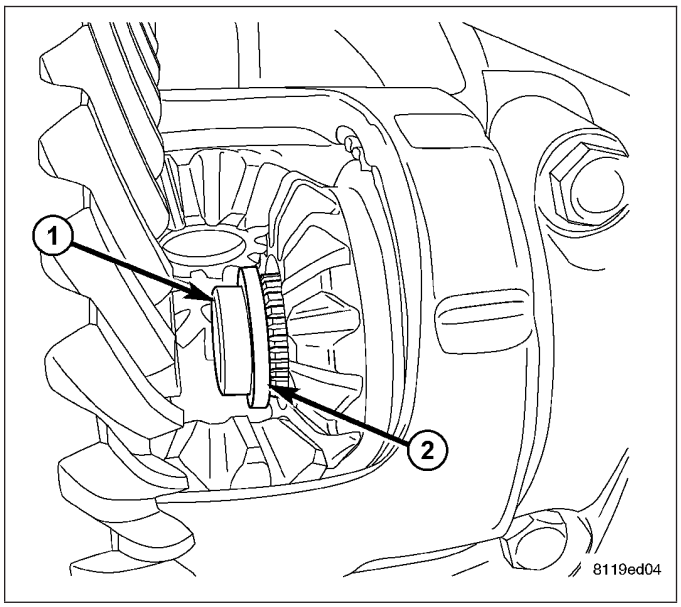


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5. Remove pinion mate shaft (2) from differential case.



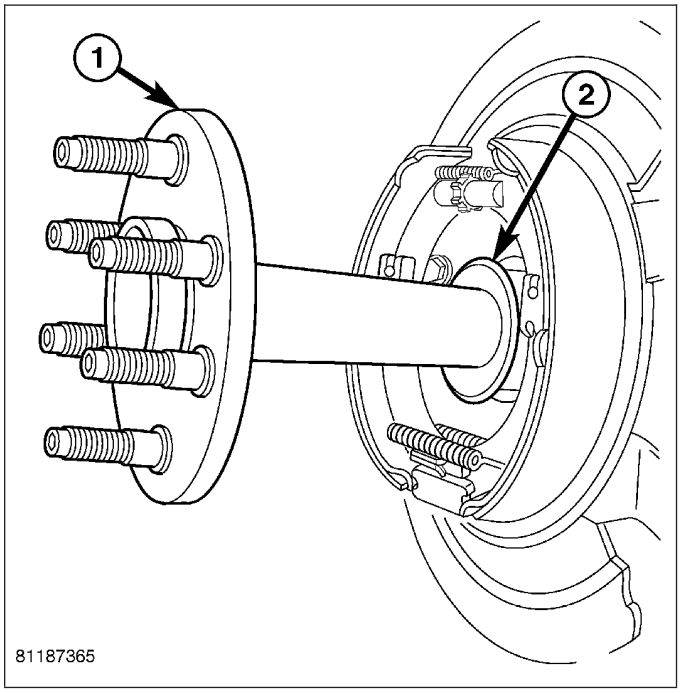
6. Push axle shaft (1) inward and remove axle shaft C-lock (2).
7. Remove axle shaft.



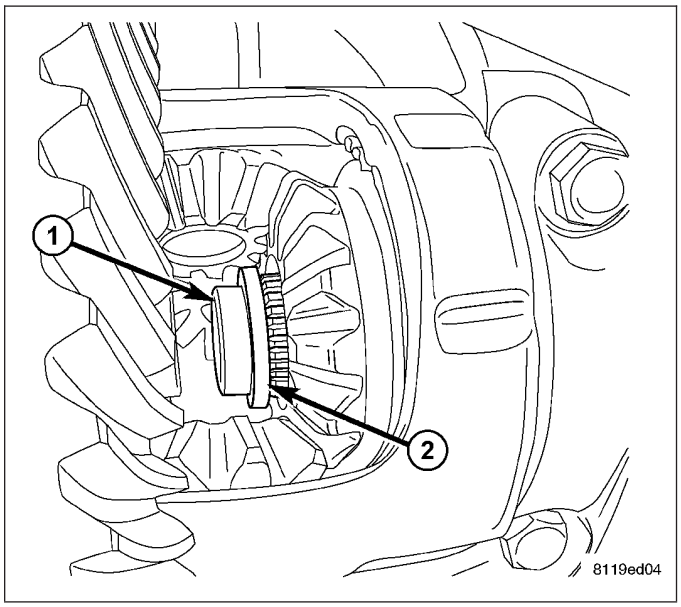
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INSTALLATION

1. Lubricate bearing bore and seal lip with gear lubricant.
2. Insert axle shaft (1) through seal (2), bearing and engage into side gear splines.

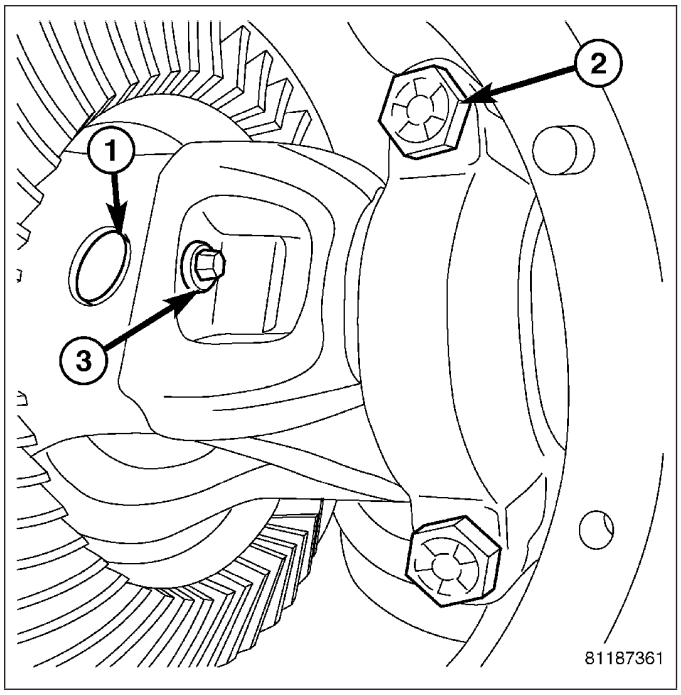


3. Insert C-lock (2) in end of axle shaft (1) then push axle shaft outward to seat C-lock in side gear.
4. Insert pinion mate shaft into differential case and through thrust washer and pinion gear.



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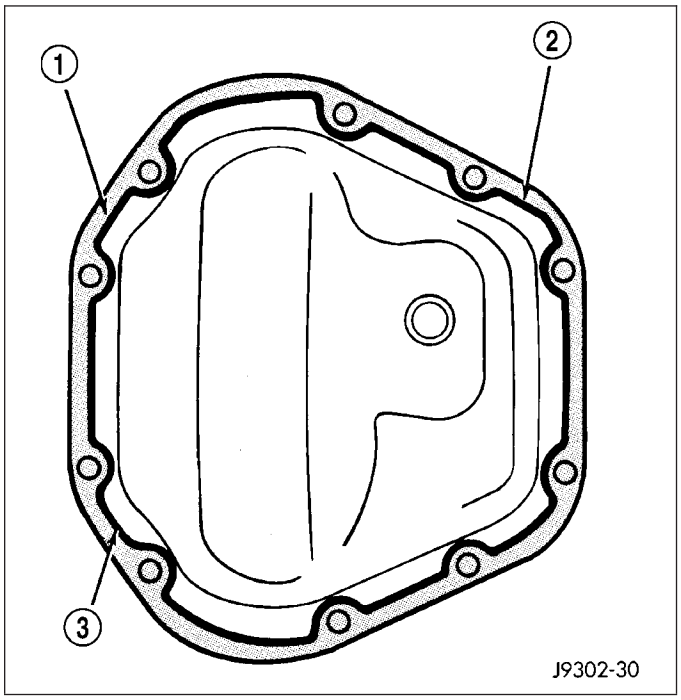
5. Align hole in pinion mate shaft (1) with hole in differential case and install lock screw (3) with Loctite® 242 or equivalent. Tighten lock screw to 27 N·m (20 ft. lbs.).



6. Apply a bead of orange Mopar Axle RTV sealant (2) or equivalent to the housing cover (1).

CAUTION: If housing cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instruction will result in a leak.

7. Install cover and tighten bolts in a criss-cross pattern to 48 N·m (35 ft. lbs.).
8. Fill differential lubricant to bottom of the fill plug hole.
9. Install fill hole plug and tighten to 27 N·m (20 ft. lbs.).
10. Install brake rotor and caliper adapter with caliper.

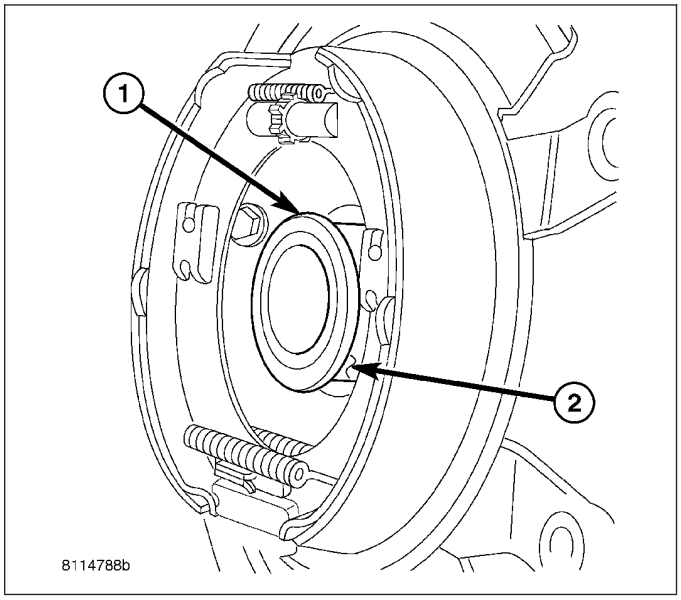


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SEAL-AXLE SHAFT

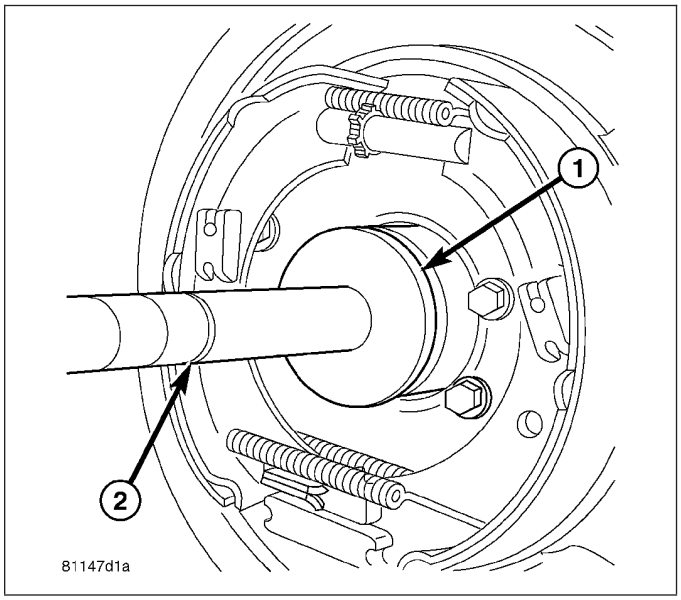
REMOVAL

1. Remove axle shaft.
2. Remove axle shaft seal (1) from the end of the axle tube (2) with a pry bar.



INSTALLATION

1. Remove any old sealer/burrs from axle tube.
2. Coat **new** seal lip with axle lubricant and install seal with Installer 9343 (1) and Handle C-4171(2).
3. Install axle shaft.

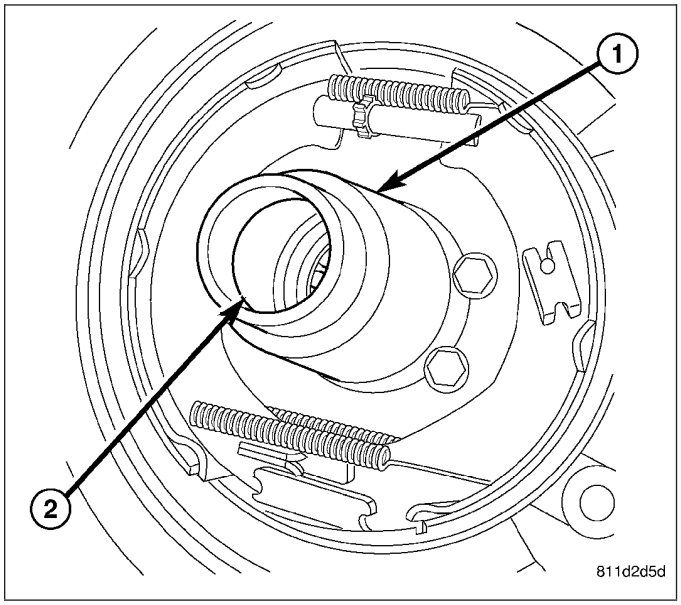


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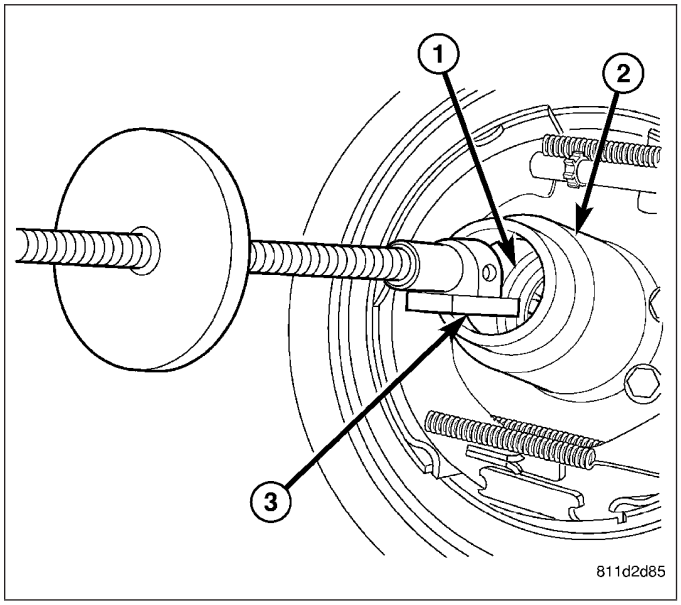
BEARING-AXLE

REMOVAL

1. Remove axle shaft.
2. Remove axle seal with pry bar.
3. Position bearing (2) Receiver 9345 (1) on axle tube.

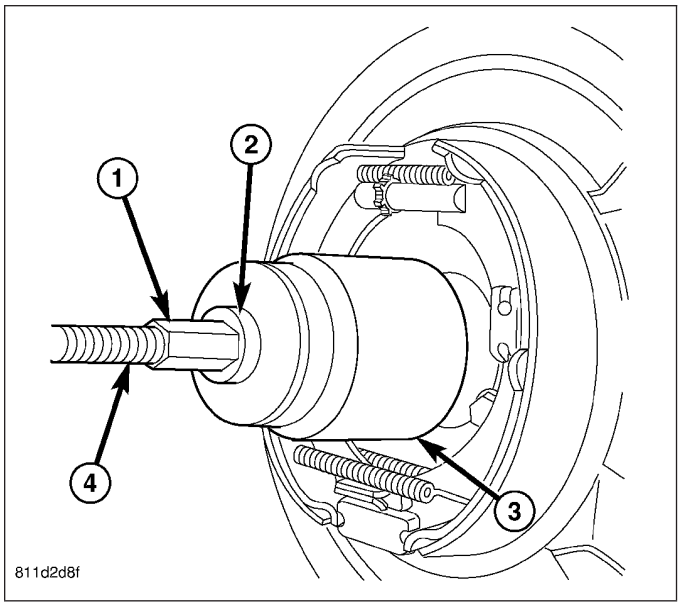


4. Insert bearing Remover 6310 with Foot 6310-9 (3) through receiver (2) and bearing (1).



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5. Tighten Remove 6310 nut (1) to pull bearing (3) into the receiver (3).

