90-1, ***Publication Date: JANUARY 4, 1990***

Hard Start - All With Duraspark II Ignition Modules - Revised Applications	Article No. 90-1-5

FORD:
1976-83 THUNDERBIRD
1976-86 MUSTANG
1978-83 FAIRMONT
1978-86 CROWN VICTORIA
1981-82 ESCORT,EXP
1983-86 LTD
1984-87 TEMPO

LINCOLN MERCURY:
1976-83 COUGAR
1976-86 CAPRI
1978-83 ZEPHYR
1978-86 GRAND MARQUIS
1981-82 LN7, LYNX
1982-83 TOWN CAR
1983 CONTINENTAL
1983-86 MARQUIS
1984-87 TOPAZ

LIGHT TRUCK:
1973-78 BRONCO
1976-83 ECONOLINE, F-150-350 SERIES
1983-88 RANGER

MEDIUM/HEAVY TRUCK:
1979-89 C SERIES, F & B SERIES, L SERIES

This TSB article is being republished in its entirety to correct the Motorcraft part number for the E9VZ-12A199-A Ignition Module.

ISSUE:
A hard starting condition may exist if the incorrect Duraspark II ignition module is used. Revised Duraspark II ignition module assembly application charts are shown below.

ACTION:
If service is required, refer to the following Duraspark II Ignition Module Assembly Application Charts for correct parts usage. Although some earlier models such as the Fiesta, Granada, Monarch, etc. are no longer carried in the TSB index, they are shown in the charts for easy reference.

NOTE:
IT'S IMPORTANT TO NOTE THAT DURASPARK II IGNITION MODULE (D9VZ-12A199-A) CAN NOT BE USED ON 1984-88 2.0L RANGERS OR ON 1984-91 6.1L OR 7.0L, F, B, C, AND L MEDIUM/HEAVY TRUCKS.

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 89-19-3

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 610300

90-1, ***Publication Date: JANUARY 4, 1990***

• **Engine - RTV Sealer - Limited Shelf Life** • **RTV Sealer - Limited Shelf Life**	**Article No. 90-1-8**

FORD:
1988-90 CROWN VICTORIA, ESCORT, FESTIVA, MUSTANG
1989-90 PROBE, TAURUS, TEMPO, THUNDERBIRD

LINCOLN-MERCURY:
1988-90 CONTINENTAL, GRAND MARQUIS, MARK VII, TOWN CAR
1989 TRACER
1989-90 COUGAR, SABLE, TOPAZ

MERKUR:
1988-89 XR4TI
1989-90 SCORPIO

LIGHT TRUCK:
1988-90 AEROSTAR, BRONCO II, BRONCO, ECONOLINE, F-150, F-250, F-350, RANGER

MEDIUM/HEAVY TRUCK:
1988-90 C SERIES, CARGO SERIES, F & B SERIES, L SERIES

ISSUE:
Ford RTV sealer (E8AZ-19562-A, Spec. ESE-M4G195-B) has maximum shelf life of one year. RTV containers have been labeled with expiration dates since July, 1989.

ACTION:
Do not use RTV sealer that is not labeled with an expiration date or is past its expiration date. This applies only to E8AZ-19562-A RTV sealer.

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4700

90-1, ***Publication Date: JANUARY 4, 1990***

• **Odometer - Incorrect Mileage Reading** • **Speedometer - Odometer Indicates Incorrect Mileage Reading**	**Article No. 90-1-14**

MEDIUM/HEAVY TRUCK:
1987-89 C SERIES, F & B SERIES, L SERIES

ISSUE:
An odometer that displays an incorrect mileage reading may be caused by the stepper motor inside the speedometer. The stepper motor may not produce enough torque to advance the odometer.

ACTION:
Install a new speedometer assembly with a stepper motor that produces more torque. Refer to the appropriate Medium/Heavy Truck Shop Manual, Section 33-25 for service details. Use the following Speedometer Application Chart to make sure of the correct service part usage.

NOTE:
ALL SERVICE REPLACEMENT SPEEDOMETERS INCLUDE A LABEL TO RECORD THE MILEAGE AT THE TIME OF REPLACEMENT. THIS LABEL MUST BE PLACED ON THE DRIVER'S DOOR JAM.

OTHER APPLICABLE ARTICLES:

89-2-7

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 2300, 2310

90-2, ***Publication Date: January 17, 1990***

Safety Belt - Front - Instructions Not To Alter 1990 Safety Belt Restraint Systems	Article No. 90-2-1

FORD:
1990 CROWN VICTORIA, ESCORT, MUSTANG, TAURUS, TEMPO, THUNDERBIRD

LINCOLN-MERCURY:
1990 CONTINENTAL, COUGAR, GRAND MARQUIS, MARK VII, SABLE, TOPAZ, TOWN CAR

LIGHT TRUCK:
1990 AEROSTAR, BRONCO II, BRONCO, ECONOLINE, F SUPER DUTY, F-150, F-250, F-350, RANGER

MEDIUM/HEAVY TRUCK:
1990 C SERIES, CARGO SERIES, F & B SERIES, L SERIES

ISSUE:
The 1990 three-point front seat shoulder/lap safety belt active restraint systems (except for Canadian Escort models) no longer offer the tension eliminator function.

The 1990 restraint systems meet all Federal and Canadian Motor Vehicle Safety Standards (F/CMVSS).

ACTION:
Do NOT alter the restraint systems in any way. The past model safety belt comfort clip must not be used with the 1990 restraint system.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 1051

Bulletin Contents

TSB Article 90-2-12 has been superseded by Article 90-6-16.

90-2, ***Publication Date: January 17, 1990***

Starter - Caterpillar 3406 PEEC Engine - Removal And Installation Procedure	Article No. 90-2-13

MEDIUM/HEAVY TRUCK:
1990 L SERIES

This TSB article is being republished in its entirety to include a new service labor time.

ISSUE:
The starter motor removal and installation on L-Series trucks with the Caterpillar 3406 PEEC engine requires the partial removal of the PEEC box.

ACTION:
Use the following starter removal and installation procedure if service is required.

REMOVAL

1. Disconnect the positive battery cable from the battery.
2. Remove the clutch linkage frame mounted bracket and lever assembly.
3. Remove the three (3) fasteners holding the PEEC module to the engine.
4. Move the PEEC module outboard and forward. Let the PEEC module hang by its wiring and fuel lines.

   NOTE:
   DO NOT DISCONNECT THE WIRING OR FUEL LINES FROM THE PEEC MODULE.

5. Remove the battery cable strap attached to the engine below the PEEC module.
6. Disconnect the wiring and cables from the starter motor.
7. Remove the three (3) starter motor retaining bolts.
8. Remove the starter motor from the truck by moving the starter upward between the frame and the engine.

INSTALLATION

1. Install the starter motor by moving the starter downward between the frame and the engine.
2. Install the three (3) starter motor retaining bolts.
3. Connect the wiring and cables to the starter motor.
4. Install the battery cable to the engine below the PEEC module.

5. Re-position the PEEC module inboard and rearward.
6. Install the three (3) fasteners that hold the PEEC module to the engine.
7. Install the clutch linkage frame mounted bracket and lever assembly.
8. Re-connect the positive battery cable to the battery.

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 89-23-15

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 2700, 2760, 2800, 4800

90-2, ***Publication Date: January 17, 1990***

Fuel System - 6.6L Ford Diesel With Bosch "A" Type Fuel Injection Pump - Lift Pump Availability	**Article No. 90-2-14**

MEDIUM/HEAVY TRUCK:
1987-90 CARGO SERIES, F & B SERIES, L SERIES

ISSUE:
The lift pump for the fuel system on the 160 and 165 HP 6.6L Ford diesel engine with a type "A" Bosch fuel injection pump is not available in the Ford service part system.

ACTION:
In the event that a lift pump for a Bosch type "A" fuel injection pump is required, orders must be placed with your local Bosch dealer. The Bosch part number is 9-440-080-018.

NOTE:
INSTALLATION OF A LIFT PUMP FOR A BOSCH "P" TYPE INJECTION PUMP ON AN "A" TYPE INJECTION PUMP WILL RESULT IN DAMAGE TO THE "A" TYPE PUMP.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4500

• **Leaks - Transmission Fluid At Modine Oil Cooler Input And Output Ports** • **Transmission - Modine Oil Cooler - Input And Output Ports Damaged**	**Article No. 90-2-15**

MEDIUM/HEAVY TRUCK:
1989 LNT-8000, LNT-9000, LT-8000, LT-9000, LTL-9000, LTS-8000, LTS-9000

ISSUE:
Damaged oil cooler inlet and outlet ports or leaking transmission fluid from the oil cooler tubes may be caused by the cooler tubes vibrating. The oil cooler tubes can vibrate if the cooler support bracket fasteners are loose or if a retaining clip lacks sufficient clamping force.

ACTION:
Tighten the cooler support bracket and install rubber insulators over the oil cooler tubes. Refer to the following procedure for service details.

SERVICE PROCEDURE

1. Tighten the oil cooler support bracket fasteners to a torque of 25-31 lb-in (3-4 N-m), Figure 1.

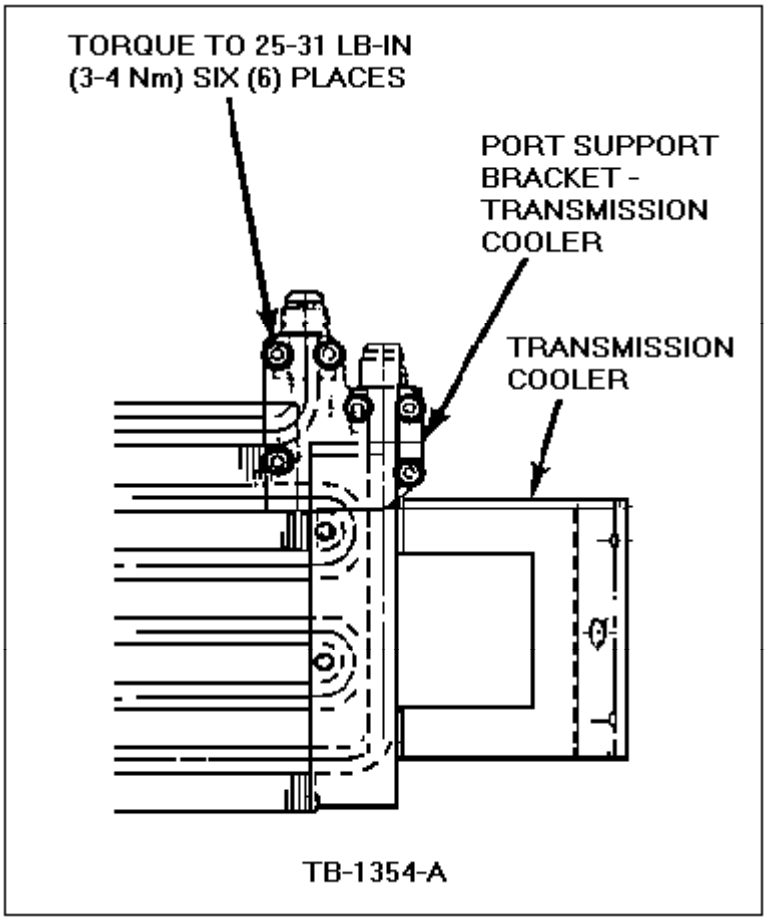


Figure 1 - Article 90-2-15

2. Remove the oil cooler tube retaining clip, Figure 2.

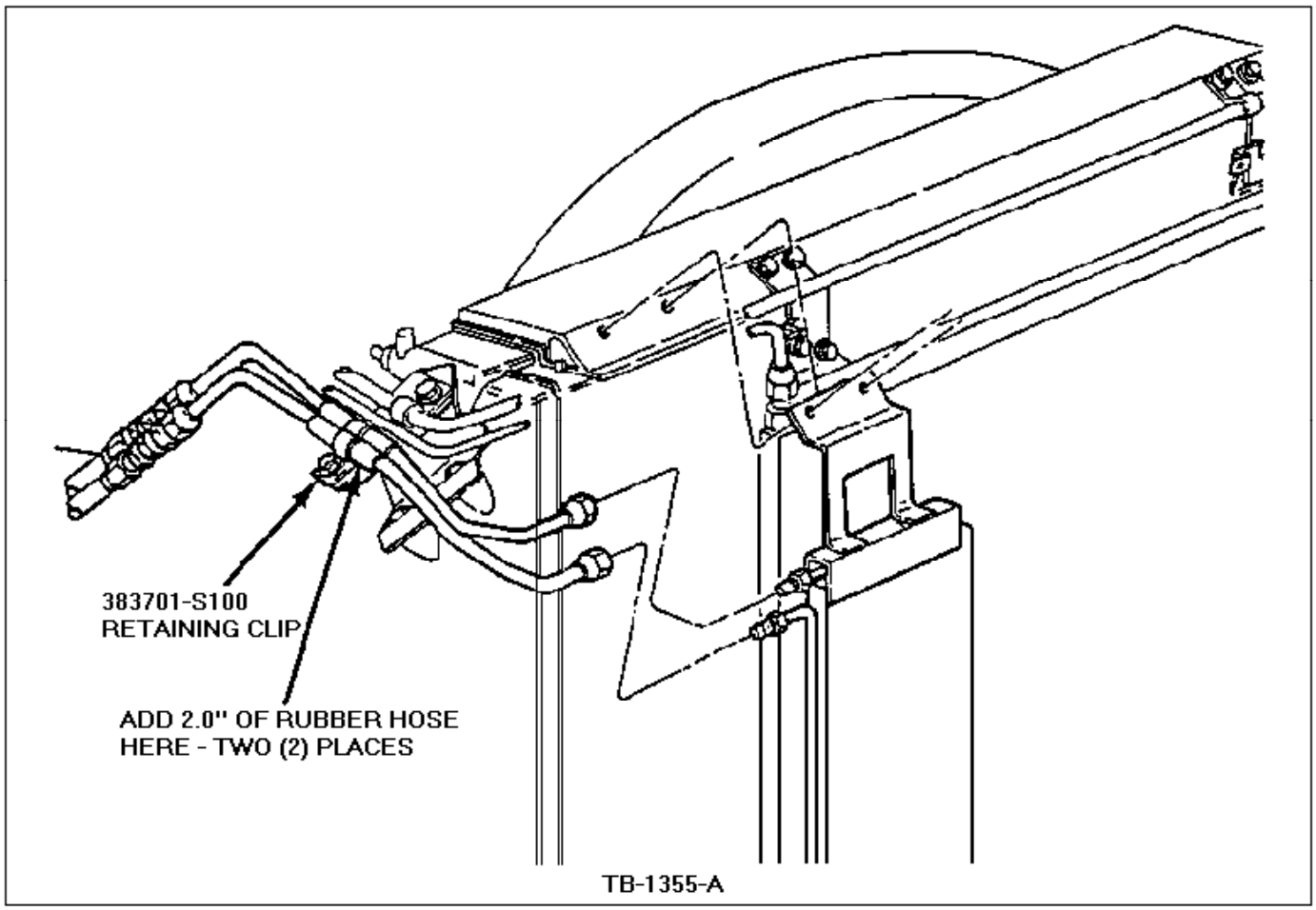


Figure 2 - Article 90-2-15

3. Install a two (2) inch length of slit rubber hose sleeve (DOHZ-2B452-C) on each of the oil cooler tubes at the point where they are clipped.

4. Install a new retaining clip, (383701-S100). Tighten the bolt on the retaining clip to a torque of 85-115 lb-in (10-13 N-m).

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 5970

90-3, ***Publication Date: JANUARY 31, 1990***

Steering - Greaseable Draglinks, Tie Rods And Tie Rod Ends - Availabilty And Usage	**Article No. 90-3-13**

MEDIUM/HEAVY TRUCK:
1970-90 C SERIES, CL-CLT-9000 SERIES, F & B SERIES, L SERIES

ISSUE:
Greaseable draglinks, tie rods and tie rod ends (standard on all 1990 medium, heavy and extra-heavy trucks) are now available to service prior model year vehicles.

ACTION:
If service is required, refer to the following Vehicle Application Charts for the correct draglink, tie rod and tie rod end service part numbers.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 3100

Bulletin Contents

TSB Article 90-3-14 has been superseded by Article 90-5-13.

Gauge - Ammeter - Lacks Sensitivity	**Article No. 90-3-15**

MEDIUM/HEAVY TRUCK:
1985-86 L SERIES

ISSUE:
The ammeter may not move very much when indicating the charge or discharge of the battery. This usually occurs because the shunt wire is not long enough.

ACTION:
Increase the length of the shunt wire to increase the amount of deflection in the gauge. Use the following service procedure.

SERVICE PROCEDURE

1. Disconnect the battery.

2. Disconnect the ammeter shunt wire at the junction block. It is the yellow wire with the yellow terminal in the 14398 wiring harness, Figure 1.

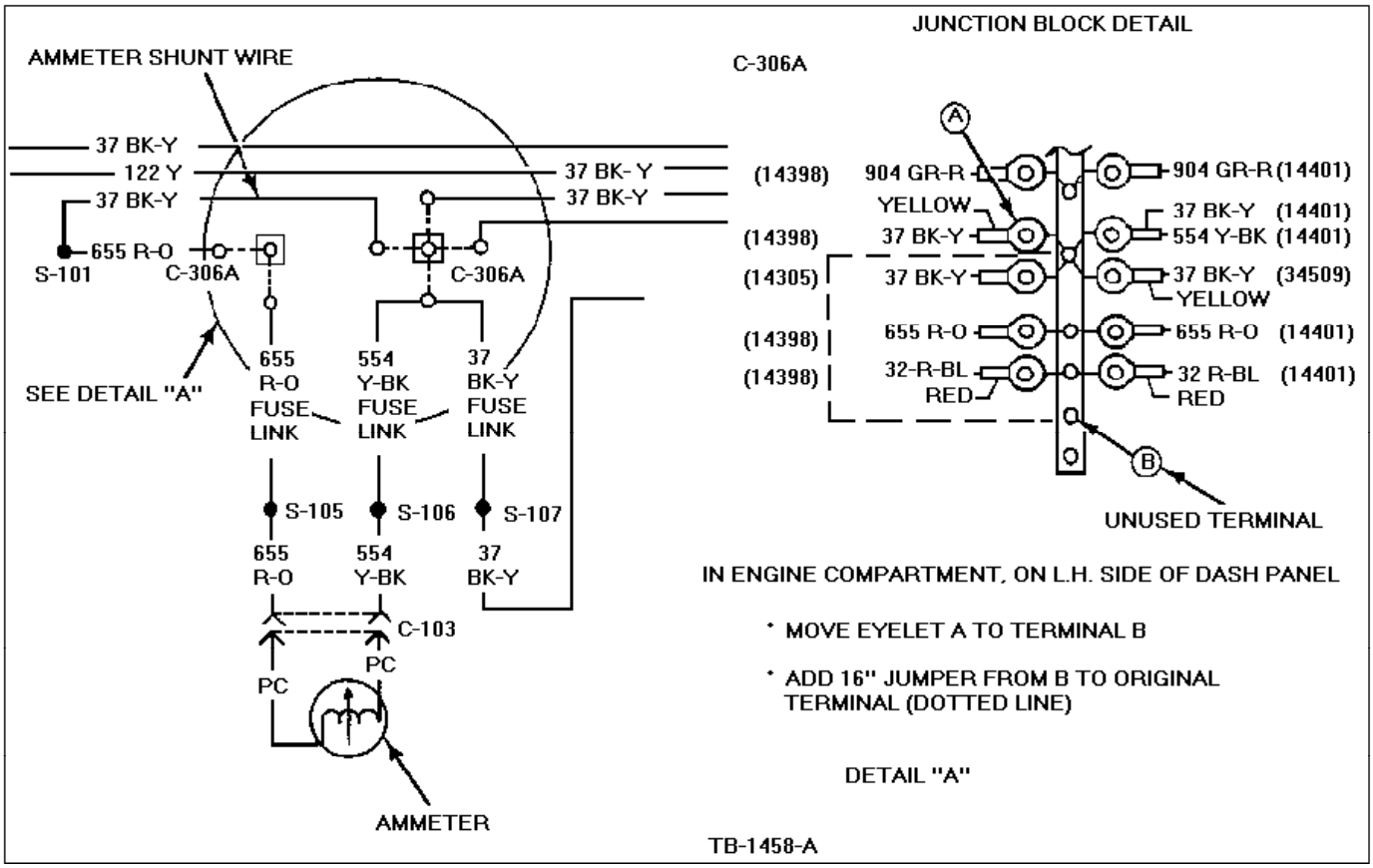


Figure 1 - Article 90-3-15

3. Add a longer shunt.

   a. Move the wiring eyelet to the nearest blank terminal, Figure 1.

   b. Add a 16" 8 gauge jumper wire between the new terminal and the original terminal.

4. Reconnect the battery.

5. Test the operation of the ammeter as follows:

   - With the ignition off, the ammeter should show "0" or be at the center scale.
   - With the ignition off and the headlights on, the ammeter should deflect towards DISCHARGE.
   - With the engine started, the ammeter should deflect towards CHARGE and slowly return towards the center scale.

OTHER APPLICABLE ARTICLES: 85-18-14

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 2300, 2310, 2770, 2750

90-4, ***Publication Date: FEBRUARY 14, 1990***

Cooling System - Use Of Recycled Engine Coolant - Service Tip	Article No. 90-4-10

FORD:
1984-90 CROWN VICTORIA, ESCORT, MUSTANG, TEMPO, THUNDERBIRD
1986-90 TAURUS
1988-90 FESTIVA
1989-90 PROBE

LINCOLN-MERCURY:
1984-86 CAPRI
1984-87 LYNX
1984-90 CONTINENTAL, COUGAR, GRAND MARQUIS, MARK VII, TOPAZ, TOWN CAR
1986-90 SABLE
1987-90 TRACER

MERKUR:
1985-90 XR4TI
1988-89 SCORPIO

LIGHT TRUCK:
1984-90 BRONCO II, BRONCO, ECONOLINE, F-150, F-250, F-350, RANGER
1986-90 AEROSTAR

MEDIUM/HEAVY TRUCK:
1984-90 C SERIES, F & B SERIES, L SERIES
1986-90 CARGO SERIES

ISSUE:
Ford Motor Company does not authorize the use of recycled engine coolant nor do they sanction the use of any machines or devices that recycle engine coolant.

Recycled engine coolant is not equivalent to the factory fill OEM coolant, the Ford premium cooling system fluid (E2FZ-19549-AA) or the Ford heavy duty low silicate cooling fluid (E6HZ-19549-A).

The quality of engine coolant degenerates with use. Recycling used engine coolant is very difficult to do without exposing the used coolant to additional foreign substances. Merely adding an additive to the coolant will not restore it.

ACTION:
Use new engine coolant that meets Ford Motor coolant specifications for the engine being serviced.

Properly dispose of the used coolant.

WARNING:
THE DISPOSAL OF ALL USED ENGINE COOLANT MUST ALWAYS BE DONE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4300

90-4, ***Publication Date: FEBRUARY 14, 1990***

Engine - 6.6L And 7.8L Ford Diesel- Valve Lash Adjustment Interval Changed	Article No. 90-4-16

MEDIUM/HEAVY TRUCK:
1986-90 CARGO SERIES
1987-90 F & B SERIES, L SERIES

ISSUE:
The recommended interval for the initial intake and exhaust valve lash adjustment has been changed from 24,000 miles (38,000 km) to 12,000 miles (19,000 km). The new interval will help extend the service life of the valve train components.

ACTION:
Adjust the intake and exhaust valve lash at 12,000 miles (19,000 km) because of initial wear and seating of the valve train components. After that, adjust the valve lash every 54,000 miles (87,000 km) as currently required.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4700, 4800

90-5, ***Publication Date: FEBRUARY 28, 1990***

Steering - Tilt And Telescoping Column - New Service Option And Procedure	Article No. 90-5-10

MEDIUM/HEAVY TRUCK:
1989-90 L SERIES

ISSUE:
A new tilt and telescoping steering column is available on 1990 L-Series trucks. This option can also be added as a service option on 1989 L-Series Trucks.

ACTION:
The new tilt and telescoping steering column can be installed and serviced by using the following procedures.

> **NOTE:**
> SERVICE OF THE NEW STEERING COLUMN UNTIL 9/01/90, WILL REQUIRE COMPLETE STEERING COLUMN REPLACEMENT. SERVICE TO THE STEERING COLUMNS AFTER 9/01/90 CAN BE HANDLED WITH INDIVIDUAL DETAIL COMPONENTS.

Steering columns replaced before 9/01/90 MUST be returned to the Warranty Parts Return Center, Plymouth, Michigan. The steering columns must also be tagged with the appropriate FPS 700 Tag.

STEERING COLUMN DESCRIPTION

L-Series trucks can be equipped with one of two types of steering column assemblies. The tilt and telescoping adjustable column is optional. The fixed steering column is standard. The steering column assembly attaches to an intermediate shaft which connects to the steering gear on all L-Series trucks (except LL and LTL). The LL and LTL-9000 use an assembly consisting of the column, an intermediate shaft and a lower steering shaft.

REMOVAL AND INSTALLATION

Steering Wheel Removal

1. Make sure that the truck road wheels are in a straight-ahead position.
2. Scribe a mark from the steering column shaft to the steering wheel hub. This will make sure of correct reassembly.
3. Disconnect the negative battery cables.
4. Disconnect the horn wire at the connector below the instrument panel.
5. Carefully pry off the horn button using your fingertips.
6. Disconnect the horn wire at the terminal.
7. Remove the steering wheel retaining nut.

8. Remove the steering wheel with steering wheel puller, T67L-3600-A or equivalent.

Steering Wheel Installation

1. Make sure the steering column upper bearing sleeve and spring, (if equipped), are in position at the top of the steering shaft.

2. Place the steering wheel on the steering column and align the scribe marks made during removal.

3. Re-connect the horn wire at the terminal.

4. Re-install the horn button.

5. Re-connect the horn wire at the connector below the instrument panel.

6. Re-connect the negative battery cables.

Steering Column Removal

NOTE:
SEE FIGURES 1 AND 2 FOR AN ILLUSTRATED VIEW OF THE TWO TYPES OF STEERING COLUMN ASSEMBLIES.

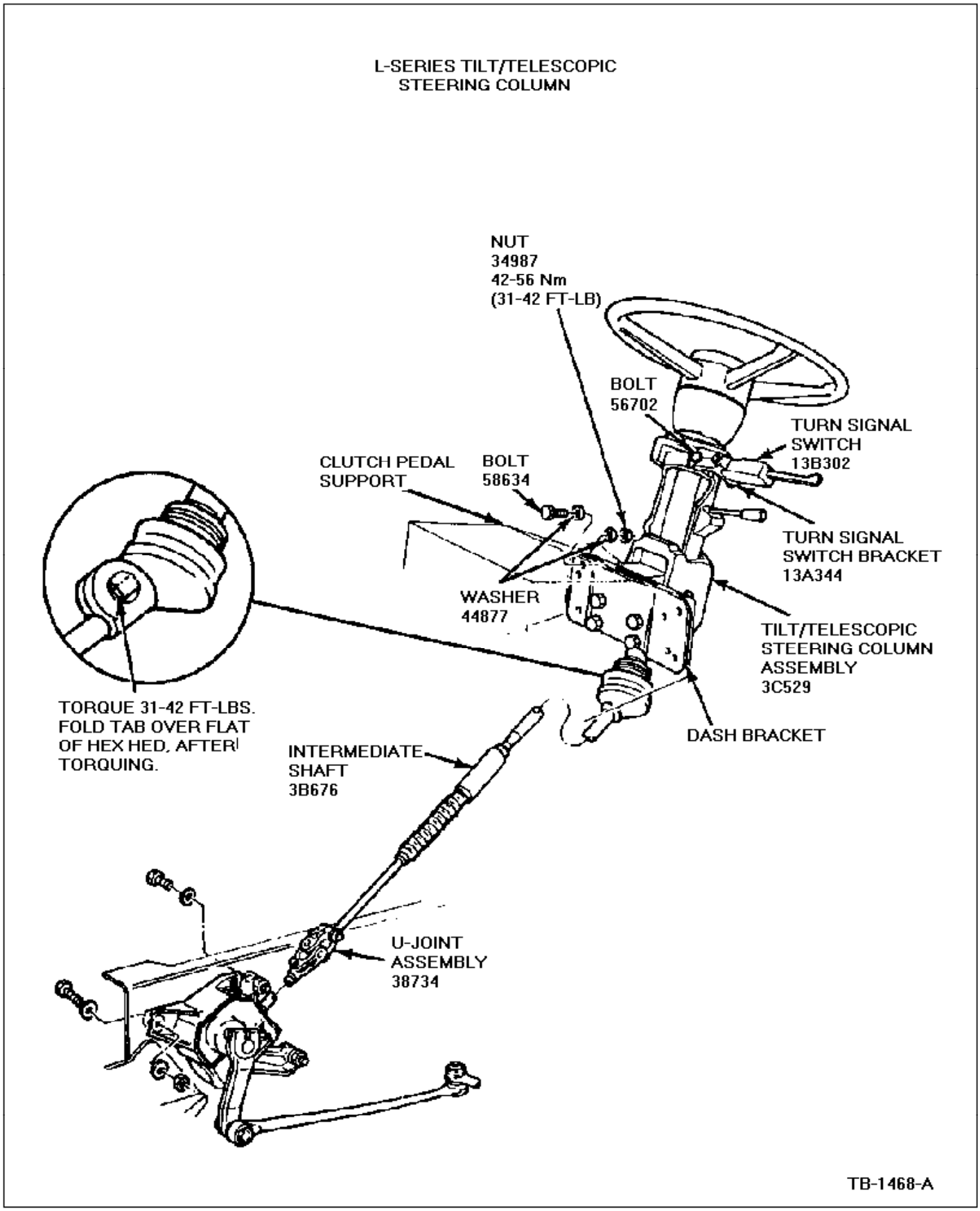


Figure 1 - Article 90-5-10

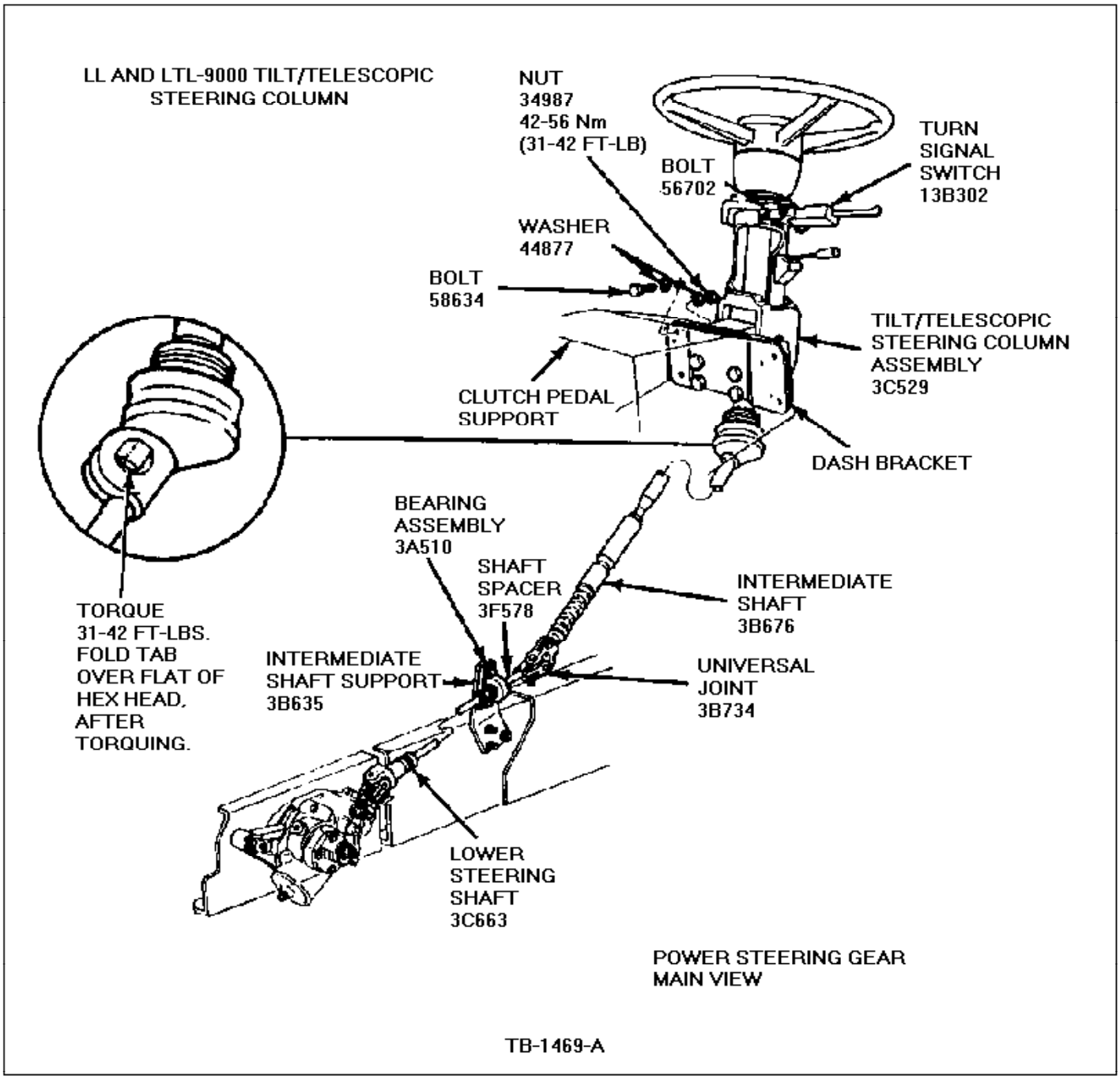


Figure 2 - Article 90-5-10

1. Disconnect the negative battery cable.

2. Remove the steering wheel.

3. Disconnect the turn signal control at the quick connect terminals.

4. Remove the air brake control from the steering column, if equipped.

5. Bend back the lock tab and remove the nut and bolt from the clamp that holds the steering column to the intermediate shaft, Figure 1 and 2.

6. Remove the four (4) bolts and nuts that hold the steering column to the dash bracket, Figures 1 and 2.

7. Remove the steering column from the truck.

8. Throw away the four (4) nuts that are between the column mounting bracket and dash bracket.

Steering Column Installation

1. Position the steering column in the truck.

2. Install the four (4) bolts and nuts that hold the steering column to the dash bracket, Figures 1 and 2. Tighten the nuts to a torque of 31-42 lb.ft. (42-56 N-m).

3. Attach the steering column to the intermediate shaft with a new clamp. Align the clamp bolt with the whistle notch in the intermediate shaft tube.

4. Tighten the clamp nut to a torque of 31-42 lb.ft. (43-56 N-m) and bend the lock tab against one of the flats on the nut.

5. Re-connect the turn signal.

6. Re-connect the air brake control, if equipped.

7. Re-install the steering wheel.

8. Re-connect the negative battery cables.

Steering Column Disassembly

1. Remove the bolt and lock washer from the horn contact housing using a 1/4 inch 12 point socket, Figure 4.

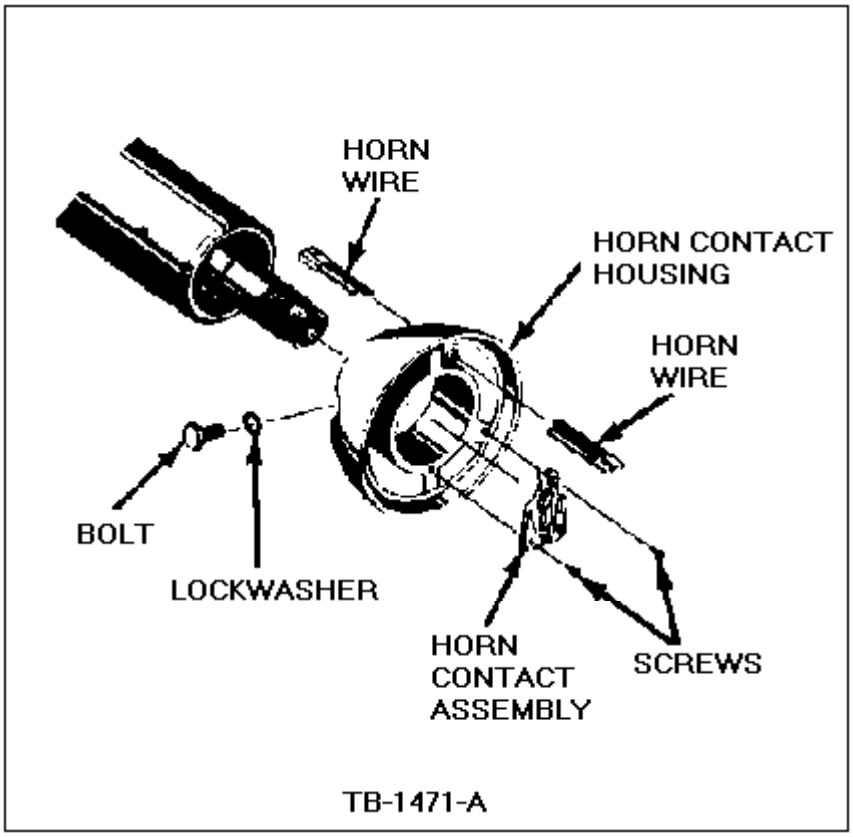


Figure 4 - Article 90-5-10

2. Remove the two (2) T25 Torx screws from the horn contact housing.

3. Remove the horn contact assembly and horn wire.

4. Remove the turn signal switch and bracket from the air brake bracket, Figure 5.

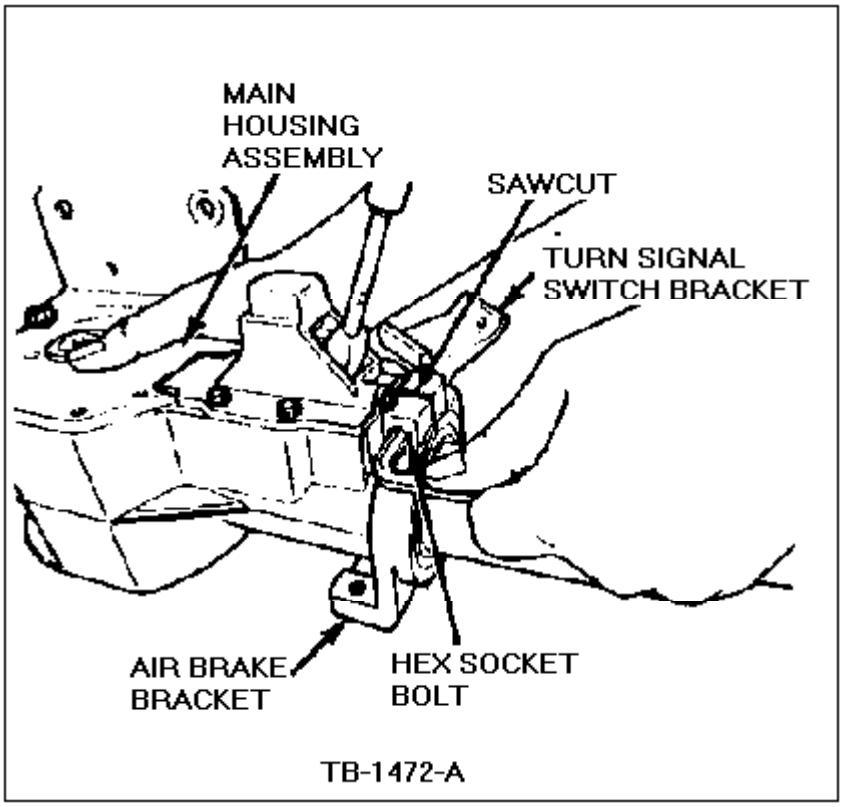


Figure 5 - Article 90-5-10

5. Remove the air brake bracket using a 1/4 inch Allen wrench, Figure 5.

6. Remove the tilt and telescoping lever.

7. Remove the spring cover plate using a 5/16 inch hex socket, Figure 6.

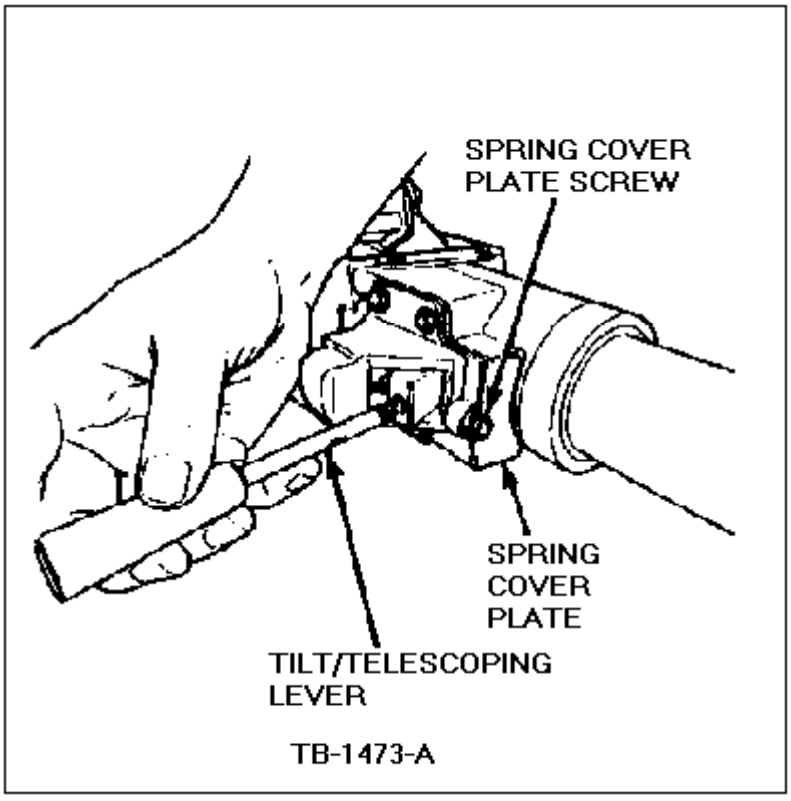


Figure 6 - Article 90-5-10

8. Remove the actuator housing, actuator housing spring, anti-rattle spring, two (2) rubber balls, actuator cam and pin assembly with the cam, lock pin and pivot pin, Figure 7.