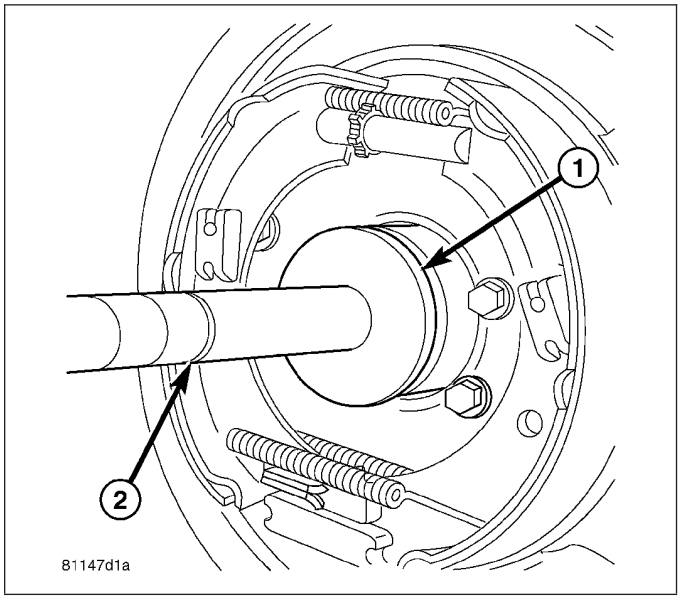


INSTALLATION

1. Remove any old sealer/burrs from axle tube.
2. Install axle shaft bearing with Installer 9344 (1) and Handle C-4171 (2). Drive bearing in until tool contacts the axle tube.

NOTE: Bearing is installed with the bearing part number against the installer.

3. Coat **new** axle seal lip with axle lubricant and install with Installer 9343 and Handle C-4171.
4. Install axle shaft.

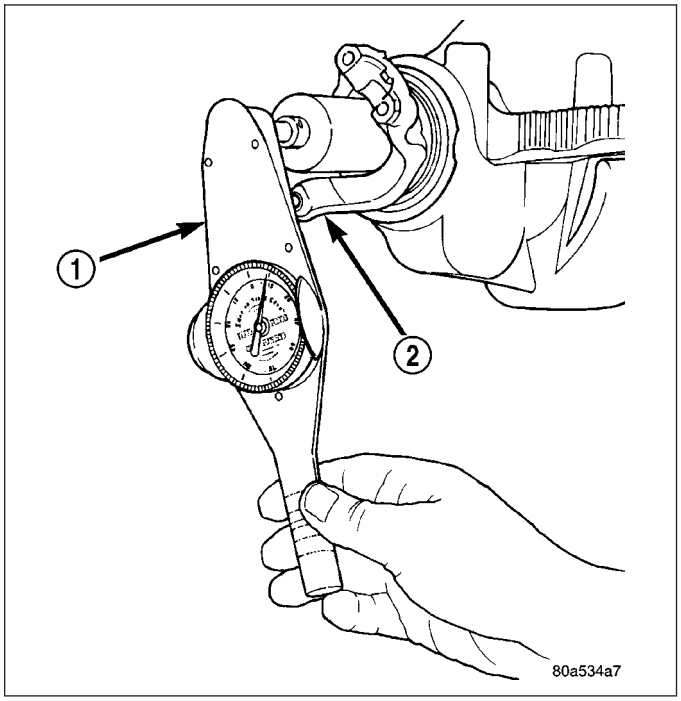


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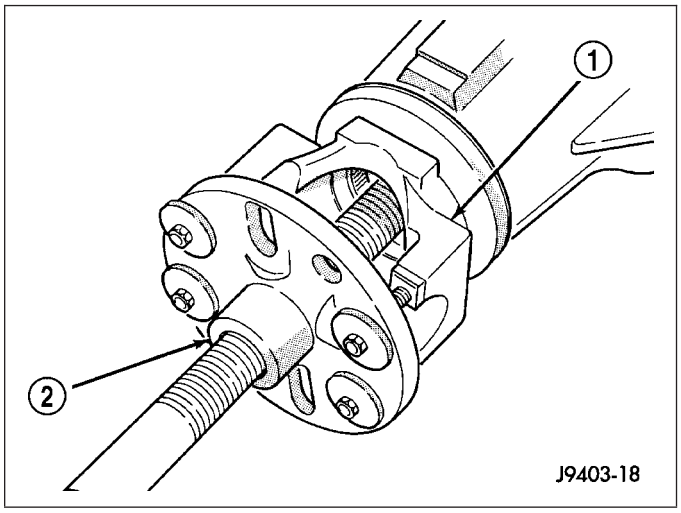
SEAL-PINION

REMOVAL

1. Remove propeller shaft.
2. Remove brake calipers to prevent any drag.
3. Rotate pinion yoke three or four times.
4. Record pinion gear (2) rotating torque with an inch pound torque wrench (1).



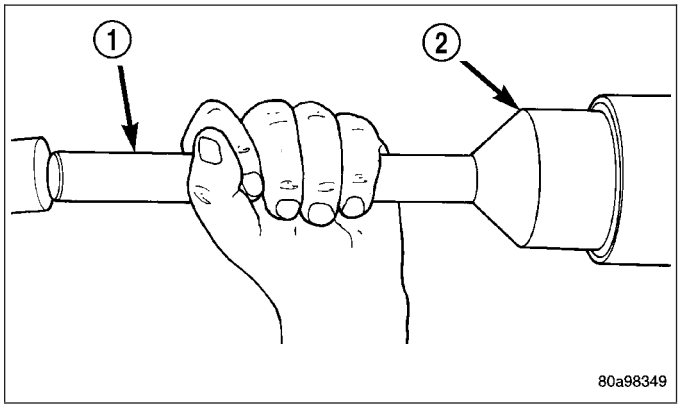
5. Hold yoke with Yoke Holder 6719A and remove pinion shaft nut and washer.
6. Remove pinion yoke (1) with Remover C-452 (2).
7. Remove pinion seal with pry tool or slide-hammer mounted screw.



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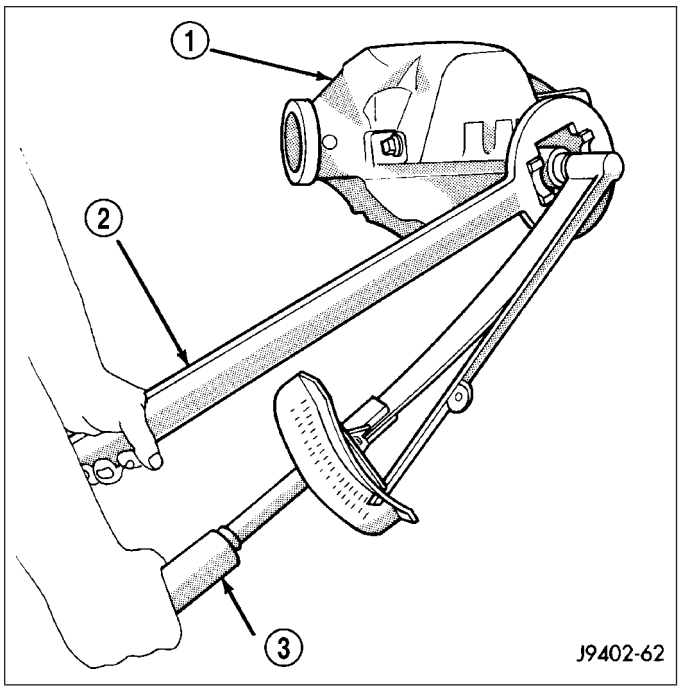
INSTALLATION

1. Coat lip of pinion seal with gear lubricant.
2. Install **new** pinion seal with Installer 9348 (2) and Handle C-4171 (1).
3. Install yoke on pinion shaft with Installer C-3718 and Yoke Holder 6719A.
4. Install pinion yoke washer with the **concave surface** against the yoke end.
5. Install **new** pinion nut.



CAUTION: Never exceed minimum tightening torque when installing the pinion yoke retaining nut at this point. Failure to heed caution may result in damage.

6. Hold pinion yoke with Yoke Holder 6719A (2) and tighten nut with torque wrench (3) to 292 N·m (215 ft. lbs.). Rotate pinion shaft several revolutions to ensure bearing rollers are seated.



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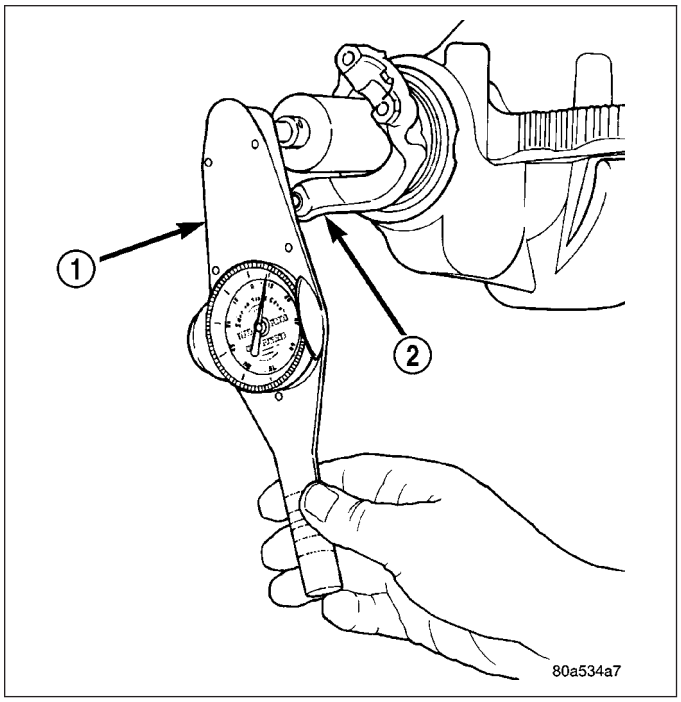
7. Rotate pinion (2) with a inch pound torque wrench (1). Rotating torque should be equal to reading recorded during removal, plus 0.56 N·m (5 in. lbs.).

CAUTION: Never loosen pinion nut to decrease pinion rotating torque and never exceed specified preload torque. Failure to follow these instruction will result in damage.

8. If rotating torque is low, use Yoke Holder 6719 to hold the pinion yoke and tighten the pinion shaft nut in 6.8 N·m (5 ft. lbs.) increments until proper rotating torque is achieved.

NOTE: The bearing rotating torque should be constant during a complete revolution of the pinion. If the rotating torque varies, this indicates a binding condition.

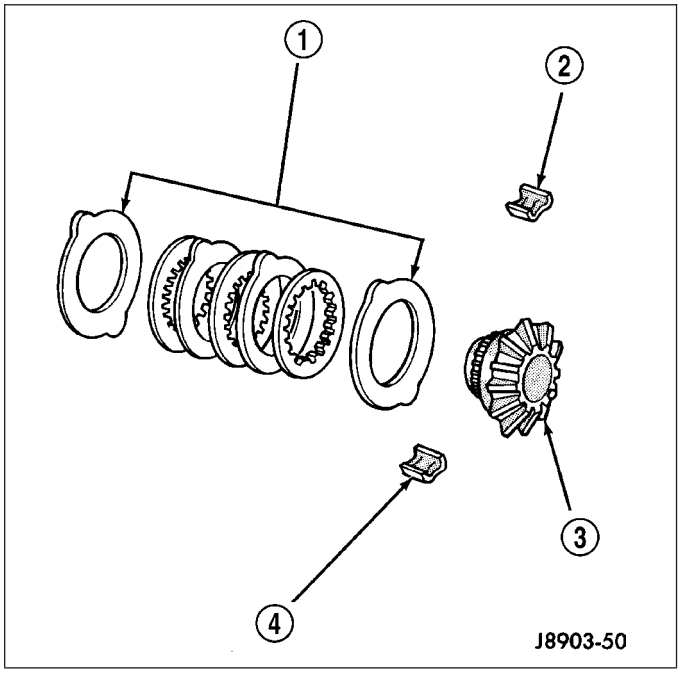
9. Install brake components.
10. Install propeller shaft.



DIFFERENTIAL-TRAC-LOK

DESCRIPTION

The Trac-Lok® differential has a one-piece differential case and similar components as a standard differential, plus two clutch disc packs (1) attached to the side gears (3) with retainers (2) (4). Differential bearing preload and ring gear backlash are adjusted with shims located between the differential case bearing cups and housing. Pinion bearing preload is set and maintained by the use of a collapsible spacer.

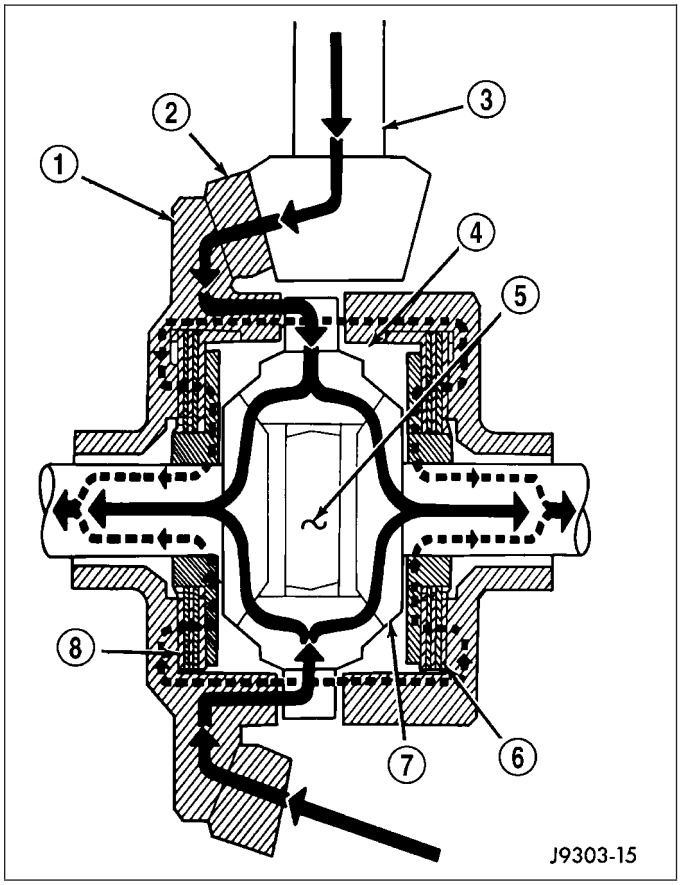


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OPERATION

This differentials clutches are engaged by two concurrent forces. The first being the preload force exerted through Belleville spring washers within the clutch packs (6) (8). The second is the separating forces generated by the side gears (7) as torque is applied through the ring gear.

This design provides the differential action needed for turning corners and for driving straight ahead during periods of unequal traction. When one wheel looses traction, the clutch packs transfer additional torque to the wheel having the most traction. This differential resist wheel spin on bumpy roads and provide more pulling power when one wheel looses traction. Pulling power is provided continuously until both wheels loose traction. If both wheels slip due to unequal traction, Trac-lok® operation is normal. In extreme cases of differences of traction, the wheel with the least traction may spin.



DIAGNOSIS AND TESTING

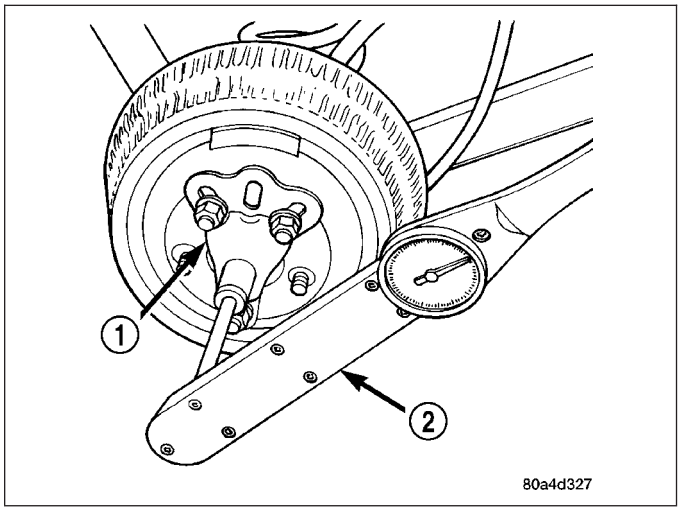
DIFFERENTIAL-TRAC-LOK

DIFFERENTIAL TEST

The most common problem is a chatter noise when turning corners. Before removing the unit for repair, drain, flush and refill axle with specified lubricant and 118 ml (4 ounce) of Mopar® Limited Slip Additive.

After changing lubricant, drive vehicle and make 10 to 12 slow figure-eight turns. This will pump lubricant through the clutches. This will correct the chatter noise condition in most instances. If chatter persists, clutch damage could have occurred.

The differential can be tested without removing the differential case by measuring rotating torque. Make sure brakes are not dragging during this measurement.



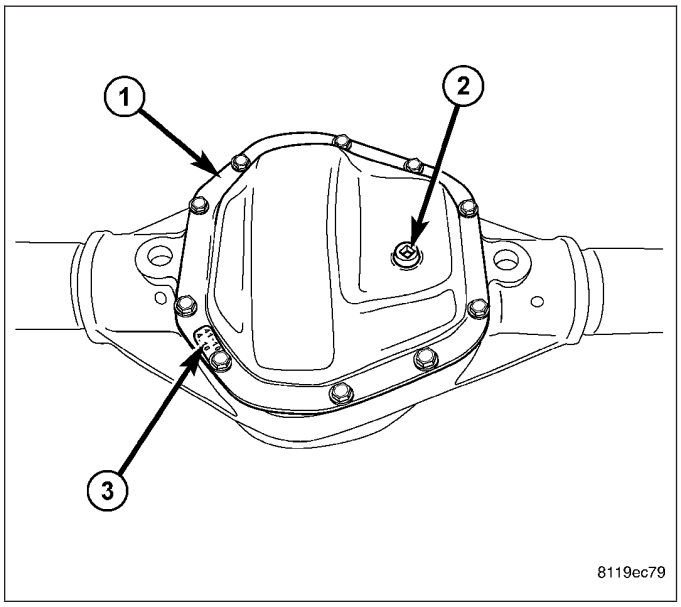
1. Place blocks in front and rear of both front wheels.
2. Raise one rear wheel until it is completely off the ground.
3. Engine off, transmission in neutral, and parking brake off.
4. Remove wheel and bolt Special Tool 6790 (1) or equivalent tool to studs.
5. Use torque wrench (2) on special tool to rotate wheel and read rotating torque.

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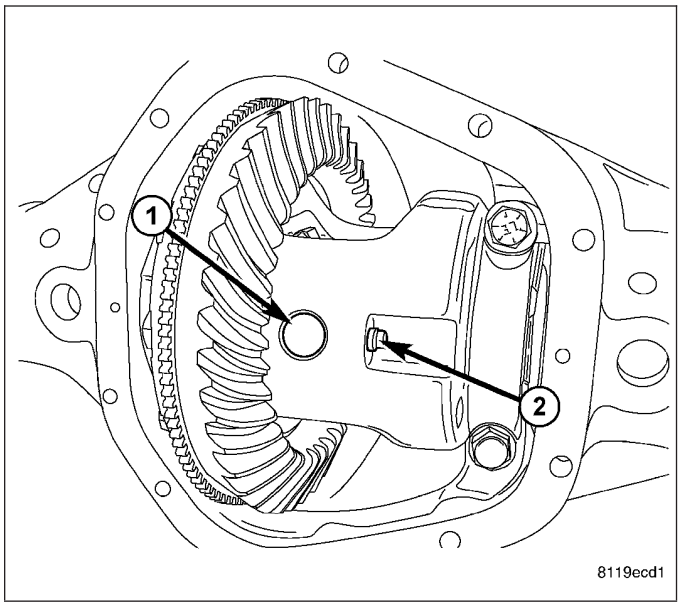
6. If rotating torque is less than 41 N·m (30 ft. lbs.) or more than 271 N·m (200 ft. lbs.) on either wheel the unit should be serviced.

REMOVAL

1. Remove drain plug (2) from differential cover (1) and drain lubricant.
2. Clean housing cavity with a flushing oil, light engine oil or lint free cloth.

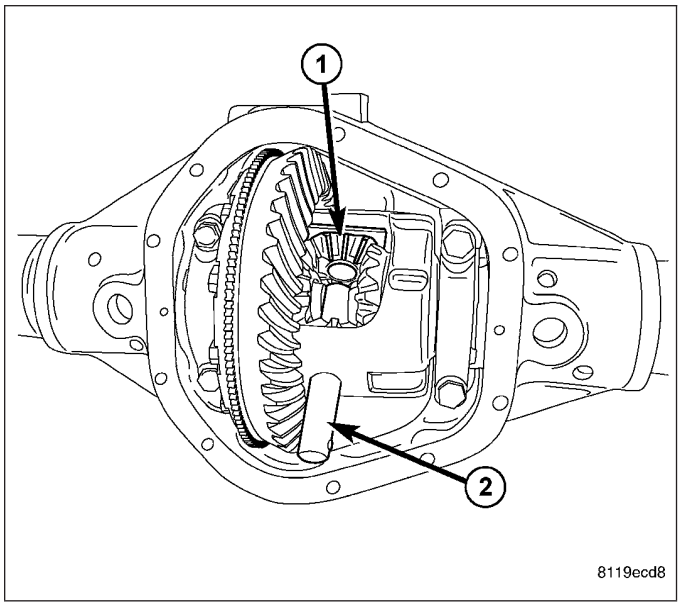


3. Remove pinion mate shaft (1) lock screw (2).

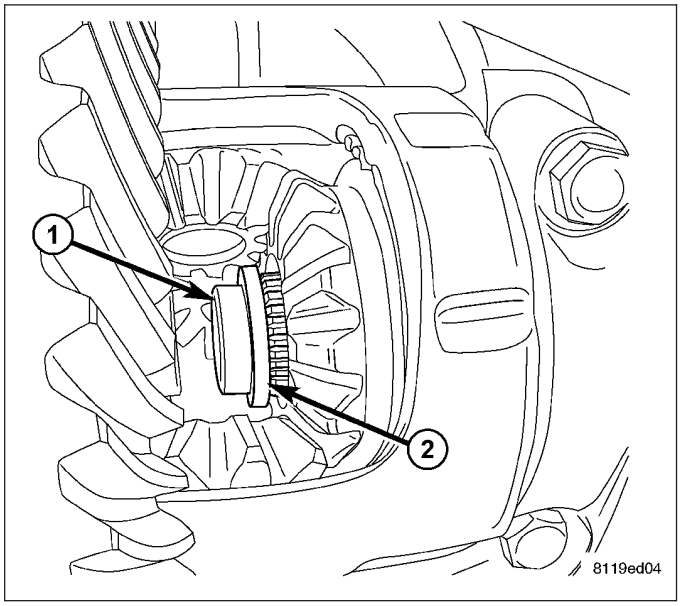


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4. Remove pinion mate shaft (2).

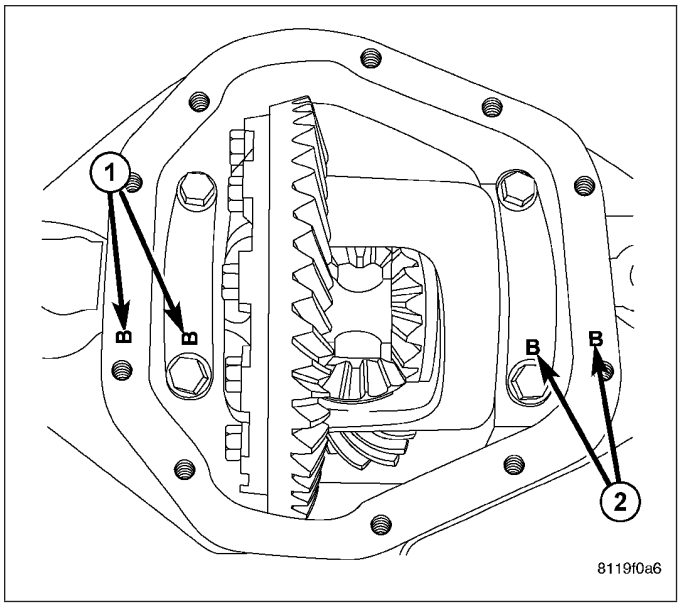


5. Push axle shafts (1) inward and remove axle shafts C-locks (2).
6. Remove axle shafts.

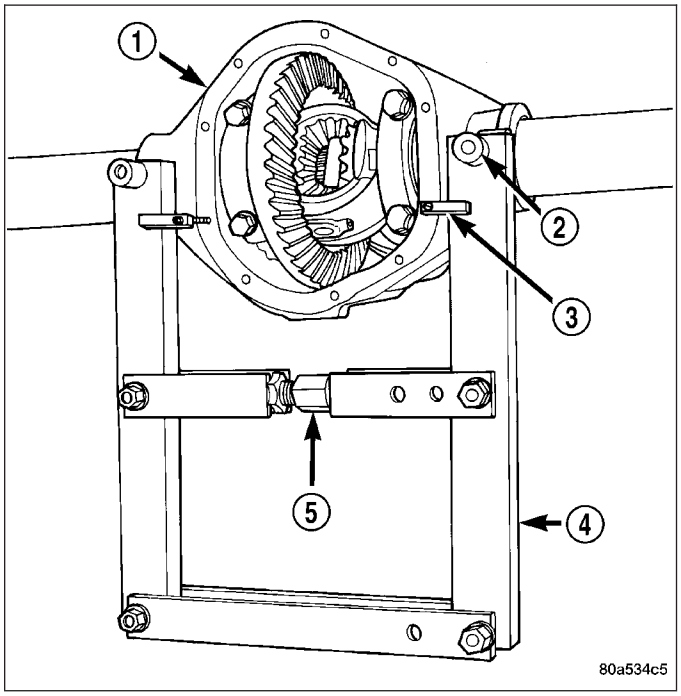


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7. Note bearing cap and housing sealing surface location marks (1).
8. Remove differential bearing caps.