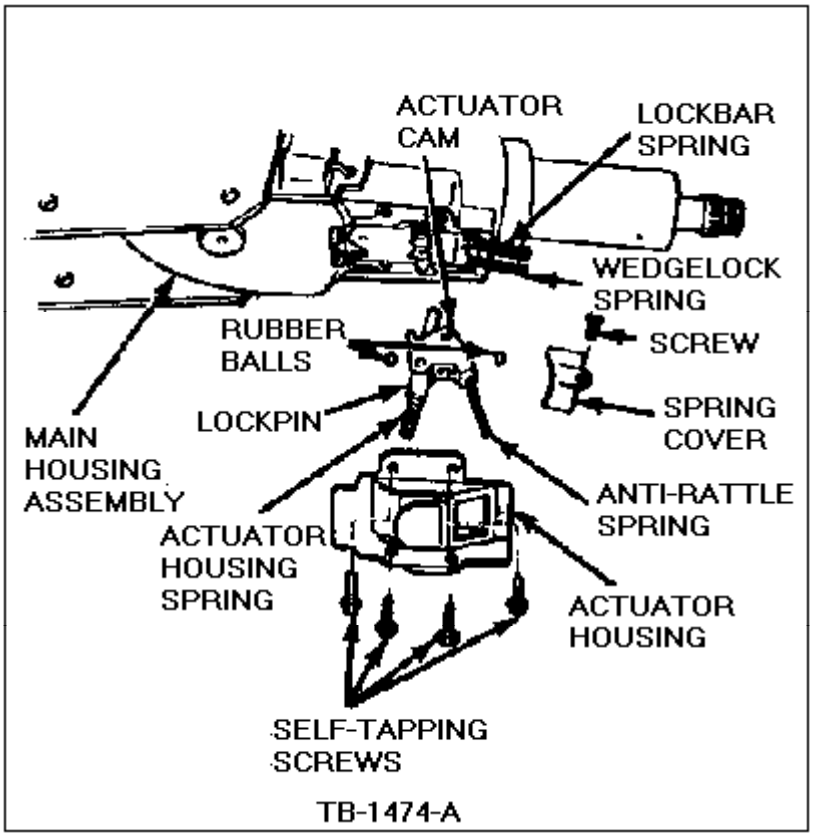


Figure 7 - Article 90-5-10

9. Remove the disengaging plate, Figure 8.

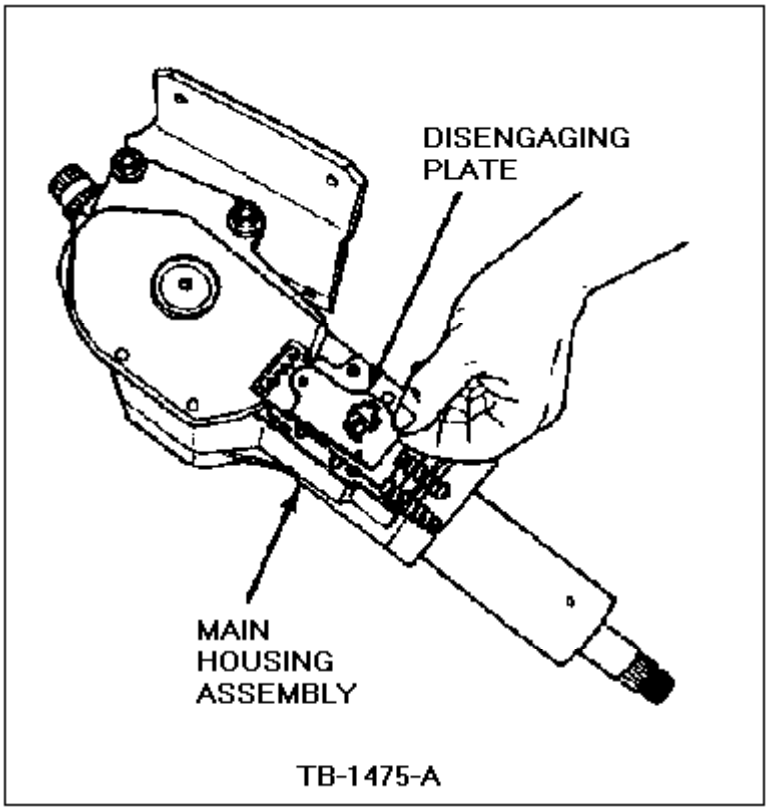


Figure 8 - Article 90-5-10

10. Remove the lockbar with the lockbar spring, Figure 9.

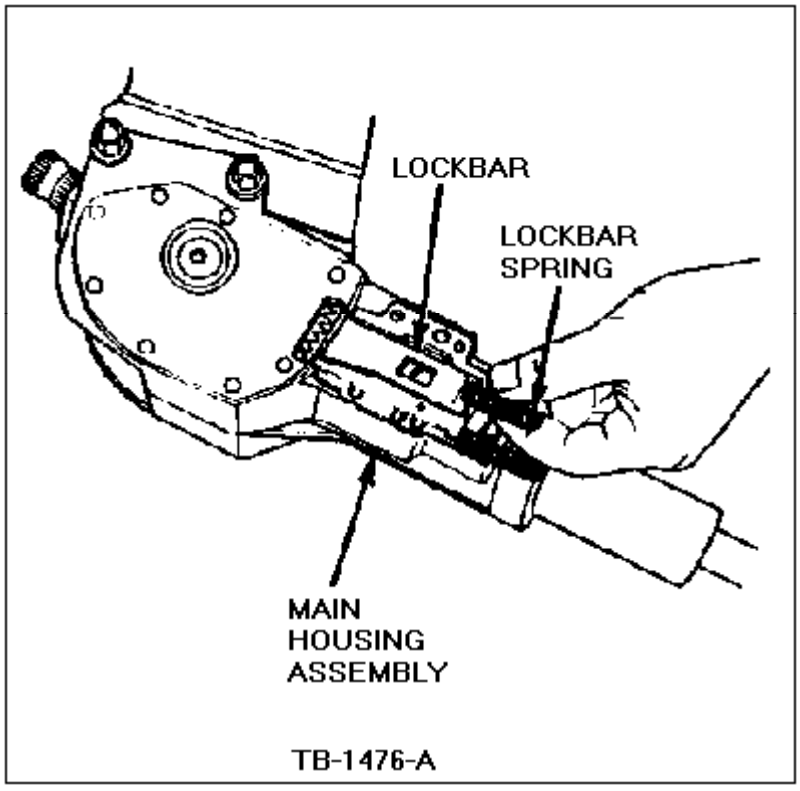


Figure 9 - Article 90-5-10

11. Remove the wedgelock and wedgelock spring, Figure 10.

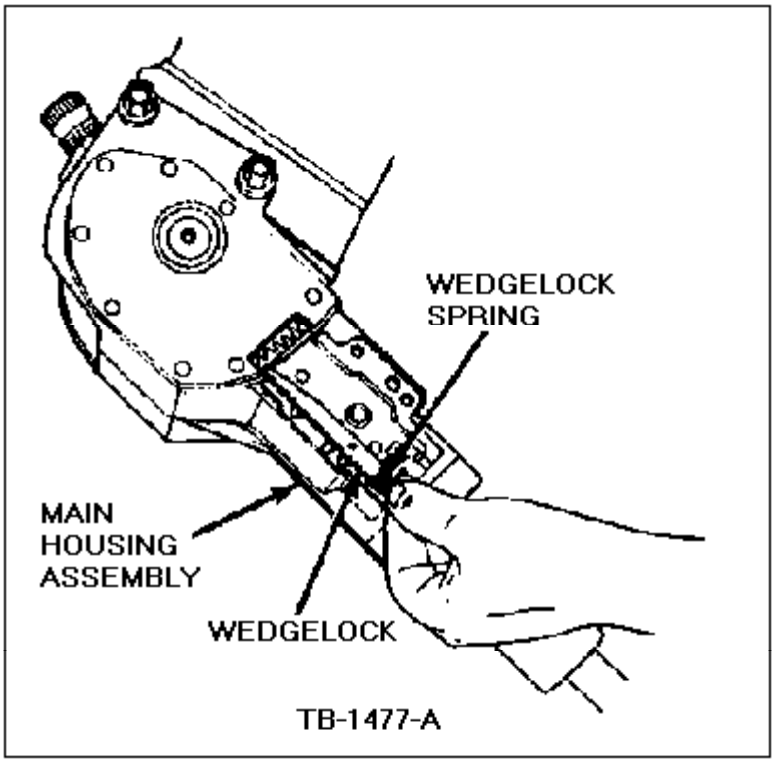


Figure 10 - Article 90-5-10

12. Make sure the steering column tilt is at full up.

13. Detach the springs from the main housing, Figure 11.

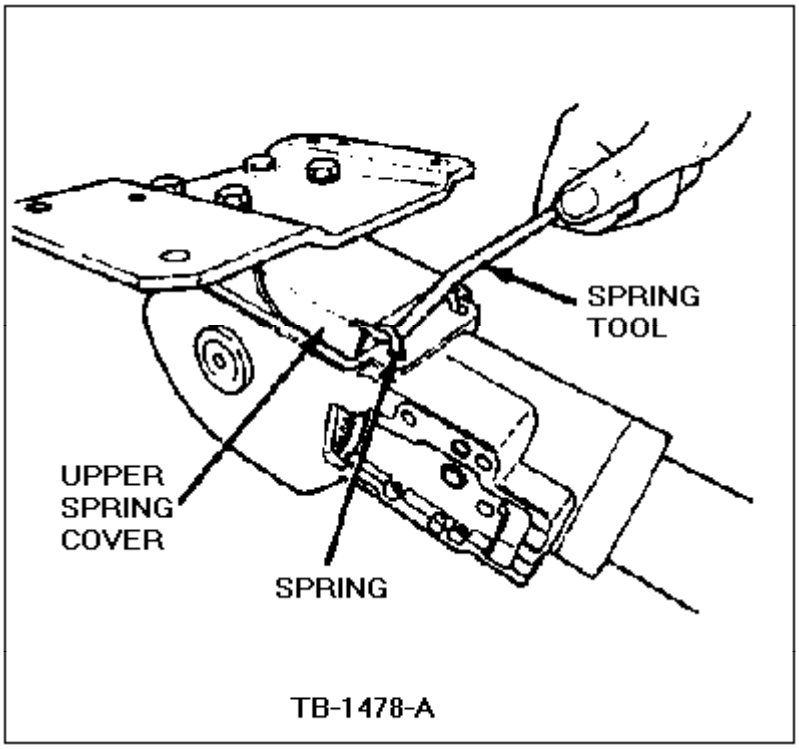


Figure 11 - Article 90-5-10

14. Remove the upper spring cover, Figure 12.

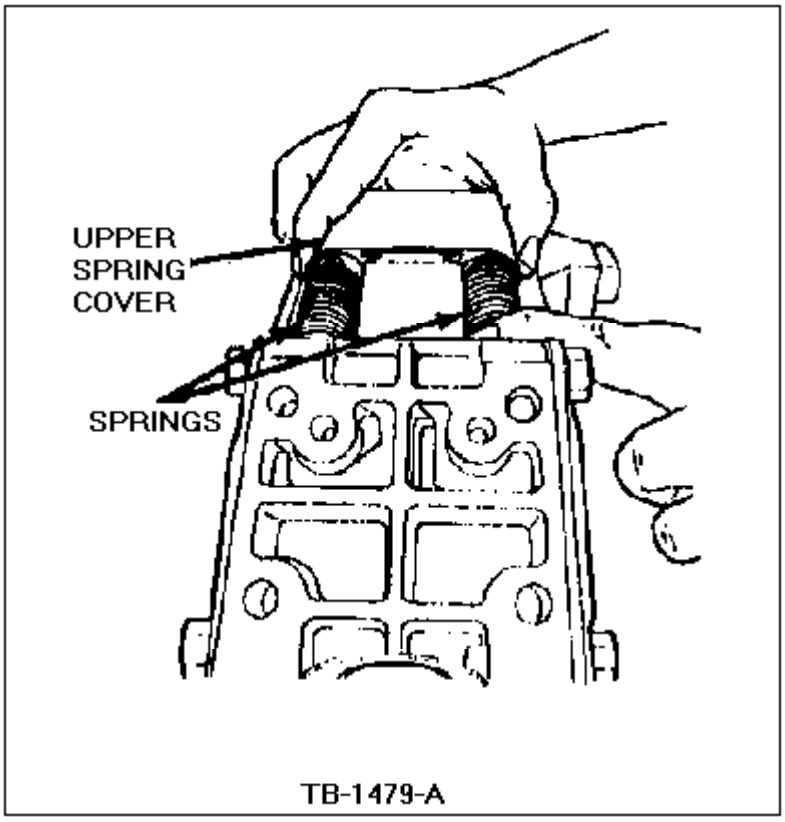


Figure 12 - Article 90-5-10

15. Remove the four (4) bolts that hold the column mounting bracket to the lower bearing housing, Figure 13.

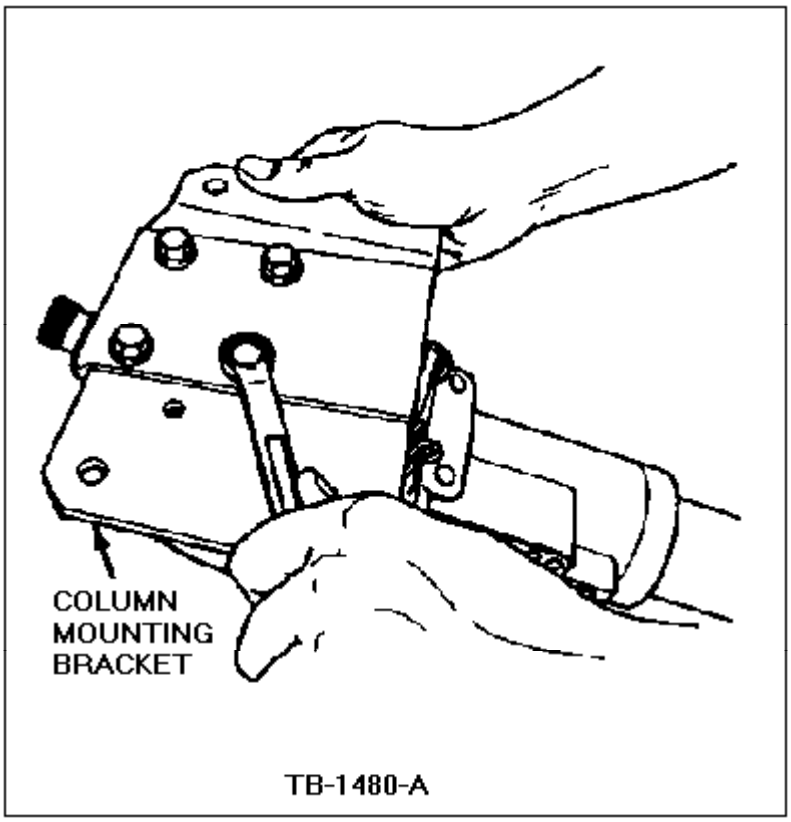


Figure 13 - Article 90-5-10

16. Remove the nut, washer, bolt and steering joint assembly from the lower end of the universal joint assembly, Figure 14.

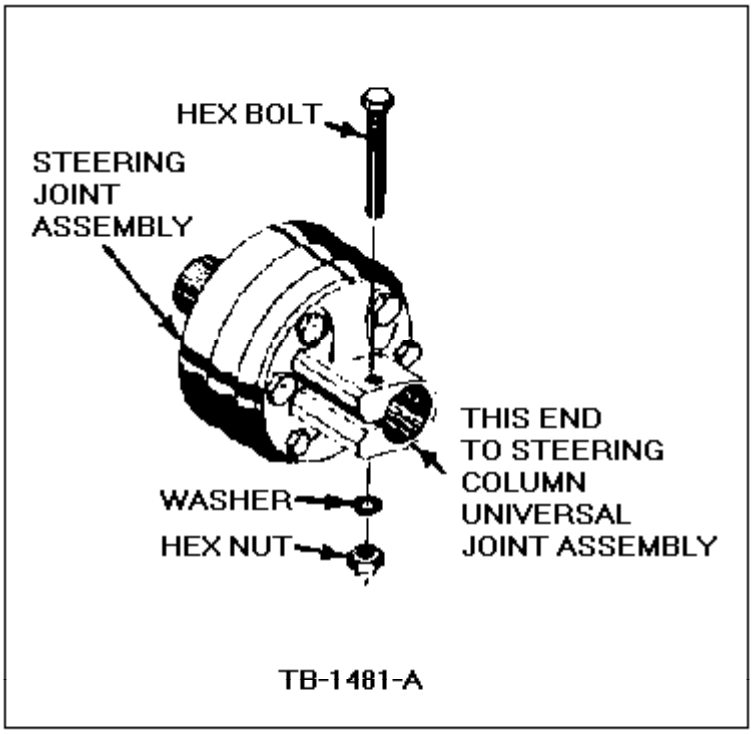


Figure 14 - Article 90-5-10

17. Make sure the steering column is fully extended.

18. Remove the four (4) screws from the support bracket and lower housing, Figure 15.

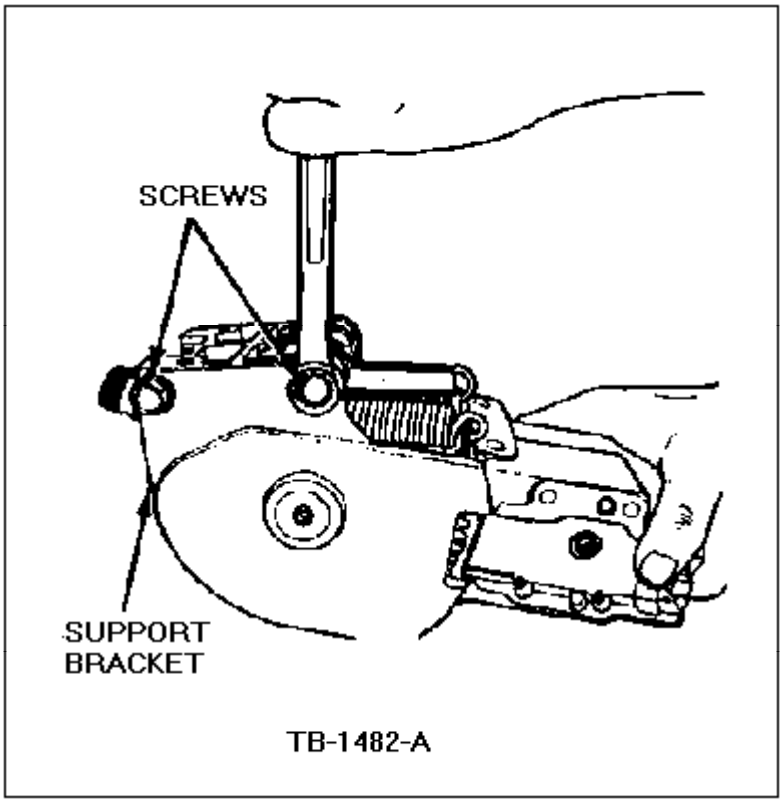


Figure 15 - Article 90-5-10

WARNING:
THE LOWER HOUSING AND UNIVERSAL JOINT ASSEMBLY MAY EJECT UNDER SPRING TENSION FROM THE MAIN HOUSING ASSEMBLY.

19. Remove the lower bearing housing and universal joint assembly and spring from the main housing assembly, Figure 16.

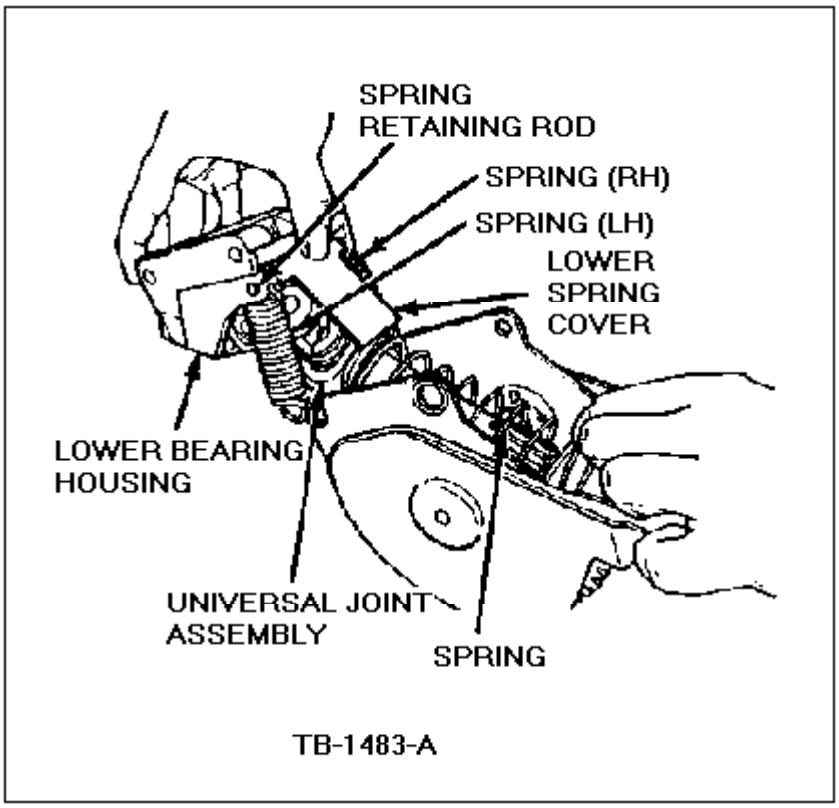


Figure 16 - Article 90-5-10

20. Remove the lower spring cover, springs and spring retaining rod from the lower bearing housing, Figure 16.

21. Remove the bearings from the lower bearing housing, if the bearings require replacement, Figure 18.

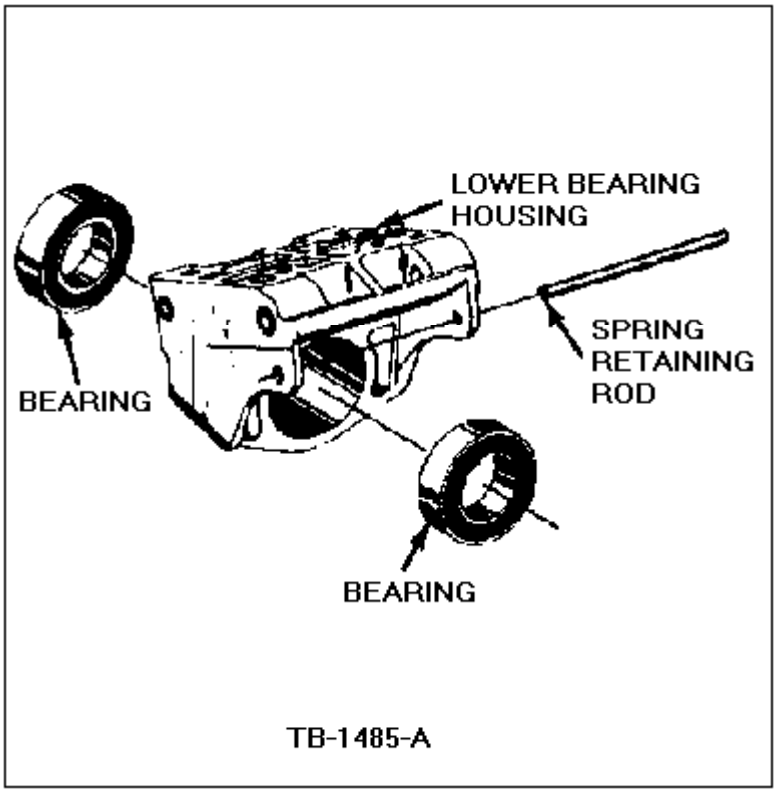


Figure 18 - Article 90-5-10

22. Remove the plug from the splined end of the universal joint column, Figure 19. A 3/16 inch Allen wrench is required.

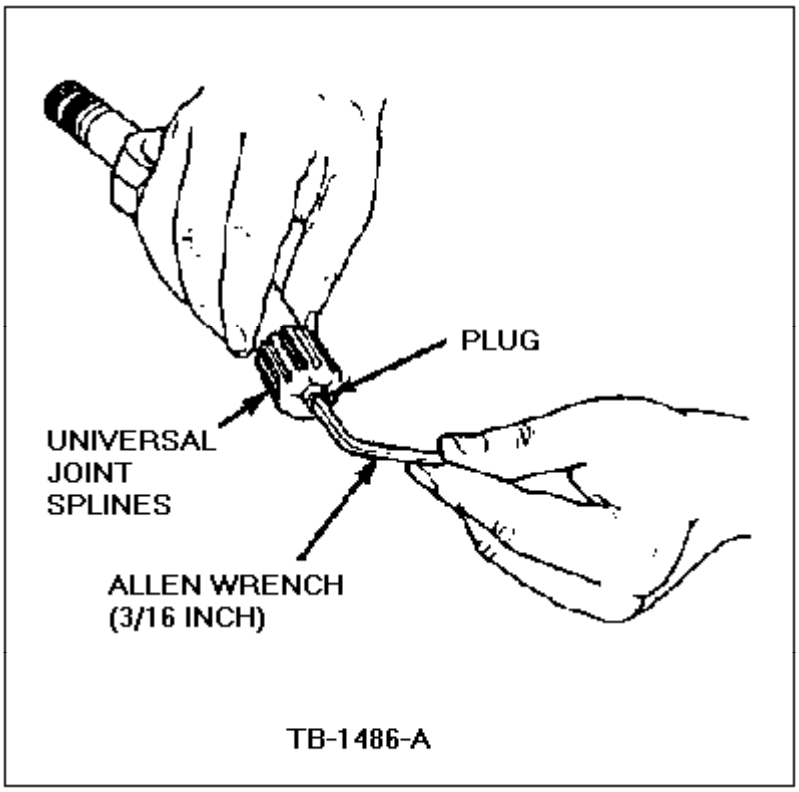


Figure 19 - Article 90-5-10

23. Remove the button head stop screw and internal lock washer from the main housing assembly, Figure 20. A 3/16 inch Allen wrench is required.

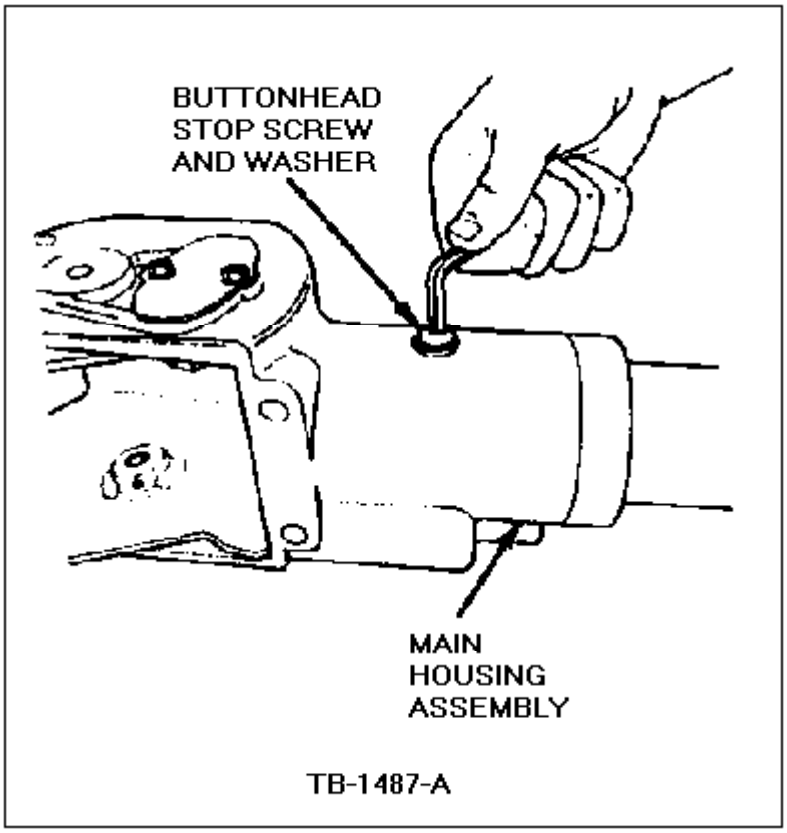


Figure 20 - Article 90-5-10

CAUTION:
DO NOT SCRATCH, DENT OR NICK THE JACKET TUBE FINISH.

24. Push the wheel tube and jacket tube assembly out through the lower end of the main housing assembly, Figure 21.

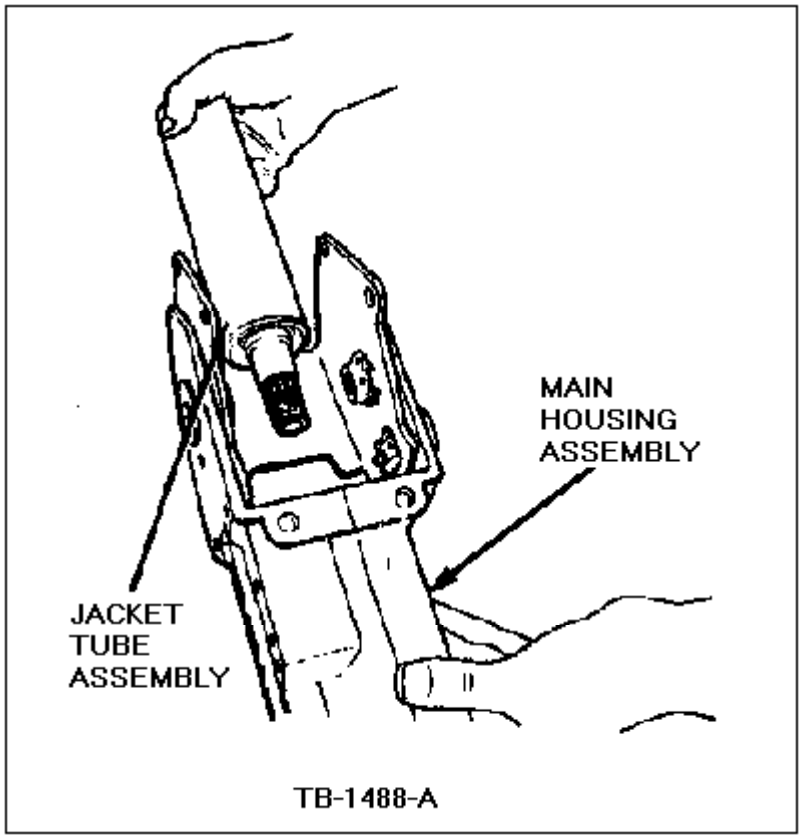


Figure 21 - Article 90-5-10

NOTE:
IF YOU DISASSEMBLE THE JACKET TUBE AND WHEEL TUBE FURTHER, YOU MUST REPLACE THE TWO (2) BEARINGS AND RETAINING RING IN THE JACKET TUBE BECAUSE OF THE PRESS FIT AND ANAEROBIC LOCKING AGENT USED AT ASSEMBLY.

25. Remove the wheel tube and sleeve assembly from the jacket tube by removing the retaining ring from the top end of the wheel tube and the internal retaining ring from the jacket tube, Figure 22.

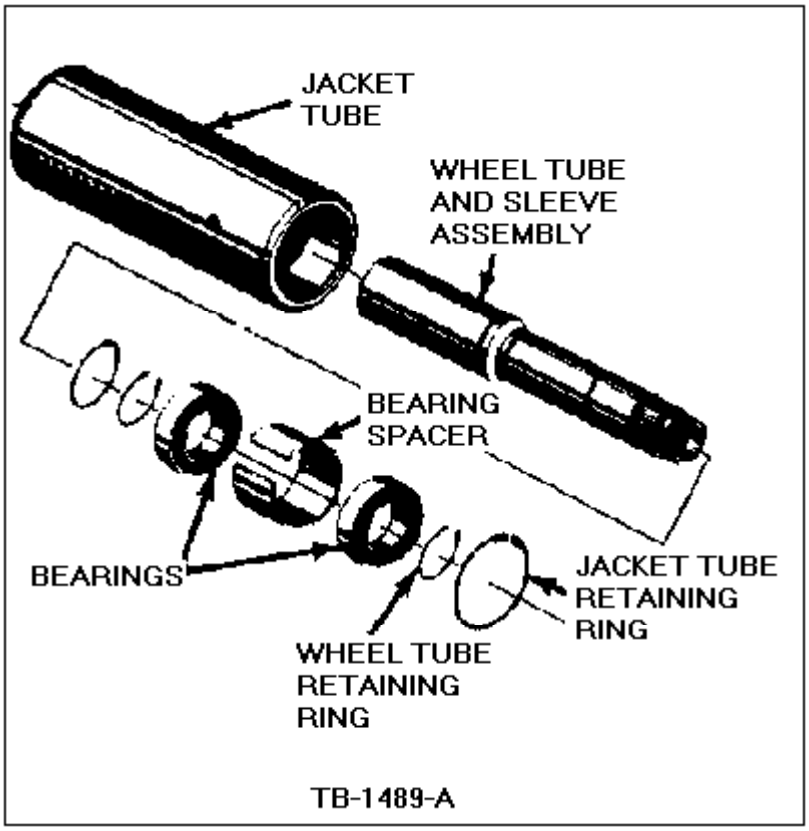


Figure 22 - Article 90-5-10

26. Insert a 8 inch (20 cm) long, 3/4 inch (1.9 cm) diameter rod into the splined end of the wheel tube.

27. Press out the wheel tube and bearing assembly from the jacket tube.

28. Remove the external retaining ring from the jacket tube, if replacement is required.

CAUTION:
DO NOT SCRATCH, DENT OR NICK THE JACKET TUBE FINISH.

29. Remove the retaining ring from the large diameter of the wheel tube and spline sleeve assembly, if replacement is required, Figure 22.

30. Press the bearings and bearing spacer off the wheel tube and splined sleeve assembly.

31. Remove the retaining ring from the wheel tube, Figure 22.

32. Throw away the bearings and retaining ring.

33. If the support bracket is to be removed from the main housing proceed as follows:

- Remove the two (2) self tapping screws, Figure 23

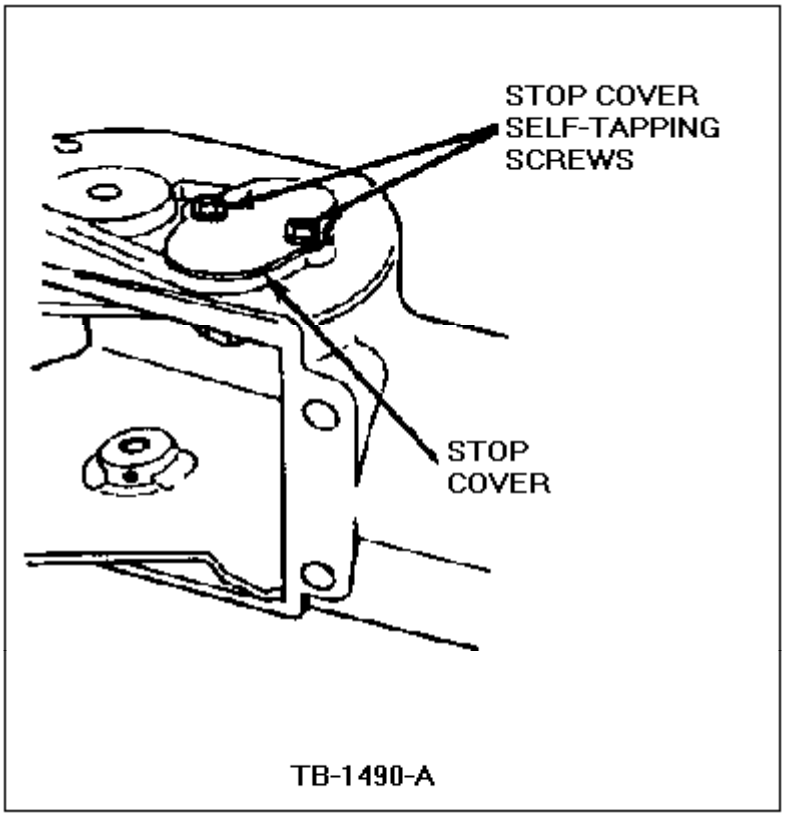


Figure 23 - Article 90-5-10

- Remove the stop cover and two (2) travel stop pins from the main housing assembly

NOTE:
MAKE NOTE OF LETTERS ON THE HOLES THE STOP PINS ARE REMOVED FROM, FIGURE 24.

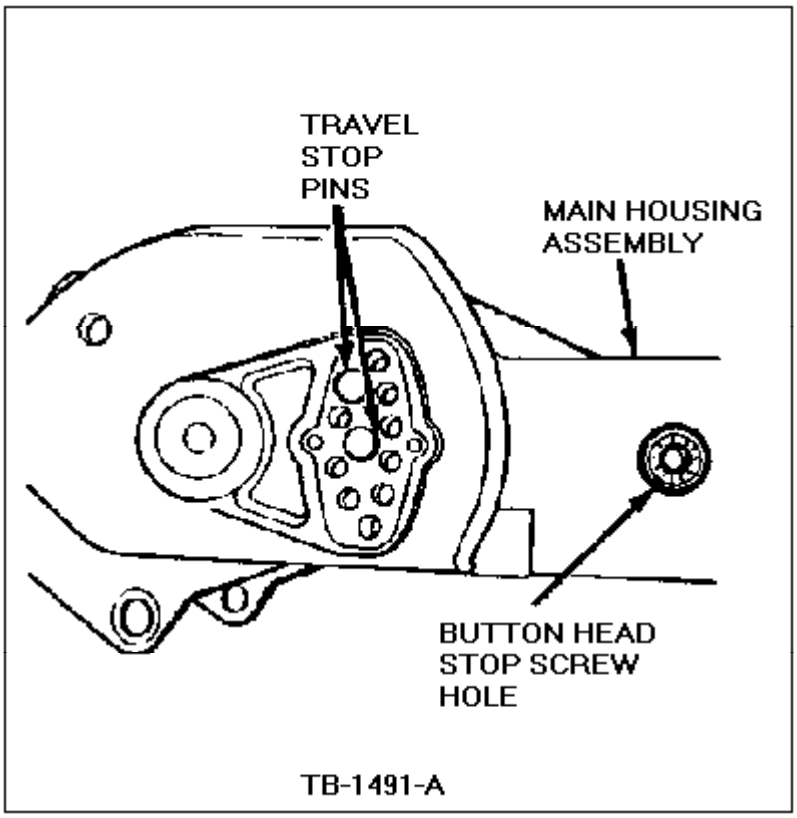


Figure 24 - Article 90-5-10

34. Remove the set screws from the two (2) support bracket nuts, Figure 25.

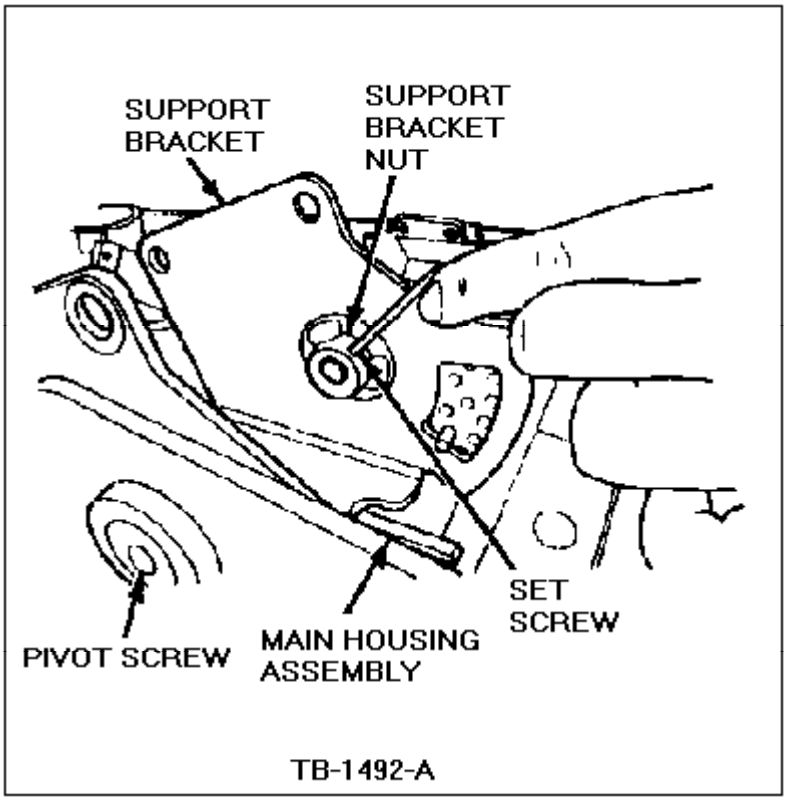


Figure 25 - Article 90-5-10

35. Turn the two (2) pivot screws from the main housing assembly and remove the support bracket.

36. Clean off the Loctite from the threads in the nuts that are an internal part of the support bracket, the pivot screws and the set screws.

NOTE:
APPLYING HEAT TO THE SUPPORT BRACKET NUTS WITH AN ELECTRIC HEAT GUN OR 1000 WATT HAIR DRYER WILL HELP WHEN REMOVING THE SET SCREWS AND PIVOT SCREWS.

CAUTION:
DO NOT EXCEED 500° F OR THE MATERIAL HARDNESS MAY BE EFFECTED.

No further disassembly of the main housing should be attempted. The components are not serviced separately. The collets and springs are staked into the housing.

Steering Column Assembly

1. Lightly grease both bosses of the support bracket.

2. Install the support bracket into the main housing sub-assembly so the support bracket teeth are on the cam-actuator side of the housing and the pivot screw holes are aligned, Figure 26.

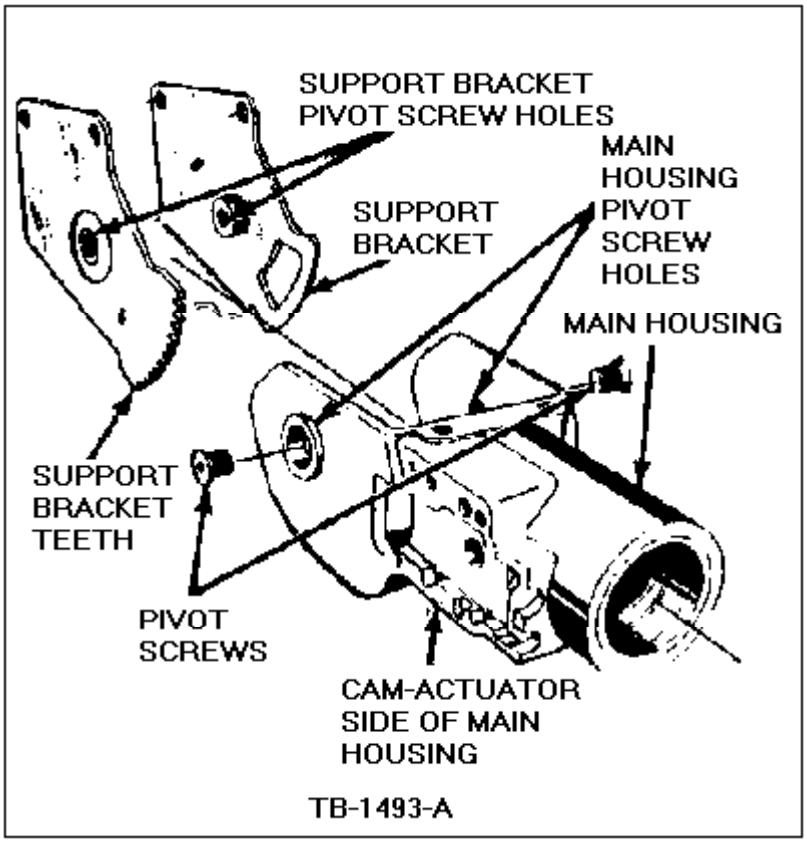


Figure 26 - Article 90-5-10

3. Turn the two (2) pivot screws loosely into the assembly, Figure 26.

4. Place a 1/2" diameter by 3" long bolt and nut between the support bracket flanges, Figure 27.

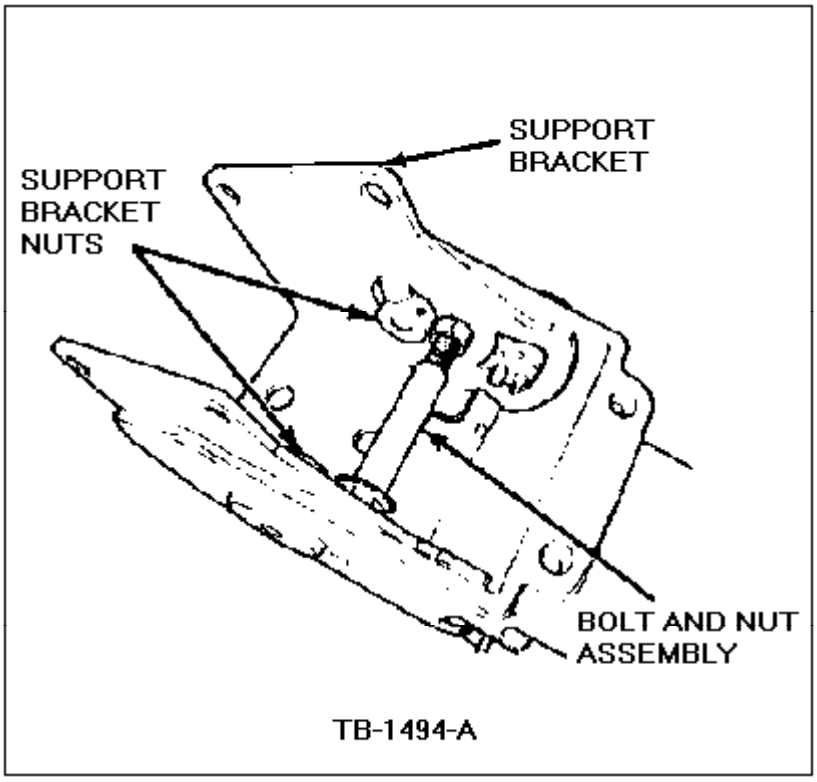


Figure 27 - Article 90-5-10

5. Use the bolt and nut as a tool to spread the support bracket flanges, Figure 27.

6. After the support bracket has been spread, remove the pivot screws, Figure 28.

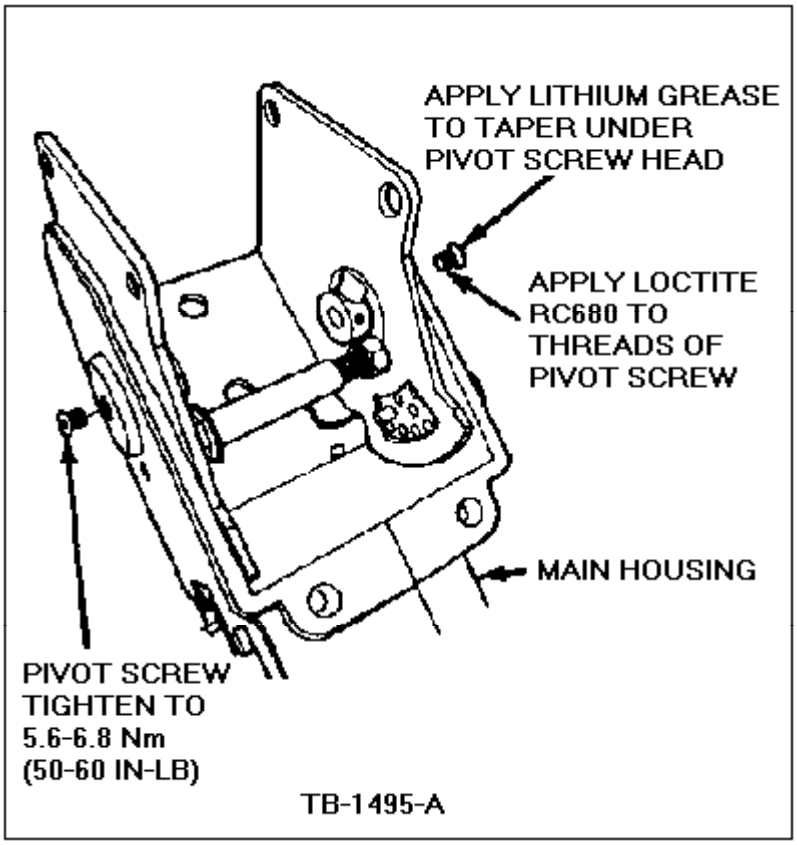


Figure 28 - Article 90-5-10

7. Apply lithium grease to the taper under the pivot screw heads.

8. Apply Loctite 262 Thread Locker on the threads of the pivot screws.

NOTE:
DO NOT ALLOW GREASE TO GET ON THE SCREW THREADS OR LOCTITE TO GET ON THE SCREW HEADS.