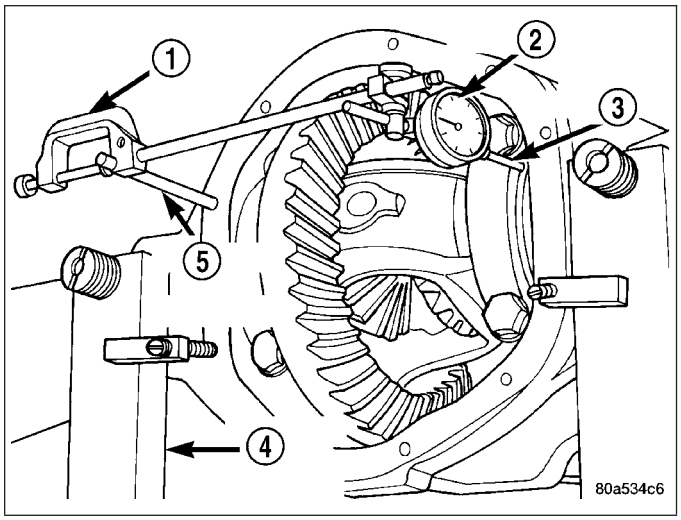


9. Position Spreader W-129-B (4) with tool dowel pins (2) seated in the locating holes. Install holddown clamps (3) and tighten turnbuckle (5) finger-tight.



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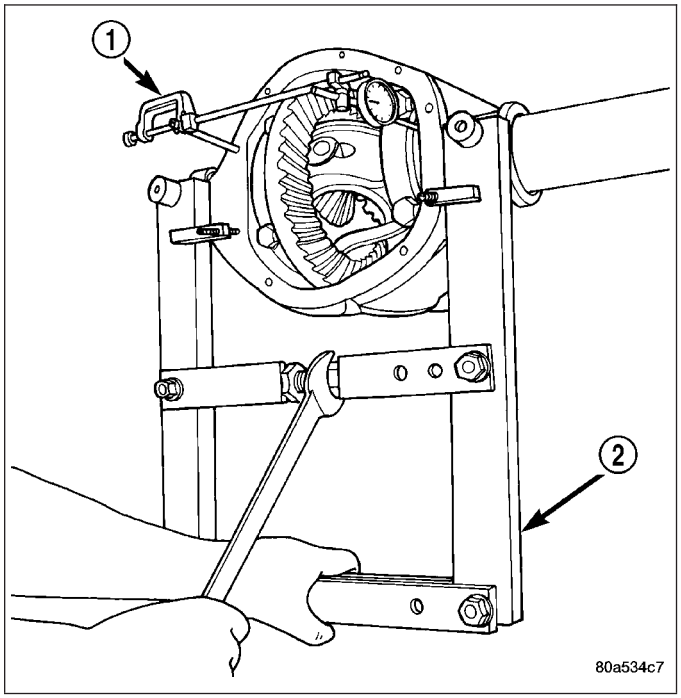
10. Install Pilot Stud C-3288-B (5) on left side of the housing and attach dial indicator (2) to the pilot stud. Load indicator plunger against the opposite side of the housing and zero indicator.



11. Spread (2) housing while measuring the distance with the dial indicator (1).

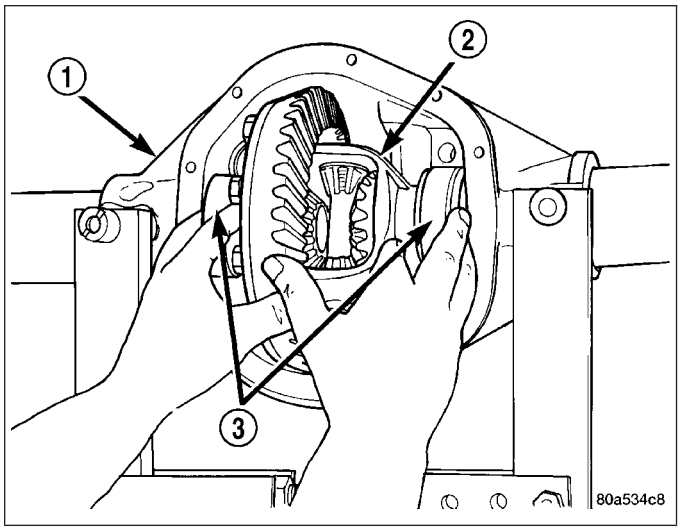
CAUTION: Never spread the housing over 0.50 mm (0.020 in). If housing is over-spread, it could be distorted or damaged.

12. Remove dial indicator.
13. Hold differential case in position and remove differential bearing caps.
14. Pry differential case loose from housing.



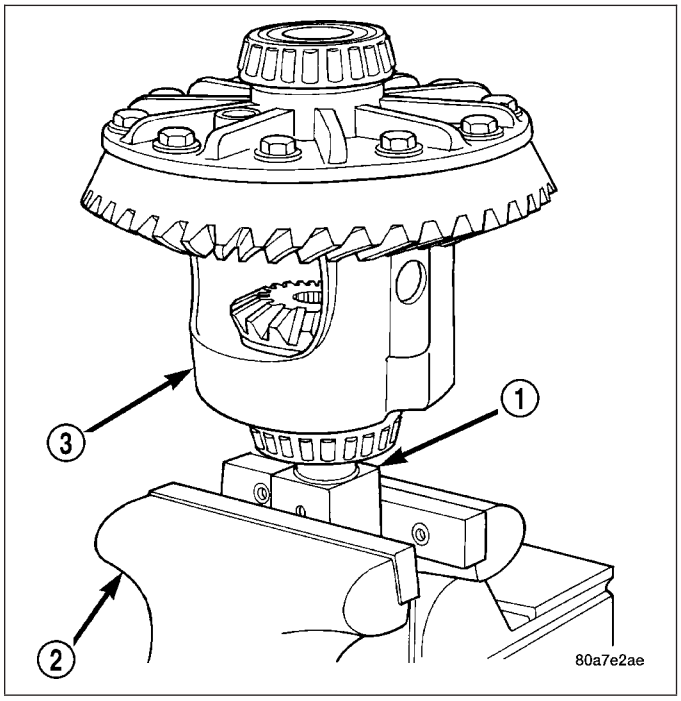
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15. Remove case (2) from housing (1) and tag bearing cups (3) and shims location.
16. Remove spreader.



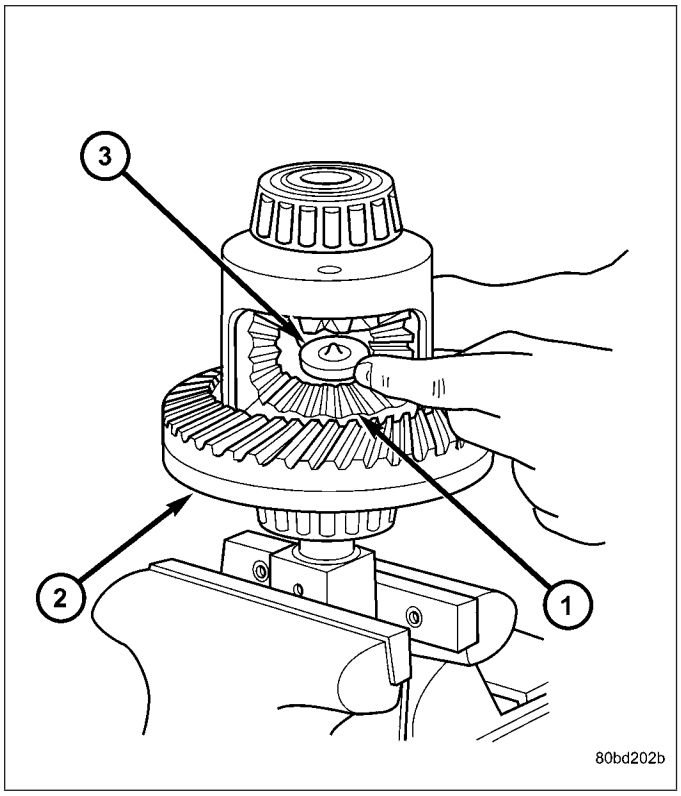
DISASSEMBLY

1. Clamp Holding Fixture 9346 (1) in vise (2) and set differential case (3) on fixture.
2. Remove pinion gear mate shaft screw.
3. Remove pinion gear mate shaft.

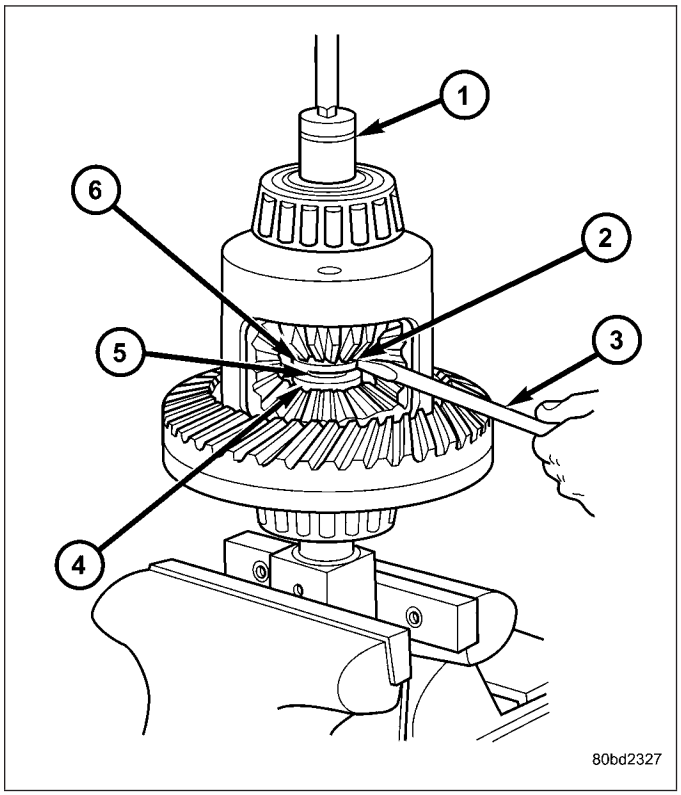


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4. Lubricate and install disc (3), that is not threaded from Trac-Lok® Tool Kit 6960 into the lower side gear (1).

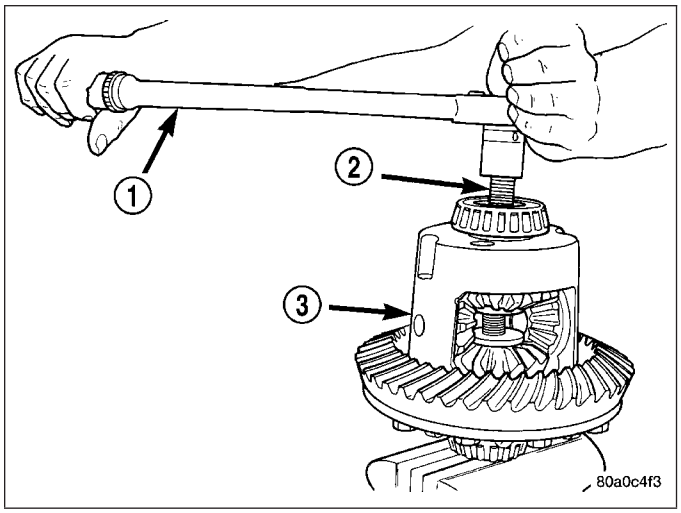


5. Install threaded disc (6) from Trac-Lok® Tool Kit 6960 into top side gear. Thread forcing screw (5) from Trac-Lok® Tool Kit 6960 through top disc until it comes in contact with lower disc (4).
6. Position a small screw driver (3) in slot of top disc (2) to prevent disc from turning.

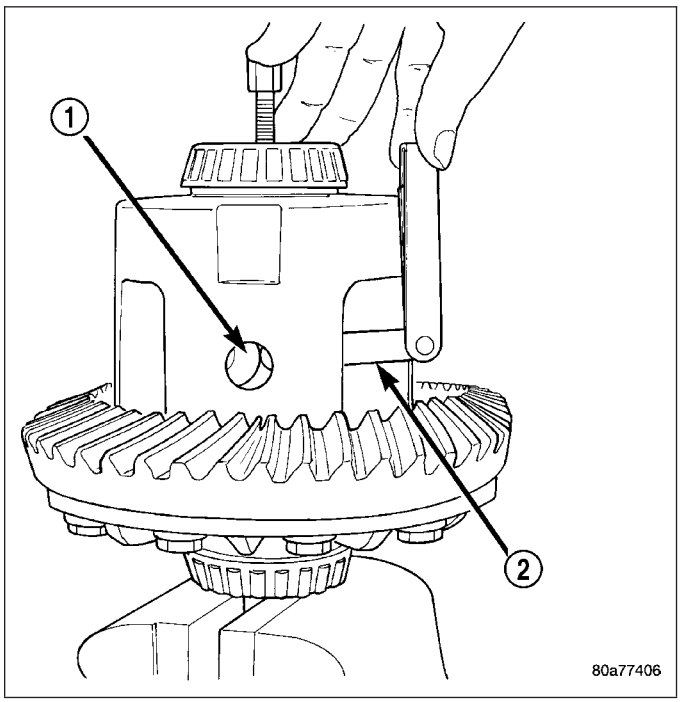


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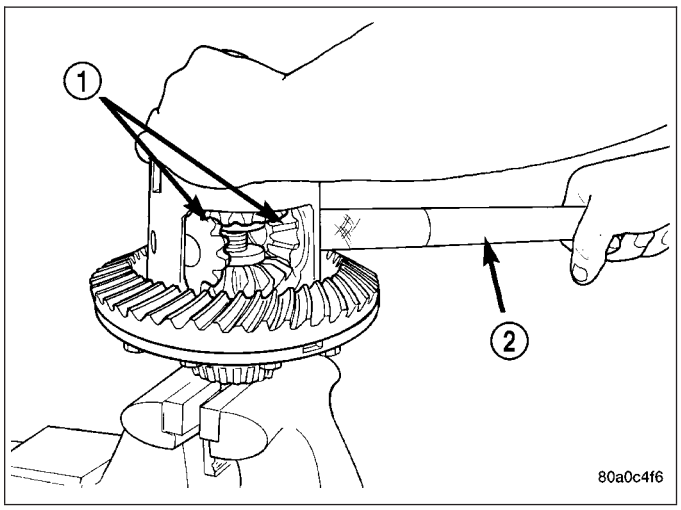
7. Tighten forcing screw (2) with torque wrench (1) to 122 N·m (90 ft. lbs.) maximum to compress Belleville springs in clutch packs.