9. Re-install the two (2) pivot screws into the support bracket assembly, Figure 29. Tighten the pivot screw on the actuator cam side first to 50-60 lb.in. (6-7 N-m).

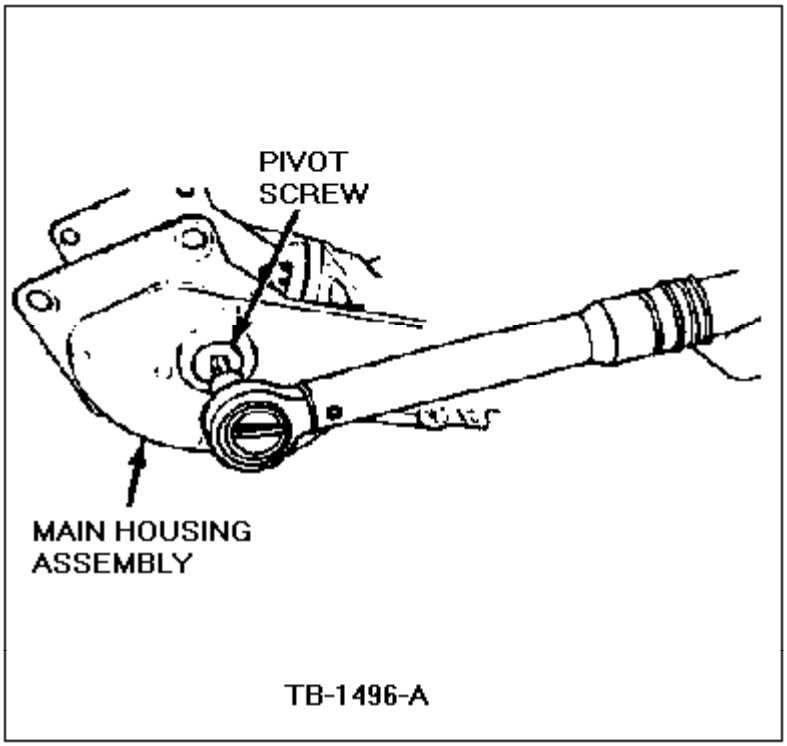


Figure 29 - Article 90-5-10

10. Tighten the two (2) set screws to 15-25 lb.in. (2-3 N-m).

11. Assemble the retaining ring onto the groove on the large diameter of the wheel tube and splined sleeve assembly and to the groove in the small diameter that is closest to the large diameter, Figure 30.

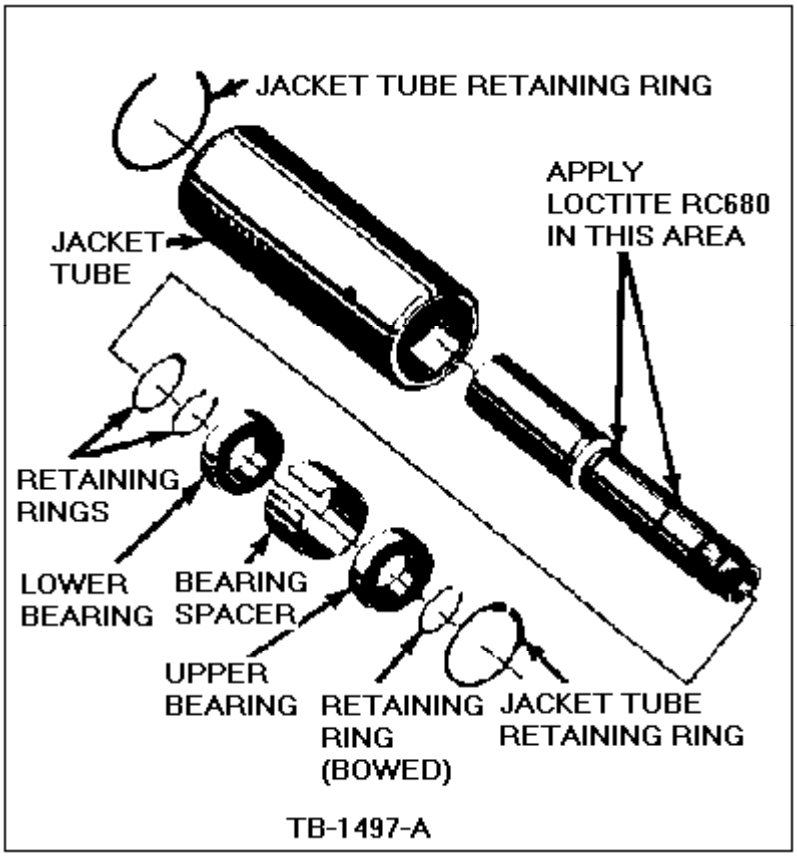


Figure 30 - Article 90-5-10

12. Evenly apply Loctite 262 Thread Locker around the wheel tube in the lower bearing support area and push the new lower bearing against the retaining ring on the wheel tube, Figure 30.

CAUTION:
BEFORE APPLYING THE LOCTITE MAKE SURE THE CONTACT AREAS ARE CLEAN AND DRY.

13. Evenly apply Loctite 262 Thread Locker around the wheel tube at the upper bearing support area.

14. Assemble the bearing spacer and push the new upper bearing onto the wheel tube until it clears the upper retaining ring groove.

15. Install the bowed retaining ring, Figure 30.

16. Press the wheel tube, sleeve and bearing as assembled into the jacket tube end that has the counter bore and internal retaining ring groove until the upper bearing is beyond the retaining ring groove.

NOTE:
THE SPLIT IN THE BEARING SPACER MUST BE ALIGNED WITH TAPPED SCREW HOLE IN THE TOP END OF THE JACKET TUBE THAT IS IN LINE WITH THE LOCK PIN HOLES TO ALLOW LATER ASSEMBLY OF THE BOLT.

17. Install the retaining rings in their grooves on the jacket tube, Figure 30.

18. Position the jacket tube end down on a pedestal that is about 4" high and 2 1/4" in diameter.

NOTE:
MAKE SURE THE CUTOUTS OF THE LOWER COLLET IN THE MAIN HOUSING ALIGN WITH THE HOLES FOR THE LOCK PIN AND STOP SCREW.

19. Tilt the support bracket in the main housing so the bracket will clear and not scratch the jacket tube.

20. Assemble the main housing and support bracket down over the wheel tube and jacket tube assembly such that the jacket tube will enter the housing bore lower collet. As the upper end of the jacket tube approaches the upper tapered collet in the housing bore, the upper collet must be pushed down with a screw driver that will pilot over the wheel tube and into the housing bore.

21. Align the jacket tube guide slot with the stop screw hole in the main housing and tighten the button head stop screw and internal tooth lock washer in the stop screw hole to 15-20 lb.ft. (20-27 N-m).

22. Press in a new bearing into each counter bore in the lower bearing housing, if required.

23. Assemble the lower serrated shaft of the universal joint into the lower bearing housing at the spring retaining rod end until it is seated against the bearing, Figure 32.

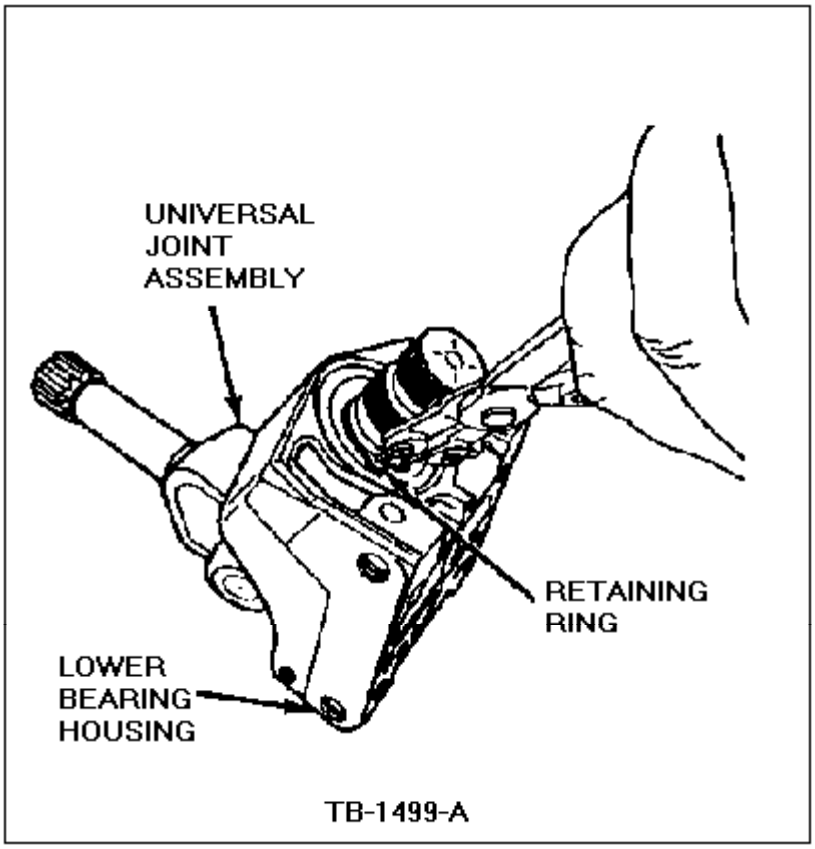


Figure 32 - Article 90-5-10

24. Install the retaining ring onto the universal joint shaft, Figure 32.

25. Turn the 1/8" pipe plug finger tight into the tapped hole in the slotted end of the universal shaft, Figure 33.

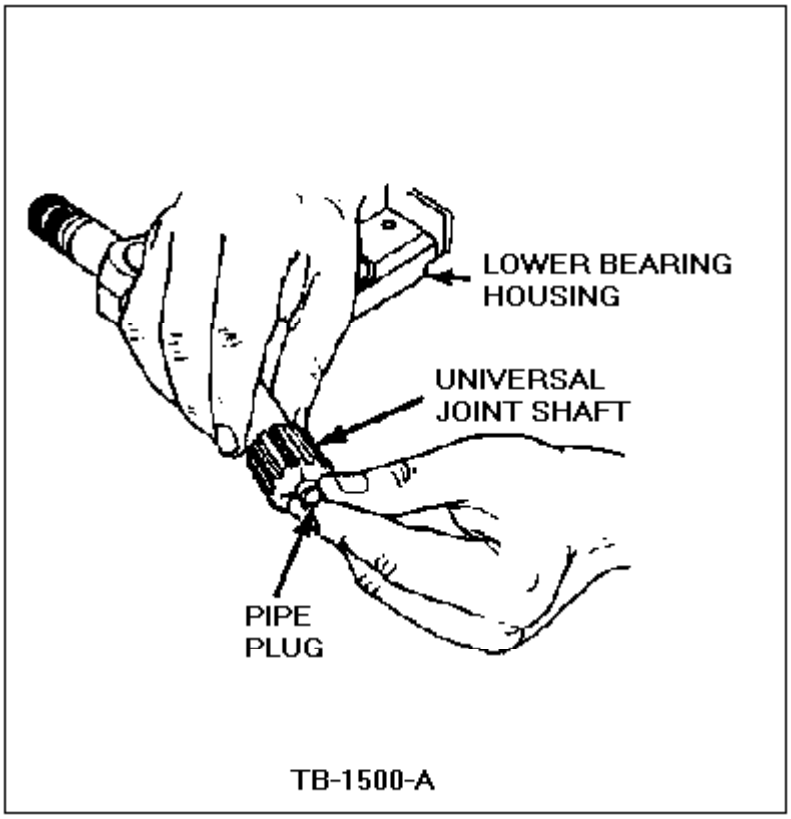


Figure 33 - Article 90-5-10

26. Install the spring retaining rod into the lower bearing housing.

CAUTION:
IF THE PIPE PLUG IS NOT TIGHTENED, THE SHAFT MAY NOT ASSEMBLE INTO THE SPLINE SLEEVE AS NEEDED.

27. Position the main housing in a soft-jawed vice with the wheel tube end pointing down. Clamp firmly against the serrated end of the wheel tube, Figure 34.

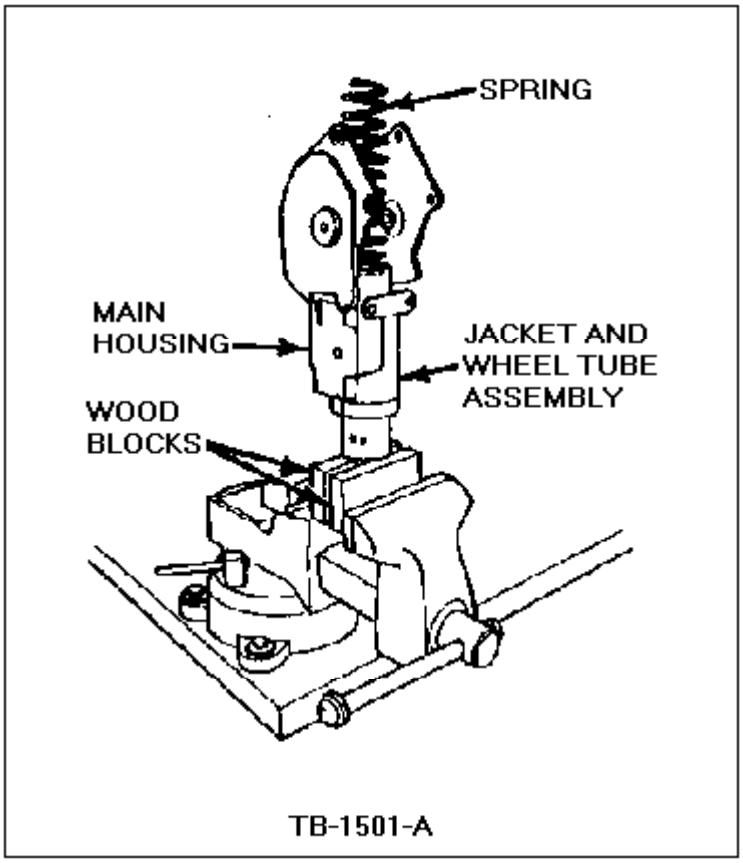


Figure 34 - Article 90-5-10

28. Push the wheel tube and jacket to the full "down" position in the main housing, Figure 34.

29. Install the spring into the jacket tube and over the lower end of the wheel tube and the splined sleeve assembly, Figure 34.

30. Grease and assemble the universal joint splined shaft into the spring and into the splined sleeve so the slot in the splined shaft aligns with the wide flute in the mating splined sleeve. The two (2) fingers in the lower universal joint shaft will help guide the shaft into the splined sleeve.

31. Push the universal joint and lower housing into the main housing and align the screw holes in the support bracket with the holes in the lower housing.

32. While holding the universal joint and lower housing in place, tighten the four (4) self-tapping screws to 25-35 lb.ft. (34-47 N-m).

CAUTION:
MAKE SURE THE UNIVERSAL JOINT SPLINED SHAFT DOES NOT COME OUT OF THE SPLINED SLEEVE.

33. Lightly grease and assemble the lock bar onto the main housing with the locking pin up, engaging the teeth with the support bracket teeth, Figure 35.

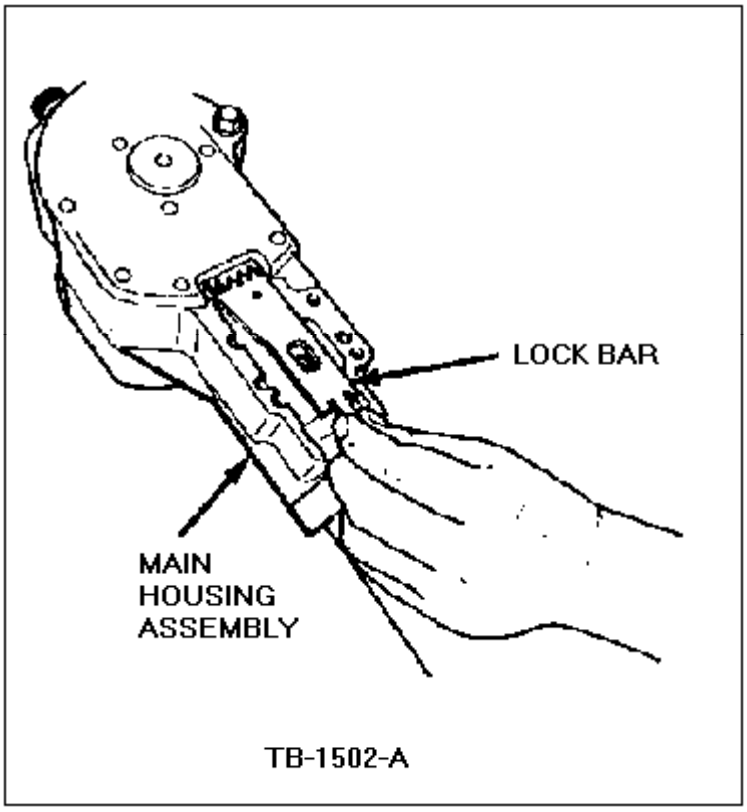


Figure 35 - Article 90-5-10

34. Lightly grease and assemble the wedge lock next to the lock bar with the tapered end toward the support bracket teeth and locating pin up, Figure 36.

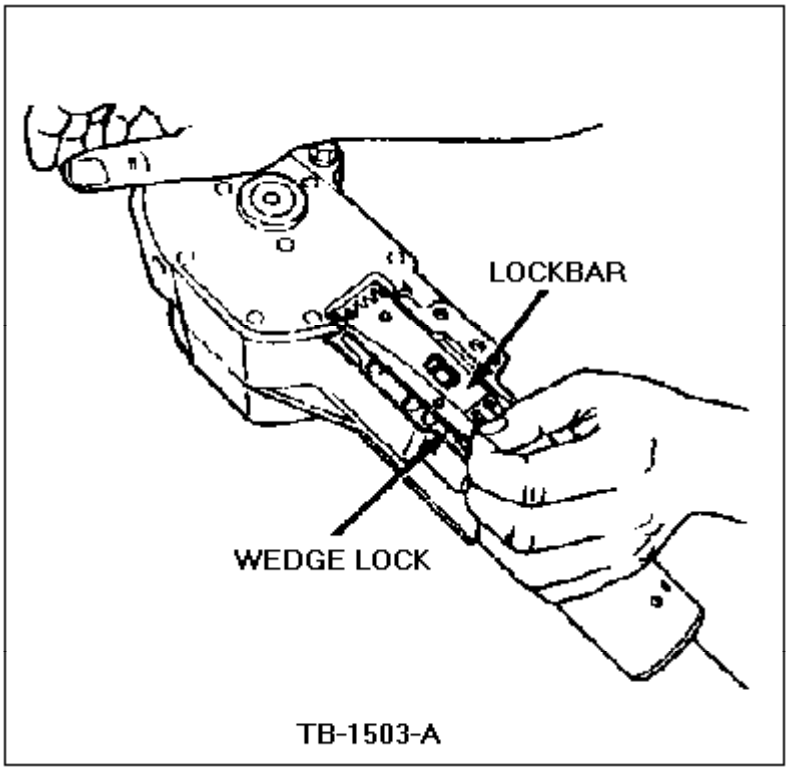


Figure 36 - Article 90-5-10

35. Lightly grease and assemble the disengaging plate with the tabs up over the locking bar and wedge lock locating pins, Figure 37.

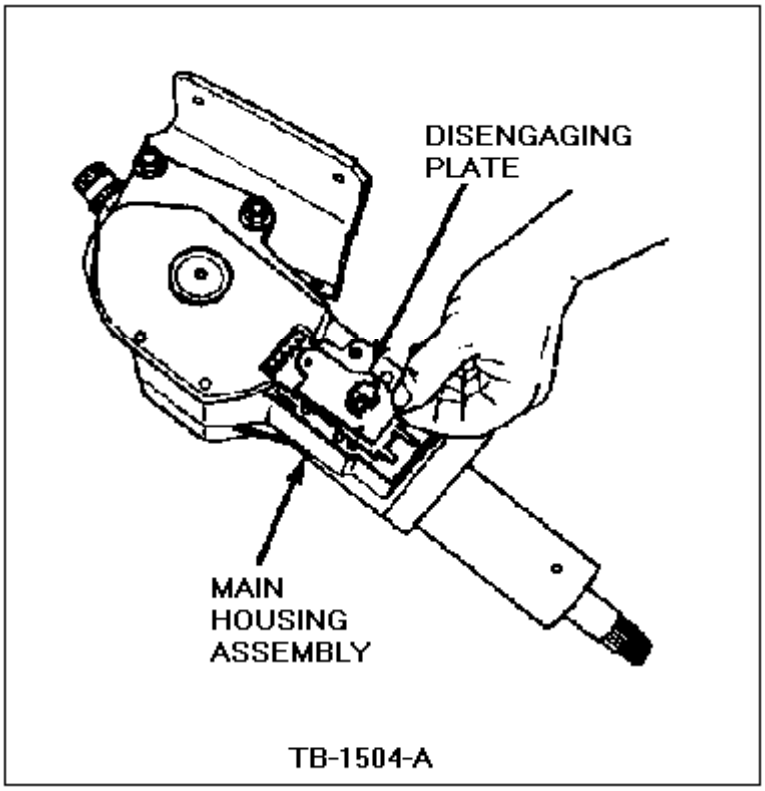


Figure 37 - Article 90-5-10

36. Assemble the lock pin into the actuator cam with the spring hole end of the lock pin on the spring cavity side of the actuator cam. Align the pivot pin holes.

37. Press the pivot pin into its hole in the lock pin and actuator cam until it is flush to .015" (.381 mm) below the actuator cam, Figure 38.

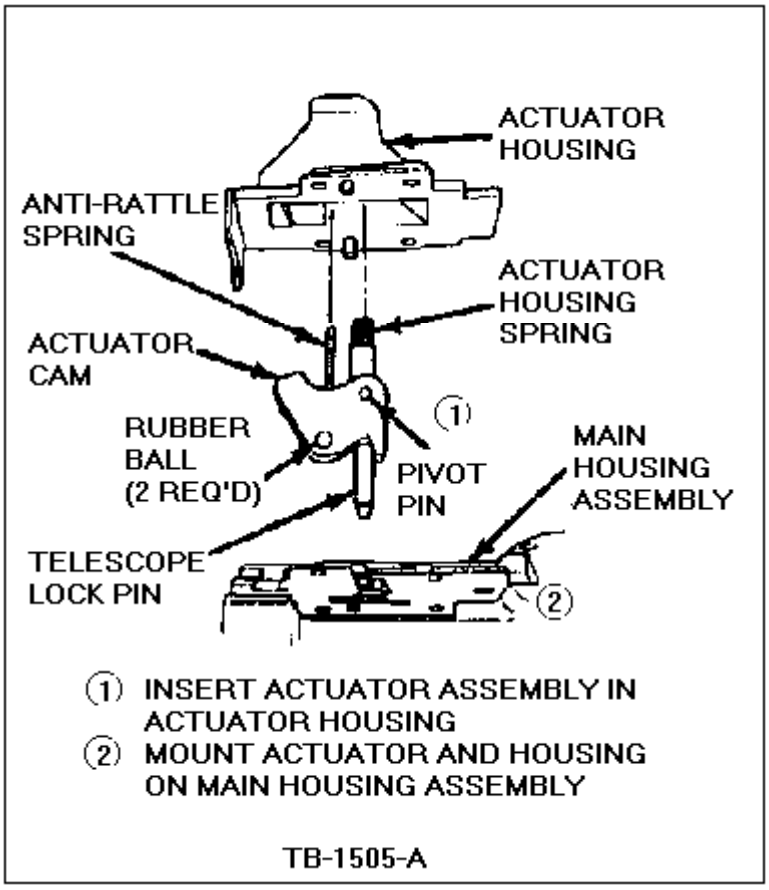


Figure 38 - Article 90-5-10

38. Grease the two (2) cavities on the sides of the actuator cam and insert a rubber ball in each cavity.

39. Grease both ends of the lock pin.

40. Assemble the spring into the bushing in the actuator housing and anti-rattle spring into the other cavity in the actuator cam housing, Figure 38.

41. Assemble the lock pin and the actuator cam into the actuator housing. Make sure to seat the spring in the cavity at the end of the lock pin and the anti-rattle spring in its cavity in the actuator cam, Figure 38.

42. While holding the actuator and springs in the actuator housing, assemble the end of the lock pin into the main housing bushing and the actuator cam ears over the disengaging plate raised tabs.

43. While holding actuator and main housing tighten the four (4) self-tapping screws to 40-60 lb.in. (4-7 N-m).

44. Assemble the spring on the end of the lock bar and the spring on the end of the wedge lock, Figure 39.

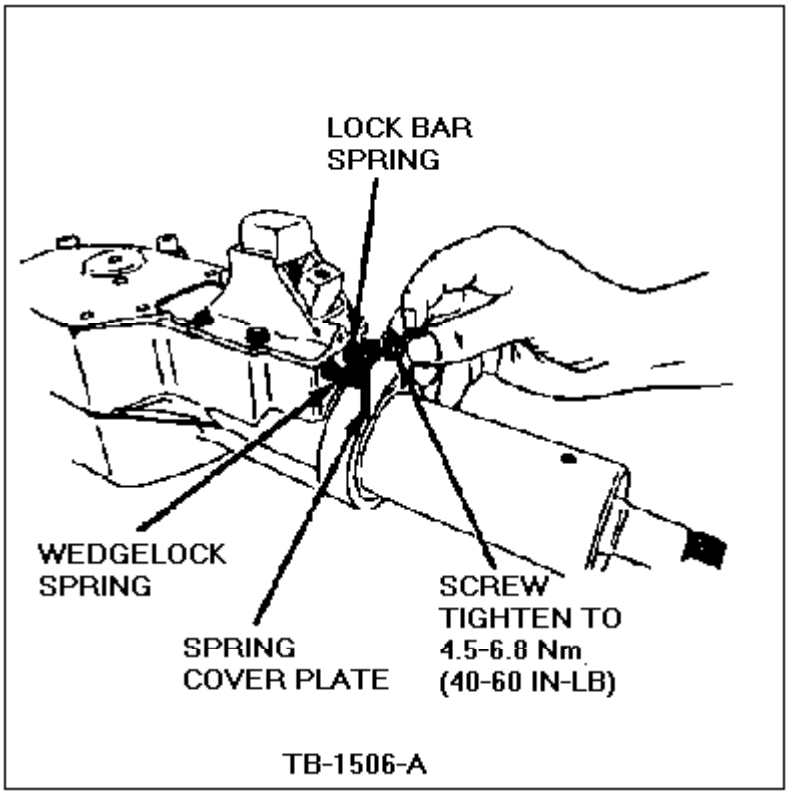


Figure 39 - Article 90-5-10

45. Assemble the spring cover plate over the springs and firmly hold in position while turning the screw into the actuator housing. Tighten the screw to 40-60 lb.in. (4-7 N-m), Figure 39.

46. Apply Loctite Threadlocker 242 on the threads of the tilt and telescoping lever, Figure 40.

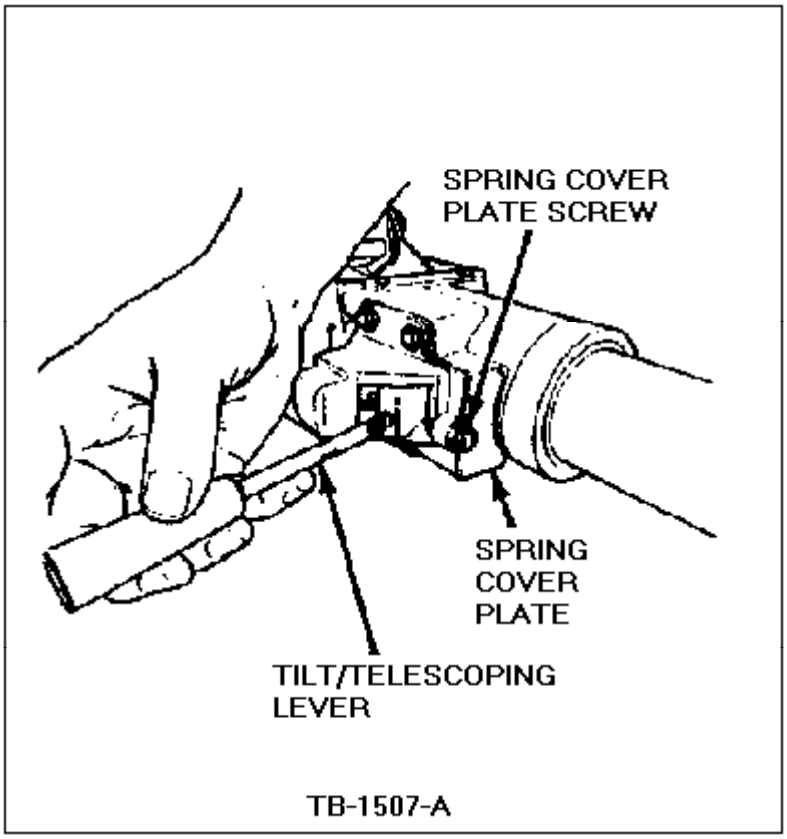


Figure 40 - Article 90-5-10

47. Install the tilt and telescoping lever into the actuator housing, Figure 40.

NOTE:
IF A NEW TILT AND TELESCOPING LEVER IS INSTALLED, IT IS NOT NECESSARY TO APPLY LOCTITE. THE NEW LEVER HAS DRI-LOC 204 ON IT.

48. Tilt and telescope the jacket and wheel tube to the full "down" position.

49. While looking down from the steering wheel end, hook the end of the green right hand coil spring on the right side of the spring retaining rod and the left hand coil spring on the left side, Figure 41.

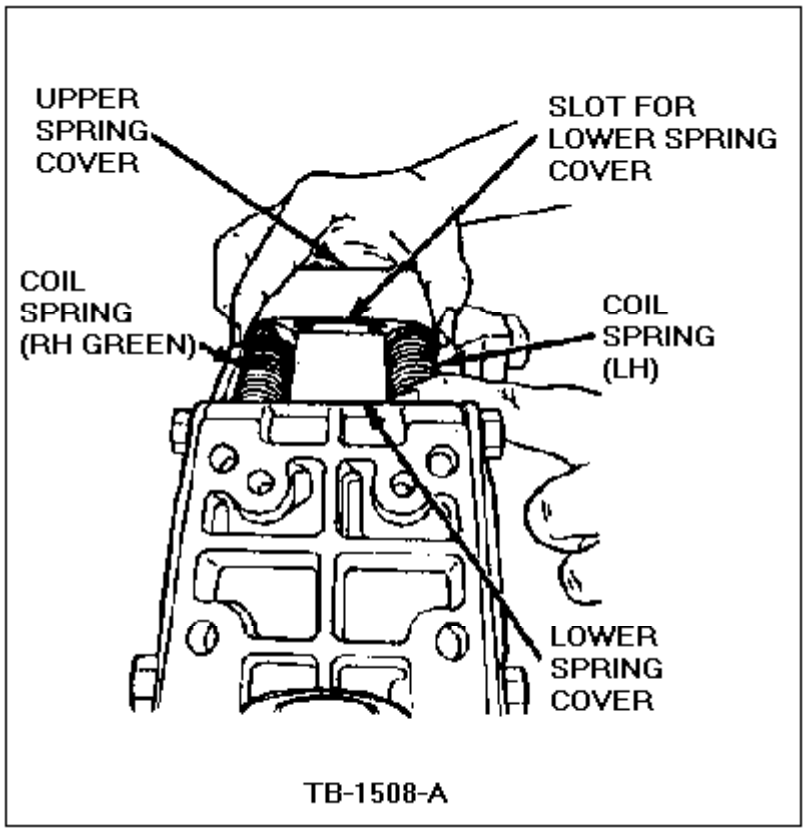


Figure 41 - Article 90-5-10

50. Snap the lower spring cover on the retaining rod between the springs.

51. Install the upper spring cover over the two (2) springs, engaging the lower spring cover in the slot provided, Figure 41.

52. Tilt the jacket tube and wheel tube to the full "up" position.

53. Hook the loose ends of the springs in the holes in the main housing.

54. Install the air brake bracket over the wheel tube and jacket tube and onto the main housing with the lugs toward the housing and the sawcut in line with the tilt lever, Figure 42.

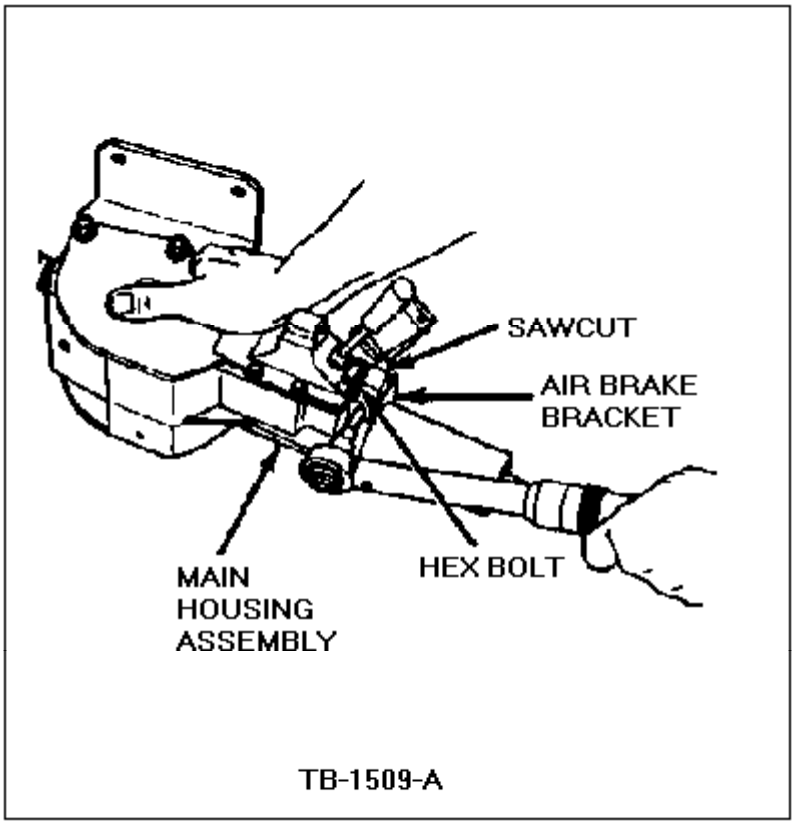


Figure 42 - Article 90-5-10

NOTE:
THE AIR BRAKE BRACKET MUST BE FLUSH TO .03" (76 mm) BELOW THE END OF THE HOUSING.

55. Tighten the screw in the air brake bracket to 10-15 lb.ft. (14-20 N-m), Figure 42.

56. Install the horn contact housing onto the jacket tube and align the bolt hole with the tapped jacket tube bolt hole.

57. Install the bolt and lock washer finger tight, Figure 43. The bolt must be tightened to 6-10 lb.ft. (8-13 N-m) after the steering wheel is installed and the horn contact housing is adjusted. Adjust the housing to 3/32" gap at the wheel skirt, Figure 43.

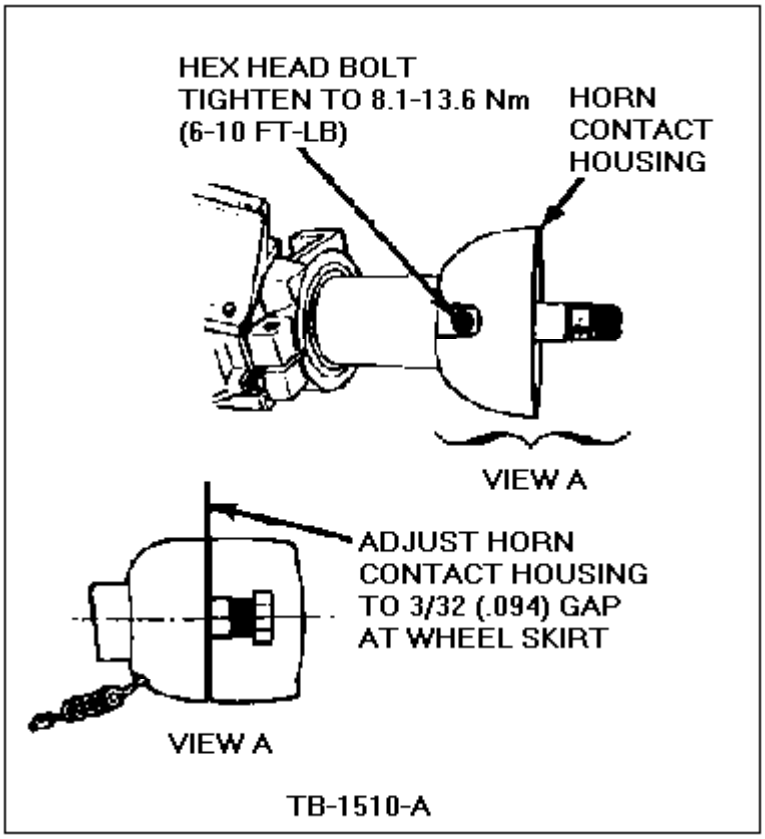


Figure 43 - Article 90-5-10

58. Install the upper end of the horn wire into the horn contact housing wire hole from the lower end and attach the two (2) horn wire terminals to the horn contact terminals, Figure 44.

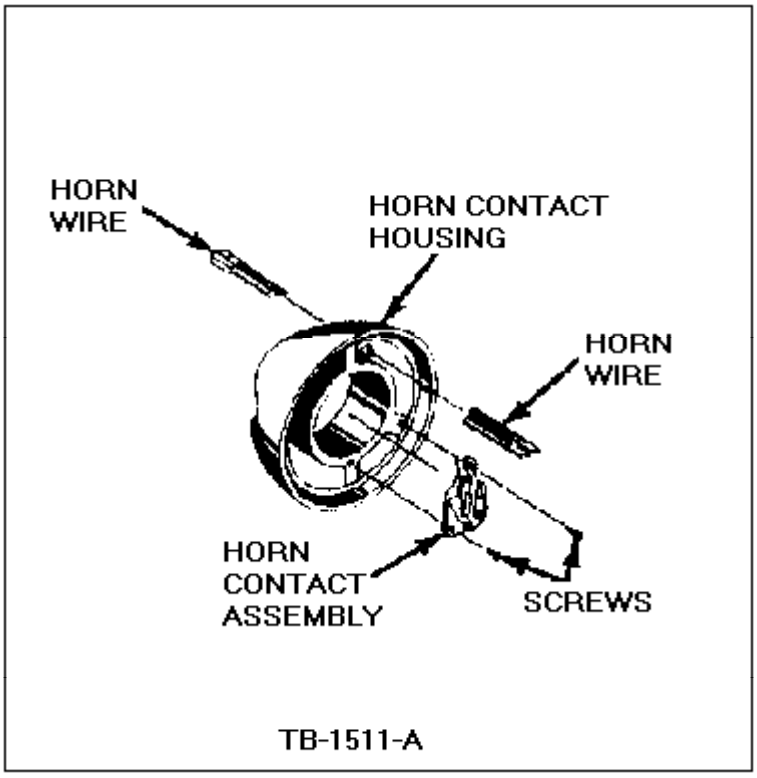


Figure 44 - Article 90-5-10

59. Attach the horn contact to the horn contact housing with two (2) screws, Figure 44. Tighten the

screws to 30-50 lb.in. (3-6 N-m).

60. If removed, insert and tap the two (2) travel stop pins in the lettered holes they were removed from.

61. Attach the stop cover with two (2) tapping screws. Tighten the screws to 40-60 lb.in. (5-7 N-m).

62. Push the telescoping jacket tube and wheel tube all the way in and turn the 1.8" pipe plug into the universal joint slotted shaft enough to hold the jacket tube and wheel tube positions when the telescoping lock pin is disengaged.

63. Loosen the pipe plug about 1/8 of a turn to allow the jacket tube and wheel tube to telescope freely under spring tension, Figure 46.

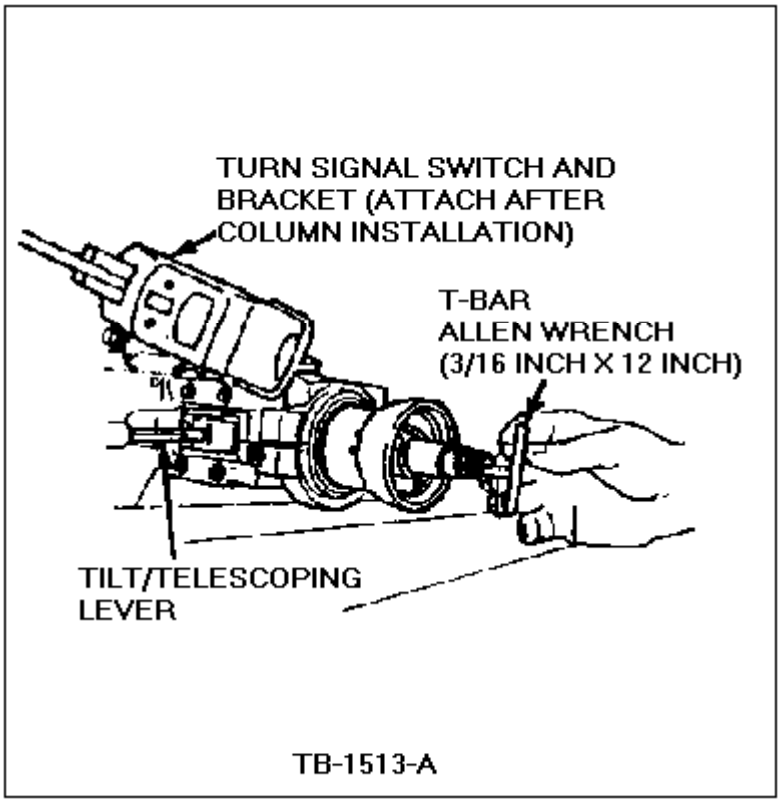


Figure 46 - Article 90-5-10

64. Make sure that when the tilt and telescope lever is held in the "up" position, the jacket and wheel assembly is free to telescope to the full "up" and "down" position.

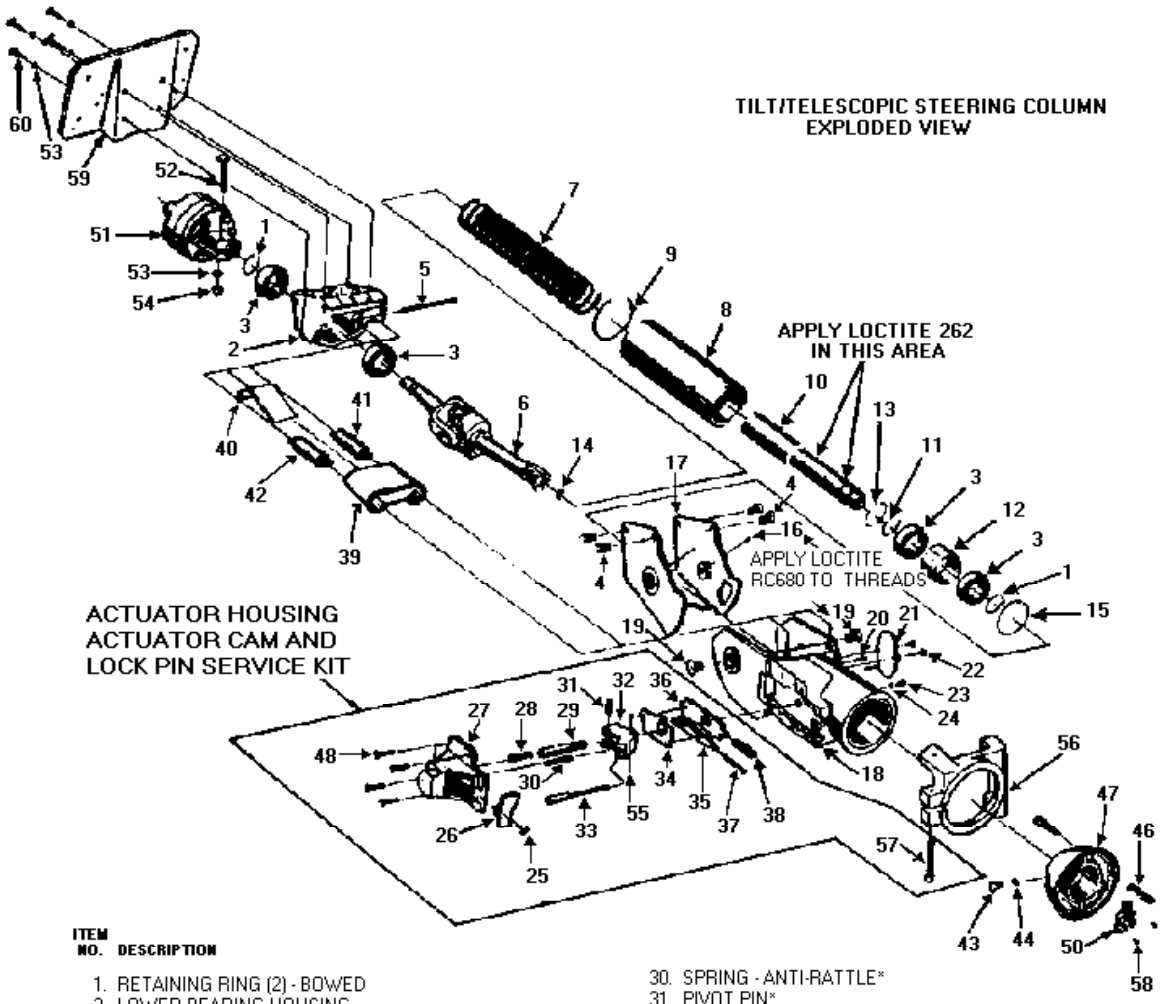
65. Make sure that when the tilt and telescope lever is held in the "down" position, the jacket and wheel assembly is free to tilt to the full "up" and "down" position.

66. Make sure that when the tilt and telescope lever is released, the tilt lever is in the locked position and the telescope and tilt position is maintained.

67. Attach the column mounting bracket on the lower bearing housing with the four (4) bolts and lock washers. Tighten the bolts to 25-35 lb.ft. (34-47 N-m).

NOTE:
THE TILT AND TELESCOPING COLUMN ASSEMBLY IS NOW COMPLETE EXCEPT FOR A WHEEL NUT TO BE ASSEMBLED AT INSTALLATION OF THE STEERING WHEEL. THE ASSEMBLY MUST CURE FOR 24 HOURS AT ROOM TEMPERATURE BEFORE BEING PUT INTO NORMAL SERVICE. THE TURN SIGNAL SWITCH AND BRACKET ASSEMBLY IS TO BE ATTACHED AFTER

INSTALLATION, FIGURE 46.



ITEM NO. DESCRIPTION

1. RETAINING RING (2) - BOWED
2. LOWER BEARING HOUSING
3. BEARING (4)
4. SELF-TAPPING SCREW (4) - 3/8-16 X 1.0 LG HEX HD.
5. SPRING RETAINING ROD
6. UNIVERSAL JOINT ASSEMBLY
7. SPRING (EXTENDED)
8. JACKET TUBE
9. RETAINING RING
10. WHEEL TUBE & SLEEVE ASSEMBLY
11. RETAINING RING
12. BEARING SPACER
13. RETAINING RING
14. PIPE PLUG, 1/8 27 DRY SEAL SOCKET HD.
15. RETAINING RING
16. SET SCREW (2) 10-24 X 3/16 LG. - SOC. HD.
17. SUPPORT BRACKET
18. MAIN HOUSING ASSEMBLY
19. PIVOT SCREW (2) 1/2 20 X 1-1/8 LG. - SOC. HD.
20. TRAVEL STOP PIN (1 OR 2)
21. STOP COVER
22. SELF-TAPPING SCREW (2) 10-24 X 1/2 LG. - HEX HD.
23. STOP SCREW - BUTTON HD. - 5/16-18
24. INTERNAL TOOTH LOCK WASHER
25. SELF-TAPPING SCREW (1) 10-24 X 5/8 LG.*
26. SPRING COVER PLATE*
27. ACTUATOR HOUSING & BUSHING ASSEMBLY*
28. SPRING - ACTUATOR HOUSING*
29. LOCK PIN - TELESCOPE*
30. SPRING - ANTI-RATTLE*
31. PIVOT PIN*
32. CAM - ACTUATOR*•
33. TILT & TELESCOPE LEVER*
34. PLATE - DISENGAGING*
35. WEDGELOCK*
36. LOCK BAR*
37. SPRING - WEDGELOCK*
38. SPRING - LOCK BAR*
39. SPRING COVER - UPPER
40. SPRING COVER - LOWER
41. SPRING R.H. (EXTEND) GREEN
42. SPRING L.H. (EXTEND)
43. HEX HEAD BOLT - 1/4-20 X 5/8
44. HELICAL SPRING LOCK WASHER
46. HORNWIRE ASSEMBLY
47. HORN CONTACT HOUSING ASSEMBLY
48. SELF-TAPPING SCREW (4) 10-24 X 7/8 LG.*
50. HORN CONTACT ASSEMBLY
51. STEERING JOINT ASSEMBLY
52. HEX HD. BOLT - 3/8-16 X 2
53. SPRING LOCKWASHER - 3/8 (5)
54. HEX NUT - 3/8-16
55. BALL - RUBBER (2) *
56. AIR BRAKE BRACKET
57. SPECIAL BOLT*
58. SCREW SELF TAPPING (2)
59. COLUMN MOUNTING BRACKET
60. HEX HD. BOLT(4) 3/8-16 X 1.0

*PARTS AVAILABLE IN SERVICE KIT ONLY

TB-1470-A

Figure 3 - Article 90-5-10

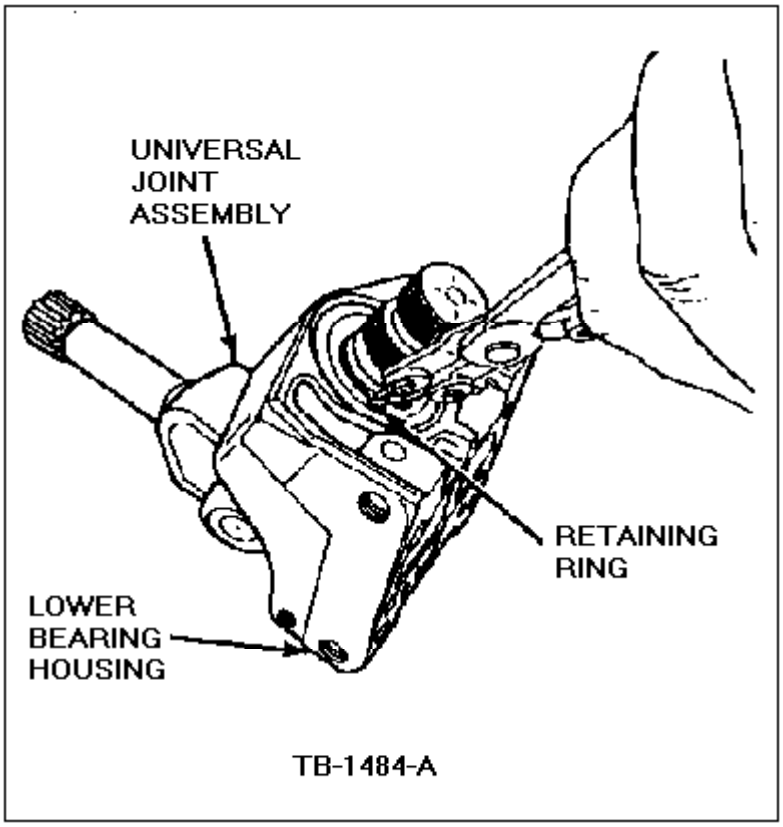


Figure 17 - Article 90-5-10

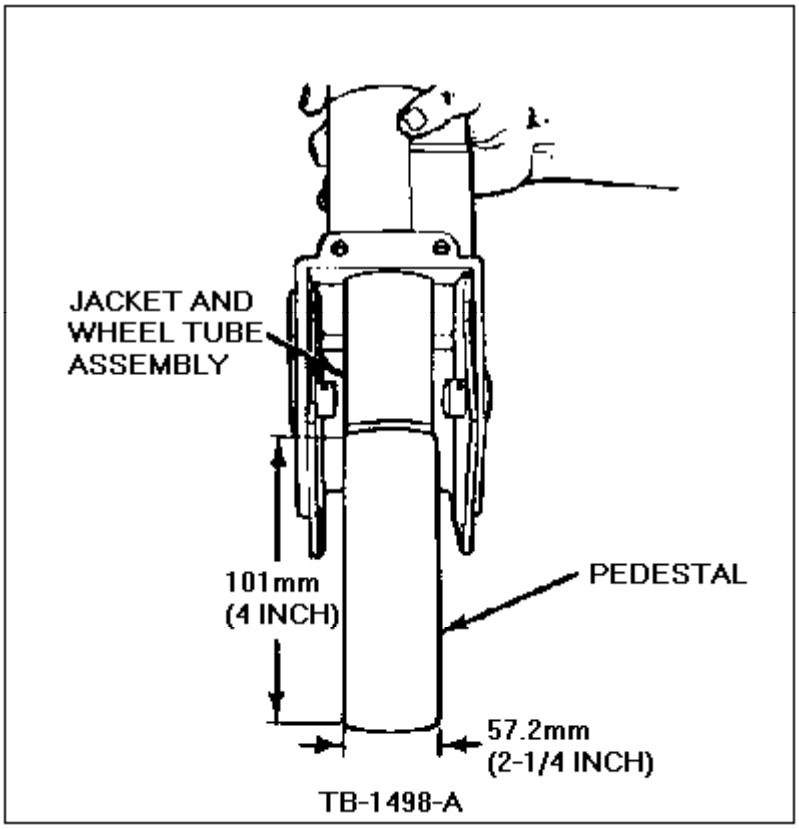


Figure 31 - Article 90-5-10

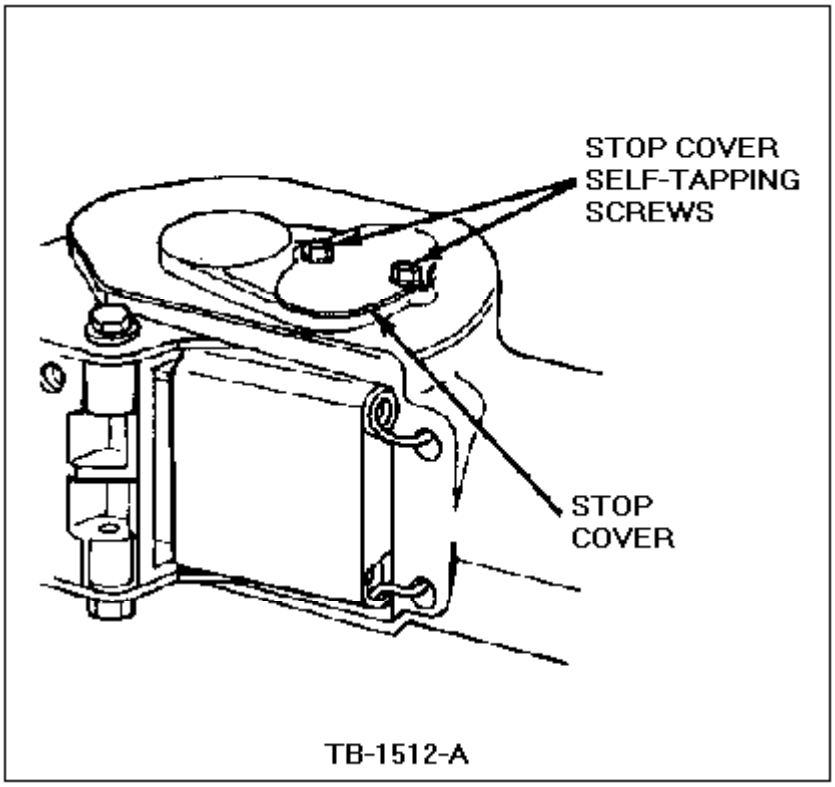


Figure 45 - Article 90-5-10

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 3100, 3800

90-5, ***Publication Date: FEBRUARY 28, 1990***

• **Suspension - Rear - Hendrickson HA - Air Suspension Leveling Valve - Adjustment Procedure** • **Suspension - Rear - Hendrickson HA With Air Suspension Leveling Valve - Rough Ride Or Poor Ride Quality**	**Article No. 90-5-11**

MEDIUM/HEAVY TRUCK:
1980-89 CL-CLT-9000 SERIES, L SERIES

ISSUE:
Rough ride or poor ride quality may be caused by the air suspension leveling valve. Units built before 11/30/89 used a leveling valve and mounting bracket with 1/4" mounting bolts that went through 3/8" mounting holes in the frame. This allowed the bolts to move in the frame holes and cause leveling valve misalignment. A leveling valve not adjusted to the proper ride height or the interface between the main support member and the frame hanger bracket not lubricated can also cause rough ride or poor ride quality.

ACTION:
If service is required, use the following air suspension leveling valve adjustment and service procedure.

SERVICE PROCEDURE

NOTE:
UNITS BUILT AFTER 11/30/89 USE A NEW LEVELING VALVE AND MOUNTING BRACKET THAT HAVE 3/8" MOUNTING BOLTS.

1. Check to see that the main body of the leveling valve is vertical and the horizontal control arm is parallel to the frame flange, Figure 1.

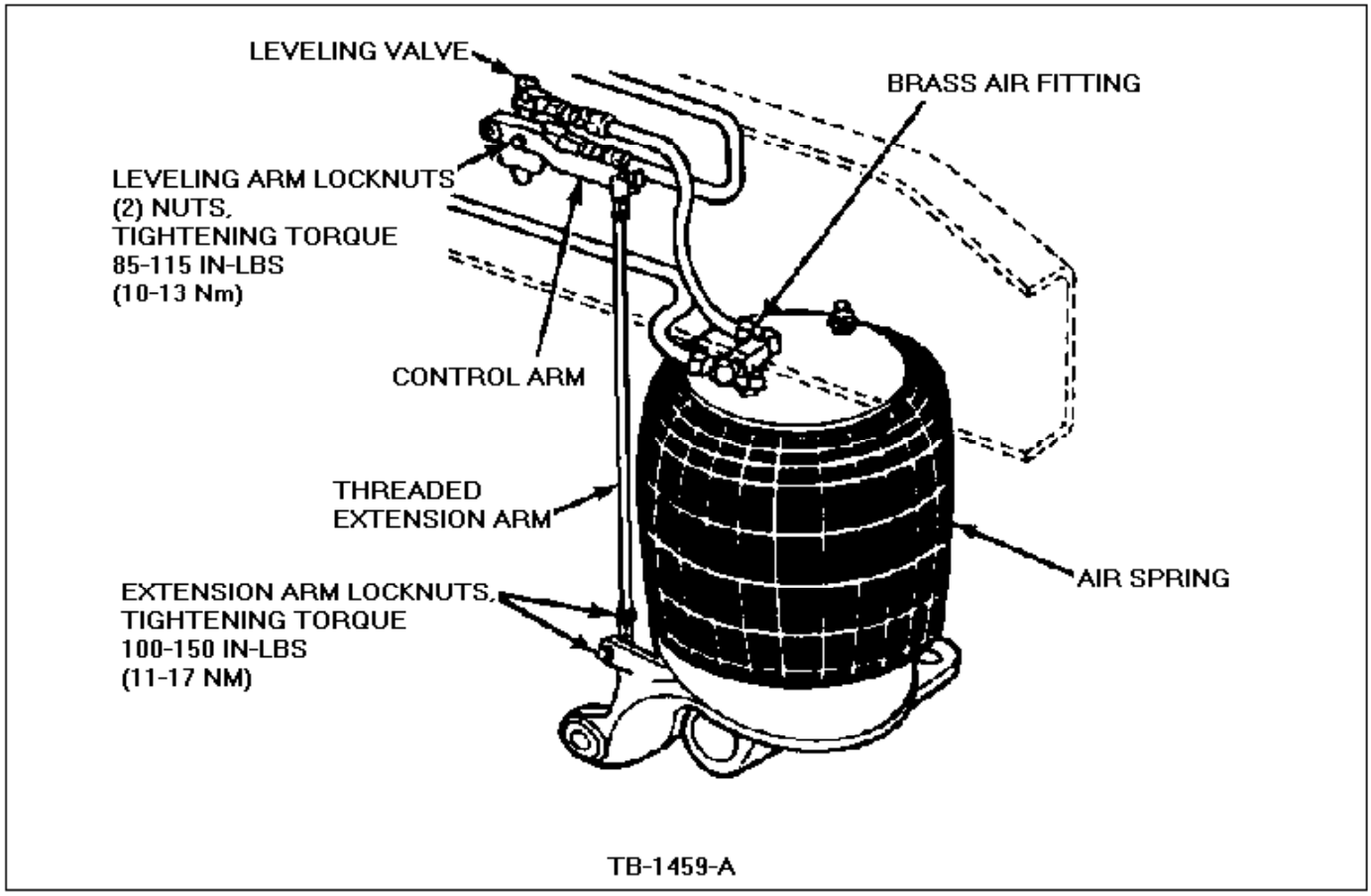


Figure 1 - Article 90-5-11

- If these conditions do not exist, continue to Step 2.
- If these conditions do exist, proceed to Step 4.

2. Install the leveling valve in the correct position.

   a. Loosen the two fasteners used to secure the valve to the frame rail.

   b. Reposition the leveling valve so that the body of the valve is vertical and the control arm is parallel with the frame flange.

3. After repositioning the leveling valve, check the ride height to make sure of the best ride quality. To check ride height, follow Steps 4-6.

4. Make sure the truck is parked on a level surface and that it has sufficient service air (at least 10 psi) to fully inflate the air bags.

5. Check the position of air spring.

   a. Remove the locknut used to attach the lower end of the extension arm to the air bag mounting plate, Figure 1.

   b. Loosen the locknut on the lower end of the extension arm, Figure 1.

   c. Turn the free end of the extension arm until the correct measurements shown in Figure 2 are obtained at each of the four axle attachment points.

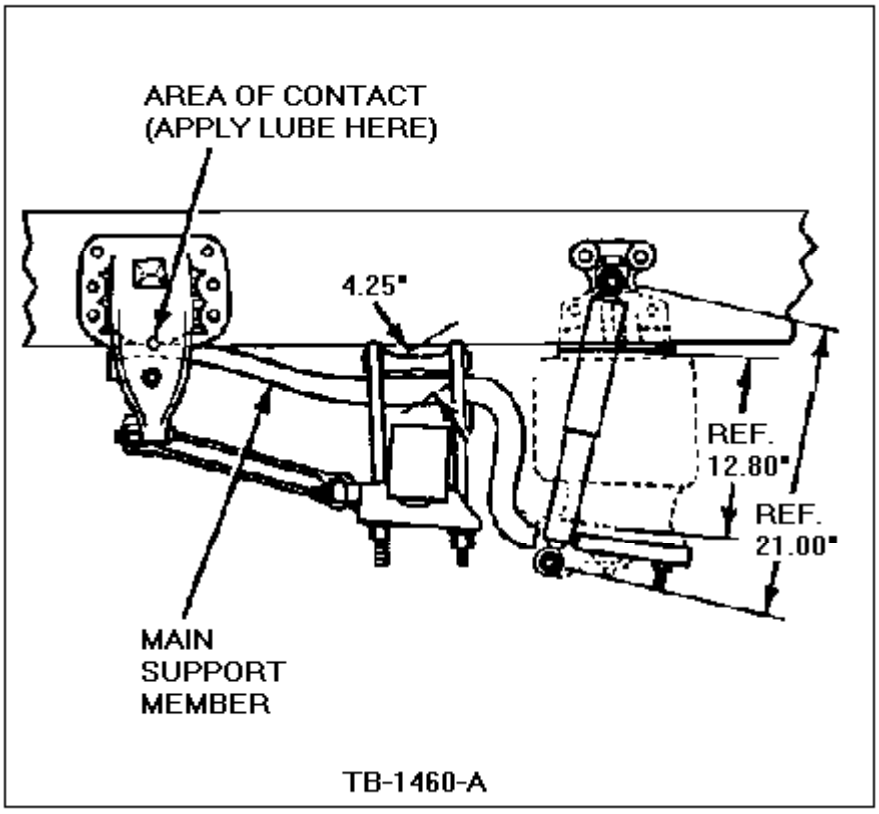


Figure 2 - Article 90-5-11

NOTE:
THE FUNDAMENTAL DIMENSION IS THE 4.25" (108 mm) MEASURED FROM THE BOTTOM OF THE FRAME TO THE BOTTOM OF THE MAIN SUPPORT MEMBER. THE AIR BAG MEASUREMENT OF 12.8" (325 mm) AND THE SHOCK ABSORBER MEASUREMENT OF 21" (533 mm) MAY VARY SLIGHTLY FROM THESE MEASUREMENTS WHICH ARE ALSO SHOWN IN FIGURE 2.

d. If additional adjustment is required and can not be obtained due to a lack of threads, repeat this procedure on the upper extension arm.

e. If further adjustment is still required, loosen the leveling arm locknut, Figure 1, and reposition the arm within the elongated hole in the arm.

6. Reattach the extension arm to the air bag mounting plate. Retorque all locknuts to the proper specifications shown in Figure 1.

7. If the ride has not improved after making these adjustments, apply a long-life lubricant (Ford Spec. ESA-M1C75-B) to the interface between the main support member and the frame hanger bracket at all four locations.

- The lubricant is best applied by lifting the rear end of the frame until there is a gap between the main support member and the cam surface of the hanger bracket. This allows the lubricant to be applied directly to the contact area of the cam surface.

- The lubricant can also be applied to either the cam surface or the main support member directly. Normal operation of the vehicle will work the lubricant into the contact areas.

- Reapply lubricant as required to maintain ride quality.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 3200

90-5, ***Publication Date: FEBRUARY 28, 1990***

Brakes - Rear - "Lucas Girling A2LS" - Hydraulic Or Air Over Hydraulic - Adjuster Cylinder Service Procedures	Article No. 90-5-12

MEDIUM/HEAVY TRUCK:
1984-90 C SERIES, F & B SERIES, L SERIES
1986-90 CARGO SERIES

ISSUE:
The adjuster cylinder may be honed to service a glazed hydraulic bore. If an adjuster cylinder is worn or scored beyond repair, new adjuster cylinder castings are now available for service use.

ACTION:
Install a new adjuster cylinder casting or hone the existing adjuster cylinder assembly. Refer to the following procedure for service details. Refer to the Adjuster Cylinder Service Parts Application Chart for correct parts usage.

SERVICE PROCEDURE

1. Inspect the adjuster cylinder housing for glazed, worn or scored bores.

2. Determine whether honing or replacing the casting is appropriate.

   NOTE:
   THE ADJUSTER CYLINDER BORE DIAMETER MUST NOT BE LARGER THAN 1.753" FOR THE 1-3/4" SIZE CYLINDER BORES OR 1.628" FOR THE 1-5/8" SIZE CYLINDER BORES. IF THE CYLINDER CASTING HOUSING BORE IS LARGER THAN THESE SPECIFICATIONS, OBTAIN A NEW CYLINDER CASTING AND SEAL KIT.

3. Hone the adjuster cylinder using a 220 spring loaded wheel cylinder stone that gives a smooth finish.

   CAUTION:
   DO NOT EXCEED 1.753" DIAMETER FOR THE 1-3/4" SIZE CYLINDERS OR 1.628" DIAMETER FOR THE 1-5/8" SIZE CYLINDERS.

4. Clean the adjuster cylinder with isopropyl alcohol to remove all honing residue.

5. Install a new seal kit. Refer to the appropriate Medium/Heavy Truck Shop Manual, Sections 12-01 and 12-03 for service details. Refer to the following Adjuster Cylinder Service Parts Application Chart for the correct seal kit part number.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 3050, 3500, 3510, 3800

90-5, ***Publication Date: FEBRUARY 28, 1990***

Brakes - Rear - Hydraulic Or Air Over Hydraulic Brake Adjustment Tool	**Article No. 90-5-13**

MEDIUM/HEAVY TRUCK:
1984-90 SERIES, F & B SERIES, L SERIES
1986-90 CARGO SERIES

This TSB article is being republished in its entirety to correct the second set of measurements given in the note.

ISSUE:
A new brake adjustment tool is now available for manually adjusting lining-to-drum clearance. This tool is for trucks equipped with the "Lucas A2LS" rear hydraulic brake system.

ACTION:
Use the new brake adjustment tool (D90T-2588-A) when manually adjusting lining-to-drum clearances.

The manual brake adjustment wheel serves the following three functions:

- Backoff the brake linings for drum removal
- Adjust lining-to-drum clearances after new lining installation
- Make additional manual adjustments, if required

NOTE:
NORMAL LINING-TO-DRUM CLEARANCE RANGE IS 0.5-1.3 MM (.020-.050 INCH). IF A MEASUREMENT EXCEEDS THIS RANGE, IT IS NECESSARY TO ADD TOP AND BOTTOM CLEARANCES. THE NORMAL RANGE FOR THE ADDITIVE OF THE TOP AND BOTTOM SHOE CLEARANCES IS 1.0-2.5 MM (.040-.100 INCH). DO NOT ATTEMPT TO ADJUST THE CLEARANCES IF THEY MEET EITHER OF THE ABOVE RANGES.

Refer to the appropriate Medium/Heavy Truck Shop Manual, Sections 12-01 and 12-03 for service details.

The new brake tool (D90T-2588-A) can be purchased from OTC Tool & Equipment Company by calling one of the following telephone numbers.

- U.S. 1-800-533-5338
- Canada 1-800-533-0492

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 90-3-14

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 3050, 3051

Bulletin Contents

TSB Article 90-5-14 has been superseded by Article 91-15-14.

90-5, ***Publication Date: FEBRUARY 28, 1990***

• **Flywheel Assembly - New Design With Spicer Clutch Mounting Hole Pattern** • **Clutch - Spicer - Flywheel Assembly Available With Spicer Bolt Hole Pattern**	**Article No. 90-5-15**

MEDIUM/HEAVY TRUCK:
1986 CARGO SERIES

ISSUE:
A new design flywheel assembly with a Spicer clutch mounting hole pattern is now available for service on Phase I 1986 Cargo trucks. It has a second set of holes drilled to accommodate Spicer clutches. Formerly, only Borg Warner clutches were used on these vehicles.

ACTION:
To install a Spicer clutch, use the new design flywheel assembly. Refer to the 1986 Cargo Truck Shop Manual, Sections 16-01 and 16-02 for clutch service details.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4700, 5550

90-5, ***Publication Date: FEBRUARY 28, 1990***

Radiator - "Ad-Tech" - Molded Plastic Tank And Core - Revised Service Replacement Procedure	Article No. 90-5-16

MEDIUM/HEAVY TRUCK:
1987-90 CL-CLT-9000 SERIES, F & B SERIES, L SERIES

This article is being republished in its entirety to expand the model year coverage to include 1987 through 1990 model year vehicles, to include F & B Series trucks, to provide information about the current gasket kit and a new torque specification.

ISSUE:
"AD-TECH" radiators are a modular design, featuring "Modine Beta Weld" core and header assemblies combined with plastic tanks. The plastic tank is sealed to the header with an O-ring gasket seal and is held in place with a removable locking strip. Radiator core replacements and tank replacements can be performed in the dealership.

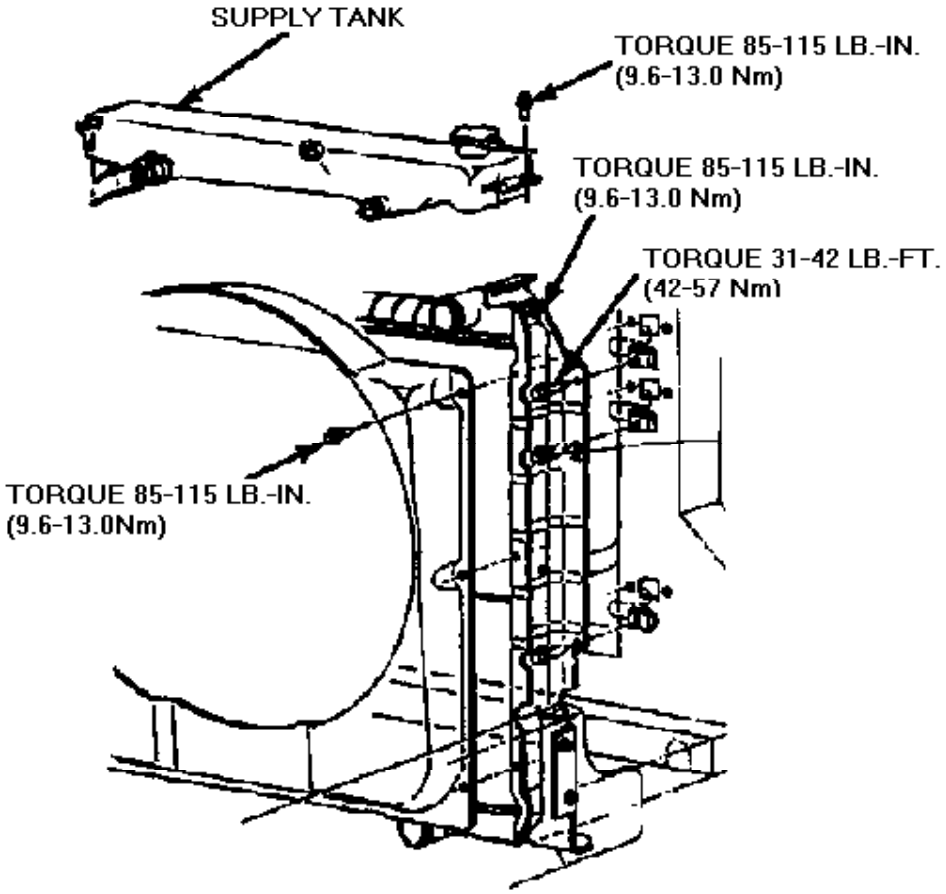
ACTION:
If service is required, use the following service procedure.

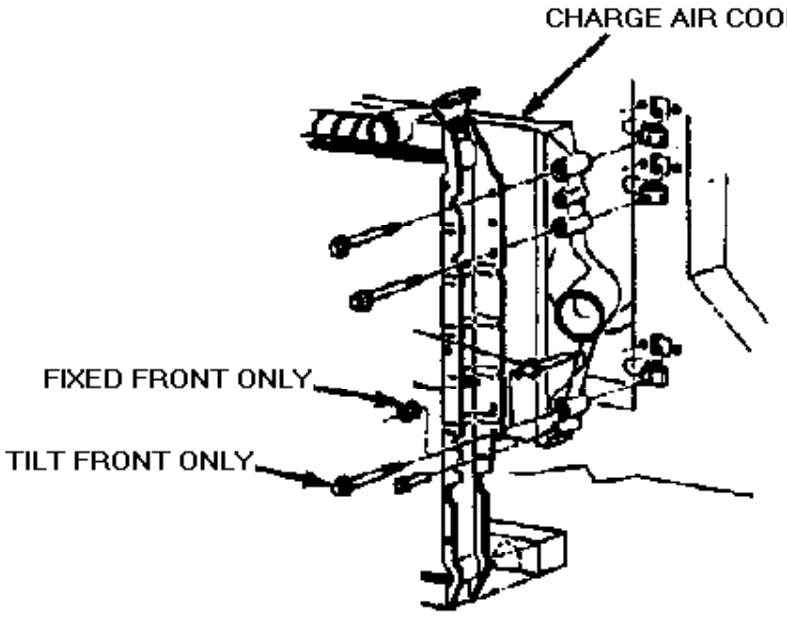
RADIATOR REMOVAL FROM TRUCK

1. Remove all attached components, including fan shroud, air conditioning condenser, transmission oil cooler, etc. from the "AD-TECH" radiator module.