8. With a feeler gauge (2) remove thrust washers (1) from behind the pinion gears.



9. Insert turning bar (2) from tool kit into pinion mate shaft hole in the case.
10. Loosen forcing screw in small increments until the clutch pack tension is relieved and differential case can be turned using turning bar.
11. Rotate differential case until the pinion gears (1) can be removed.



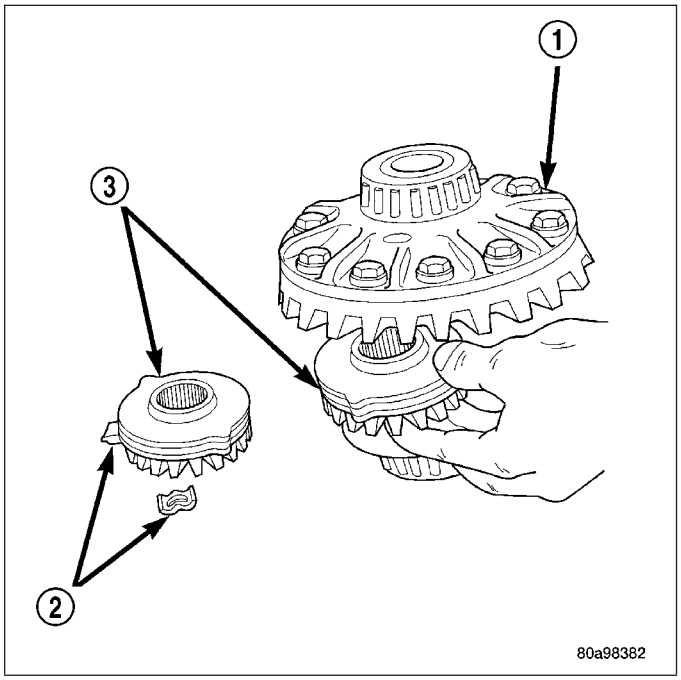
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12. Remove pinion gears from differential case.

13. Remove forcing screw and discs.
14. Remove top side gear (3), clutch pack (3) and retainer (2).

NOTE: Keep plates in correct order during removal.

15. Remove differential case from fixture. Remove lower side gear, clutch pack retainer and clutch pack.

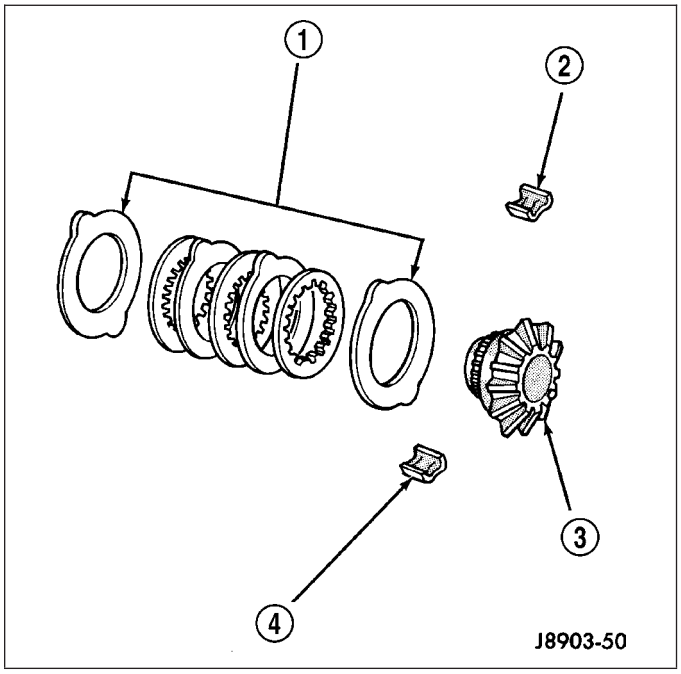


ASSEMBLY

Clean all components in cleaning solvent and dry components with compressed air. Inspect clutch pack plates (1) for wear, scoring or damage. Replace both clutch packs if any one component in either pack is damaged. Inspect side gears and pinions. Replace any gear that is worn, cracked, chipped or damaged. Inspect differential case and pinion shaft. Replace if worn or damaged.

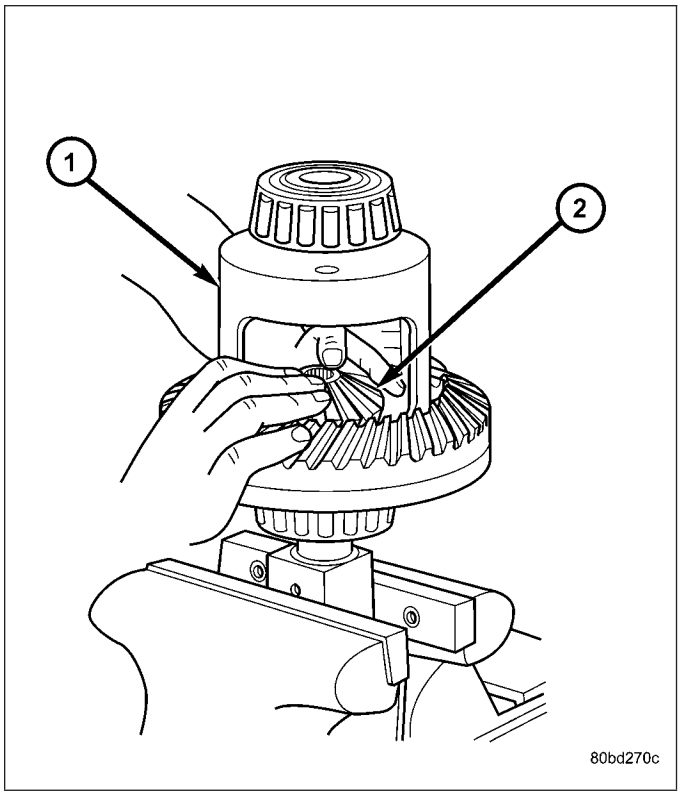
NOTE: New Plates and discs with fiber coating (no grooves or lines) must be presoaked in Friction Modifier before assembly. Soak plates and discs for a minimum of 20 minutes.

1. Lubricate each component with gear lubricant before assembly.
2. Assemble clutch discs (1) into packs and secure disc packs with retaining clips (4).
3. Position differential case on the Holding Fixture 9346.



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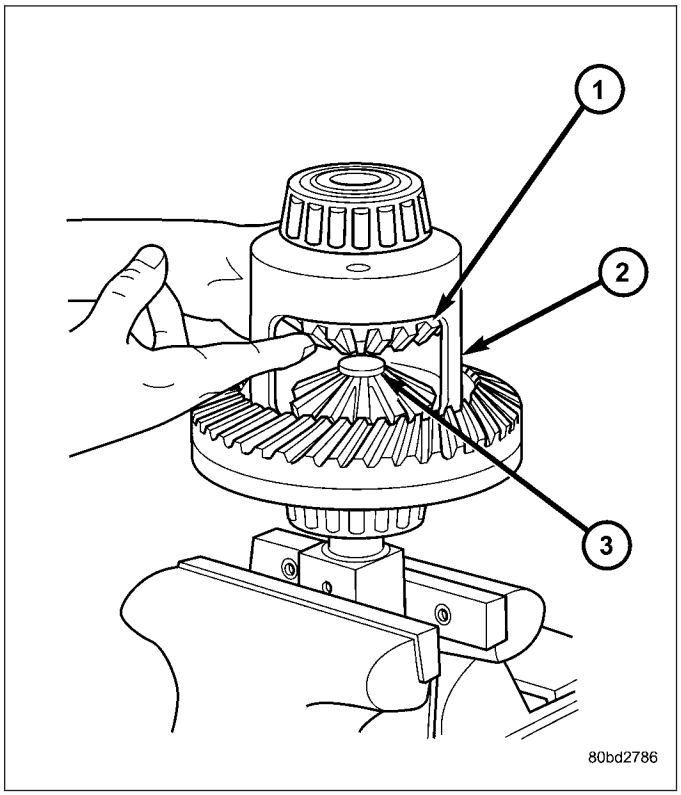
4. Position assembled clutch disc packs on the side gear hubs.
5. Install clutch pack (2) and side gear (2) in the differential case (1) and verify clutch pack retaining clips are in position.
6. Install lubricated disc from Trac-Lok® Tool Kit 6960 into lower side gear.



7. Install upper side gear (1) and clutch disc pack (1) and verify clutch pack retaining clips are in position.
8. Hold assembly in position and install threaded disc from tool kit into top side gear.
9. Install forcing screw from Trac-Lok® Tool Kit 6960 and tighten screw to slightly compress clutch disc.
10. Place pinion gears in position in side gears and verify that the pinion mate shaft hole is aligned.
11. Rotate case with turning bar until pinion mate shaft holes in pinion gears align with holes in case.

NOTE: It may be necessary to slightly tighten the forcing screw in order to install the pinion gears.

12. Tighten forcing screw to 122 N·m (90 ft. lbs.) maximum to compress the Belleville springs.
13. Lubricate and install thrust washers behind pinion gears and align washers with a small screw driver. Insert mate shaft into each pinion gear to verify alignment.
14. Remove Forcing Screw, Discs and Threaded Adapter.



15. Install pinion gear mate shaft and align holes in shaft and case.
16. Install pinion mate shaft screw.

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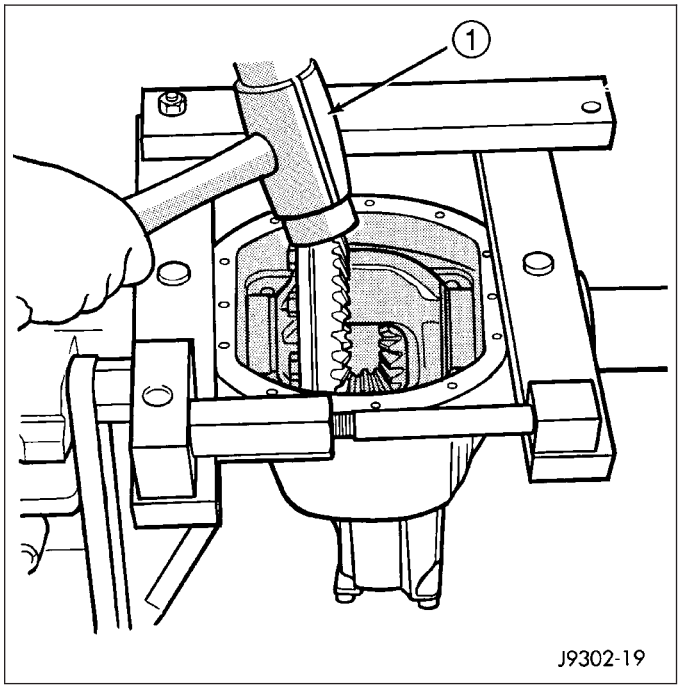
INSTALLATION

NOTE: If differential bearings or differential case are replaced, differential side bearing shim requirements may change.

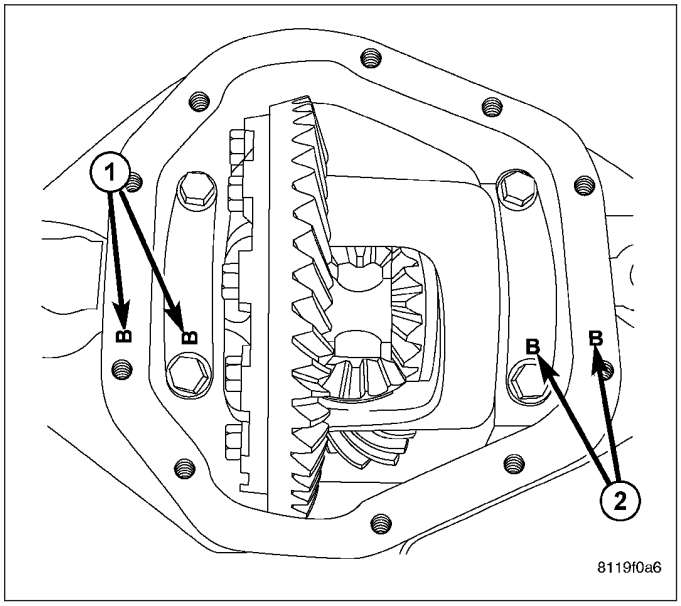
1. Position Spreader W-129-B with tool dowel pins seated in the locating holes. Install hold down clamps and tighten the tool turnbuckle finger-tight.
2. Install Pilot Stud C-3288-B on left side of the differential housing and attach dial indicator to the pilot stud. Load the indicator plunger against the opposite side of the housing and zero dial indicator.
3. Spread housing while measuring the distance with the dial indicator.

CAUTION: Never spread the housing over 0.50 mm (0.020 in). Failure to follow these instructions will damaged the case.

4. Remove dial indicator.
5. Install differential into the housing. Tap differential case with a soft hammer (1) to ensure bearings are seated.
6. Remove spreader.

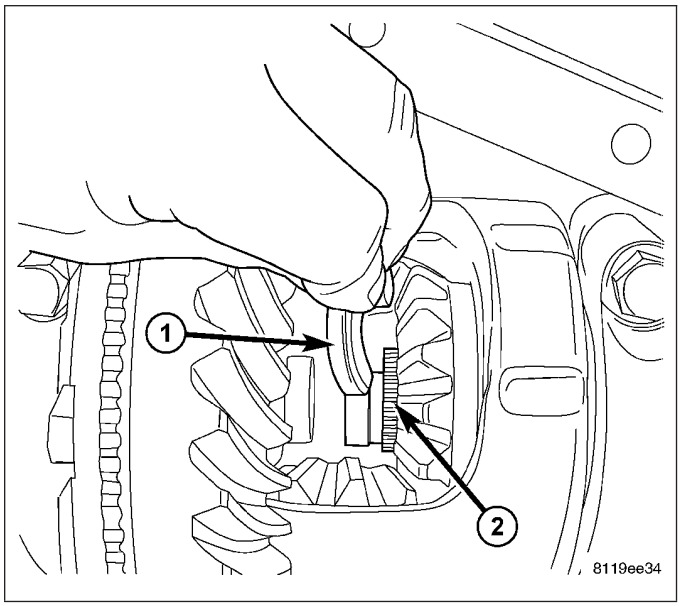


7. Install bearing caps in their original locations (1) (2) and tighten bearing cap bolts in a criss-cross pattern to 108 N·m (80 ft. lbs.).

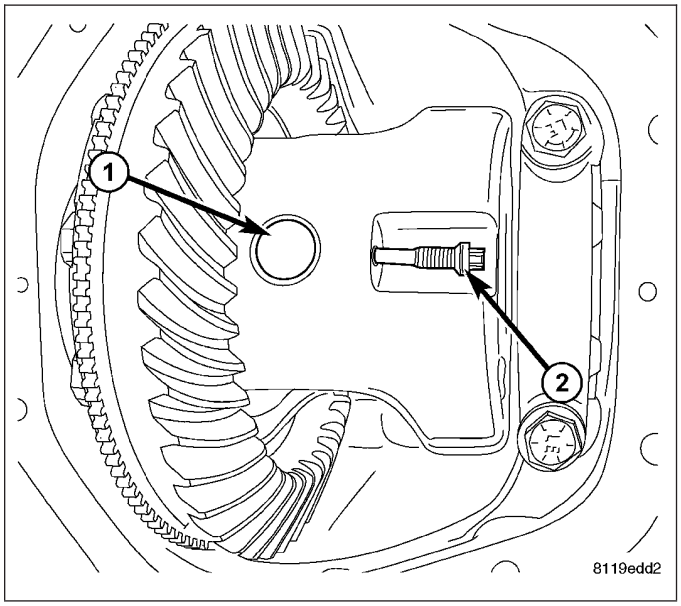


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8. Install axle shafts.
9. Install axle shaft (1) C-locks (2).



10. Install pinion mate shaft (1) and install mate shaft lock screw (2) and tighten to 27 N·m (20 ft. lbs.).

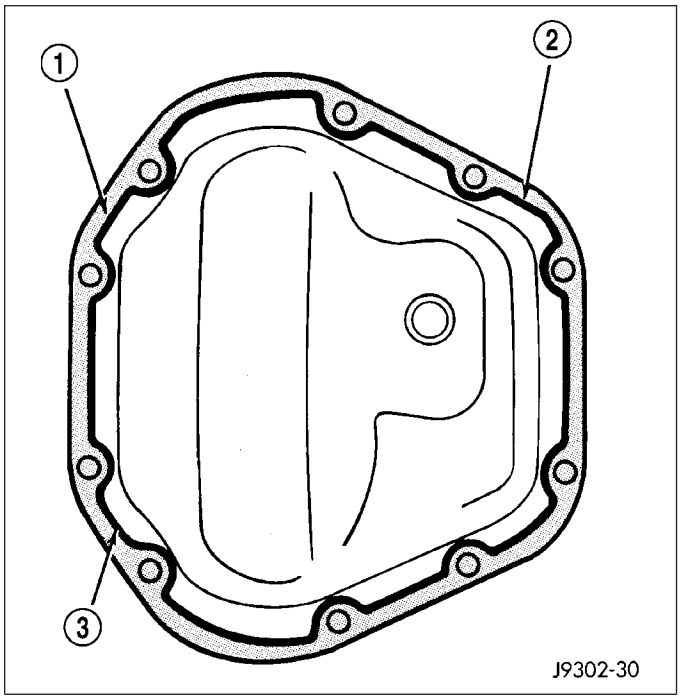


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11. Apply a bead of orange Mopar Axle RTV sealant (2) or equivalent to the housing cover (1).

CAUTION: If housing cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instructions will result in a leak.

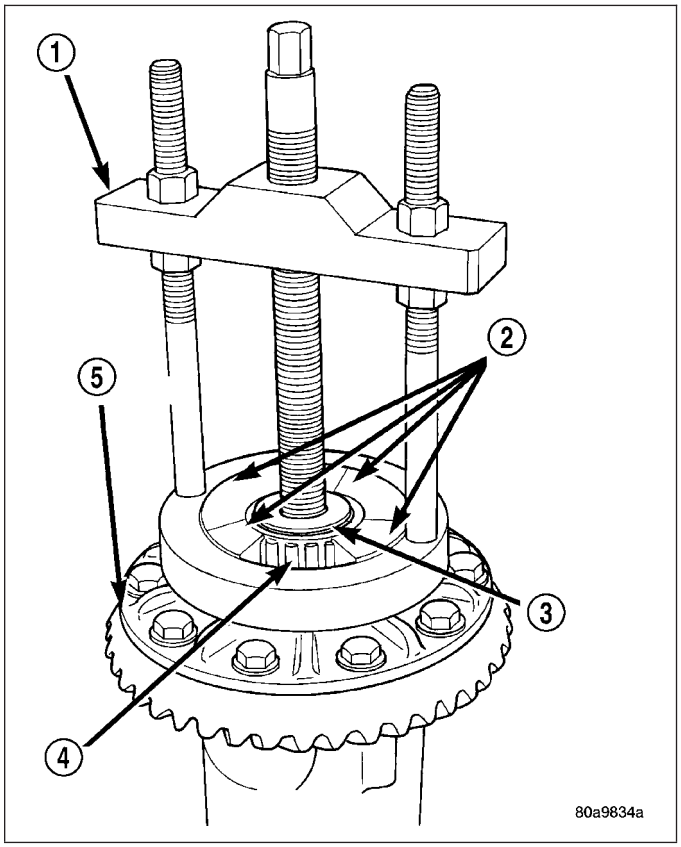
12. Install cover and tighten bolts in a criss-cross pattern to 48 N·m (35 ft. lbs.).
13. Fill differential lubricant to bottom of the fill plug hole.
14. Install fill hole plug and tighten to 27 N·m (20 ft. lbs.).



BEARING-DIFFERENTIAL CASE

REMOVAL

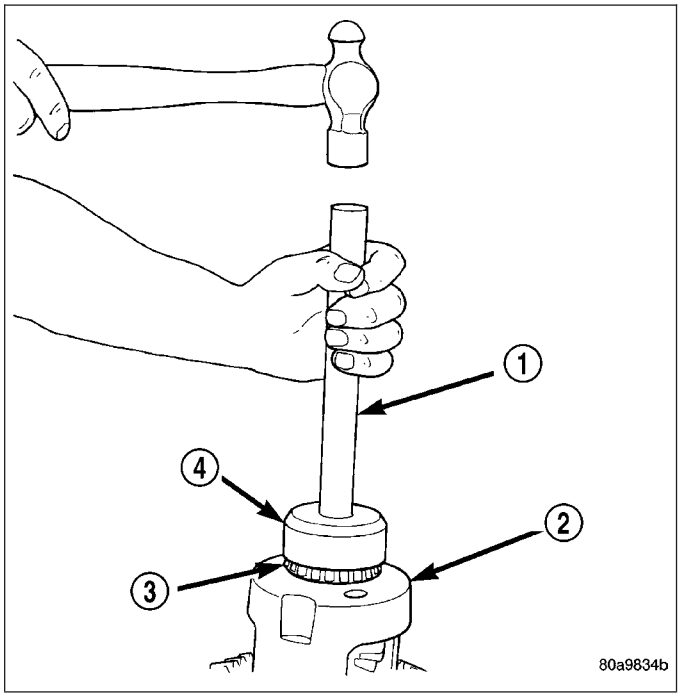
1. Remove differential case from housing.
2. Remove bearings (4) from differential case (5) with Puller/Press C-293-PA (1), Adapters C-293-62 (2) and Disc 8139-2 (3).



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INSTALLATION

1. Install differential side bearings (3) with installer C-4190 (4) and Handle C-4171(1).
2. Install differential case (2) into the housing.

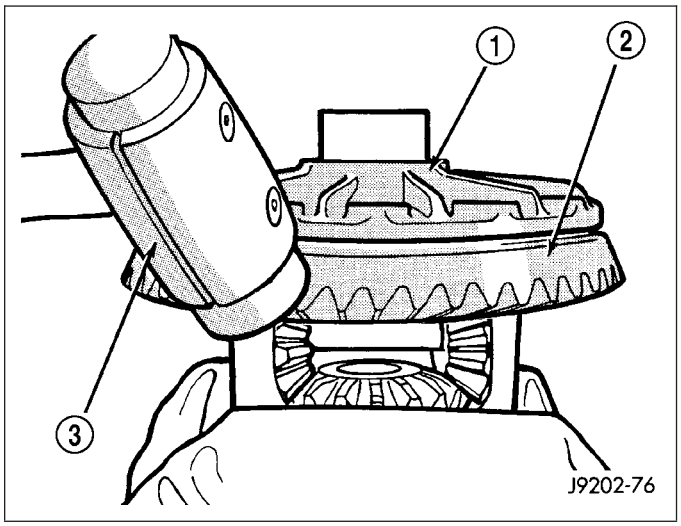


GEAR-PINION/RING

REMOVAL

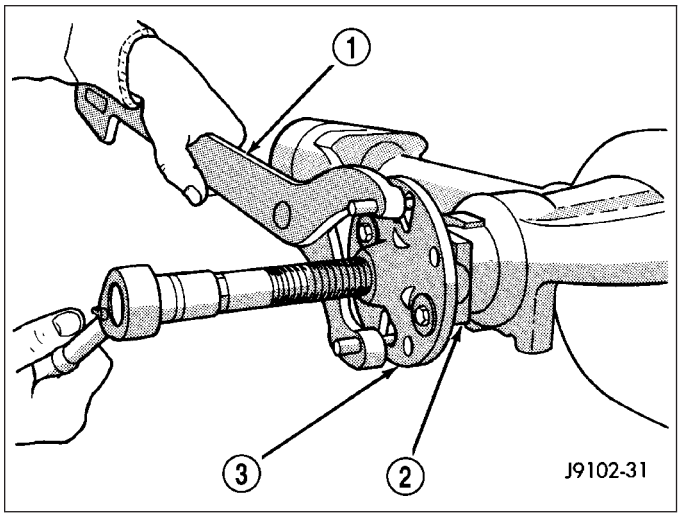
NOTE: The ring and pinion gears are service as a matched set. Never replace ring gear without replacing the matched pinion gear.

1. Remove differential from housing.
2. Place differential case (1) in a vise with soft metal jaw protectors.
3. Remove bolts holding ring gear to differential case.
4. Drive ring gear (2) from the differential case (1) with a soft hammer (3).
5. Remove exciter ring from the differential case by slowly tapping the ring with a brass drift.

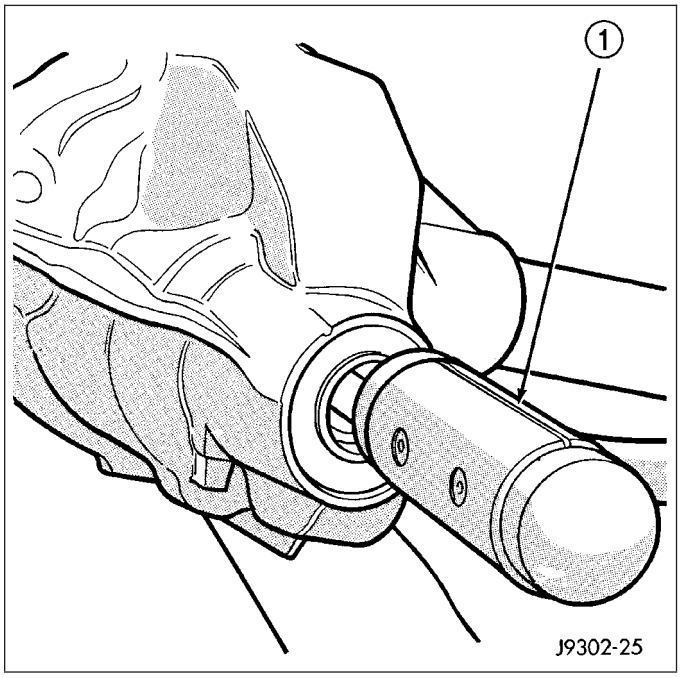


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6. Hold yoke with Yoke Holder 6719A and remove pinion yoke nut and washer.
7. Remove pinion yoke (2) with Remover C-452 (3) and Flange Wrench C-3281(1).