2. Remove supporting structural pieces from the radiator, Figures 1 through 5.

F & B SERIES
RADIATOR REMOVAL AND INSTALLATION





TB-1305-A

Figure 1 - Article 90-5-16

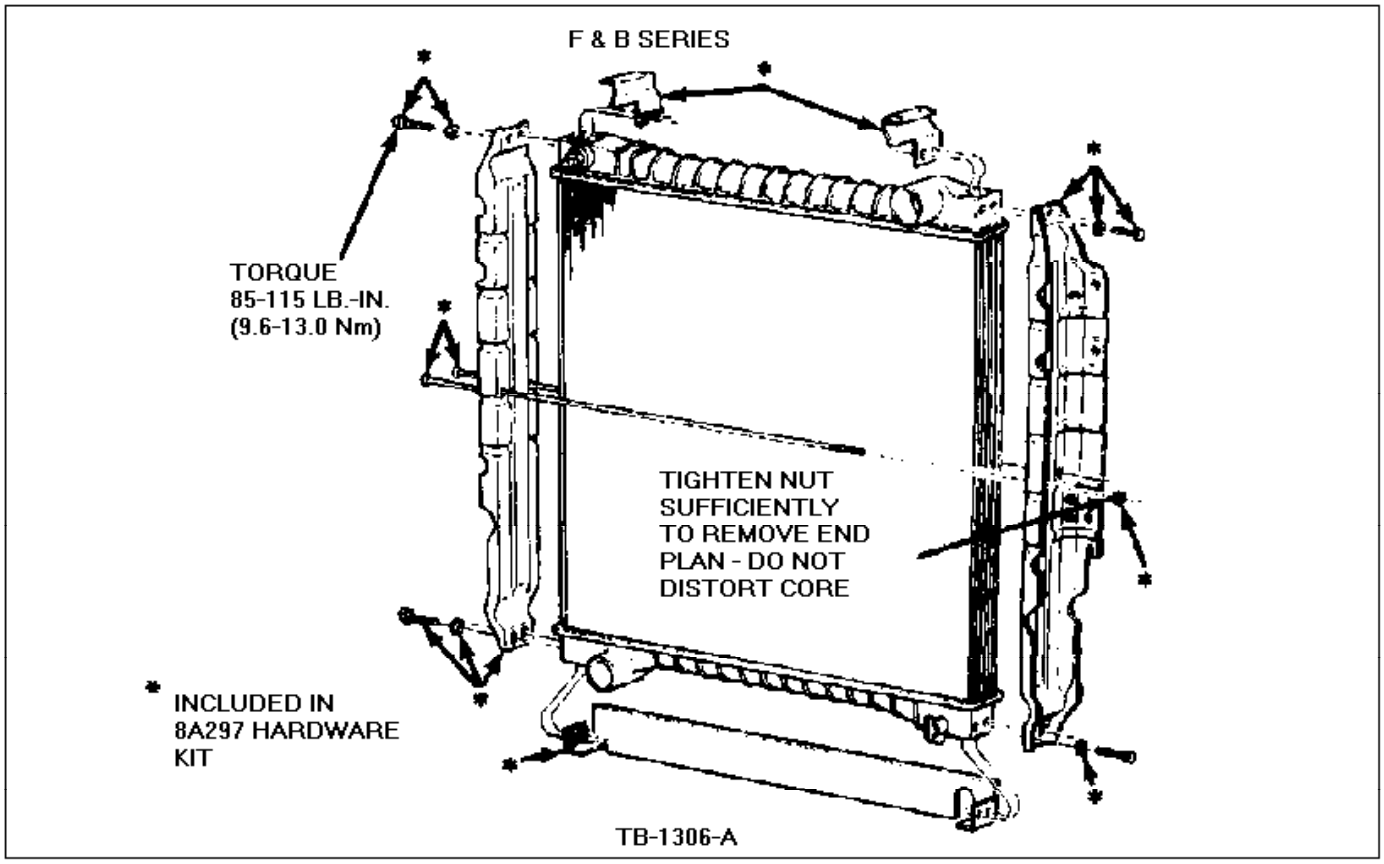


Figure 2 - Article 90-5-16

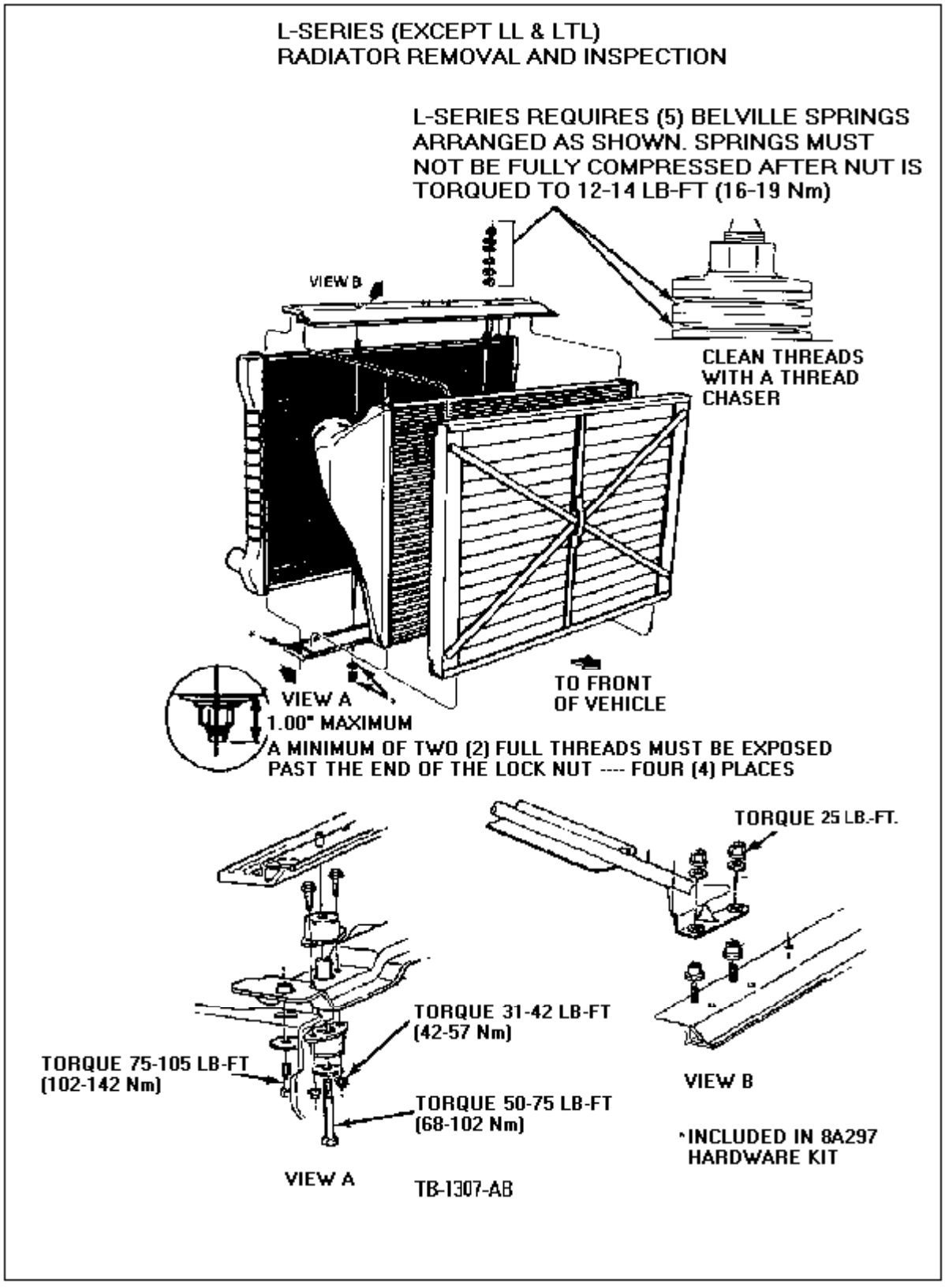


Figure 3 - Article 90-5-16

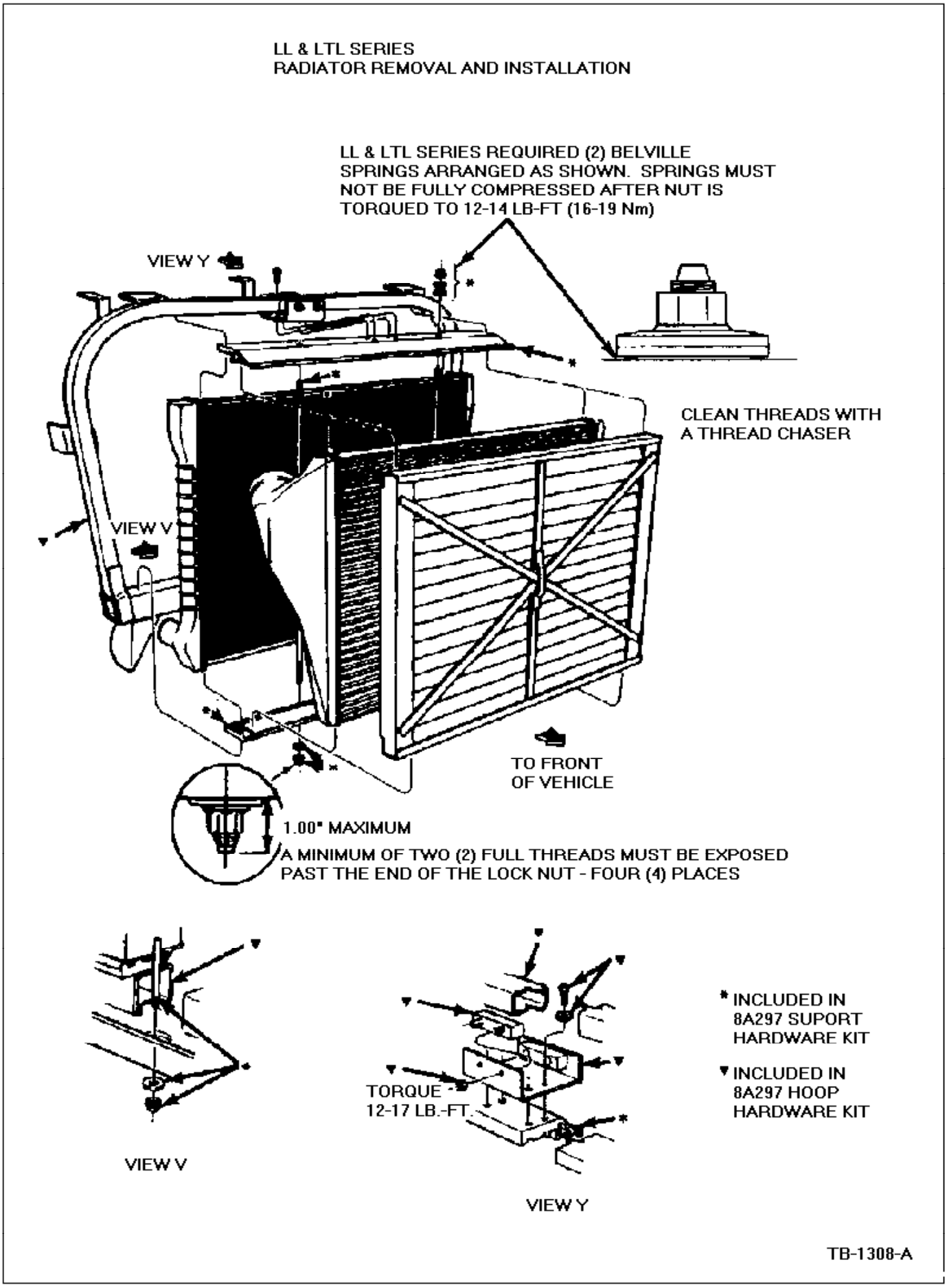


Figure 4 - Article 90-5-16

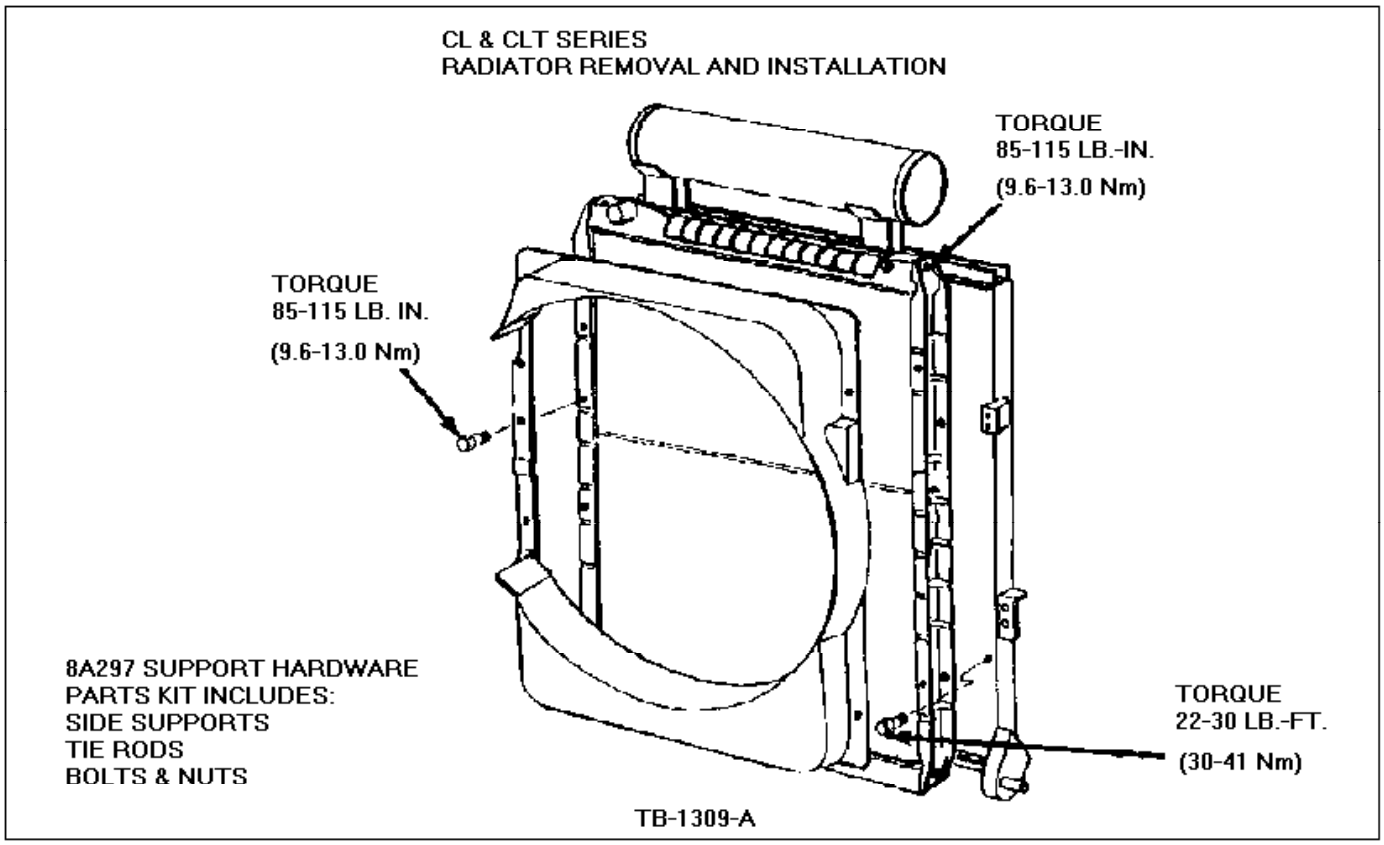


Figure 5 - Article 90-5-16

NOTE:
REFER TO THE APPLICATION CHARTS ON THE FOLLOWING PAGES OF THIS TSB FOR APPROPRIATE RADIATOR ASSEMBLY, CORE-HEADER ASSEMBLY, TANK, GASKET STRIP KIT, VENT AND DRAINCOCK SERVICE PART NUMBERS.

RADIATOR TANK REPAIR PROCEDURE

The radiator tanks are molded glass-filled nylon and are secured to the core header by locking strips, Figure 6. If damaged, replace the tank. Do not attempt to repair or reseal it.

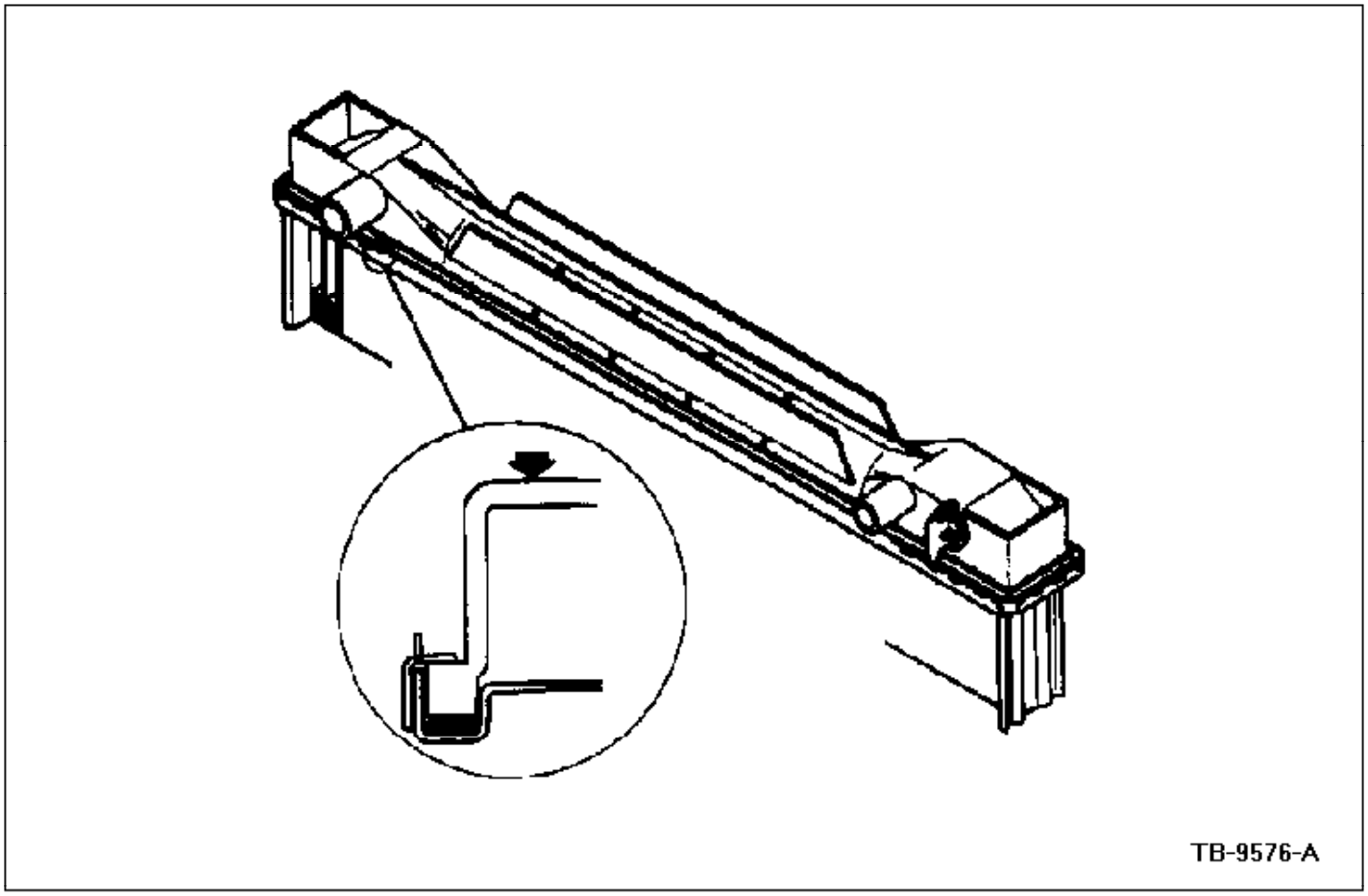


Figure 6 - Article 90-5-16

WARNING:
COMPLETELY SUPPORT THE HEADER TO PREVENT DISTORTION, FIGURE 7. IF THE HEADER BECOMES EXCESSIVELY DISTORTED, THE CORE MAY NEED TO BE REPLACED. THE HEADER MUST BE COMPLETELY SUPPORTED WITH A HEADER SUPPORT TOOL, FIGURE 8.

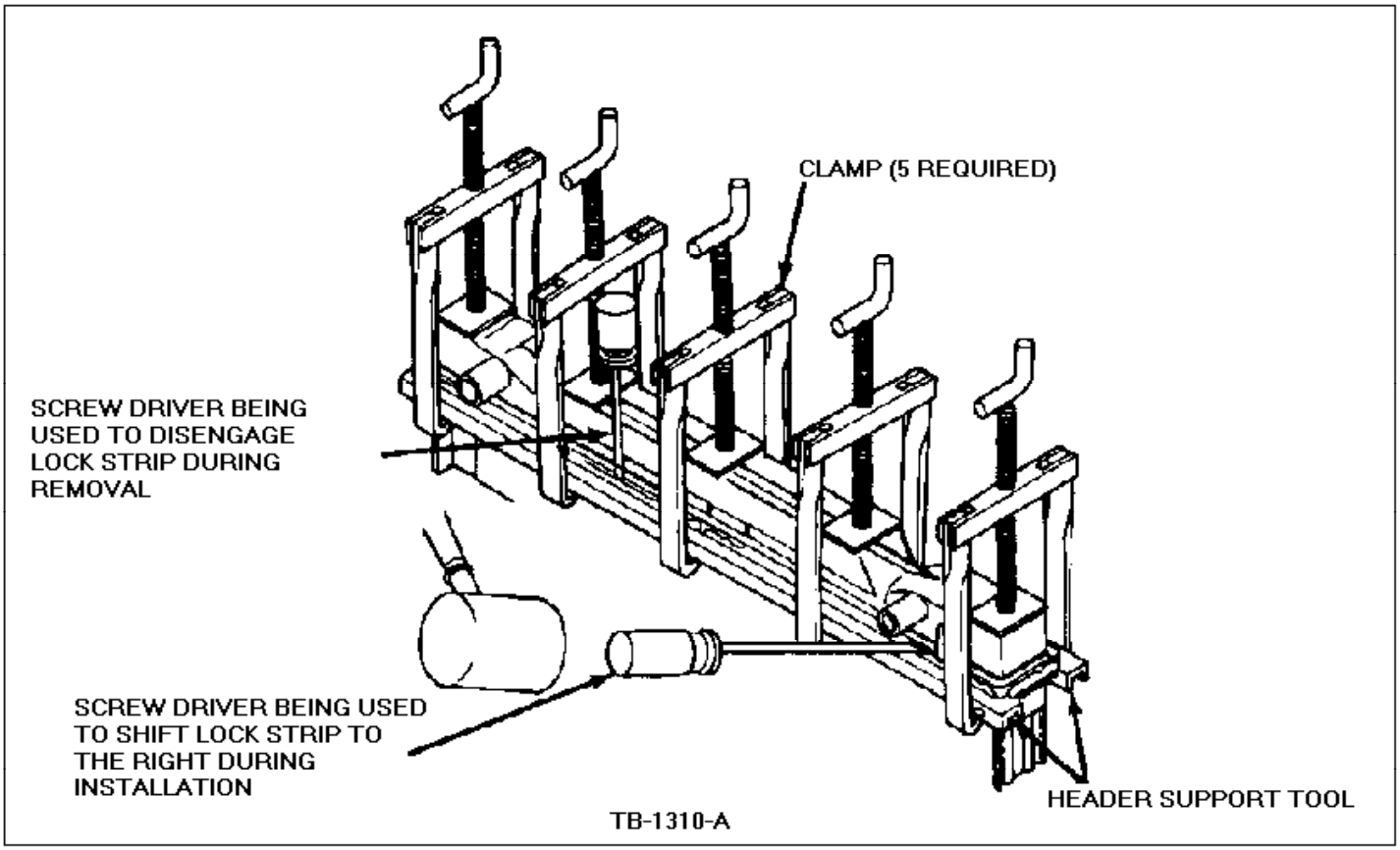


Figure 7 - Article 90-5-16

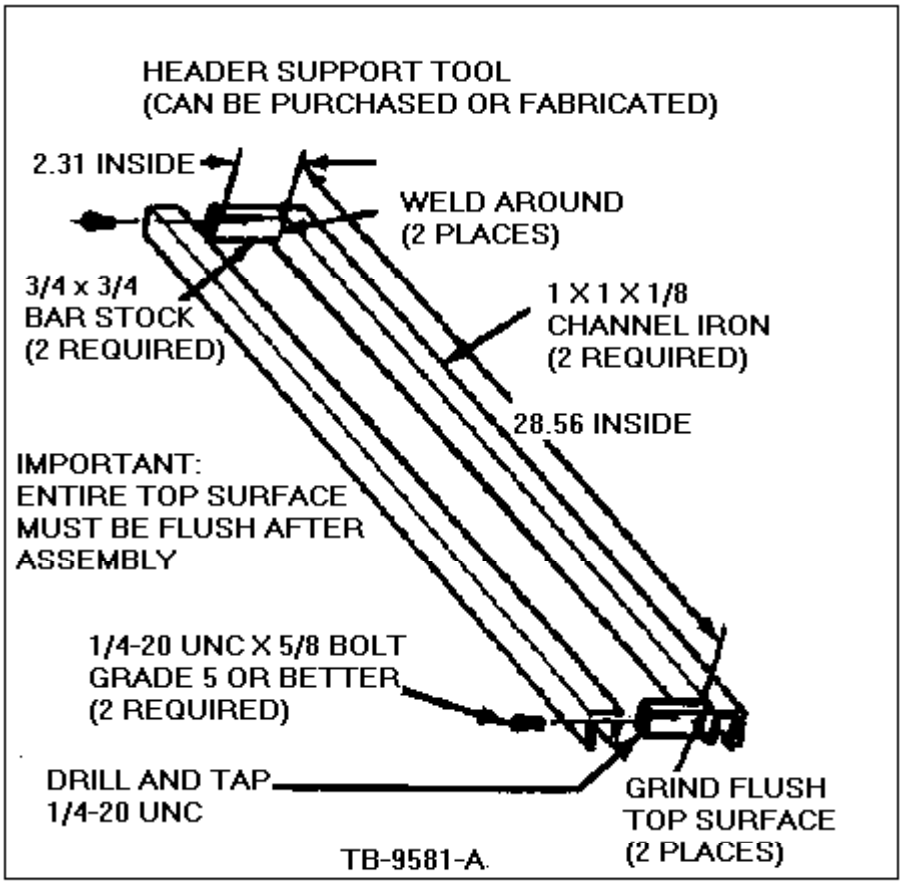


Figure 8 - Article 90-5-16

"HEADER SUPPORT TOOL AND J-CLAMPS" MAY BE PURCHASED FROM: ***JOHNSON MANUFACTURING, P.O. BOX 96, PRINCETON, IOWA 52768, TELEPHONE: (319) 289-5123***

IN CANADA: ***JOBBORN MANUFACTURING (1975) LTD. 97 FRID STREET, HAMILTON, ONTARIO L8P4M3, TELEPHONE: (416) 522-2580***

Tank Removal

1. Position the header support tool and five header clamps as shown in Figure 7.
2. Hand tighten header clamps evenly until the locking strips become loose enough to be removed by hand or with the aid of a small screwdriver, Figure 7.
3. Remove the locking strip retainers if so equipped.
4. Remove all locking strips and throw away.
5. Loosen and remove header clamps and header support.
6. Lift tank from core header.
7. Remove the O-ring seal from the header and throw away.

Tank Installation

1. Inspect the sealing surface of the radiator core header to be sure it is clean and free of foreign material or damage.
2. Straighten the flanges of the header if required with a flat metal piece and wide jawed pliers, Figure 9.

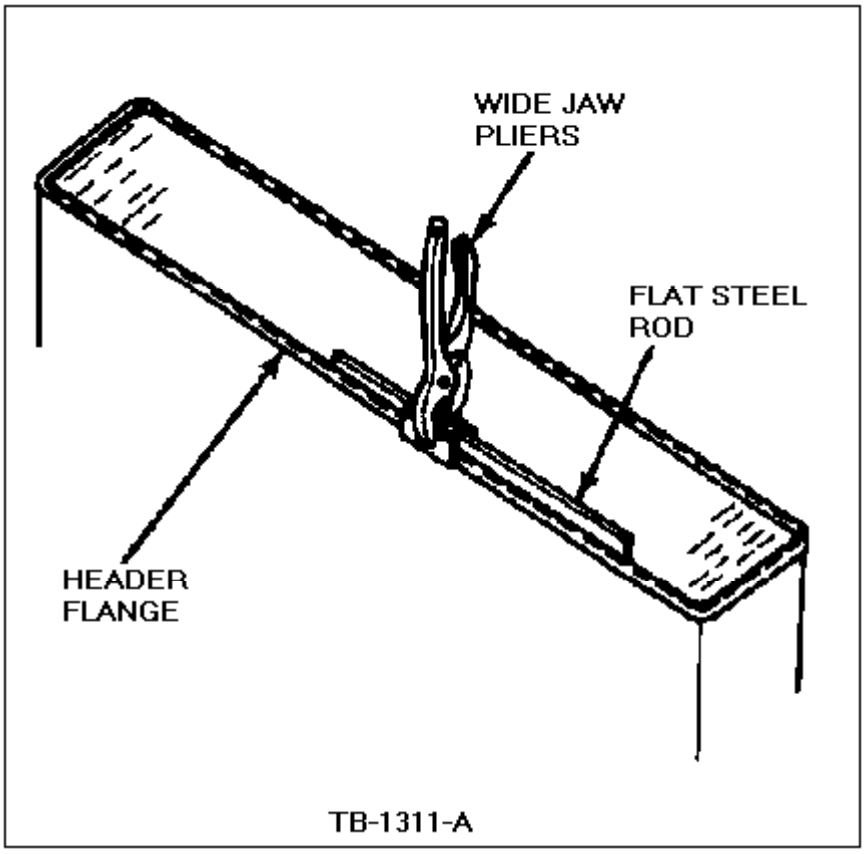


Figure 9 - Article 90-5-16

3. Dip the new O-ring in fresh glycol and position it in the header groove.

   NOTE:
   DO NOT USE RTV IN THE HEADER GROOVE.

4. If working on a multiple pass (low flow) radiator, apply a 1/4" bead of Dow Corning Silicone RTV 732 on the cross over portion of the O-ring at the tank baffle location.

   NOTE:
   THE RTV REQUIRES 24 HOURS TO CURE.

5. Position the tank to the header. Make sure not to scratch the tank sealing surfaces. Be sure the top and bottom of the tank is positioned properly.

6. Clamp the tank in position on the header with the header support tool and five (5) header clamps, Figure 7. Tighten the header clamps to compress the O-ring gasket until the new locking strips can be inserted by hand.

7. Insert the new locking strips. Make sure all the tabs are positioned into the header slots. Tap strips to the right using a screwdriver and hammer as shown in Figure 7. This tapping locks the new strip into place. When fully engaged there will be an opening in the left hand edge of the header slot, Figure 10.

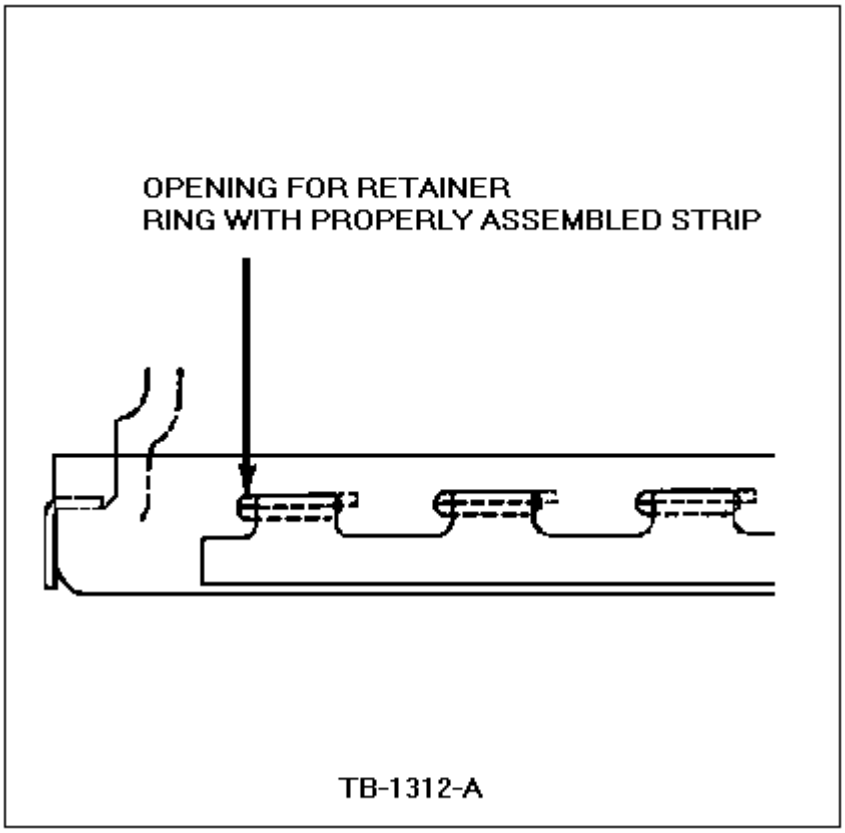


Figure 10 - Article 90-5-16

8. Remove the header clamps and header support from the radiator:

When using wire ring retainers:

- At the furthest left slot of each strip, add the wire ring retainer to prevent the strips from sliding back out of the header, Figure 11.

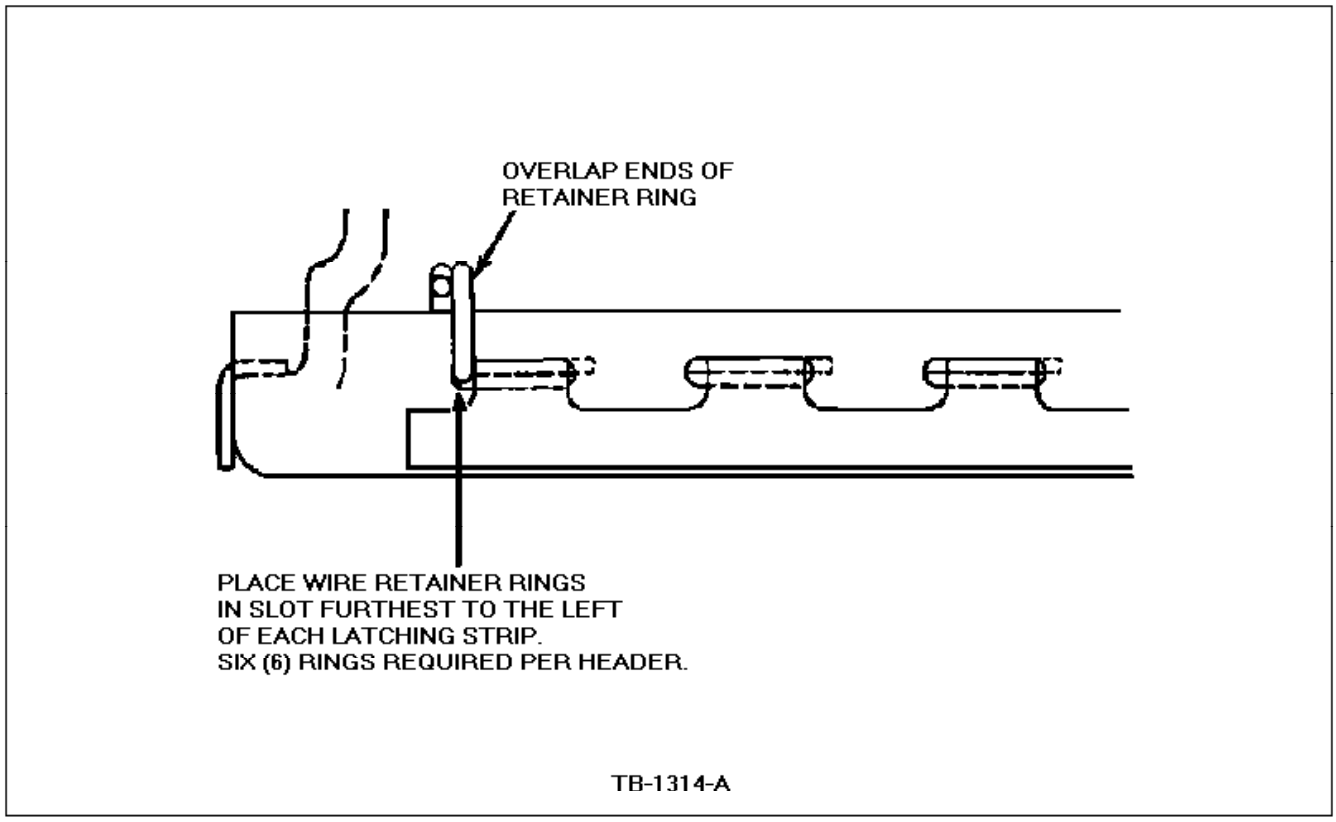


Figure 11 - Article 90-5-16

- Crimp wire ring retainers to overlap the ends. Butt joints at the ends are not acceptable.

When using spring clip retainers:

- Install one (1) retainer on each side of the header so that it engages both strips, Figure 12.

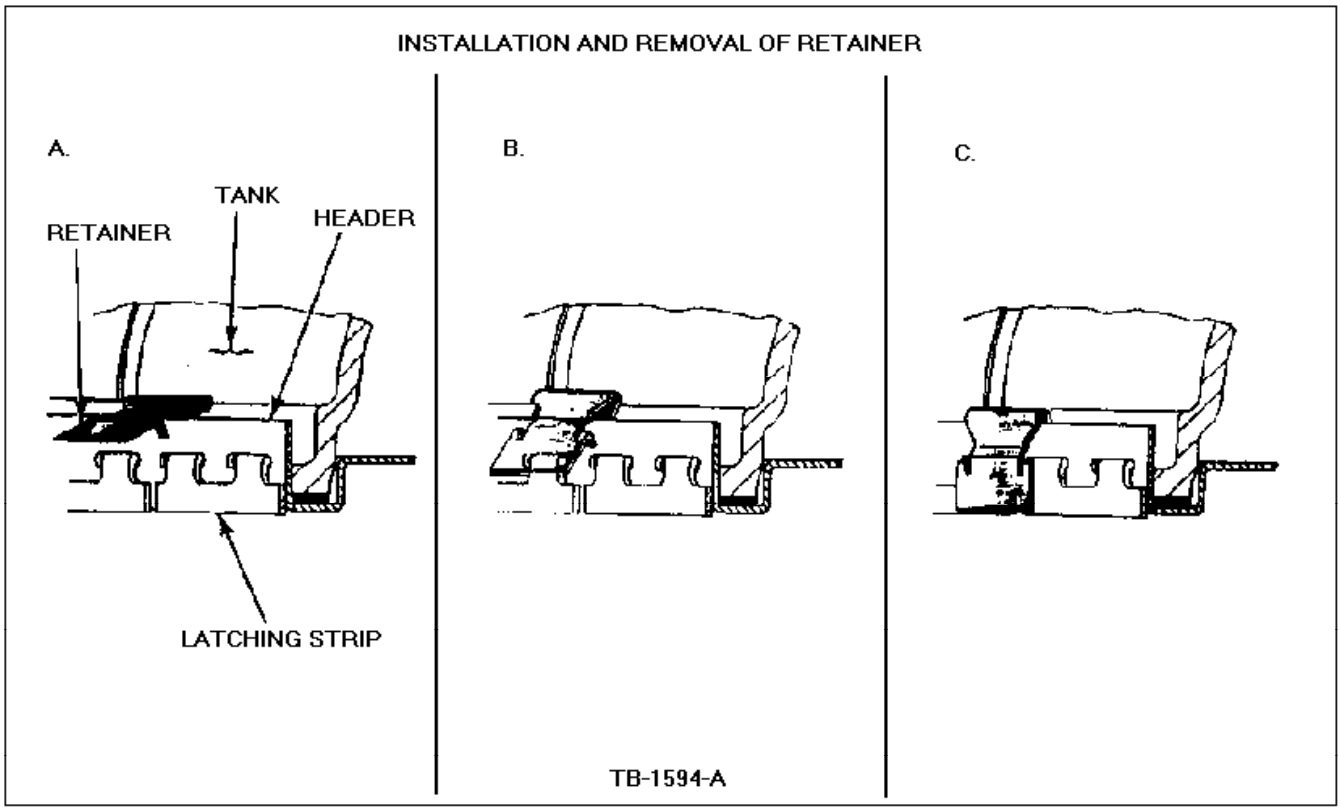


Figure 12 - Article 90-5-16

- Install one (1) retainer on each end of the header at the left slot.

9. Leak test the radiator at 16-18 PSIG.

RADIATOR INSTALLATION IN TRUCK

1. Re-attach supporting structural pieces to the radiator.

   NOTE:
   TO PREVENT POTENTIAL DAMAGE, TORQUE RADIATOR AND SUPPORTING COMPONENTS AS SPECIFIED. REFER TO FIGURES 1 THROUGH 5 FOR TORQUE VALUES.

2. Apply Ford Threadlocker (E2FZ-19554-B) to all threaded fasteners to prevent loosening.

DRAINCOCK AND THREADED VENT FITTING

The draincock and vent fitting are located in the plastic radiator tank and can be replaced without disassembling the radiator, Figure 13.

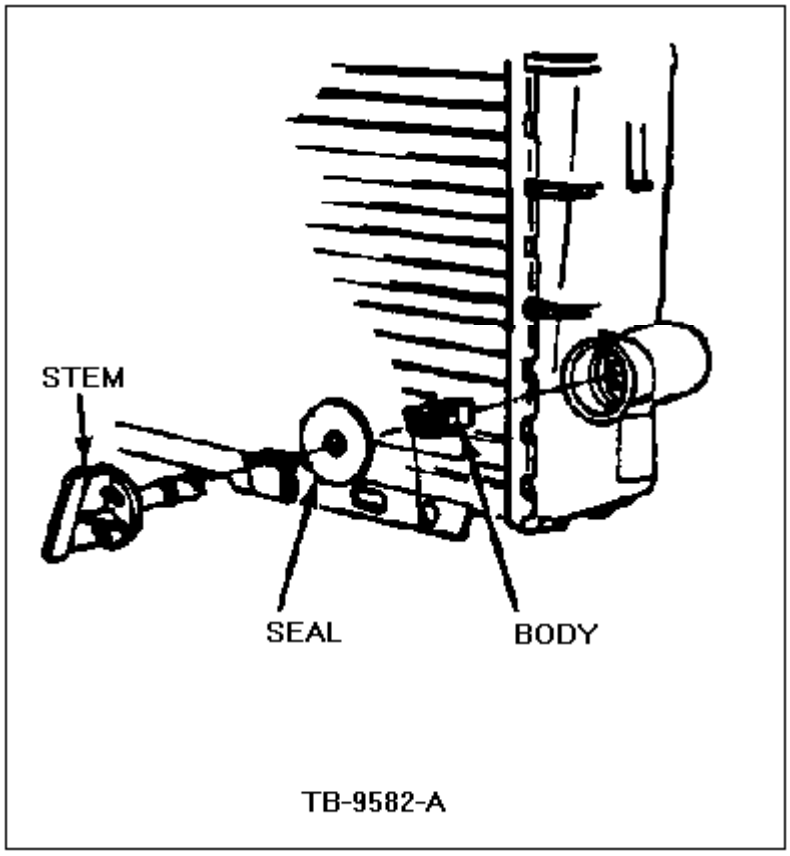


Figure 13 - Article 90-5-16

Removal

1. Turn the stem assembly counterclockwise to unscrew the stem. When the stem assembly is unscrewed to the end of the threads, pull the stem from the radiator tank and body, Figure 13.

2. Remove the body from the radiator tank by squeezing the sides together with a pair of needlenose pliers, Figure 14. Then, pull the body from the inlet tank.

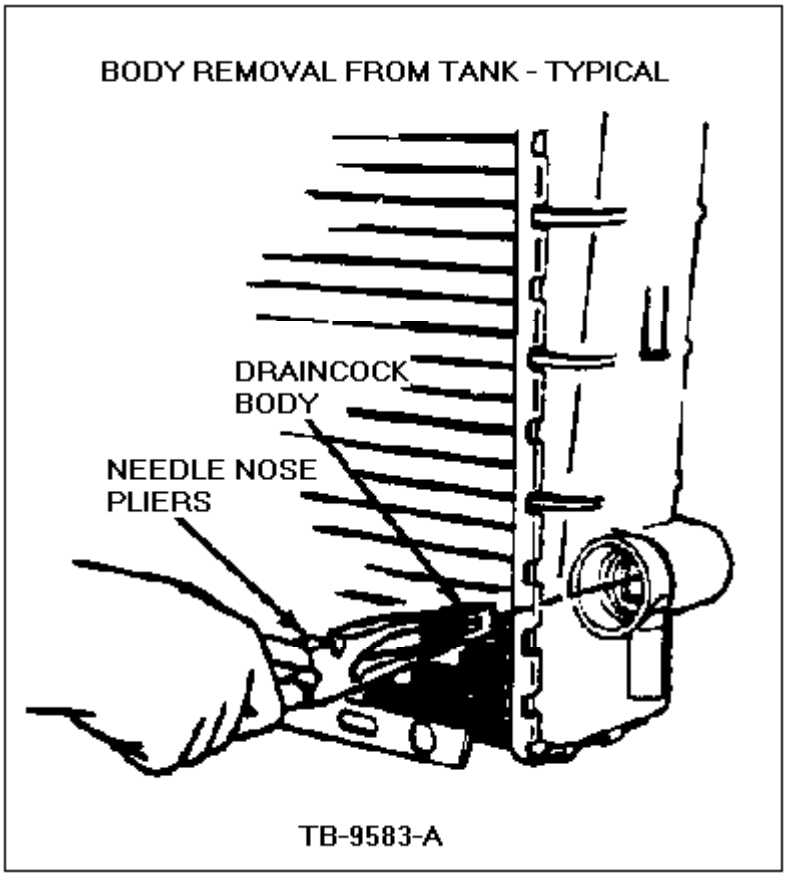


Figure 14 - Article 90-5-16

Installation

1. Check the draincock or vent fitting to make sure the body is installed loosely on the stem, Figure 15. If the stem is screwed into the body, the assembly cannot be installed into the tank opening.

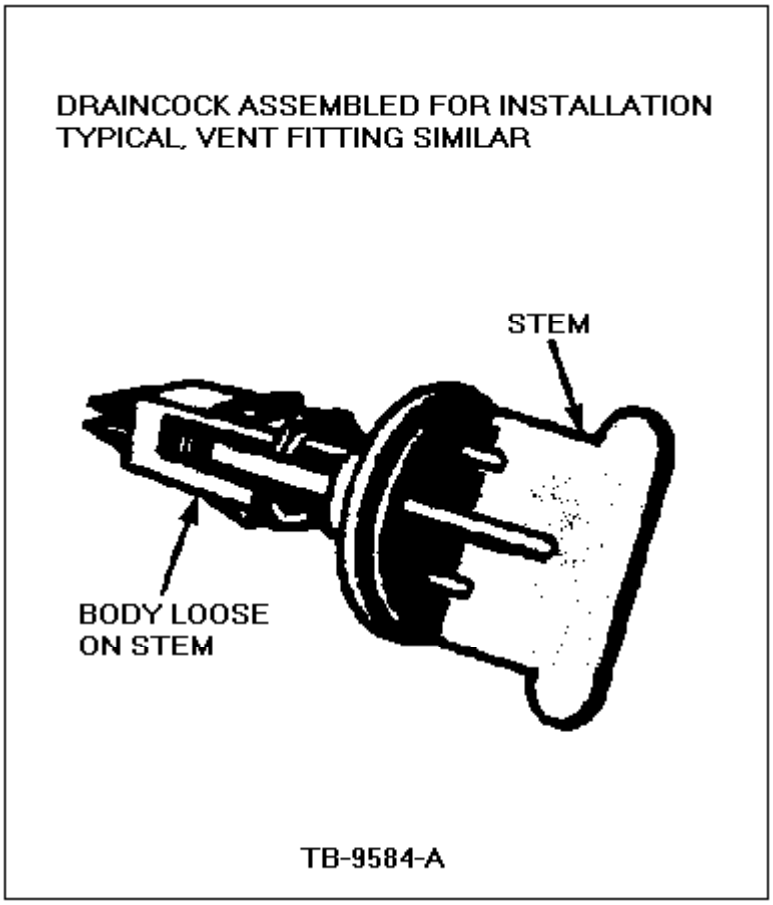


Figure 15 - Article 90-5-16

2. Lubricate the seal with fresh glycol and push the loosely assembled draincock or vent assembly body into the tank opening until it snaps into place.

3. Tighten the stem by turning clockwise to a torque of 18-25 lbs.in. (2.0-2.7 N-m).

Radiator Core Repair

The "AD-TECH" radiator core is of copper-brass construction and can be repaired by using the usual good radiator shop repair procedures for this type of radiator core.

CAUTION:
UNLESS THE PLASTIC TANK IS FIRST REMOVED FROM THE RADIATOR CORE, HEAT MUST BE KEPT AWAY FROM THE HEADER/GASKET/TANK AREA. DO NOT ATTEMPT TO CLEAN AN "AD-TECH" RADIATOR CORE USING CAUSTIC CLEANING SOLUTIONS UNLESS THE PLASTIC TANKS ARE FIRST REMOVED. IMMERSING THE PLASTIC TANKS IN A CAUSTIC CLEANING SOLUTION CAN DAMAGE THE TANKS AND O-RING GASKETS.

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 89-20-17

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

DEALER CODING

OASIS CODES: 4300, 4301, 5800

90-5, ***Publication Date: FEBRUARY 28, 1990***

Clutch - Spicer 14-1 And 14-2 - Stamped Angle-Spring - 6.6L & 7.8L Ford Diesel Engines And Cat 3208 - Service Tips	**Article No. 90-5-17**

MEDIUM/HEAVY TRUCK:
1990 and prior C SERIES
1987-90 F & B SERIES, L SERIES

ISSUE:
Various Service Tips have been developed to help the heavy truck service technician to troubleshoot and adjust Spicer stamped angle-spring clutches. These include...

- Recognizing symptoms of potential concerns
- Inspecting and checking the affected clutch components
- Determining which clutch parts actually require replacement
- Adjusting procedures for synchronized and non-synchronized transmissions

ACTION:
If service is required, use the following service procedure to adjust and check the clutch components.

ADJUSTMENT PROCEDURES - FOR NON-SYNCHRONIZED TRANSMISSIONS WITH CLUTCH BRAKE

Clutch Brake

1. Adjust the external linkage rod so that the clutch brake squeeze begins about 1" (25.4mm) from the end of the end of the pedal stroke as shown in Figure 1.