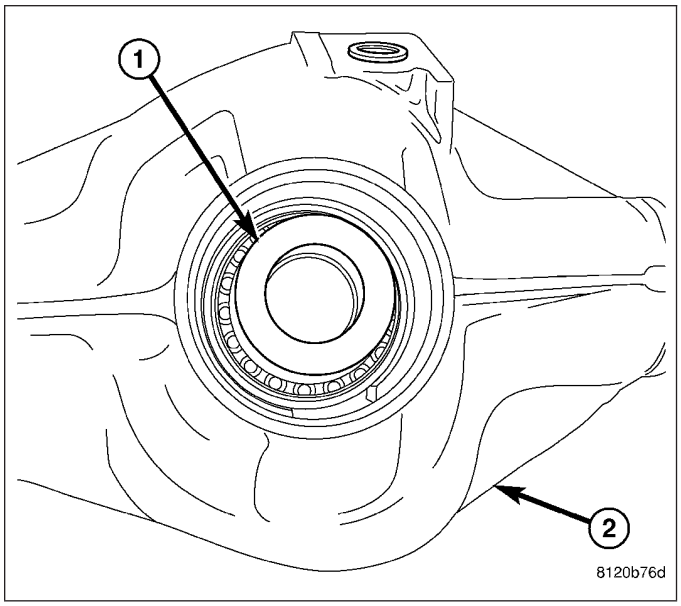


8. Remove pinion gear from housing with a soft hammer (1).

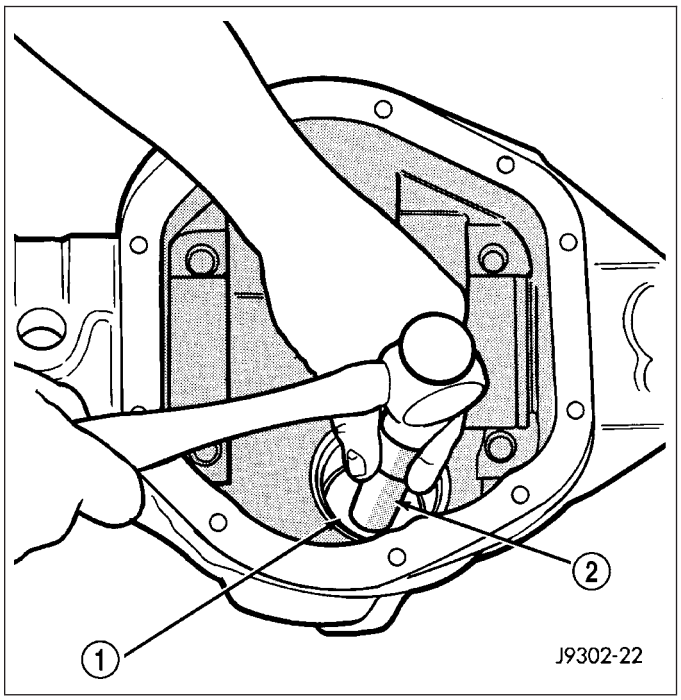


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9. Remove pinion seal with a slide hammer or suitable pry bar.
10. Remove oil slinger (1) and front pinion bearing from housing (2).

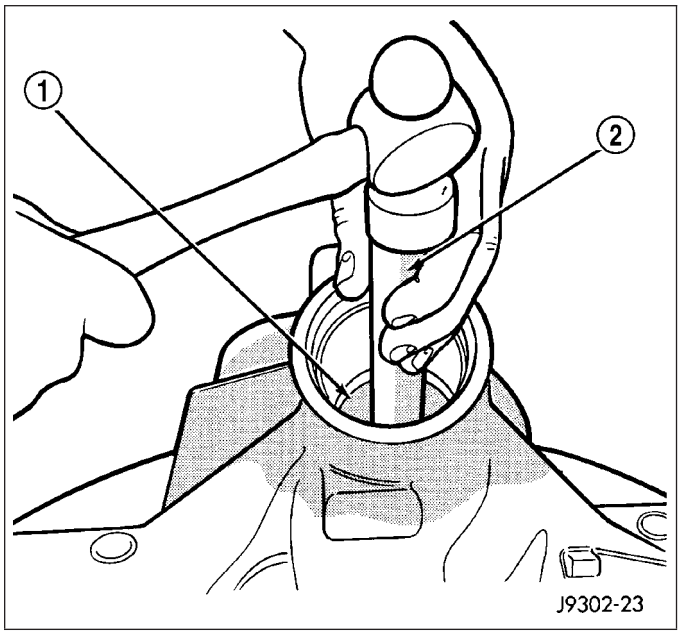


11. Remove front pinion bearing cup with Remover D-158 (1) and Handle C-4171(2).

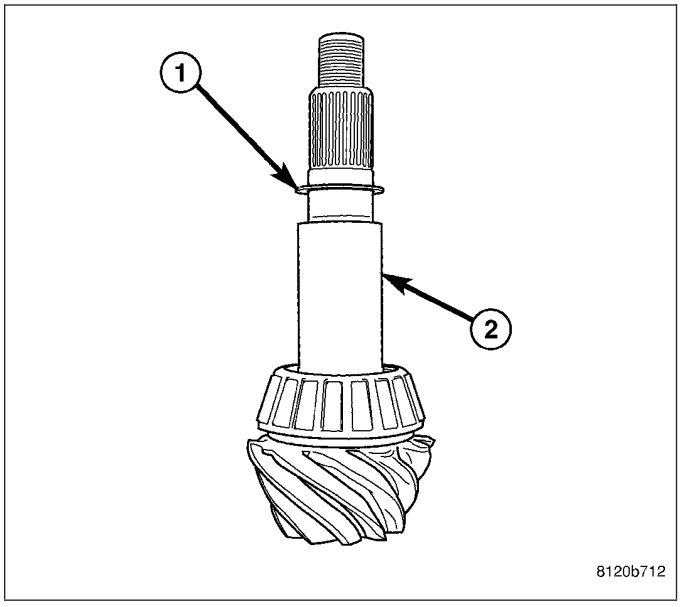


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12. Remove rear bearing cup with Remover D-162 (1) and Handle C-4171 (2).

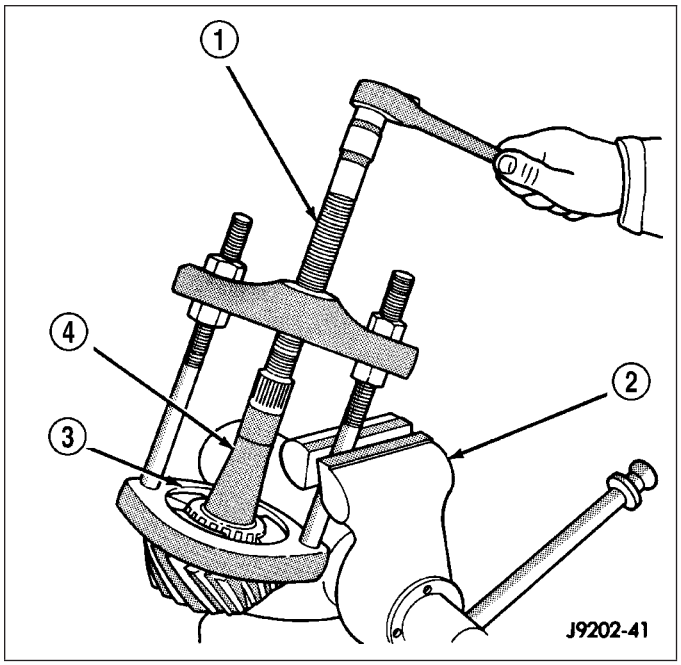


13. Remove pinion preload shims (1) from pinion shaft (2).

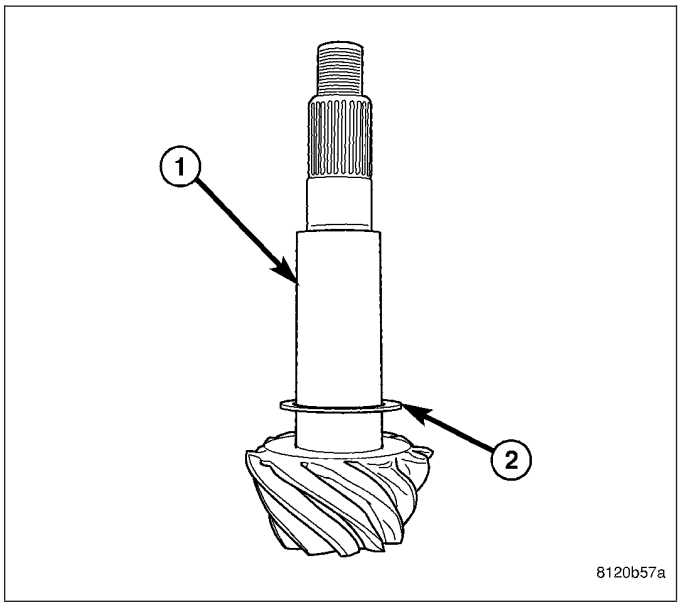


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14. Remove rear pinion bearing with Puller/Press C-293-PA (1) and Adapters C-293-37 (3).



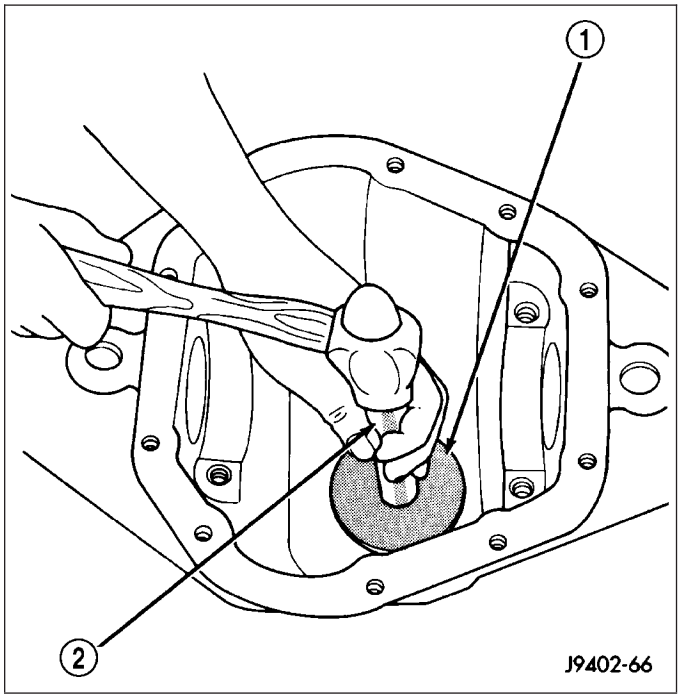
15. Remove pinion depth shims (2) from pinion shaft (1) and record shim thickness.



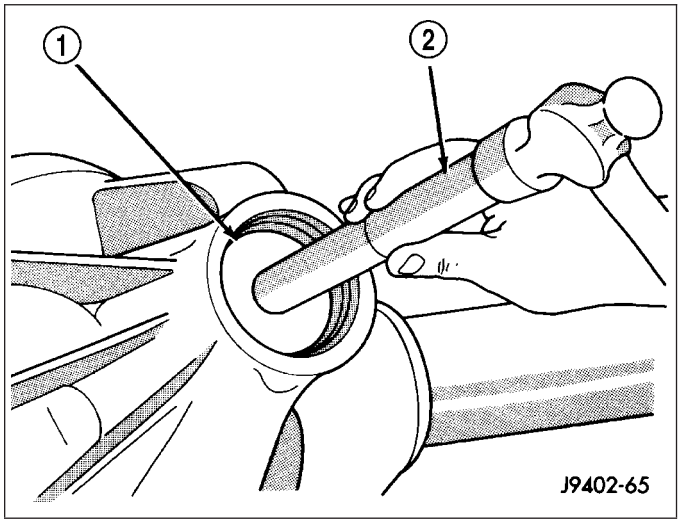
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INSTALLATION

1. Apply Mopar Door Ease stick or equivalent lubricant to outside surface of bearing cups.
2. Install rear pinion bearing cup with Installer D-111 (1) and Handle C-4171 (2).

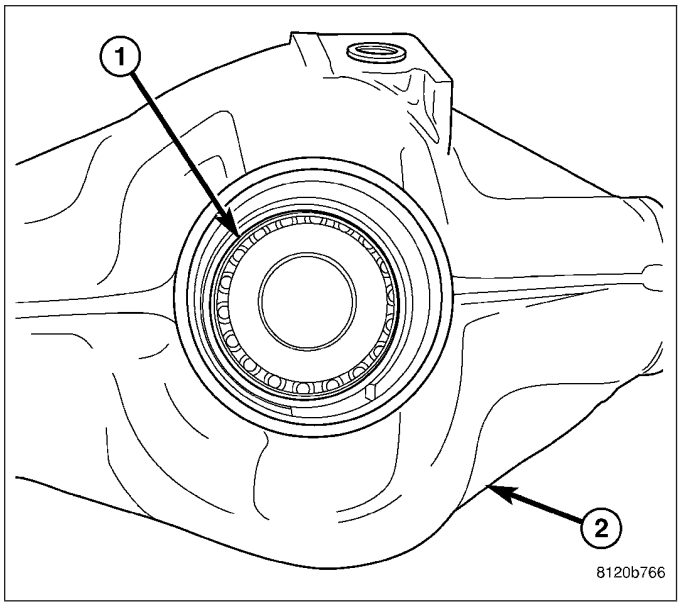


3. Install front pinion bearing cup with Installer D-146 (1) and Handle C-4171 (2).

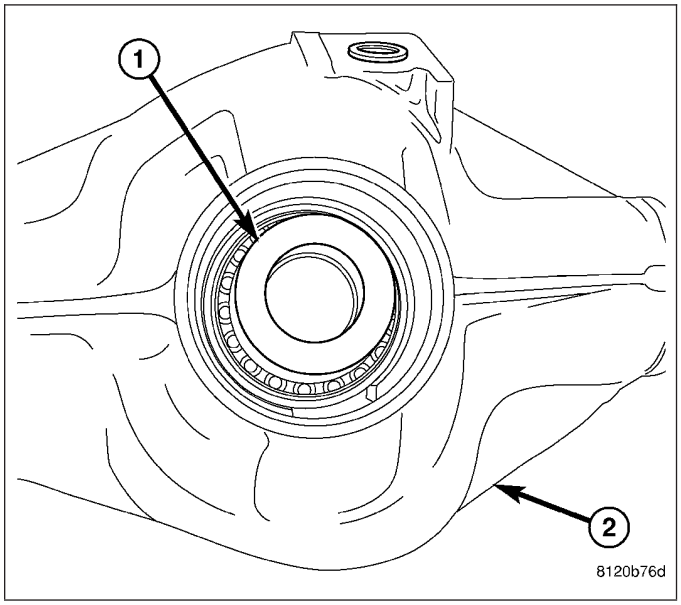


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4. Install front pinion bearing (1) into housing (2).