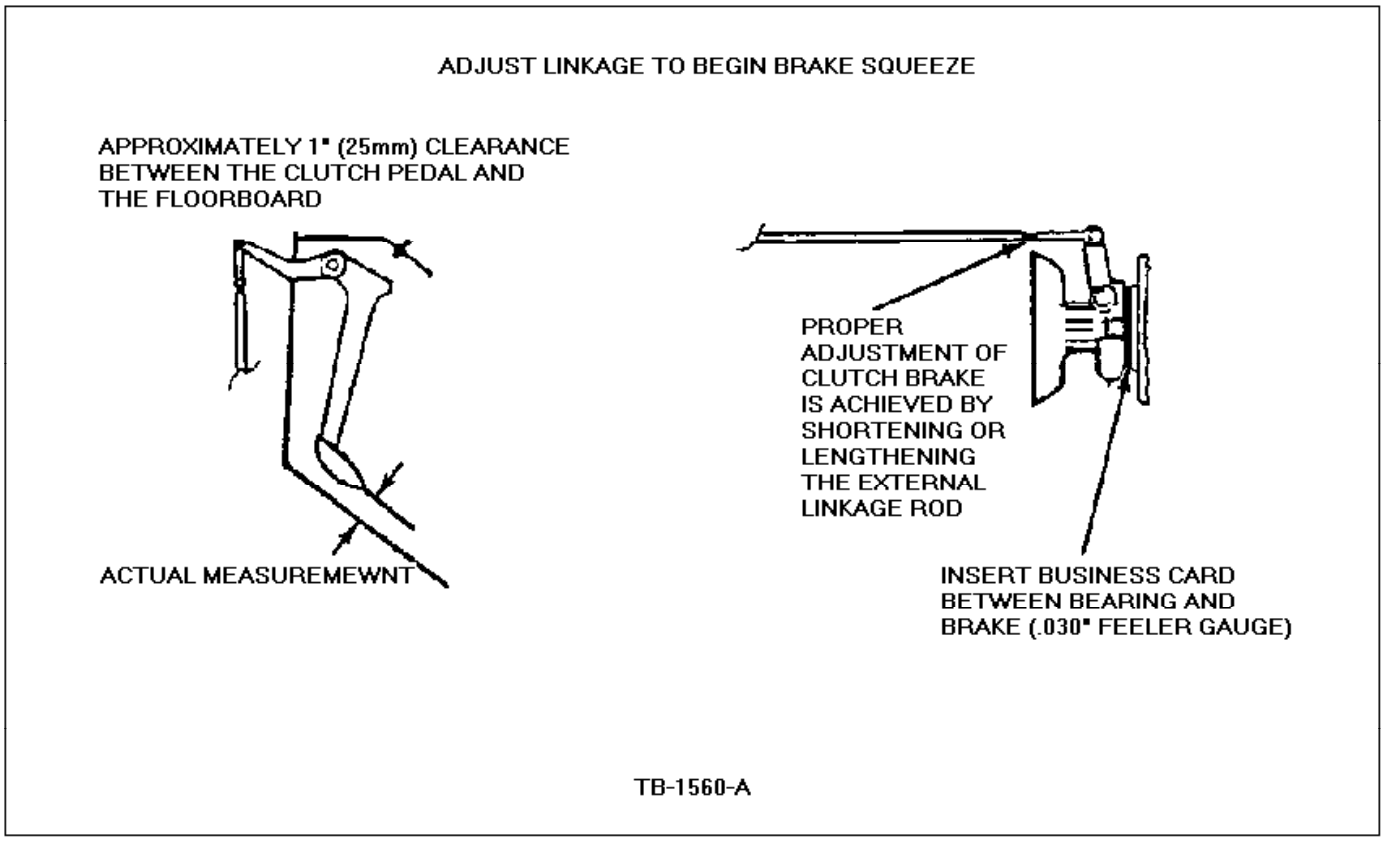


Figure 1 - Article 90-5-17

2. Check the adjustment results by placing a business card (or similar device) behind the clutch release bearing and depressing the clutch pedal. The card should be held tight.

3. Release the clutch pedal. See if the card slips out when the pedal is about 1" (25.4mm) from the end of the pedal stroke.

Clutch Free Travel

1. Adjust the clutch internally to get about 1.5" (38.1mm) free play at the top of the stroke or 1/8" (3.2mm) as shown in Figure 2.

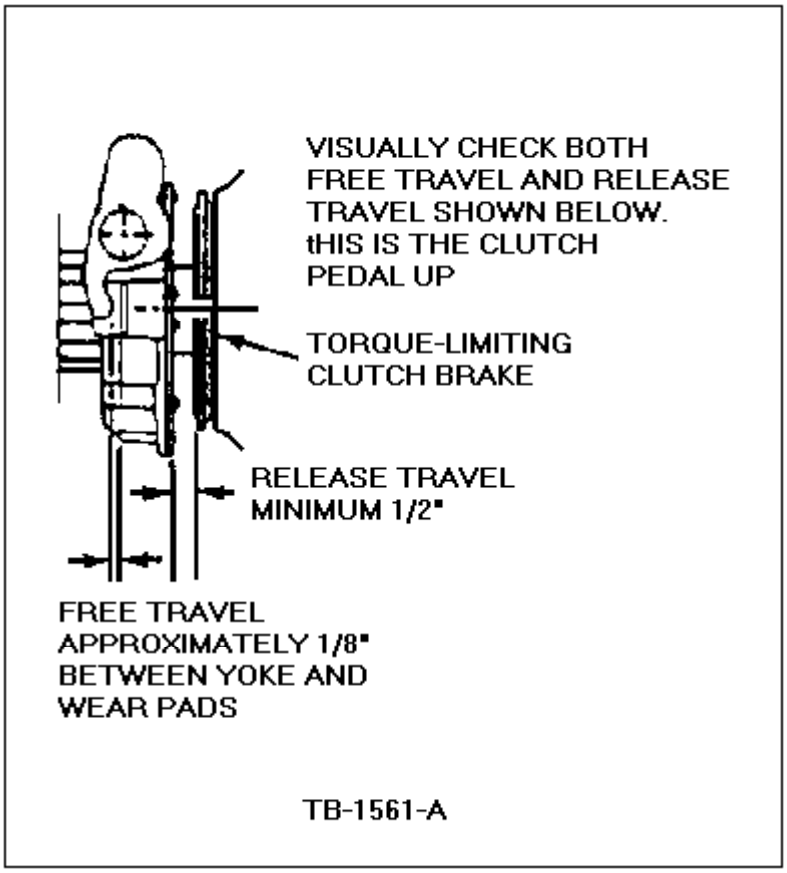


Figure 2 - Article 90-5-17

2. Remove the lockstrap and turn the adjusting ring as shown in Figure 3.

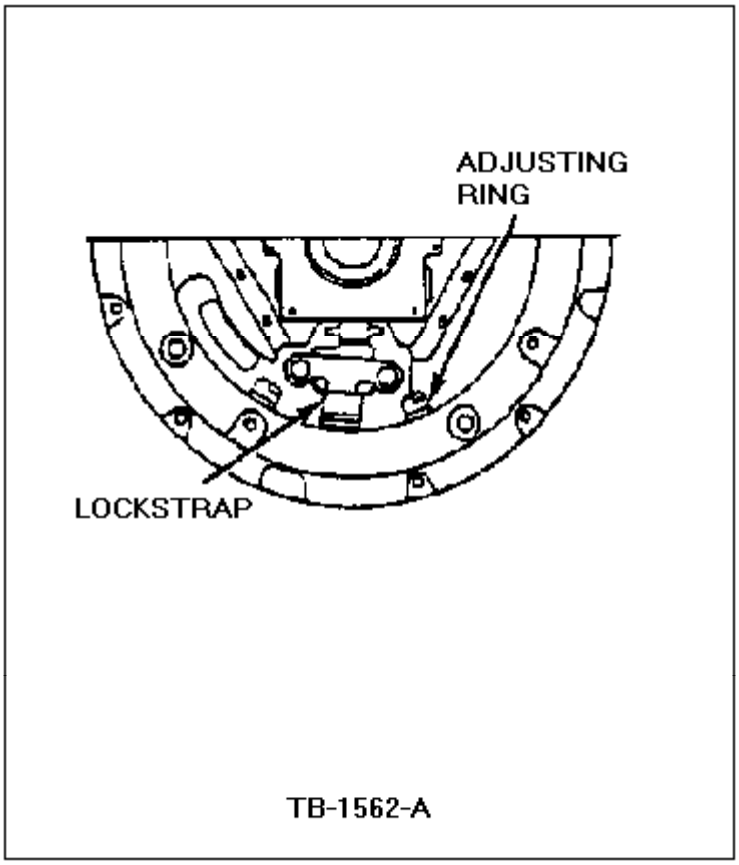


Figure 3 - Article 90-5-17

a. Turning the adjusting ring clockwise moves the release bearing toward the transmission and increases free travel.

b. The clutch pedal must be pushed to the floor to turn the adjusting ring.

3. Check the distance from the clutch release bearing to the clutch brake, Figure 2. There must be 1/2" (12.7mm) movement of the release bearing for proper clutch release. Adjust the clutch internally to obtain this.

ADJUSTMENT PROCEDURES - FOR SYNCHRONIZED TRANSMISSIONS ONLY WITHOUT CLUTCH BRAKE

1. Check measurement with clutch pedal up, Figure 4.

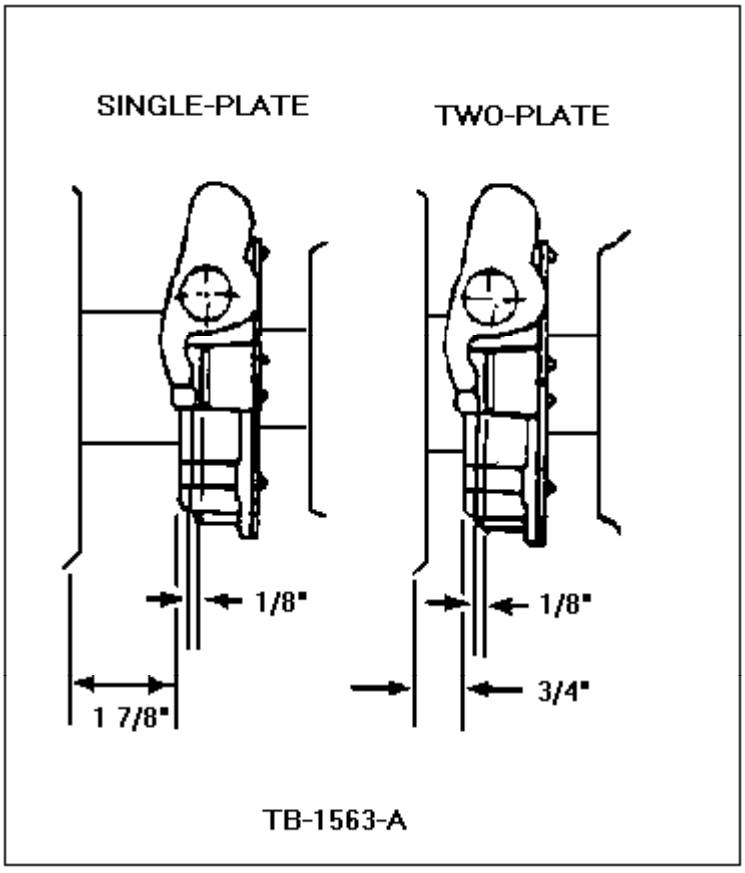


Figure 4 - Article 90-5-17

2. Remove the lockstrap on these manually adjusted clutches.

3. To set 1 7/8" (47.6mm) or 3/4" (19.1mm) dimension as shown in Figure 4, proceed as follows:

a. With pedal depressed, turn the adjusting ring to obtain about 1 7/8" (47.6mm) or 3/4" (19.1mm) as shown in Figure 4 for the respective single or two-plate clutches.

b. Turn the adjusting ring clockwise to move the release bearing toward the transmission.

c. Turn the adjusting ring counterclockwise to move the release bearing toward the engine.

4. To set 1/8" (3.2mm) dimension as shown in Figure 4, proceed as follows:

   a. Adjust the external linkage by shortening or lengthening to obtain 1/8" (3.2mm) between the release yoke fingers and the wear pads on the release bearing housing.

   b. Check to see that this adjustment provides approximately 1 1/2" (38.1mm) of free travel at the pedal.

   c. Tighten all locknuts.

   NOTE:
   FOR HYDRAULIC LINKAGE, REFER TO THE MANUFACTURER'S SPECIFICATIONS FOR PROPER ADJUSTMENT OF THE SYSTEM.

CLUTCH AND DRIVEN DISC CHECK

If the release of the clutch is still not acceptable after the linkage and clutch adjustments have been made, proceed as follows:

1. Adjust the clutch so that there is NO free travel, Figures 5 & 6.

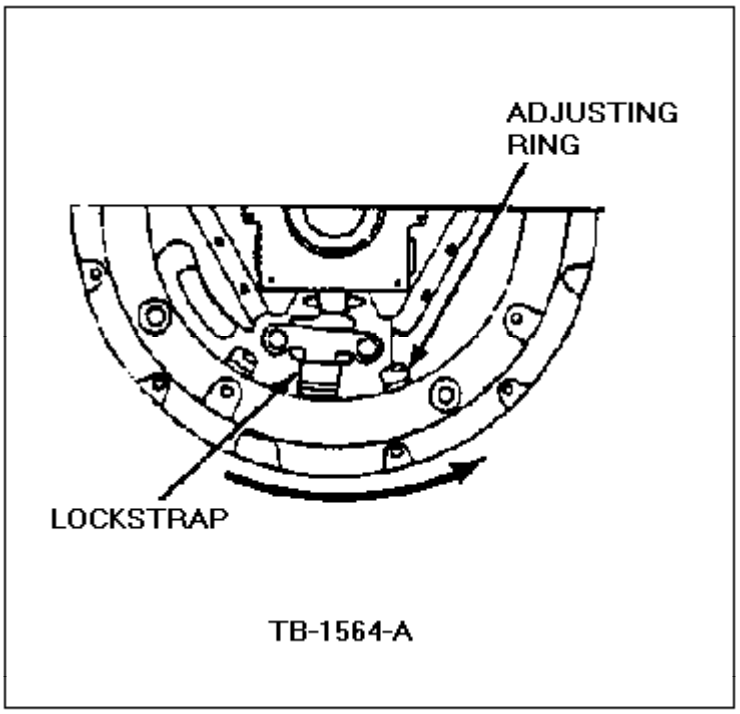


Figure 5 - Article 90-5-17

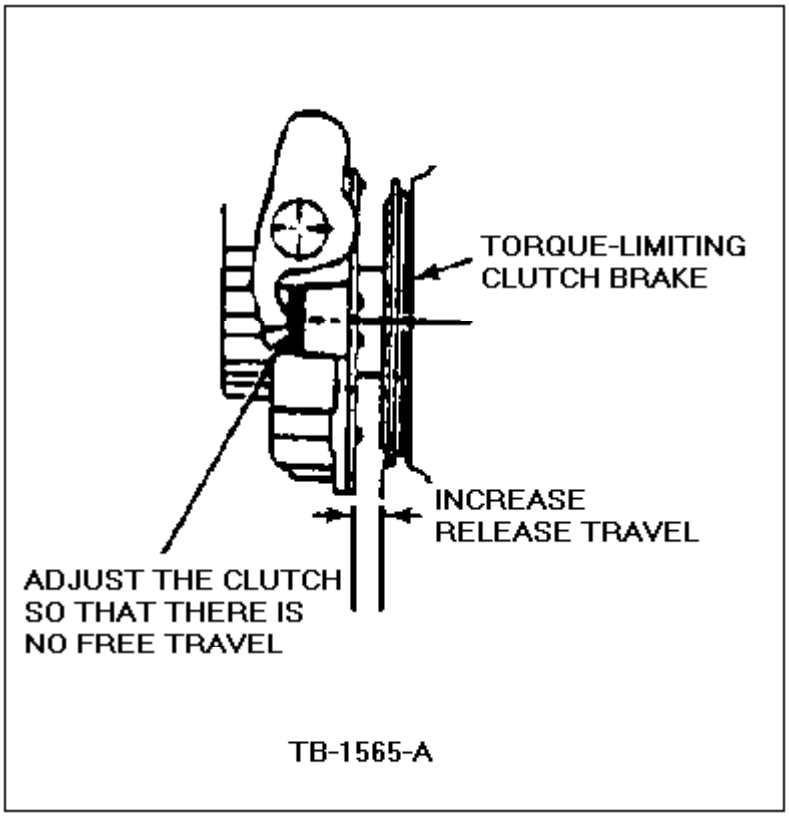


Figure 6 - Article 90-5-17

2. Turn the adjusting ring counterclockwise to increase release bearing travel.

   - This will create additional release bearing travel.
   - It increases the internal pressure plate travel.

   NOTE:
   DO NOT ADJUST LINKAGE.

3. Test drive and determine if the release of the clutch has been effected.

4. If the release has improved, replace the driven discs only. Refer to the appropriate Medium/Heavy Truck Shop Manual, Section 16-02 for service details.

   NOTE:
   CERAMIC DISCS ONLY.

5. Re-adjust the clutch after replacing the discs.

CHECK THE TORQUE-LIMITING CLUTCH BRAKE (NON-SYNCHRONIZED TRANSMISSIONS)

1. Clamp the clutch brake, on the outside diameter, in a vise.

2. Slide a modified input shaft (a cut input shaft with a nut welded on it to accommodate a torque wrench) through the clutch brake, Figure 7.

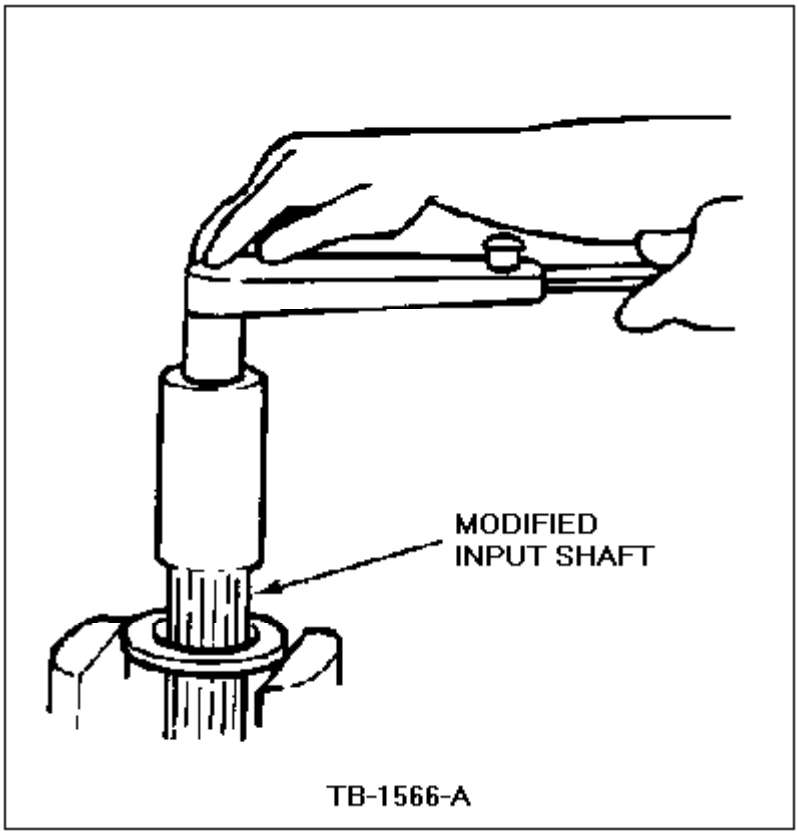


Figure 7 - Article 90-5-17

3. Connect the torque wrench to the nut and rotate two half turns. Take note of the torque reading.

4. The torque should not read lower than 12 lb-ft (16.3 N-m).

   a. If the reading is higher than 12 lb-ft (16.3 N-m), reuse the brake.

   b. If lower, replace it.

   c. If the reading is more than 35 lb-ft (47.5 N-m), replace the clutch brake to eliminate the possibility of tang breakage.

CLUTCH REMOVAL AND INSPECTION

1. Block the release bearing with wood blocks (1/2" x 1/2" x 3" for two-plate and 1/2" x 1 3/4" x 3" for single plate) using the tool provided in Spicer Clutch Service Kit CSK1 or equivalent tool as shown in Figure 8.

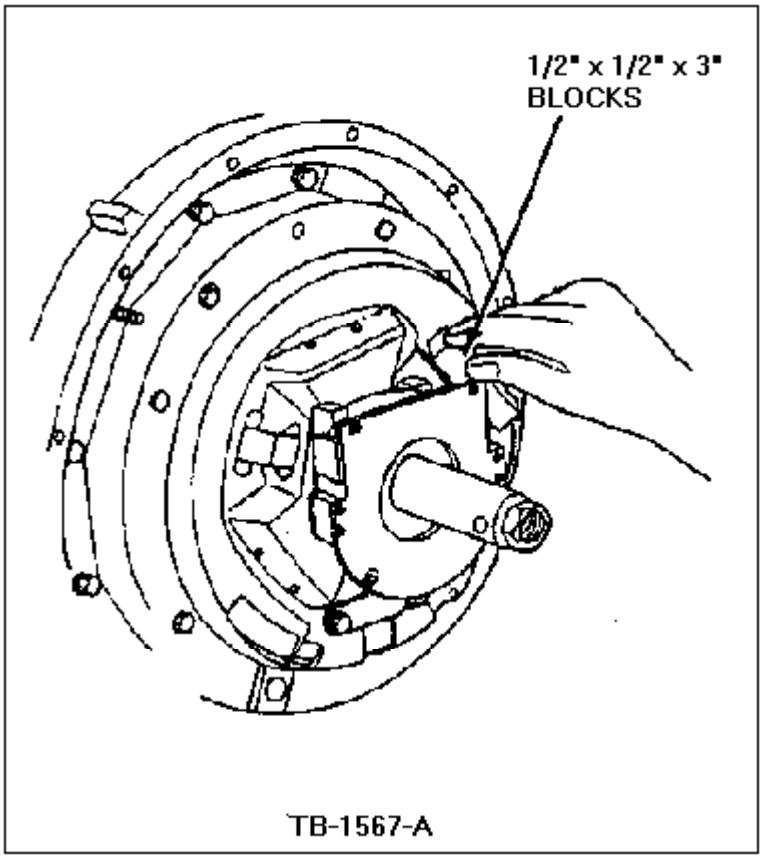


Figure 8 - Article 90-5-17

2. Remove the clutch from the flywheel. Refer to the appropriate Medium/Heavy Truck Shop Manual, Section 16-02 for service details.

3. Check the driven disc.

    a. On each disc, measure the gauge (facing) thickness in three or four areas around the disc, Figure 9.

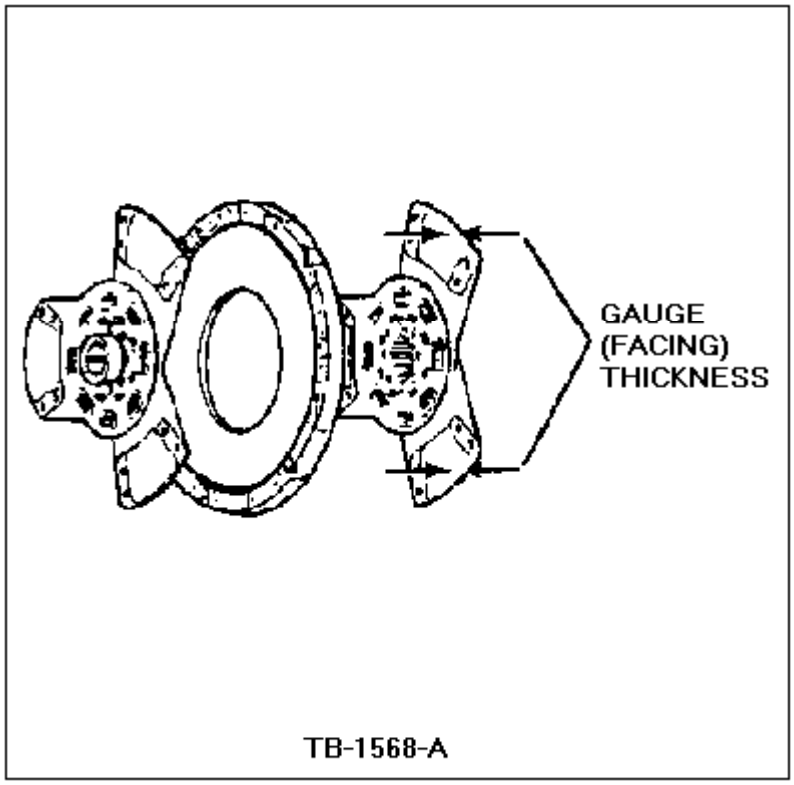


Figure 9 - Article 90-5-17

b. If the thickness varies by more than .008" (.203mm) on the facing surface, replace the disc.

NOTE:
THE FRONT AND REAR DISC MAY HAVE DIFFERENT THICKNESSES.

4. Check the driven disc hub spline for burrs or uneven wear. If either is evident, replace the disc.

5. Check the flywheel surface. Check for...

- Concavity
- Convexity
- Runout
- Allowable grind for a re-ground flywheel

Refer to the appropriate Medium/Heavy Truck Shop Manual, Section 16-02 for inspection and checking procedures. The engine manufacturer has specification on these measurements and their recommendations should be followed.

6. Check the pilot bearing. If the bearing is rough, replace it.

TWO-DISC CLUTCH WITH POSITIVE SEPARATOR 14-2 APPLICATIONS

1. When reinstalling the intermediate plate assembly, be sure that the four (4) separator pins are flush with the cast surface of the intermediate plate lug, Figure 10.

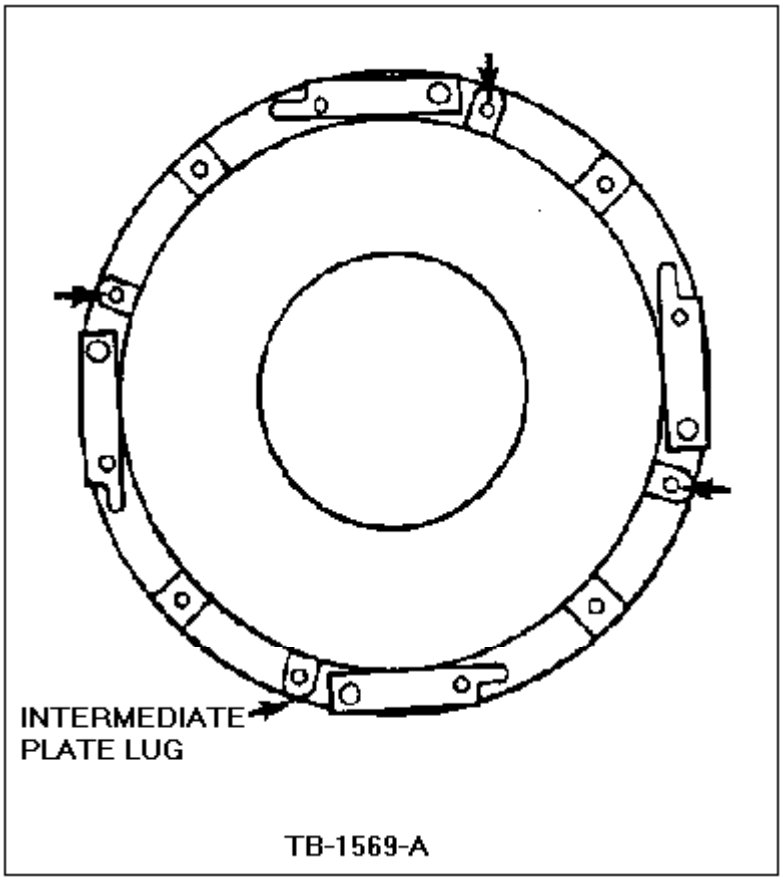


Figure 10 - Article 90-5-17

2. Install the intermediate plate assembly as shown in Figure 10 with the drive straps toward the pressure plate.

OTHER APPLICABLE ARTICLES:

89-7-14

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 5550, 5800

90-6, ***Publication Date: MARCH 14,1990***

• **Air Conditioning - Compressor - Drive Belt Rolls Off - 6.6L And 7.8L Ford Diesel Engine** • **Air Conditioning - Compressor - Pulley Misaligned - 6.6L and 7.8L Ford Diesel Engine**	**Article No. 90-6-16**

MEDIUM/HEAVY TRUCK:
1989-90 F & B SERIES, L SERIES

This TSB article is being republished in its entirety to correct the Motorcraft drive belt prefix. The correct prefix for the 15/32" wide belt is "JB".

ISSUE:
An air conditioner compressor drive belt that rolls off the compressor pulley may be caused by misaligned crankshaft and idler pulleys. This may be caused by an incorrectly installed adjustment block on the adjustment rod of the compressor mount.

ACTION:
Install the A/C compressor adjustment block in the proper position. The offset hole in the adjustment block must be toward the front of the truck as shown in Figure 1.

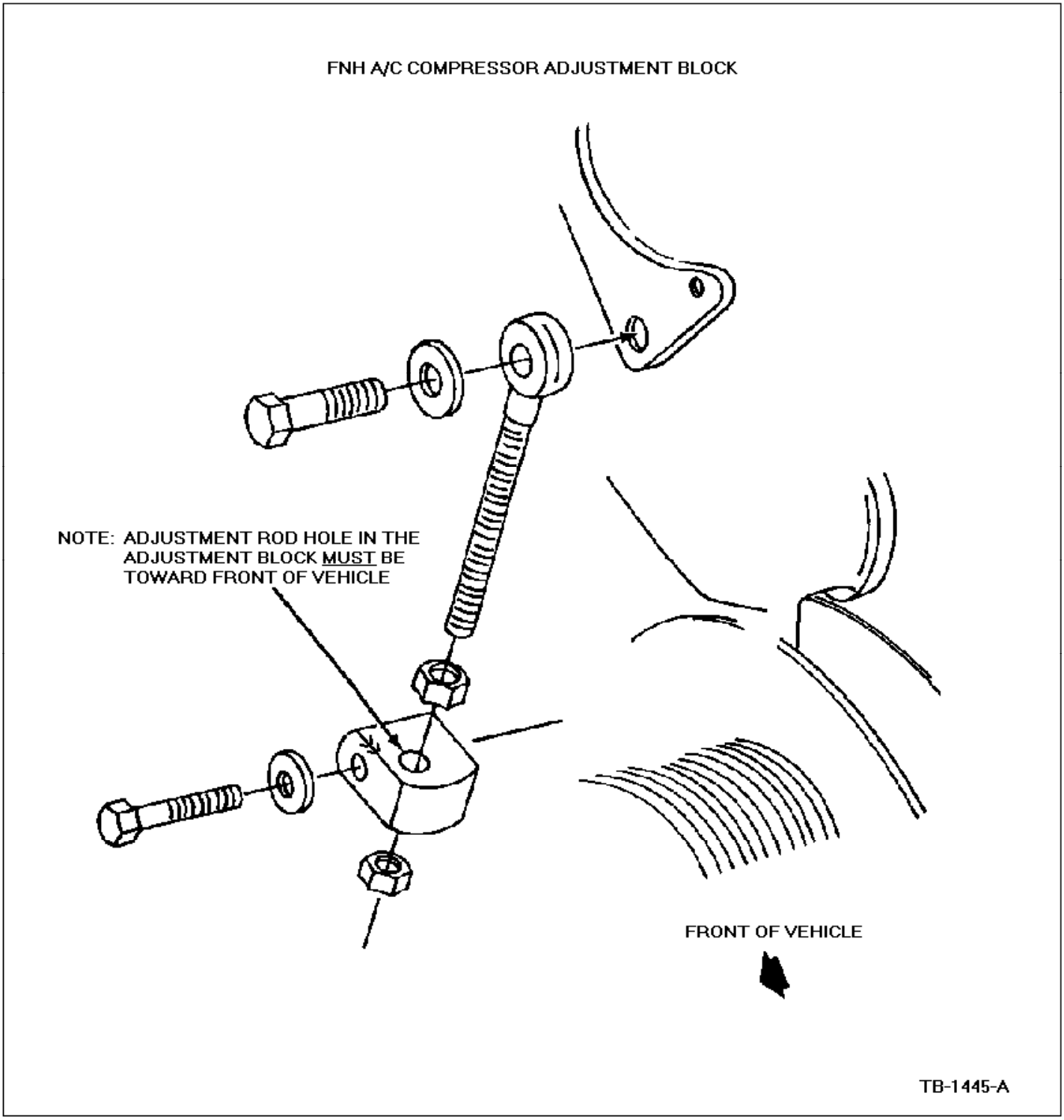


Figure 1 - Article 90-6-16

NOTE:
REPLACEMENT COMPRESSOR DRIVE BELTS MUST BE 15/32 INCHES WIDE.

In the "Motorcraft" belt line, the 15/32 inch wide belts are designated by the prefix "JB" in the belt part number.

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 90-2-12

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 2610

Exhaust - Caterpillar 3306 - Heat Shield-Muffler Inlet Pipe Clamp Cracked Or Broken	Article No. 90-6-17

MEDIUM/HEAVY TRUCK:
1989 L SERIES

ISSUE:
The clamp attaching the exhaust heat shield to the muffler inlet pipe may crack or break at the spot welds because of the weakness of its stainless steel weld joints.

ACTION:
Install new clamps made of zinc coated, low carbon steel which are more durable and a new heat shield, Figure 1. Tighten clamps to 85-115 lb-in (10-13 N-m).

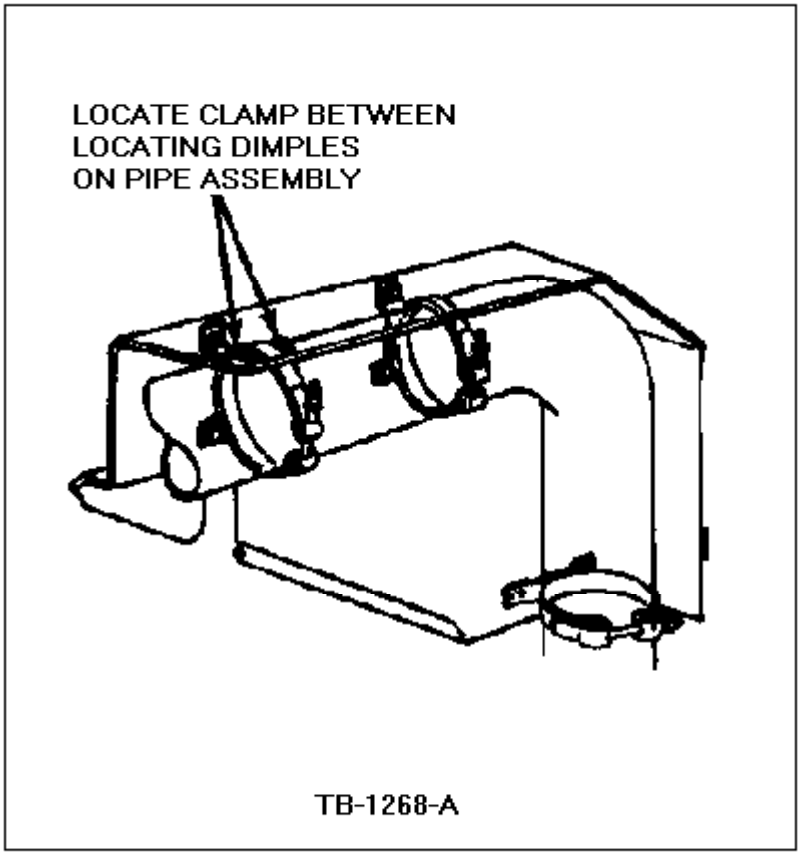


Figure 1 - Article 90-6-17

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 4600

90-7, ***Publication Date: March 28, 1990***

• **Engine - 6.6L And 7.8L Ford Diesel With Approved Luber-Finer - Oil Change Interval Extended** • **Oil System - 6.6L And 7.8L Ford Diesel Engine With Approved Luber-Finer - Oil Change Interval Extended**	**Article No. 90-7-22**

MEDIUM/HEAVY TRUCK:
1986-90 CARGO SERIES
1987-90 F & B SERIES, L SERIES

ISSUE:
The normal engine oil change interval for Ford Diesel Engines equipped with approved Luber-finer oil filter installations is extended to 12,000 miles. Also, in cases of "Severe Service" applications the mileage interval when using the Luber-finer is correspondingly double that shown as the normal service interval. The 1991 Owner Guides will reflect these changes.

ACTION:
No corrective action is required.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4100

90-7, ***Publication Date: March 28, 1990***

Cooling System - Hose Clamps - Torque Specification Change	Article No. 90-7-23

MEDIUM/HEAVY TRUCK:
1990 ALL MEDIUM/HEAVY TRUCK LINES

ISSUE:
The new torque specification applied to cooling system clamps with a diameter of 2 1/2" (63.5 mm) or larger has been standardized to 120-150 lb-in (14-17 N-m) to reduce cooling system leaks.

ACTION:
Tighten cooling system clamps to the new torque specification to reduce cooling system leaks.

NOTE:
F-SERIES TRUCKS WITH GAS ENGINES AND WITH FRONT POWER TAKE-OFF OPTIONS WILL CONTINUE TO USE THE OLD TORQUE SPECS AS LISTED IN THE CURRENT SHOP MANUALS.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4300

Cooling System - 6.6L And 7.8L Ford Diesel Engines - Engine Coolant Filter - Service Tips	**Article No. 90-7-24**

MEDIUM/HEAVY TRUCK:
1987-90 CARGO SERIES, F & B SERIES, L SERIES

ISSUE:
Incorrect coolant flow in the engine coolant filter may be caused by dirt in the filter's adapter and/or fittings.

ACTION:
When servicing the engine coolant filter, check the coolant flow to and from the coolant filter adapter. Use the following service procedure.

1. Remove the coolant filter.

2. Place a drain pan beneath the adapter as shown in Figure 1.

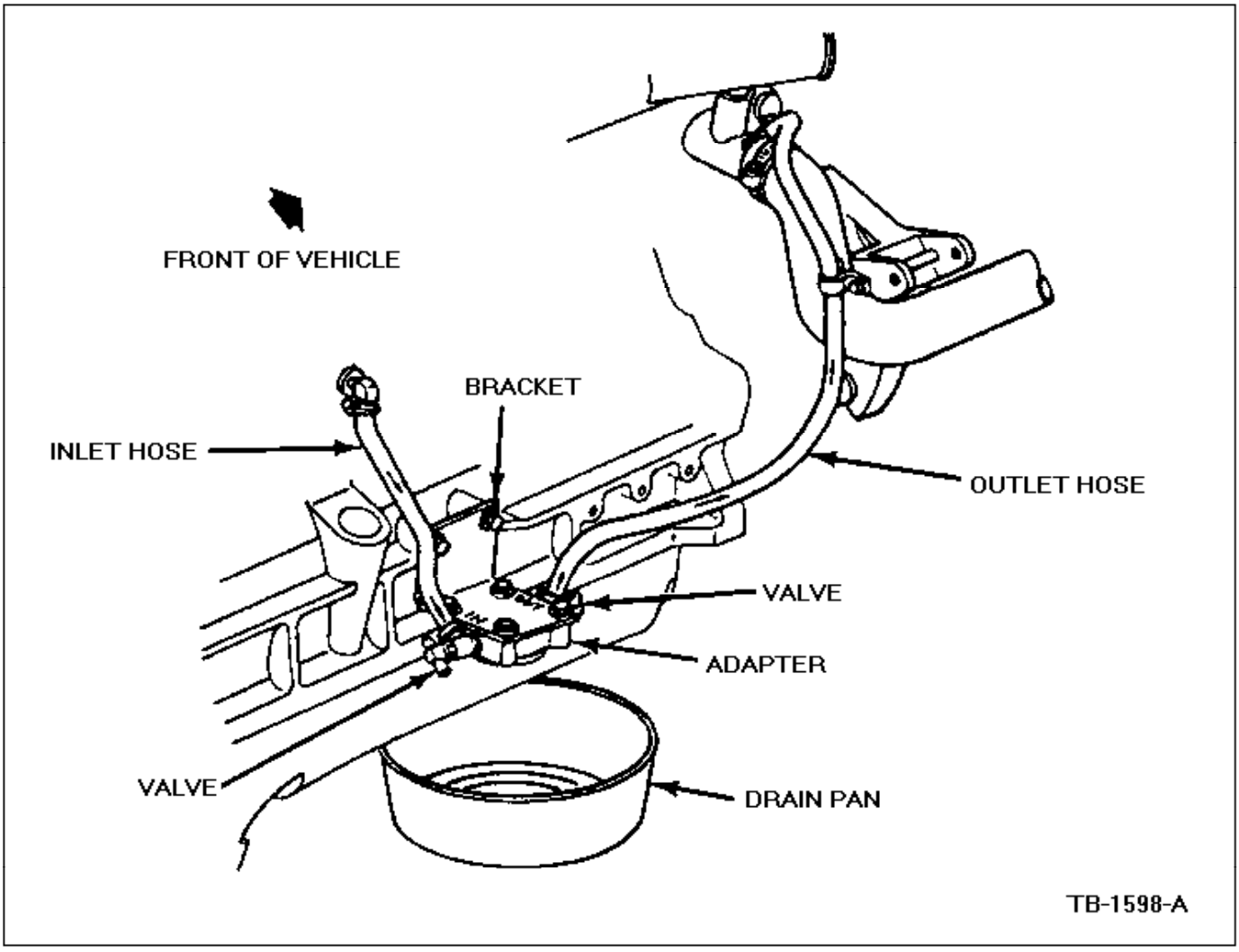


Figure 1 - Article 90-7-24

3. Operate the inlet and outlet valves.
4. Watch the coolant flow from the inlet and outlet orifices of the adapter.
5. If coolant does not flow freely from the orifices, clean the filter adapter and fittings.
6. Replace the coolant into the cooling system after the new coolant filter has been installed.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4300, 4301

90-8, ***Publication Date: APRIL 11, 1990***

• **Brakes - Hydraulic - Rubber Brake Hoses Are Wet From Sweating** • **Brakes - Hydraulic - Rubber Hoses - Fluid Leak Testing Procedure**	**Article No. 90-8-19**

MEDIUM/HEAVY TRUCK:
1990 and prior ALL MEDIUM/HEAVY TRUCK LINES

This TSB article is being republished in its entirety to expand the model year coverage.

ISSUE:
The wet appearance of the outer cover of rubber brake hoses is called "sweating". This is a normal condition for neoprene rayon braid hose. The "sweating" condition is not evidence of a brake fluid leak and will not result in a loss of pressure in the system.

ACTION:
No action is required for a normal "sweating" brake hose. However,to test for a hydraulic fluid leak, proceed as follows:

1. Check the brake fluid level in the master cylinder. If necessary, add brake fluid.
2. Wipe off the hose(s) in question with a clean cloth and an all purpose cleaner, then dry.
3. With the engine running, fully depress the brake twice and hold for two (2) minutes.
    - If the pedal goes down, check all of the connections for leaks and repair as required.
    - If the pedal goes down and no visible leaks are seen, then the master cylinder is leaking internally and must be replaced. Refer to the appropriate Medium/Heavy Truck Shop Manual, Section 12 for service details.

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 83-17-16

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 3050

90-8, ***Publication Date: APRIL 11, 1990***

Cooling System - 6.6L And 7.8L Ford Diesel And Caterpillar 3306, 3406 And 3176 Diesel Engines - Availability Of New "Modine" Charge Air Coolers	Article No. 90-8-20

MEDIUM/HEAVY TRUCK:
1987-90 L SERIES

ISSUE:
New "Modine" charge air coolers with improved durability are now available for service. The affected trucks are equipped with AD-TECH radiators.

ACTION:
No corrective action is required. Refer to the following "Modine" Charge Air Cooler Application Chart for correct parts usage.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 4700

Transmission - Eaton/Fuller Twin-Countershaft Models - Shipping Seal Removal	**Article No. 90-8-21**

MEDIUM/HEAVY TRUCK:
1989-90 C SERIES, CARGO SERIES, CL-CLT-9000 SERIES, F-700, F-7000, F-800, F-8000, FT-800, FT-8000, FT-900, L SERIES

ISSUE:
A shipping seal was added to transmissions built after early 1989. It was placed between the input shaft and the front cover of the twin-countershaft transmissions to eliminate oil leakage during shipment. It is not required for operation of the transmission. The shipping seal is not a serviceable item.

ACTION:
Remove the shipping seal before installing the transmission, Figure 1. There is no need to install a replacement because the transmission continues to be sealed during operation by the spiral cut grooves on the input shaft.

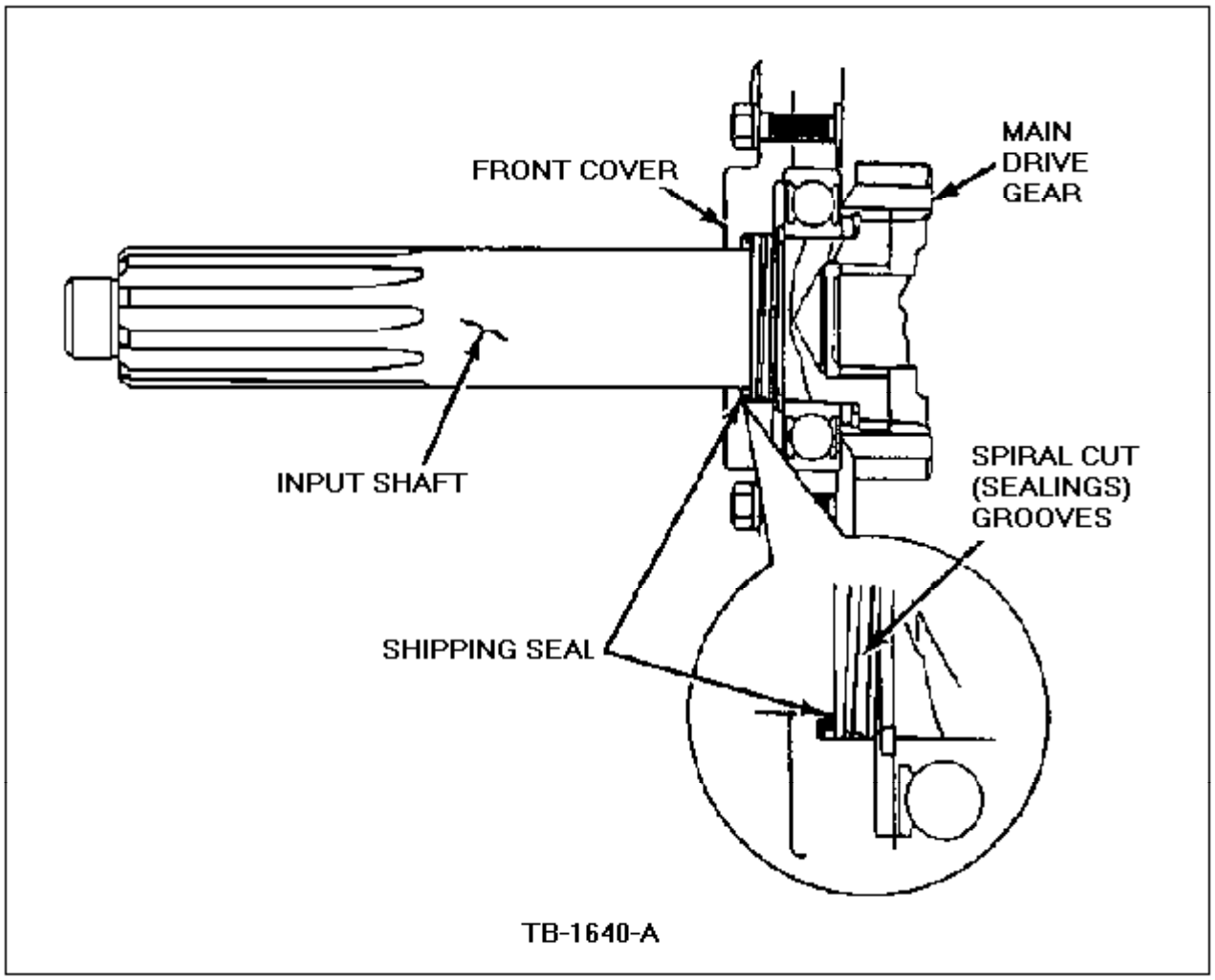


Figure 1 - Article 90-8-21

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 5800

Radiator - 6.6L And 7.8L Diesel Engine - Upper Hose Ruptures At Support Bracket	Article No. 90-9-10

MEDIUM/HEAVY TRUCK:
1987-89 L SERIES

ISSUE:
The upper radiator hose may rupture if it contacts a broken or failed support bracket.

ACTION:
Install a new design upper radiator support bracket that has a bolt and nut on the hook end of the bracket for better hose support. Refer to the following procedure for service details.

SERVICE PROCEDURE

1. Remove the old upper radiator support bracket, Figure 1. Save the existing bolt for securing the new bracket.

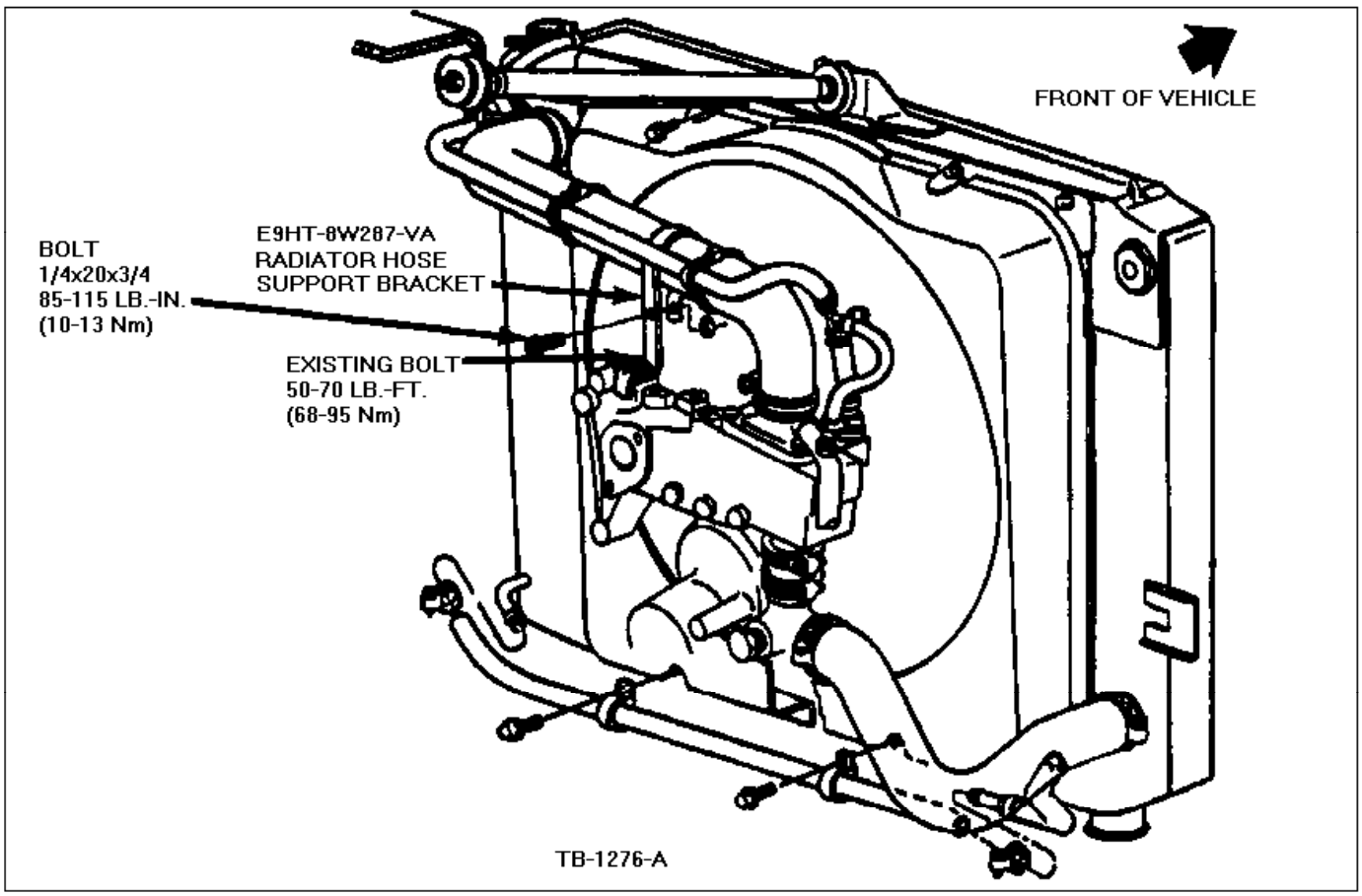


Figure 1 - Article 90-9-10

2. Examine the upper radiator hose. If it is worn, torn or chafed, replace it.

3. Install the new-design upper radiator support bracket, Figure 1.

   a. Place the hook end of the bracket around the hose.

   b. Insert the 1/4 x 20 x 3/4" bolt through the holes in the bracket and attach the nut. Hand tighten.

   c. Attach the lower end of bracket to the engine with the washer and bolt removed in Step #1. Tighten the bolt to 50-70 lb.ft. (68-95 N-m).

      NOTE:
      IF THE ORIGINAL BOLT IS BENT, DAMAGED OR SUSPECTED OF FATIGUE, REPLACE IT WITH A NEW BOLT.

   d. Tighten the hook end bolt to 85-115 lb.in. (10-13 N-m).

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 4300, 4301

• **Ride - NVH - Use Of 90 Degree Phased Driveshafts - Service Tips** • **Driveline - Application of 90 Degree Phased Driveshafts - Vehicles With Two Piece Drivelines - Service Tips**	**Article No. 90-9-11**

MEDIUM/HEAVY TRUCK:
1989-90 F-600, F-700, FT-900, L-SERIES

ISSUE:
Some Ford heavy trucks are designed with "out-of-phase" 90° two (2) piece driveshafts, Figure 1. The primary reason for using the 90° phased driveshafts is to meet higher torsional acceleration demands of these vehicles.

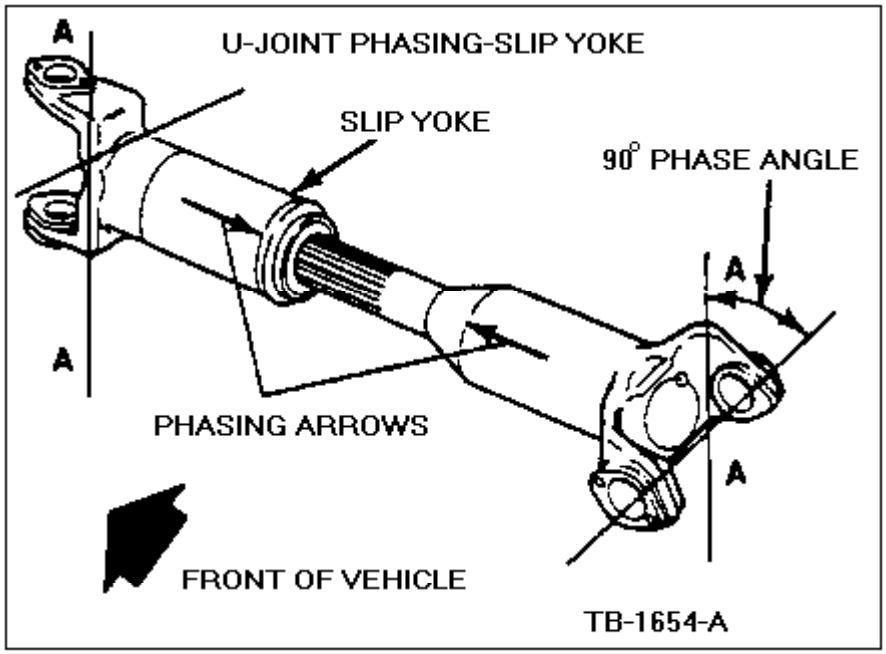


Figure 1 - Article 90-9-11

When U-joint yokes are assembled to their shafts in the same plane, they are "in phase"; when they are assembled to the shafts in different planes, they are "out-of-phase". Except as noted in TSB 88-24-10, most production drivelines use "in-phase" driveshafts with parallel yokes, Figure 2, for most applications to simplify driveline design, assembly and service.

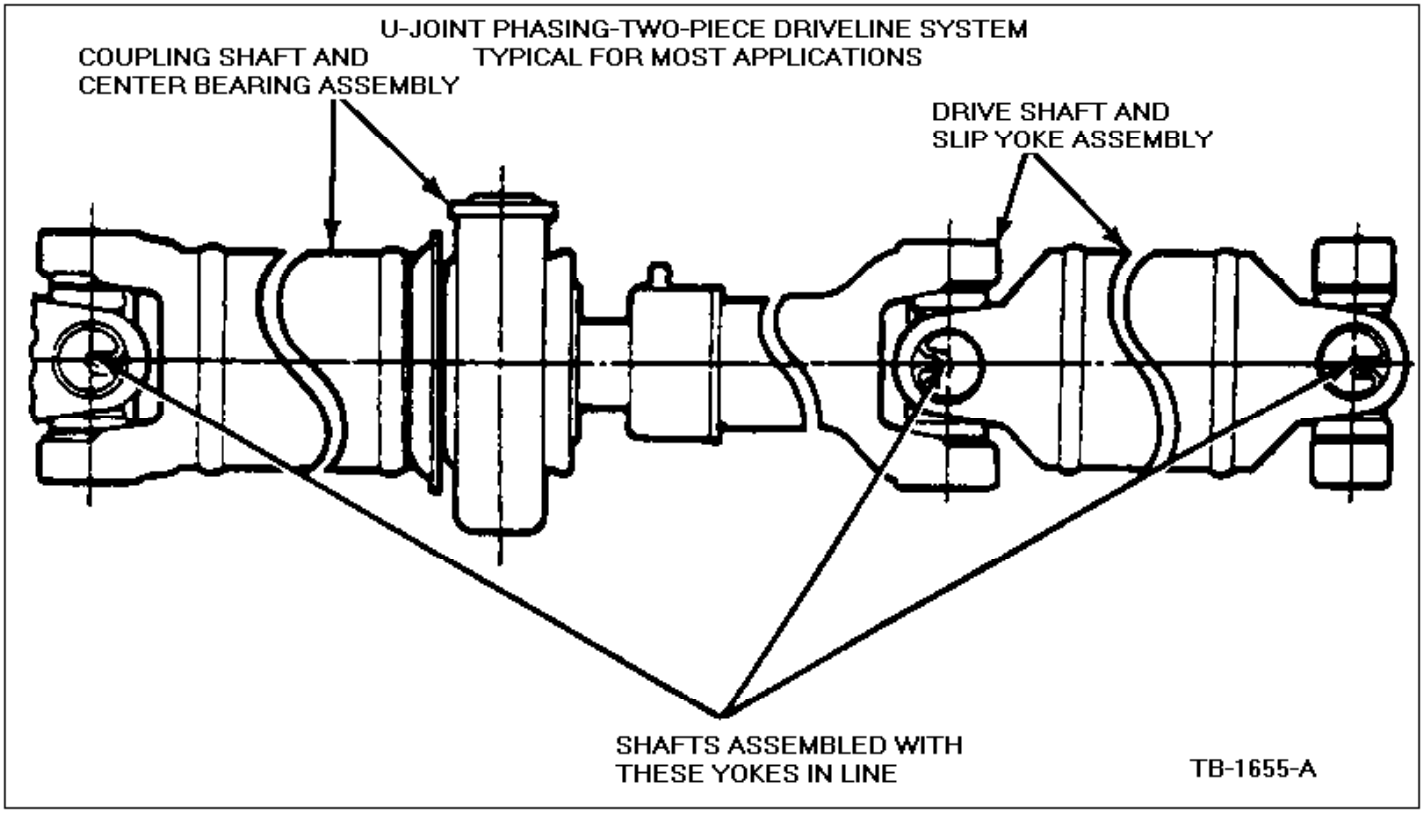


Figure 2 - Article 90-9-11

The only affected 1989/90 F/L- Series trucks with the two (2) piece drivelines are shown below.

- F-600/700 Low Profile trucks with a Ford Diesel engine
- FT-900 trucks
- LT/LNT/LTS/LTA/LTL-9000 trucks with E4 suspension
- LT/LNT/LTS/LTA/LTL-8000/9000 trucks with HA suspension

NOTE:
ONE, THREE, AND FOUR-PIECE DRIVELINES WILL CONTINUE TO HAVE PARALLEL YOKE CONSTRUCTION. ON A TWO-PIECE DRIVESHAFT, EITHER THE COUPLINGSHAFT OR THE DRIVESHAFT MAY HAVE THE 90° YOKE PHASING, BUT NOT BOTH SHAFTS IN THE SAME VEHICLE. SEE TSB 88-24-10 FOR 1987-88 APPLICATIONS.

ACTION:
If driveline service is required, make sure that the original yoke phasing stays the same to minimize driveline NVH. Improperly phased driveshafts are certain to induce ride NVH concerns.

Use one of the following methods to make sure of the correct yoke phasing.

- Align the main driveshaft U-joint phasing-slip yoke arrows as shown in Figure 1.
- Make sure the replacement part has the same supplier's part number as the original. This part number is shown on the blue and white plastic label of the shaft.
- Cross-reference the affected Ford Engineering part numbers (shown on the same shaft label and included on the production broadcast sheet provided with each vehicle) with the supplier's part numbers, yoke sizes and truck applications.

OTHER APPLICABLE ARTICLES:

88-24-10

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 3200, 5950, 7210

90-10, ***Publication Date: May 9, 1990***

• **Suspension - Rear - "Neway" - Lean, Poor Ride, Driveline Vibration** • **Suspension - Rear - "Neway" Ride Height Specifications And Adjustment Procedures**	**Article No. 90-10-12**

MEDIUM/HEAVY TRUCK:
1990 and Prior CL-CLT-9000 SERIES, L SERIES

This TSB article is being republished in its entirety to correct the mounting bracket part number for 1988 and newer trucks.

ISSUE:
New suspension service parts, ride height specifications and measurement procedures are available to service the "Neway" air suspension system. Improper ride height may result in...

- Vehicle lean
- Poor ride
- Driveline vibration
- Poor suspension component durability

ACTION:
Use the following service procedure to prepare a truck for a ride height measurement check.

SERVICE PROCEDURE

1. Make sure all of the suspension fasteners are tight. Especially check the "Neway" equalizer beam pivot, axle and transverse beam connections. Refer to the "Neway" Air Rear Suspension Torque Limits Chart below.

2. Check for air leaks. Make sure the truck is on a level surface and the secondary air brake pressure is at least 80 psi.

All "Neway" air springs should be of equal firmness and 12.7 " (323mm) high.

NOTE:
THE LH HEIGHT CONTROL VALVE CONTROLS THE LH AIR SPRINGS AND THE RH HEIGHT CONTROL VALVE CONTROLS THE RH AIR SPRINGS.

3. If the truck is equipped with an air suspension dump valve, cycle the dump valve once with the truck engine running and repeat Step #2.

4. Measure the ride height at the rear/rear axle on both sides of the truck.

The distance from the center line of the rear/rear axle to the bottom surface of the lower frame flange should be 9.75 " (248mm) to 10.25 " (260mm).

If measured from the top leading edge of the rear/rear axle housing to the frame, the dimension should be 6.85 " (174mm) to 7.35 " (187mm).

5. Adjust the height control valve(s) if one of the following conditions exists. Refer to the appropriate L Series or CL Series Shop Manual, Section 14, for adjustment procedure.

- Ride height varies by more than 0.5 " (13mm) side to side.
- Ride height on either side is less than 9.75 " (248mm) or greater than 10.25 " (260mm). This would be 6.85 " (174mm) and 7.35 " (187mm) respectively if measured from the top surface/leading edge of the rear/rear axle housing to the frame.

Component design changes have been made to improve Kentucky Truck Plant's capability to control ride height adjustment. These improvements have also been made to the service parts.

NOTE:
REPLACEMENT OF THE VALVE AND LINK ASSEMBLIES IS NOT REQUIRED UNLESS THERE IS DAMAGE TO THESE COMPONENTS. THE ADJUSTMENT PROCEDURE WILL NORMALLY CORRECT ANY RIDE HEIGHT ISSUES.

The link attaching bolt torque has been revised for the E8HZ-5A712-B/C/D valve and E8HZ-5A690-B/C/D link assembly. It is now 4-5 lb.ft. (5-7 N-m), Figure 1. All earlier models use 9-14 lb.in. The reason for the change is to assure that each end of the vertical link is free to pivot.

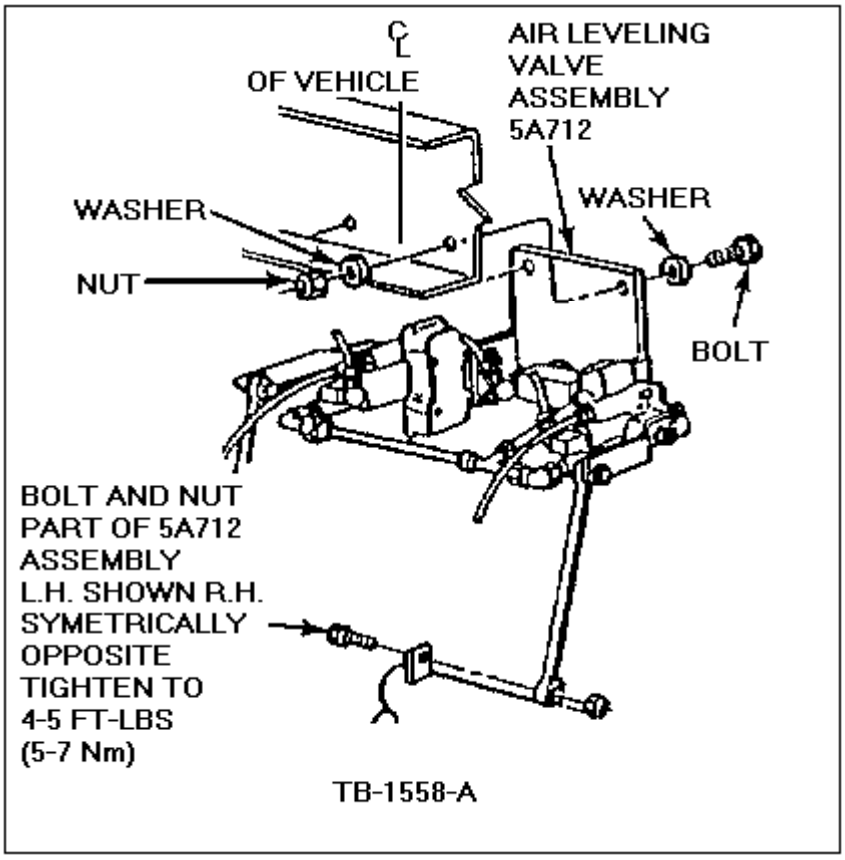


Figure 1 - Article 90-10-12

If a concern occurs with a vehicle built before 5/31/88, the link assembly should be inspected. In most cases the rod ends will show no damage. The rod end attaching bolts need only be loosened until they pivot freely and then retorqued to the correct value. However, if the rubber end has been punctured by the rod because it was clamped too tightly, replace the rod assembly with the appropriate new assembly (E8HZ-5A690-B/C/D) and tighten to 4-5 lb.ft. (5-7 N-m).

Neway air leveling valve assembly individual component service parts are listed below in the Components Service Parts Chart.

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 90-7-21

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 3200, 7210

90-11, ***Publication Date: May 23, 1990***

Steering - Power - Crank Shaft Pulley Belts - Improved Serviceability - Vehicles With 6.6L & 7.8L Ford Diesel Engines And 16K Front Axles	**Article No. 90-11-13**

MEDIUM/HEAVY TRUCK:
1989 L-8000

ISSUE:
A new design power steering cooler and right hand mounting bracket are available. The new cooler and bracket will improve serviceability for crank shaft pulley belts. Presently, it is necessary to remove the power steering cooler or bend it out of the way to service the belts.

ACTION:
If crank shaft pulley belts require replacement, install a new design power steering cooler (FOHZ-3D746-A) and mounting bracket. Refer to the following procedure for service details.

1. Remove the power steering cooler.

2. Remove old belts.

3. Install and adjust new belts as required.

4. Install a new power steering cooler assembly (FOHZ-3D746-D). The new cooler does not have fins on the right hand mounting bracket side, Figure 1.

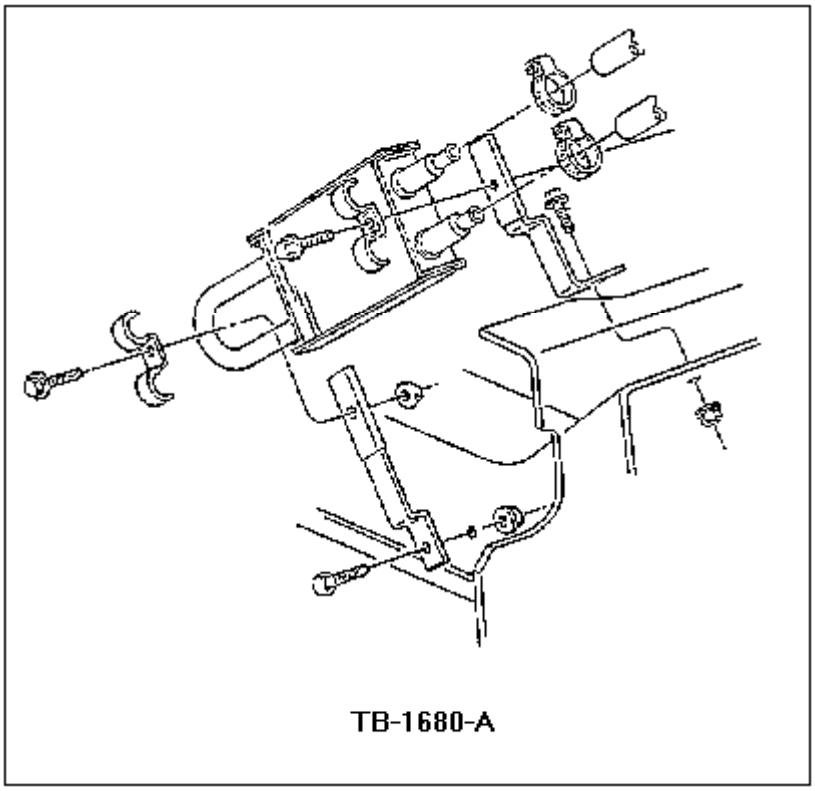


Figure 1 - Article 90-11-13

5. Re-install the old left hand mounting bracket (E8HZ-3D744-A).
6. Install a new right hand mounting bracket (FOHZ-3D744-A).
7. Tighten the four (4) mounting bracket bolts to 12-17 lb.ft. (16-23 N-m).

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 3100

• **Instruments and Accessories - Erratic Operation - Service Tips** • **Wiring - Loose Grounds - Erratic Operation Of Instruments And Accessories - Service Tips**	**Article No. 90-12-14**

MEDIUM/HEAVY TRUCK:
1990 and prior C SERIES, CL-CLT-9000 SERIES, F & B SERIES, L SERIES
1986-90 CARGO SERIES

ISSUE:
Sometimes, electrical instruments and accessories may operate erratically or not at all when they are first turned on because of poor grounds. Flickering lights and other electrical concerns are often caused by a poorly grounded wiring harness or a self-grounding relay that has a loose mounting screw.

ACTION:
Inspect for poor electrical grounds by using the following checklist.

SERVICE PROCEDURE

1. Use the vehicle wiring diagrams to determine the location of the various ground connections that pertain to the effected circuits. For example, a loose ground wire such as that shown in Figure 1, can cause the heater blower to seek ground through the engine temperature gauge.

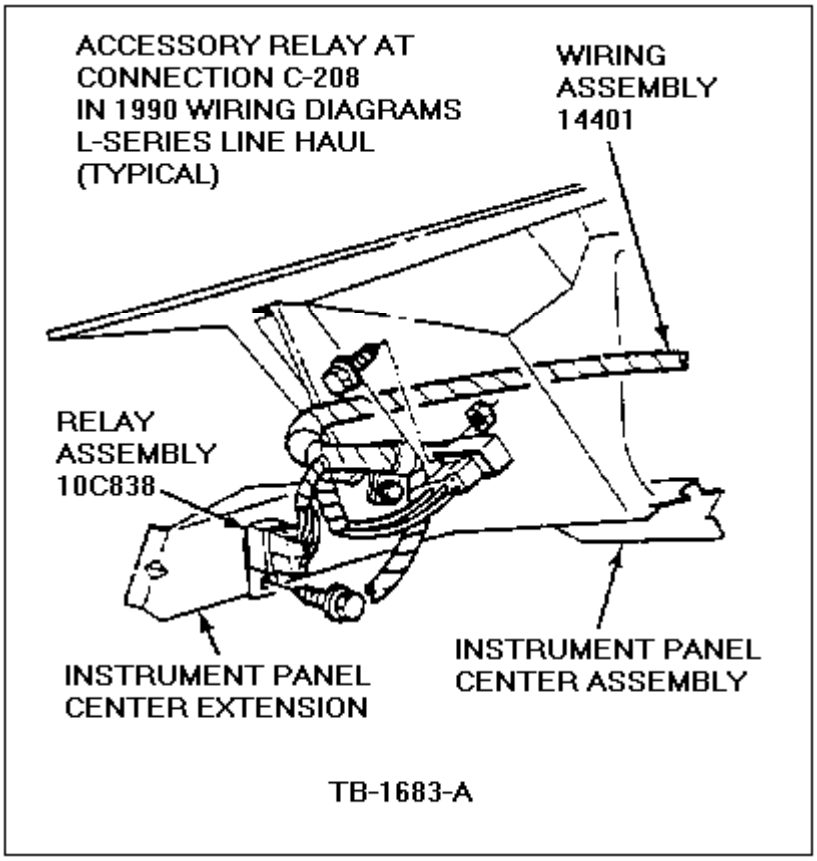


Figure 1 - Article 90-12-14

2. Look for self-grounding relays that may have loose mounting screws. This condition, shown in Figure 2, can cause flickering lights and an erratic performing/inoperative radio or blower.

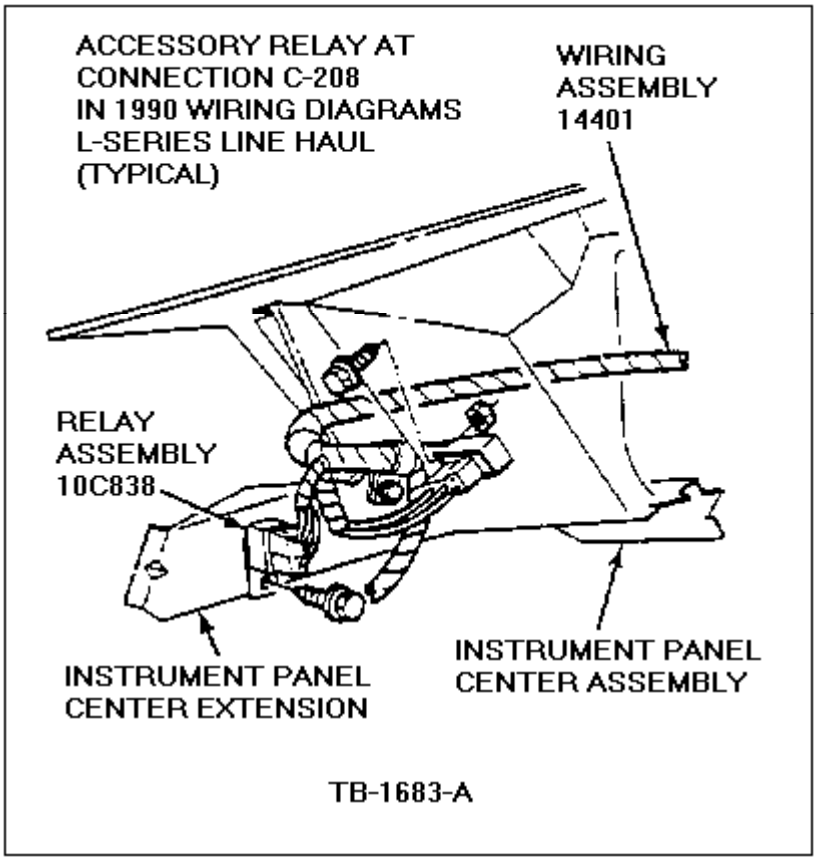


Figure 2 - Article 90-12-14

3. Check ground eyelets that connect to the brake pedal and instrument panel braces to be certain that they are securely fastened.

4. Check ground cables connecting the cab to the frame or the frame to the engine to be sure they are secure.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 2100, 2200, 2300, 2310, 2400, 2500, 2700, 2770, 2900

90-12, ***Publication Date: JUNE 7, 1990***

• **Fan Belt - Cummins L10 - Short Life And Lacks Full Belt Tension - Vehicles Built From 1/22/90 To 4/26/90** • **Fan Clutch - Support Plates - Cummins L10 - Rework Procedure To Remove Raised Ford Logo - Vehicles From 1/22/90 To 4/26/90**	**Article No. 90-12-15**

MEDIUM/HEAVY TRUCK:
1990 L SERIES, LTL-9000

ISSUE:
Incorrect fan belt tension and short fan belt life may be caused by the inability to install the belt to full tension during the initial adjustment. This occurs because the pulley and bracket assembly hangs on the "raised" Ford logo and part number of the fan clutch support plate mounting surface.

ACTION:
Remove the "raised" Ford logo and part number from the mounting surface of the fan clutch support plate. Refer to the following procedure for service details.

SERVICE PROCEDURE

1. Remove the fan and fan clutch pulley & bracket assembly from the fan clutch support plate. Refer to the 1990 L-Series Shop Manual, Section 27-09 for removal information.

2. Grind away the "raised" Ford logo and part number from the mounting surface of the fan clutch support plate.

3. Re-install the fan and fan clutch pulley & bracket assembly onto the fan clutch support plate.

4. Re-tension the belts to 250 - 260 lbs. tension.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 4300, 4700

Clutch - Lubrication Of Linkage Pivot Points - Revised Maintenance Schedule	Article No. 90-12-16

MEDIUM/HEAVY TRUCK:
1990 and prior CL-CLT-9000 SERIES, F & B SERIES, L SERIES
1986-90 CARGO SERIES

ISSUE:
The maintenance schedule for lubricating the clutch linkage pivot points has been revised. The new schedule allows for more frequent lubrications to ensure proper operation of the clutch linkage.

ACTION:
Use the following Revised Lubrication Schedule For Normal Service Operation for determining the correct maintenance interval. Refer to Figures 1-6 to locate the lubrication points.