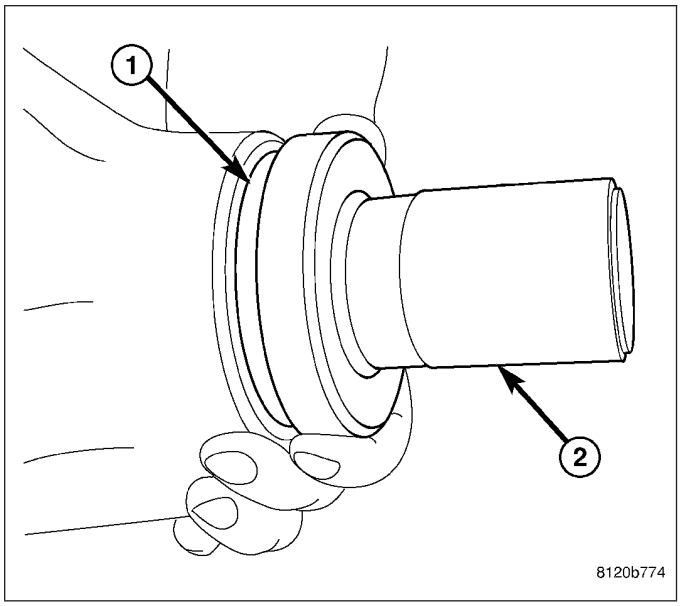


5. Install oil slinger (1) into housing (2).

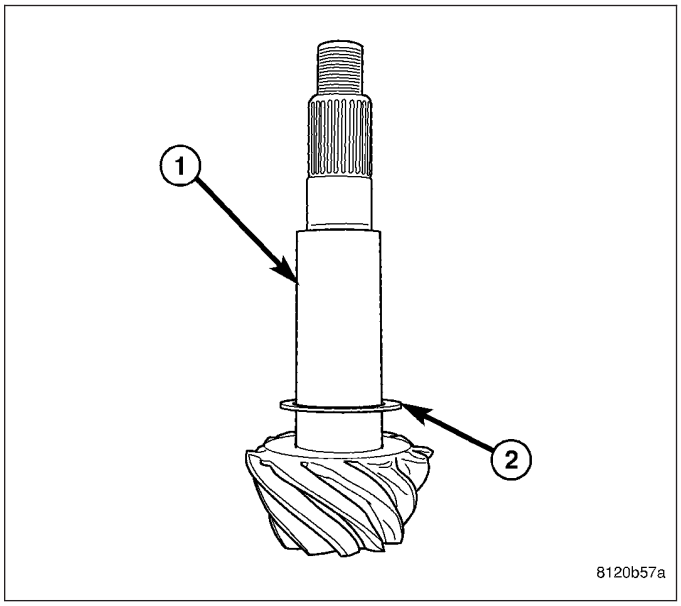


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6. Apply a light coating of gear lubricant on the lip of pinion seal. Install **new** pinion seal (1) with Installer 9348 (2).

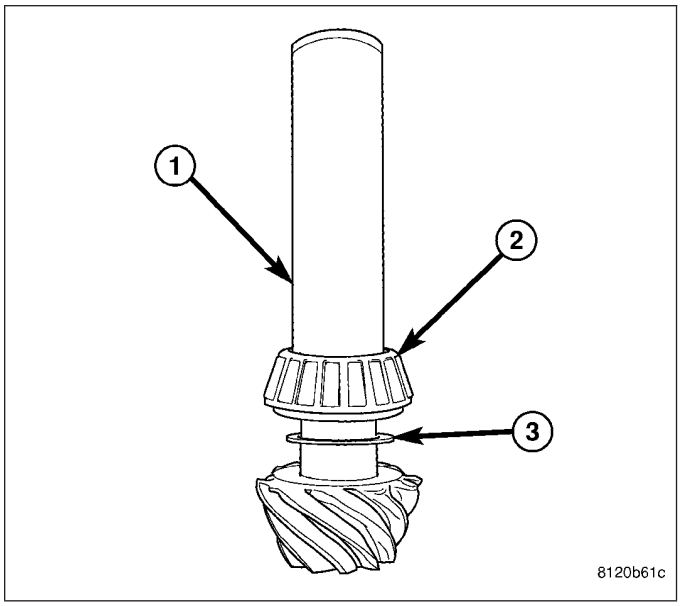


7. Install pinion depth shim (2) on pinion gear shaft (1).

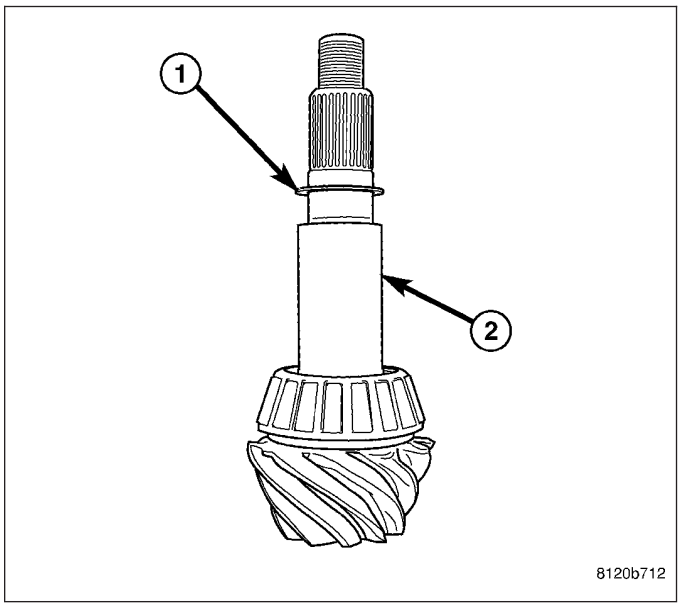


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8. Install rear pinion bearing (2) on pinion gear with Installer 9347 (1) and a press.

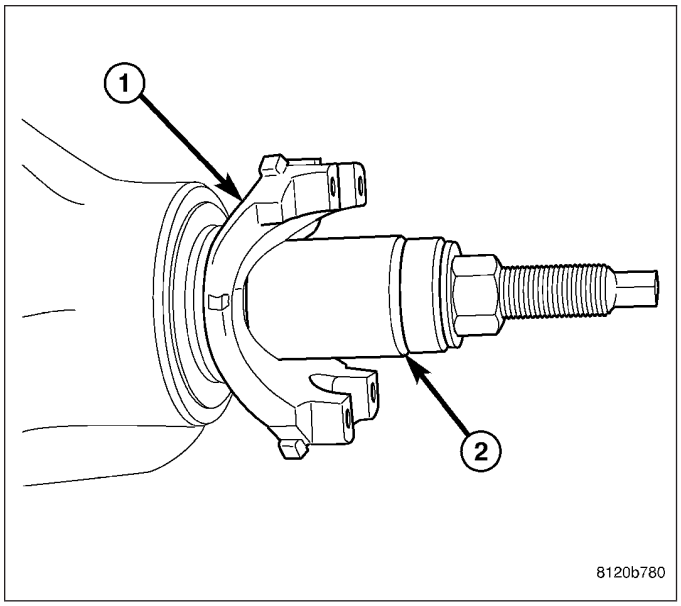


9. Install pinion preload shims (1) on pinion shaft (2).

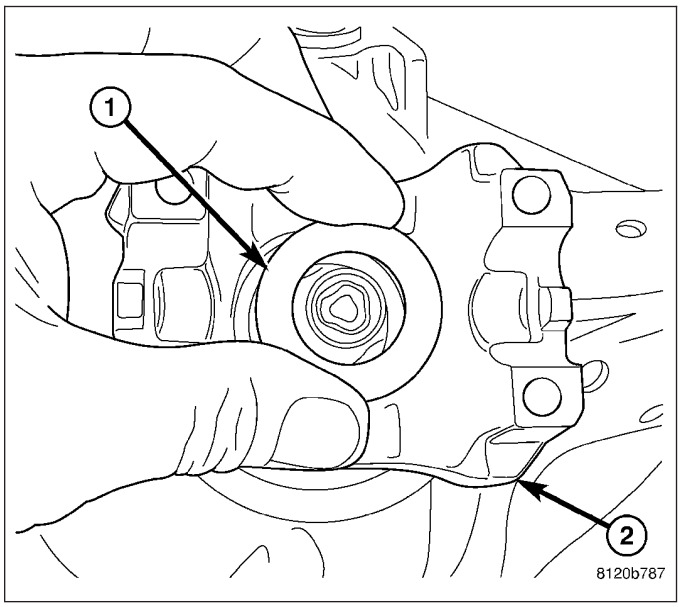


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10. Install pinion gear in housing.
11. Install yoke (1) with Installer C-3718 (2).

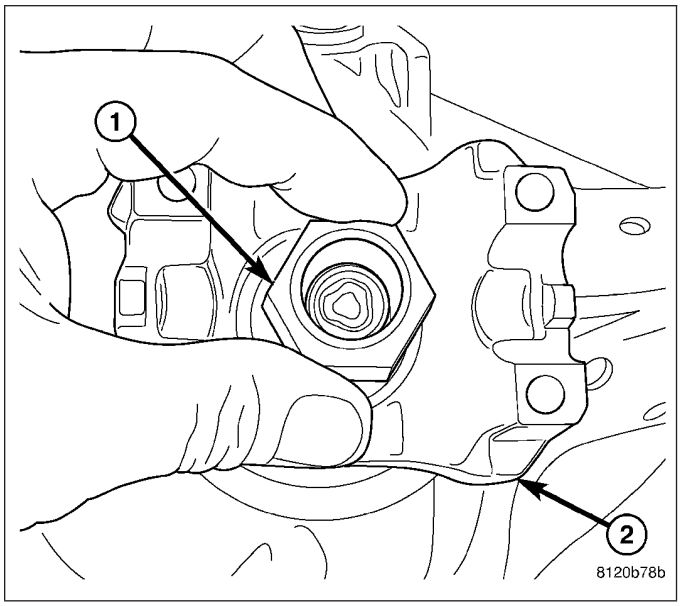


12. Install yoke (2) washer (1) on pinion.

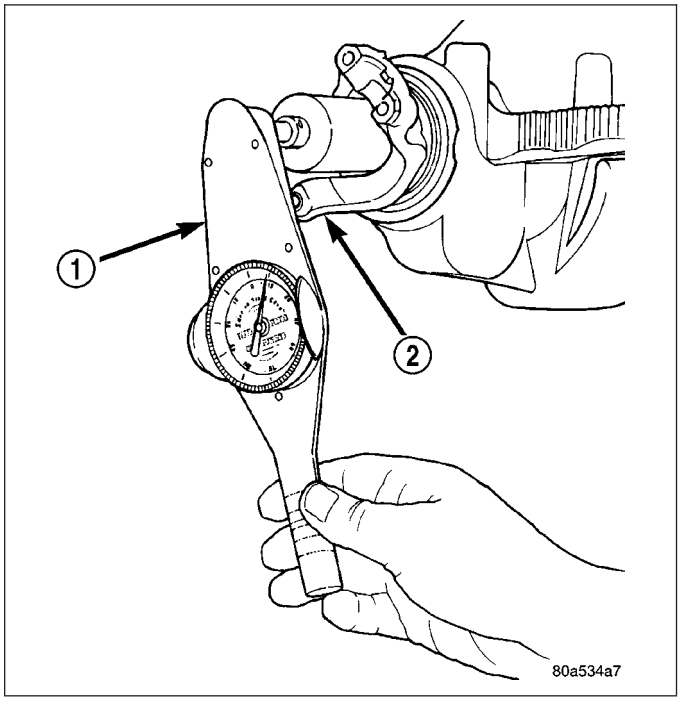


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13. Install **new** pinion nut (1).



14. Tighten pinion nut with Yoke Holder 6719A to 292 N·m (215 ft. lbs.) minimum. **Do not over-tighten.** Maximum torque is 447 N·m (330 ft. lbs.).
15. Tighten pinion nut with Yoke Holder 6719A and a torque wrench set at 447 N·m (330 ft. lbs.). Slowly tighten the nut in 6.8 N·m (5 ft. lbs.) increments until the rotating torque is achieved. Measure rotating torque with torque wrench (1) frequently.
16. Pinion rotating torque should be:
    - Original Bearings - 1 to 3 N·m (10 to 20 in. lbs.)
    - New Bearings - 1.7 to 3.9 N·m (15 to 35 in. lbs.)
17. Invert differential case in the vise.

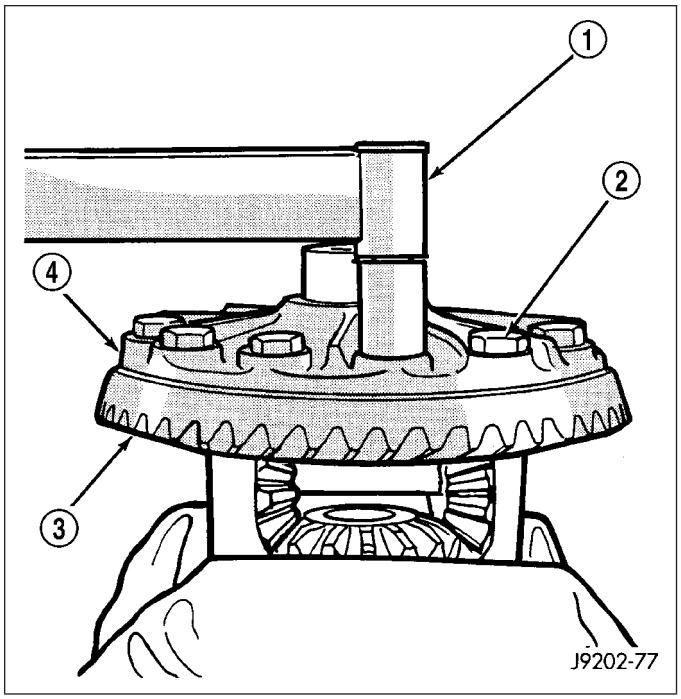


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18. Position exciter ring on differential case slowly and evenly tap the exciter ring into position with a brass drift.
19. Install ring gear (2) and start two ring gear bolts (2) to provide case-to-ring gear bolt hole alignment.
20. Invert differential case in the vise.
21. Install **new** ring gear bolts and alternately tighten to 177 N·m (130 ft. lbs.).

CAUTION: Never reuse ring gear bolts. Failure to follow these instructions can fracture bolts causing damage.

22. Install differential into housing and verify backlash and gear contact pattern.
23. Measure Total Torque to Rotate with an inch pound torque wrench. This measurement should be the pinion torque to rotate plus 0.33 - 0.56 N·m (3 - 5 inch pounds).



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