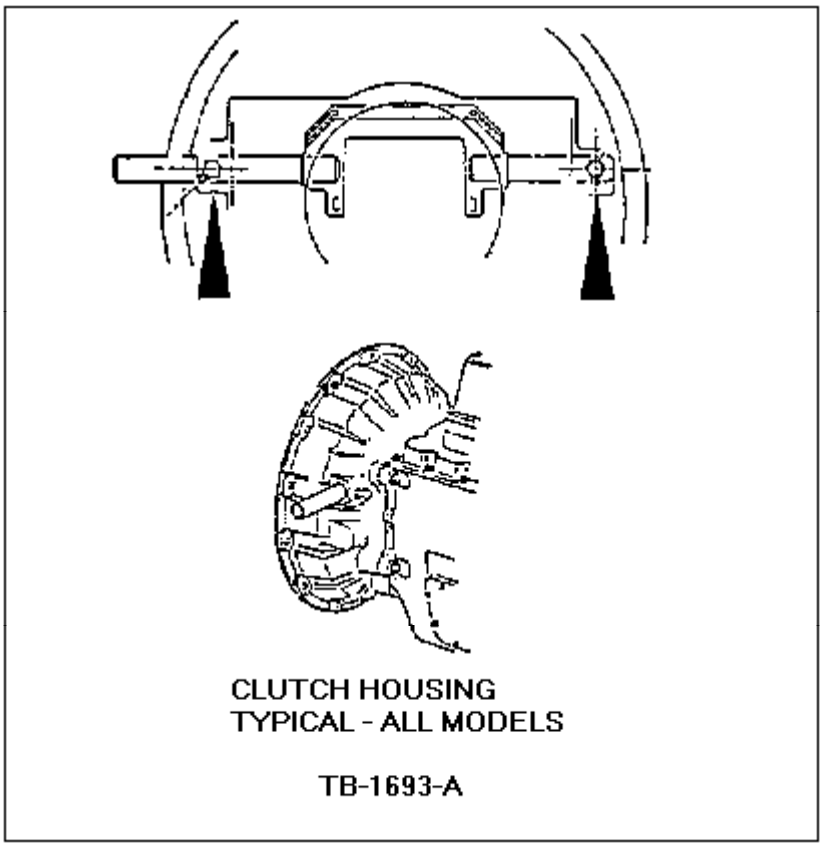


Figure 1 - Article 90-12-16

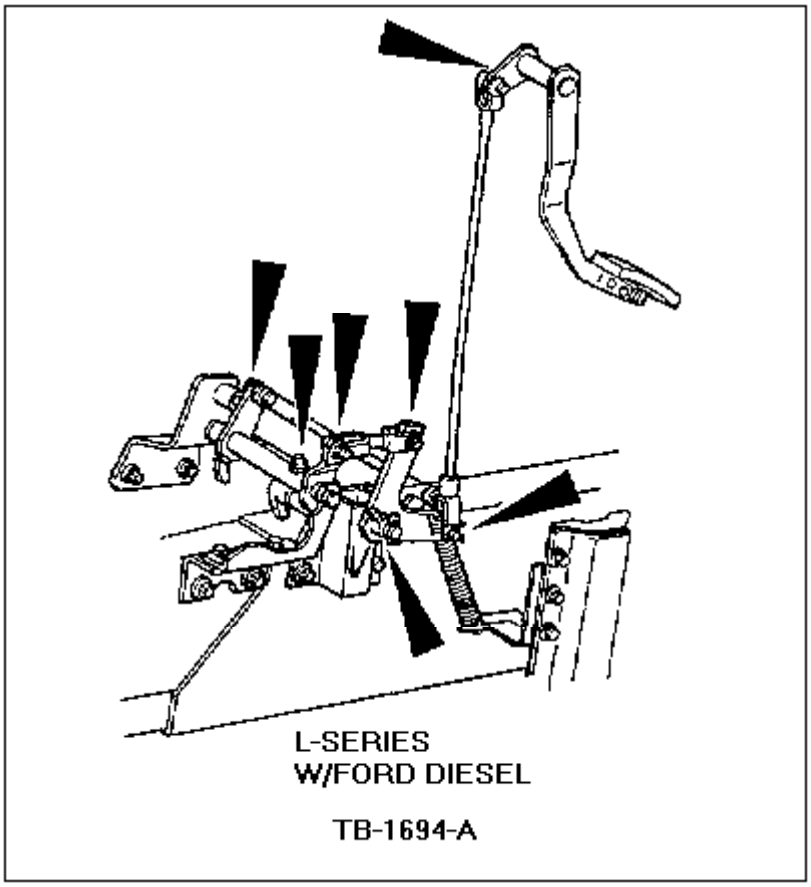


Figure 2 - Article 90-12-16

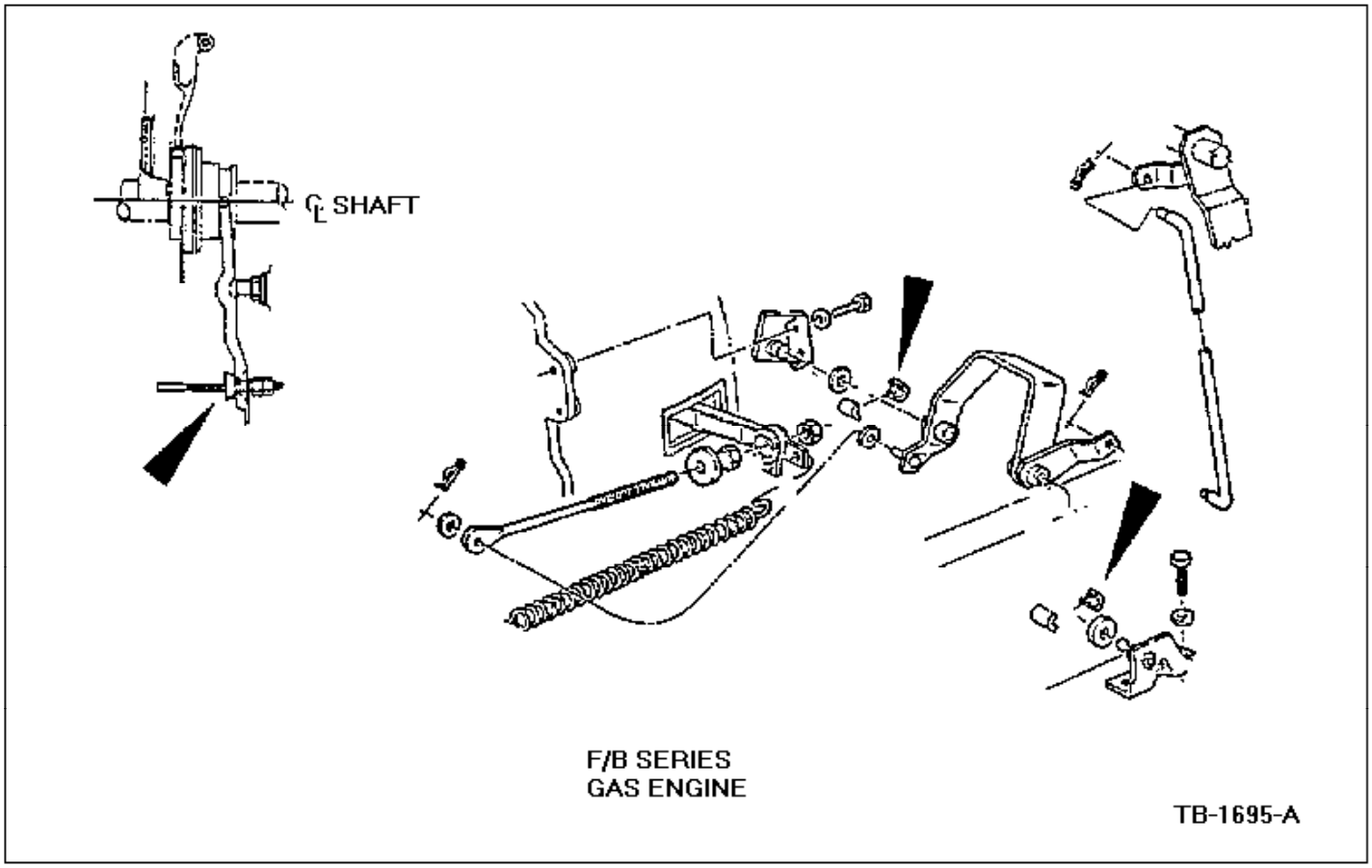


Figure 3 - Article 90-12-16

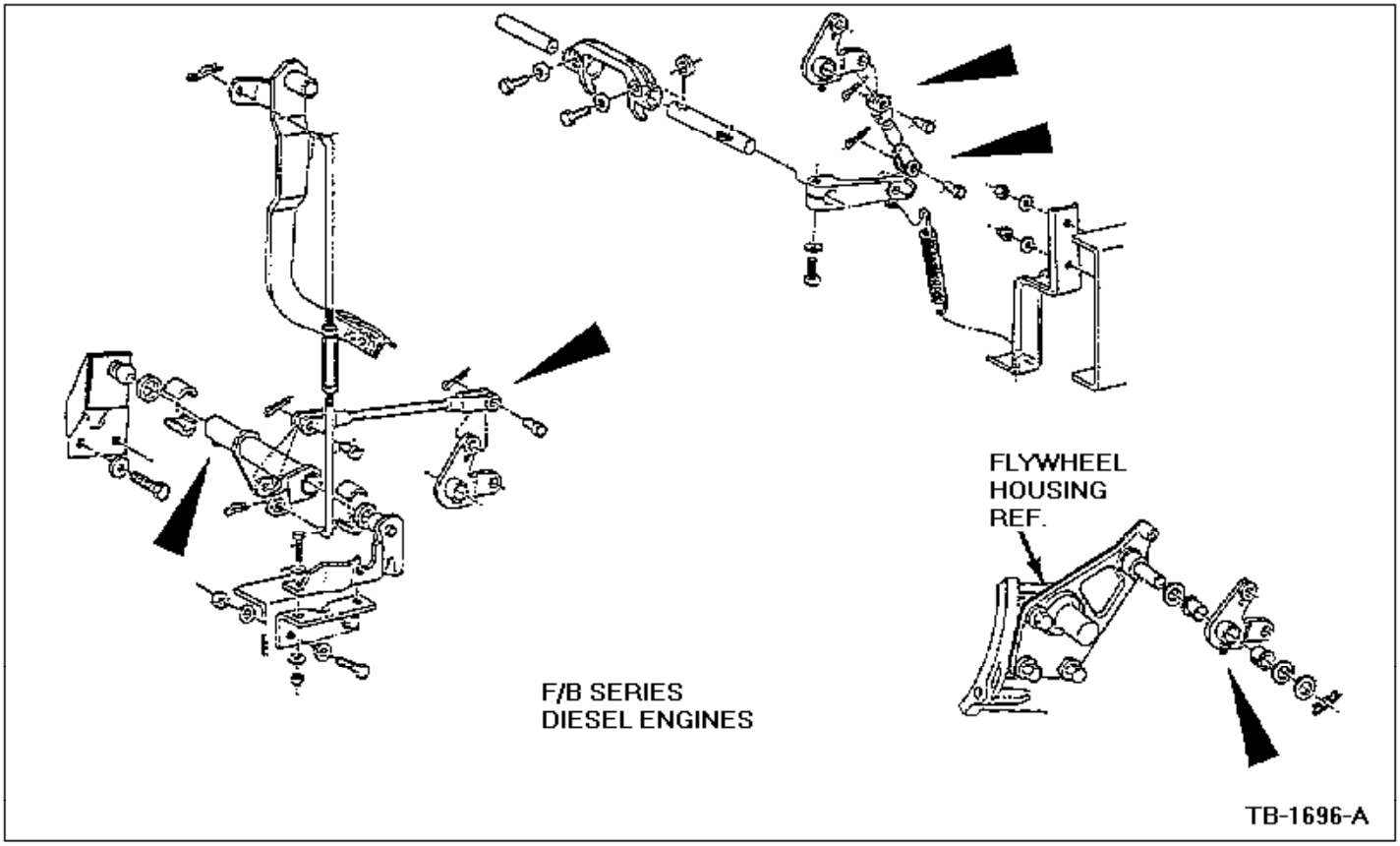


Figure 4 - Article 90-12-16

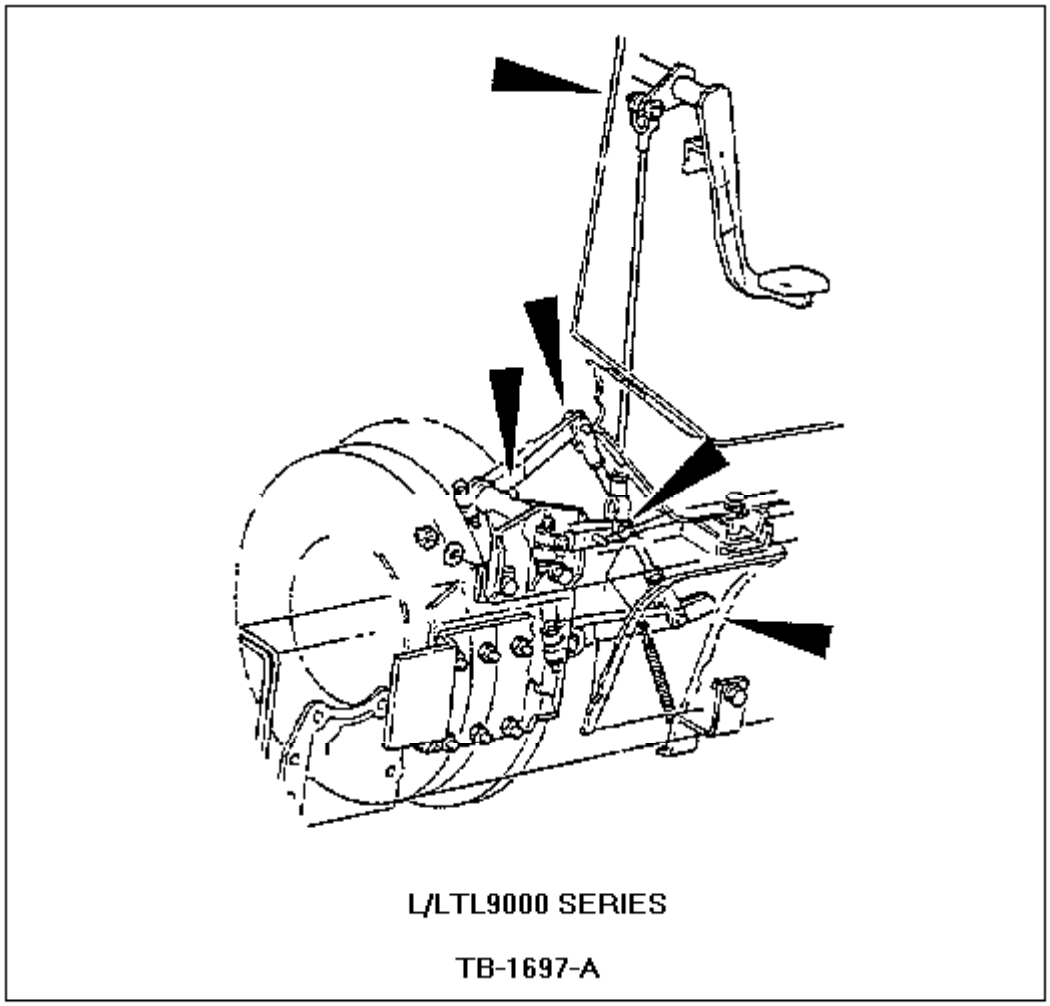


Figure 5 - Article 90-12-16

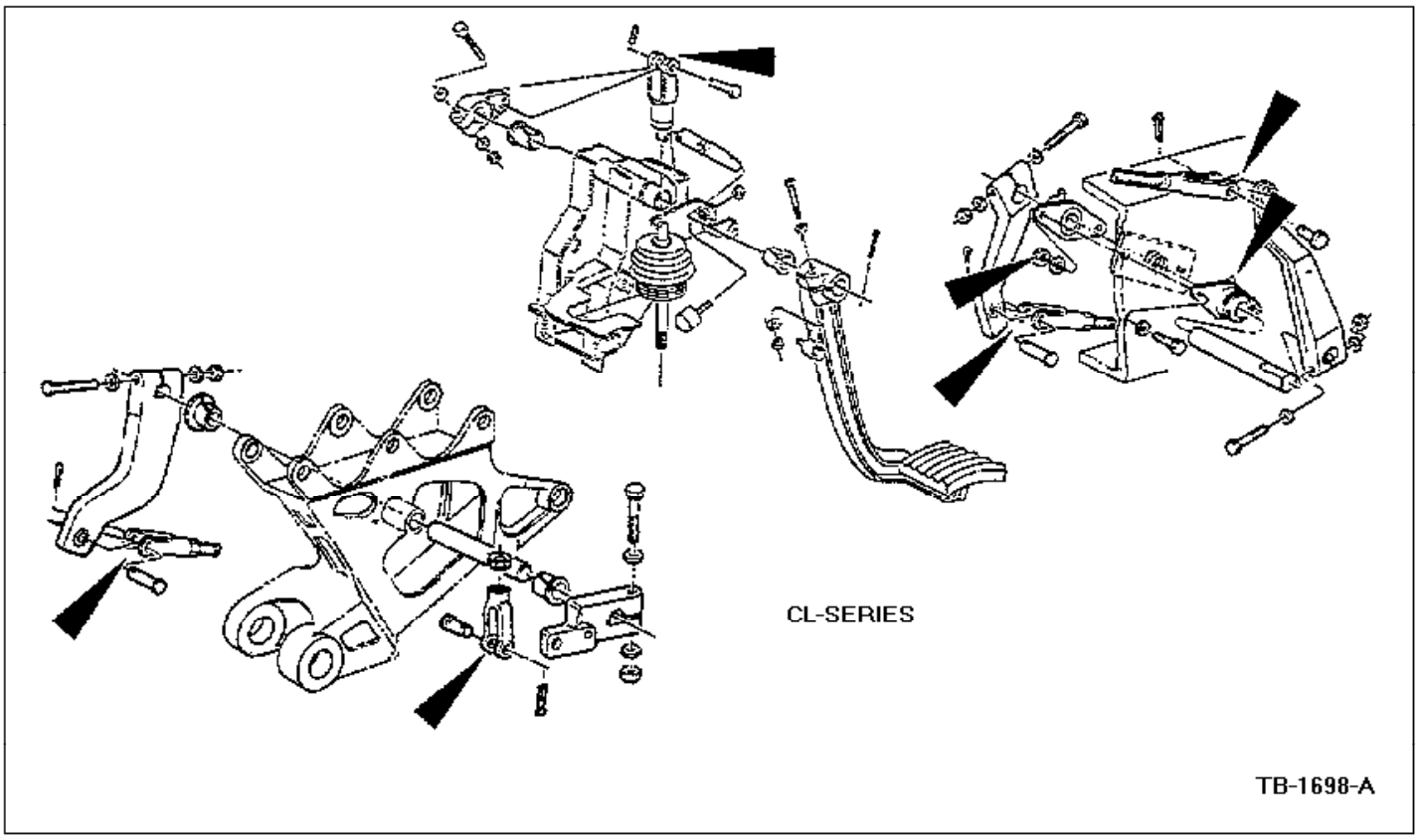


Figure 6 - Article 90-12-16

- For severe service operation, grease every month.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 5550

90-13, ***Publication Date: June 20, 1990***

Hinge - Door - New Greasable Service Assembly	**Article No. 90-13-12**

MEDIUM/HEAVY TRUCK:
1969-90 L SERIES

ISSUE:
A new greaseable door hinge is available for service. The new hinge can be used in place of an old hinge. However, the new hinge must be installed as an assembly.

ACTION:
No corrective action is required.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 1200, 1800

90-13, ***Publication Date: June 20, 1990***

• Hard Start - Slow Crank - 6.6L & 7.8L Ford Diesel Engines - Poor Ground • Battery - Frame Ground Cable Breaks • Wiring - 14398 Wiring Harness Damaged - Frame Ground Cable Broken	Article No. 90-13-13

MEDIUM/HEAVY TRUCK:
1986-90 CARGO SERIES

ISSUE:
The frame ground cable from the clutch housing to the right frame rail may break. This may cause damage to the wiring harness 14398 (connector to the alternator) because the engine cranking current will pass through the ground connection of the harness. It may also result in a hard start/slow crank condition.

ACTION:
Install a new braided frame ground cable from the clutch housing to the frame rail as shown in Figure 1. Examine wiring harness 14398 and repair as required.

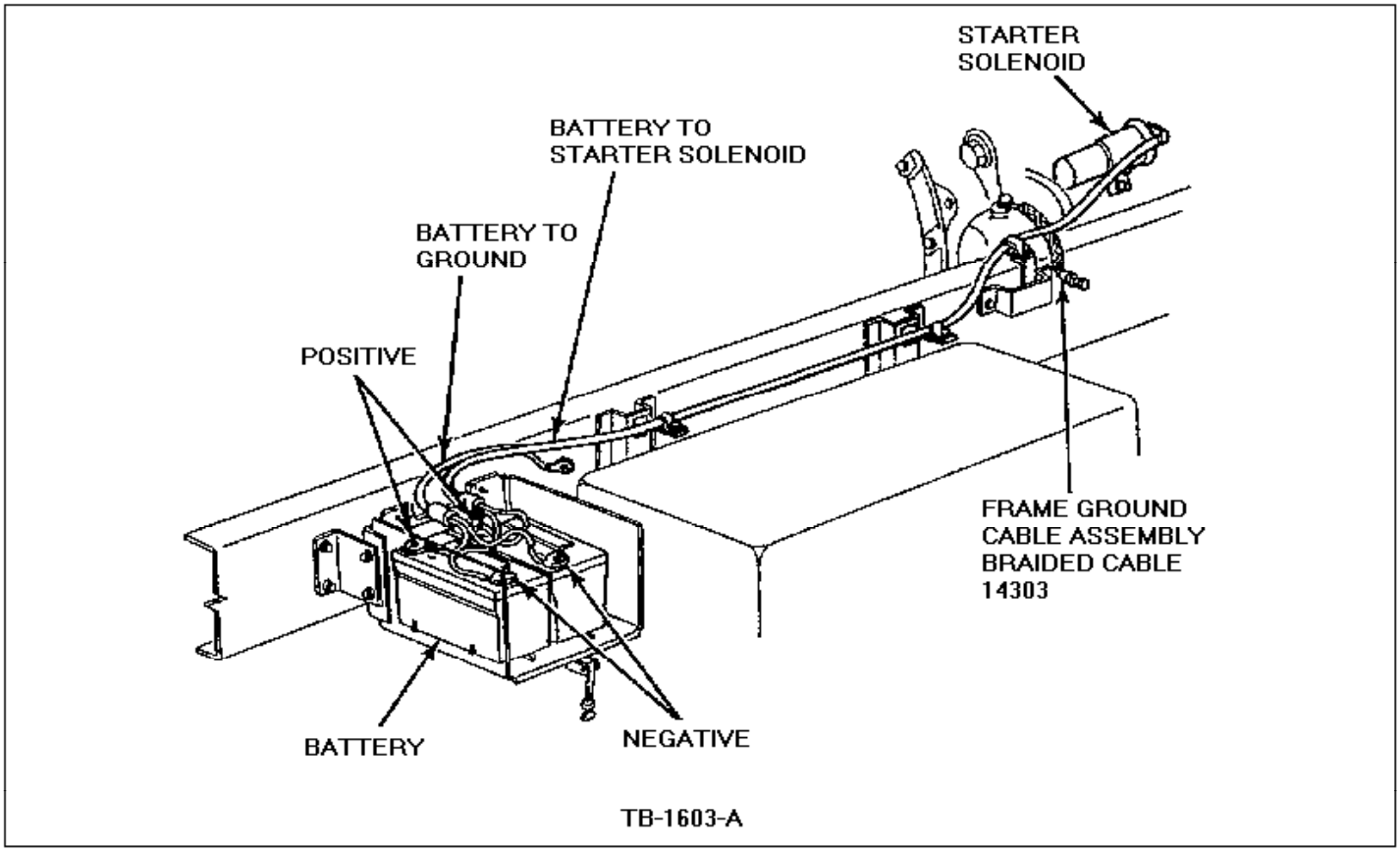


Figure 1 - Article 90-13-13

NOTE:
CONNECT THE GROUND CABLE TO THE INSIDE OF THE FRAME RAIL.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 2700, 2750, 2770, 610300

90-15, ***Publication Date: July 19, 1990***

• **Hood - Inner - Hit By Air Charge Cooler Duct - Trucks With Cat 3406B Built Between 2/14/90 And 5/1/90** • **Paint - Discoloration - Inner Hood Hit By Air Charge Cooler Duct - Trucks With Cat 3406B Built Between 2/14/90 And 5/1/90** • **Engine - Cat 3406B - Air Charge Cooler Duct Hits Inner Hood - Trucks Built Between 2/14/90 And 5/1/90**	**Article No. 90-15-12**

MEDIUM/HEAVY TRUCK:
1990 LL-9000, LTL-9000

ISSUE:
Some early-built trucks were assembled with late level air charge cooler components and previous level hood assemblies. This may result in the duct which connects the turbocharger to the air charge cooler (hot duct) hitting the inner hood and flattening the duct or heat-damaging the hood.

ACTION:
If this interference condition is encountered, install the previous level adapter and duct. Refer to the 1990 L-Series Shop Manual, Page 27-04-14 for service details.

NOTE:
THE NEW DESIGN LEVEL HOOD CAN BE IDENTIFIED BY THE SPHERICAL DEPRESSION ON THE INSIDE OF THE HOOD NEAR THE HOT DUCT.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 1100, 1200, 4700

90-16, ***Publication Date: AUGUST 1, 1990***

• **Climate Control - Heater - Insufficient Cab Heat - 6.6L And 7.8L Ford Diesel Engines** • **Cooling System - 6.6L And 7.8L Ford Diesel Engines - New "Zero Leak" Thermostat**	**Article No. 90-16-13**

MEDIUM/HEAVY TRUCK:
1986-90 F & B SERIES, L SERIES

ISSUE:
There may not be enough cab heat when idling for long periods or operating in low load applications. This occurs because of the thermostat's coolant flow.

ACTION:
Install two new "zero leak" thermostats (E6HZ-8575-B). Refer to the appropriate Medium/Heavy Truck Shop Manual, Section 22-12 for service details.

These thermostats, along with customer installed winterfronts and other aftermarket cold weather operation items, increase coolant temperature supplied to the heating system.

There should be no deterioration in the coolant system performance in warm weather operation when using these thermostats.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 208000, 208100

90-16, ***Publication Date: AUGUST 1, 1990***

• **Axle - Rear - Rear Wheel Seal Leakage - Synthetic Axle Lube** • **Leaks - Synthetic Axle Lube - "Chicago Rawhide Scotseal Plus" Rear Wheel AxleSeals** • **Wheels - Rear - Axle Seal Replacement Required When Changing Types of Lube**	**Article No. 90-16-15**

MEDIUM/HEAVY TRUCK:
1990 and prior C SERIES, CL-CLT-9000 SERIES, F & B SERIES, L SERIES
1986-90 CARGO SERIES

ISSUE:
Changing mineral based rear axle lube to a synthetic lube in trucks equipped with "Chicago Rawhide Scotseal Plus" rear wheel axle seals may shorten the seal life.

ACTION:
Replace the rear wheel seal when changing mineral based axle lube to a synthetic lube.

NOTE:
THE "SCOTSEAL PLUS" REAR WHEEL AXLE SEAL HAS BEEN TESTED AND SHOWN TO PERFORM WELL IN MINERAL BASED LUBE, SYNTHETIC LUBE, OR ANY COMBINATION OF THE TWO. HOWEVER, INITIAL OPERATION OF THE SEAL IN THE MINERAL BASED LUBE FOLLOWED BY A CHANGE TO THE SYNTHETIC LUBE MAY SHORTEN THE SEAL'S LIFE.

Refer to the appropriate Medium/Heavy Truck Shop Manual, Section 11-14 for rear wheel axle seal replacement procedures.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 509000, 510000

90-17, ***Publication Date: AUGUST 15,1990***

Steering - Power - Single Versus Dual Gear Acceptable Back Pressure Upper Limits - Trucks With 14,600-20,000 Lb. Front Axles	**Article No. 90-17-12**

MEDIUM/HEAVY TRUCK:
1991 L SERIES

ISSUE:
The design of the 1991 dual steering gear system has high flow rates at engine idle. The in-line auxiliary coolers will generate more neutral-flow back pressure than single gear systems.

ACTION:
Refer to the 1991 L-Series Shop Manual, Section 13-01 for diagnostic details and the following Acceptable Back Pressure - Upper Limit Chart for specific upper limit information.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 303000

• **Electrical - 9E306 Fuel Shut Off Solenoid Wiring Harness - Shorts Because Of Improper Routing - Cat 3306B Engine** • **Electrical - New 14305 Alternator/Regulator Wiring Harness And Associated Overlay Harnesses - Cat 3306B Engine** • **Wiring - Availability Of New 14305 Alternator/Regulator Harness And Associated Overlay Harness - Cat 3306B Engine**	**Article No. 90-17-13**

MEDIUM/HEAVY TRUCK:
1989-90 L SERIES

ISSUE:
A new design 14305 alternator/regulator wiring harness and individual associated overlay wiring harnesses are now available for service use. This new version of 14305 harness is used in combination with various short overlay harnesses to complete the electrical circuits to the various engine switch, sensor and solenoid locations. This 1990 design change was done to help eliminate electrical wire harness bundling and wire harness routing issues that have occurred in the past. The previous level complete 14305 wiring harness is no longer available.

ACTION:
If service is required, refer to the following Wiring Harness Application Chart for correct wiring harness usage. Refer to Figures 1-5 for installation and routing details.

- Figures 1 & 2 detail the installation of the harnesses to the engine.

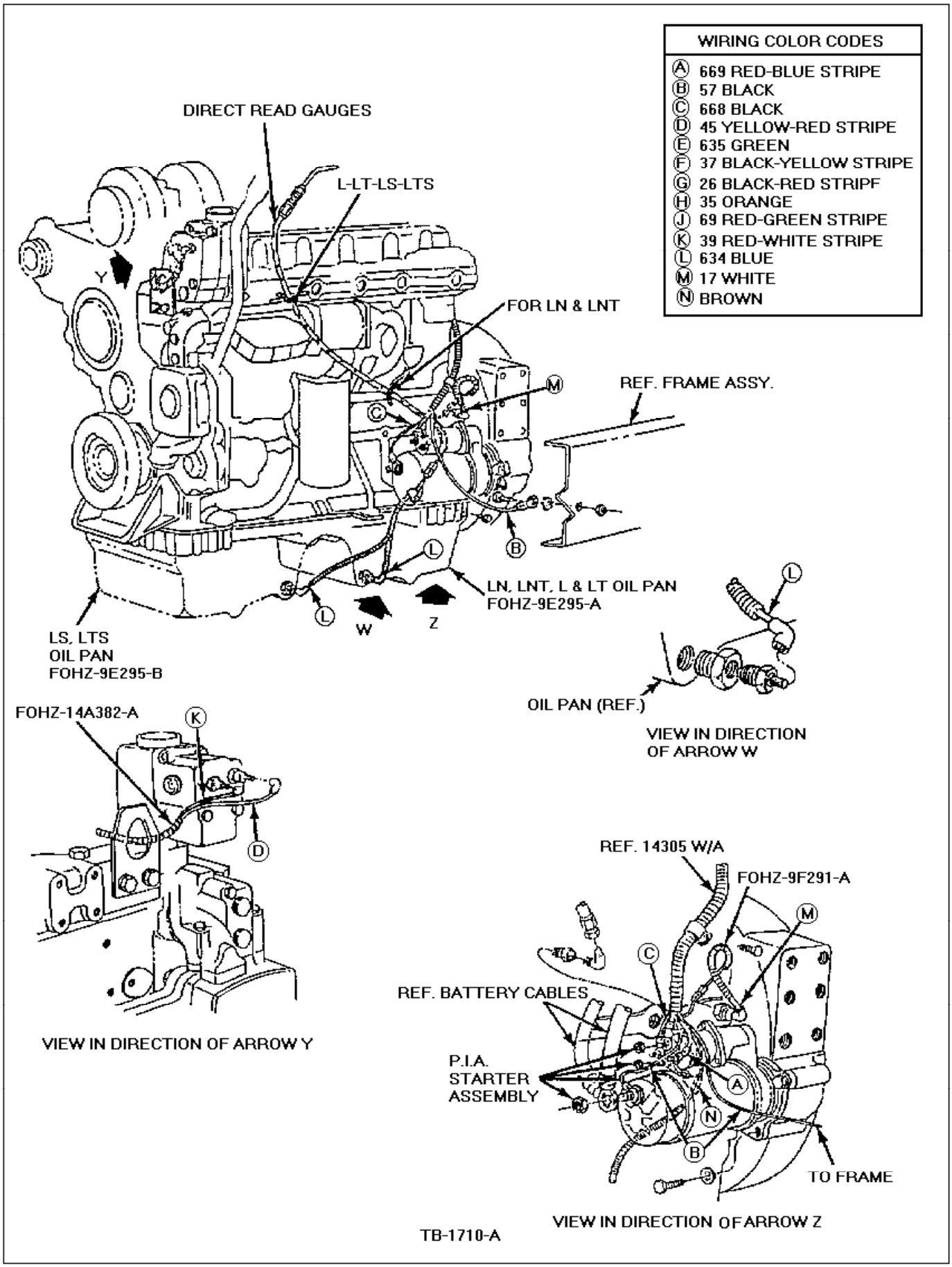


Figure 1 - Article 90-17-13

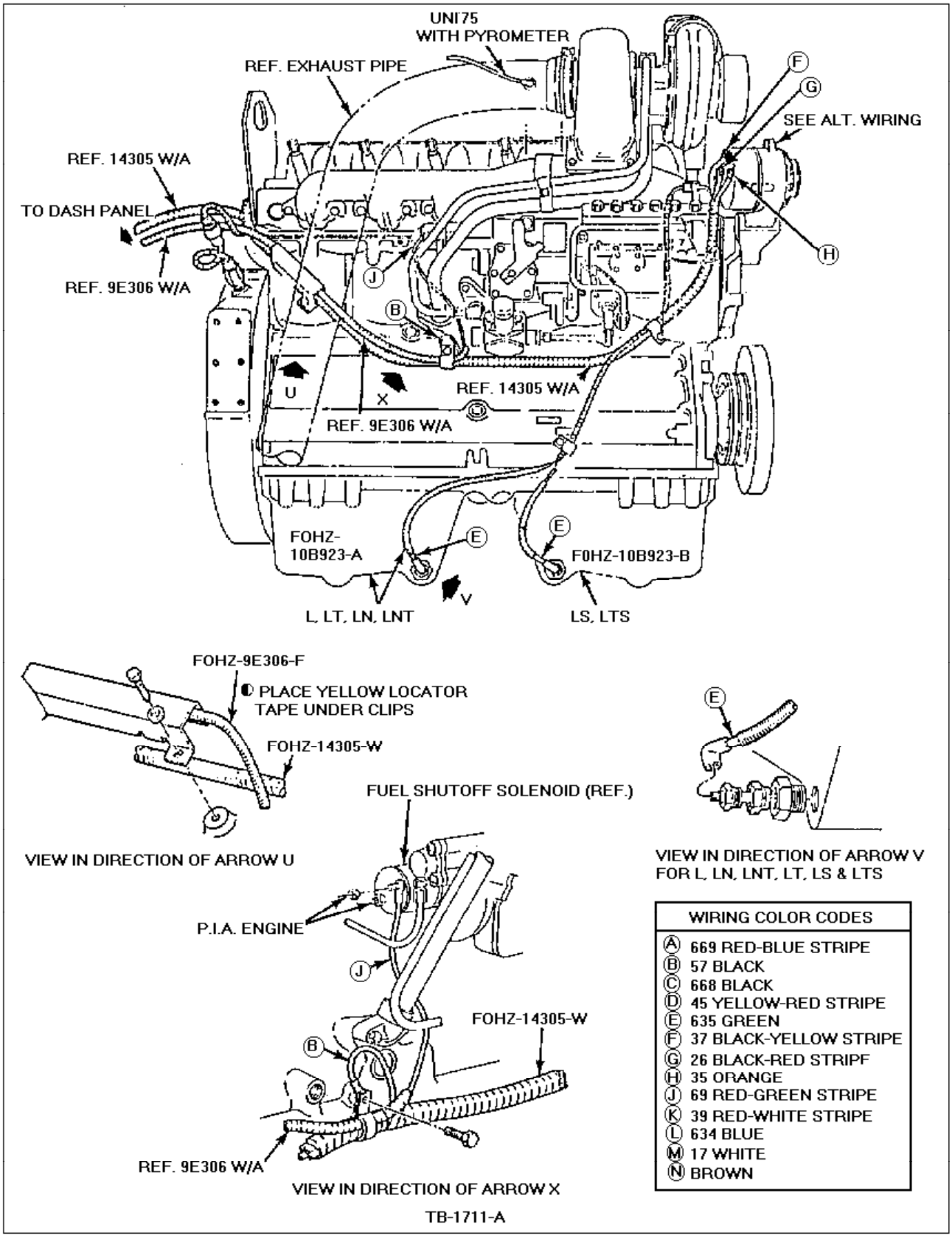
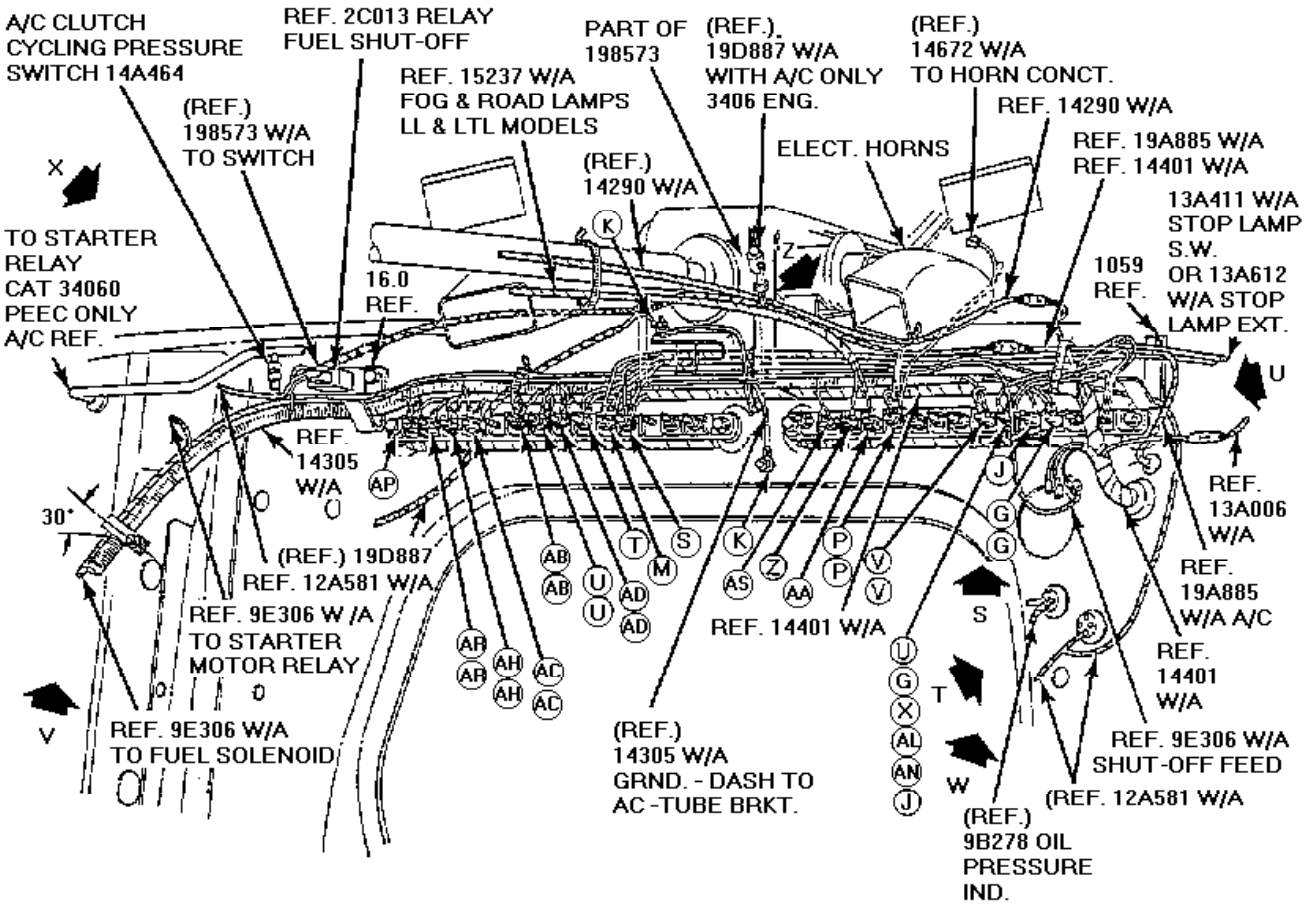
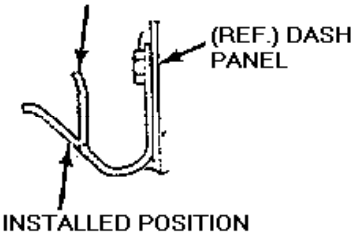


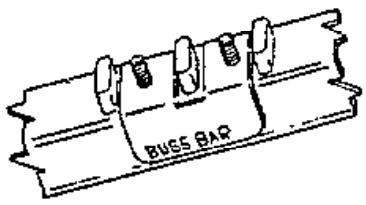
Figure 2 - Article 90-17-13

- Figure 3 shows the harness installation to the terminal strips at the dash.





VIEW IN DIRECTION OF ARROW U



VIEW IN DIRECTION OF ARROW S
(L.H. SIDE ONLY)
BUSS BAR OVER STUDS 4 & 5 FROM LEFT

WIRING COLOR CODES	
(A) 2 WHITE-BLUE STRIPE	(Y) 901 YELLOW-BLACK STRIPE
(B) 3 GREEN-WHITE STRIPE	(Z) 565 BLUE
(C) 11 BLACK-YELLOW STRIPE	(AA) 478 GRAY
(D) 12 GREEN-BLACK STRIPE	(AB) 39 RED-WHITE STRIPE
(E) 13 RED-BLACK STRIPE	(AC) 634 BLUE (FULL INST. & FLEET W/AIR BRAKES)
(F) 232 GREEN-YELLOW STRIPE	(AD) 17 WHITE
(G) 32 RED-BLACK STRIPE	(AE) RED INSULATOR
(H) 35 ORANGE	(AF) 932 BLUE
(J) 37 BLACK-YELLOW STRIPE	(AG) 156 BLUE
(K) 57 BLACK	(AH) 670 PINK
(L) 69 RED-GREEN STRIPE	(AJ) 482 BLACK-YELLOW STRIPE
(M) 284 RED	(AK) 141 BLACK-PINK STRIPE
(N) 359 BLACK-WHITE STRIPE	(AL) 71 BLACK
(P) 1 BLUE-YELLOW STRIPE	(AM) 25 BLACK-ORANGE STRIPE
(R) 182 BROWN-WHITE STRIPE	(AN) 21 YELLOW
(S) 810 RED-BLACK STRIPE	(AP) 635 GREEN (FULL & FLEET W/AIR BRAKES)
(T) 870 BLACK-WHITE STRIPE	(AR) 562 GREEN-WHITE
(U) 45 YELLOW-RED STRIPE	(AS) 399 BROWN
(V) 904 GREEN-RED STRIPE	
(W) 977 PURPLE-WHITE STRIPE	
(X) YELLOW INSULATOR	

Figure 3 - Article 90-17-13

- Figure 4 shows proper wiring harness routing around the frame.

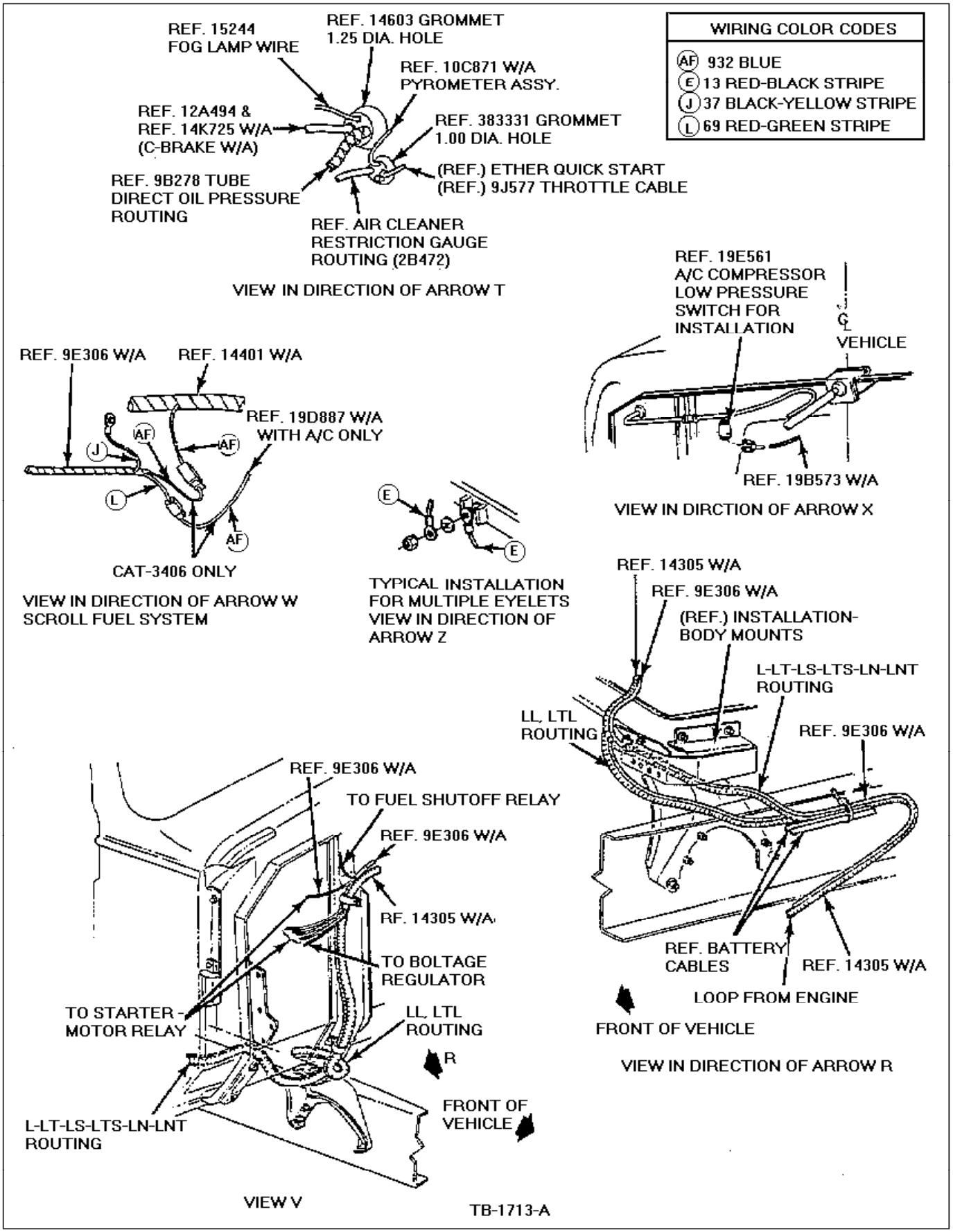


Figure 4 - Article 90-17-13

NOTE:

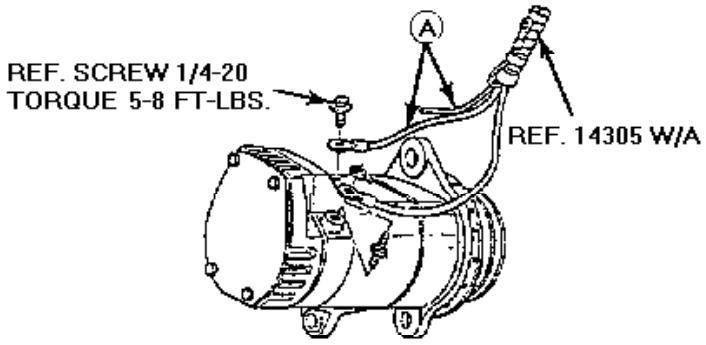
THE FAILURE MODE THAT CAUSED REPLACEMENT OF MOST OF THESE HARNESSES WAS THE 9E306 FUEL SHUT OFF SOLENOID WIRE HARNESS RUBBING ON A BRACKET ATTACHMENT BOLT. THIS BOLT IS LOCATED ON THE LEFT HAND SIDE OF THE ENGINE NEAR THE FUEL PUMP.

- Figure 5 details the attachment of the wiring harnesses to the starter, alternator and solenoid/voltage regulator.

STARTER

WIRING COLOR CODE
(A) 26- BLACK-RED STRIPE

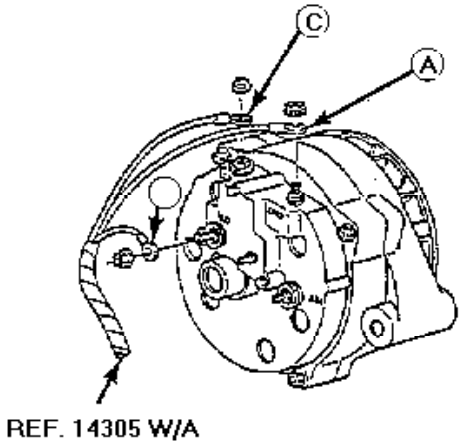
INSTALLATION OF W/A FOR L-SERIES
(EXCEPT LL & LTL)
DELCO 85 AMP. 25SI ALTERNATOR



ALTERNATOR

WIRING COLOR CODES
(A) 26 BLACK-RED STRIPE
(B) 35 ORANGE
(C) 37 BLACK-YELLOW STRIPE

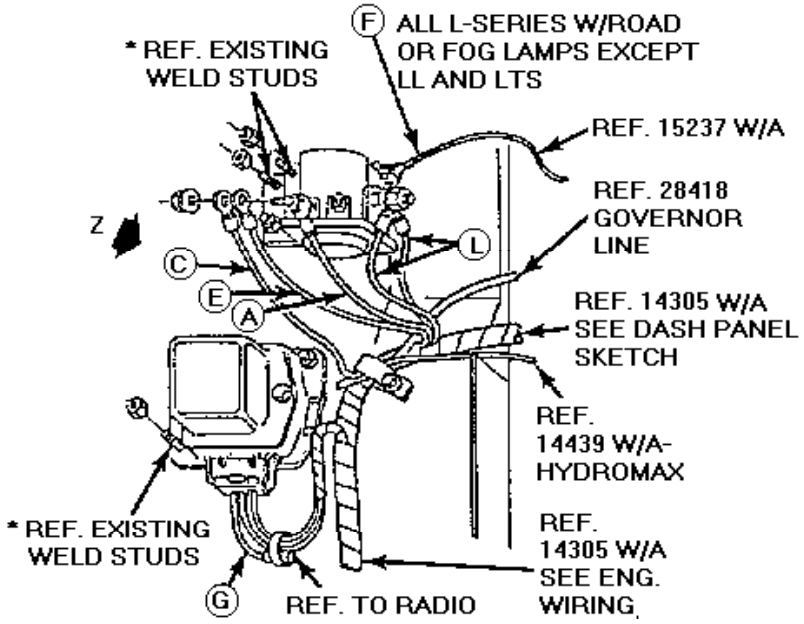
INSTALLATION OF W/A FOR L-SERIES
EXCEPT LTL AND LL
WITH 75 AND 90 AMP



SOLENOID & VOLTAGE REGULATOR

WIRING COLOR CODES
(A) 32 RED-BLUE STRIPE
(C) 37 BLACK-YELLOW STRIPE
(E) 21 YELLOW
(F) 57 BLACK
(G) 152 YELLOW
(L) 669 RED-BLUE STRIPE (FOR ALL DIESELS)

* NOTE: MOUNTING STUDS MUST BE FREE OF PAINT AND PAINT MASKING MATERIAL BEFORE INSTALLATION OF REGULATOR OR STARTER RELAY



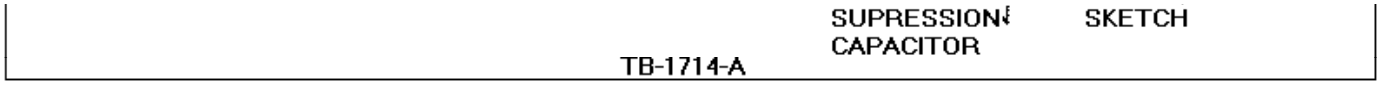


Figure 5 - Article 90-17-13

The new replacement 14305 wiring harness and five (5) possible overlay harnesses are required to replace the original complete 14305 wiring harness. Harnesses number 1, 2 and 3, on the preceding chart are required when replacing the basic 14305 wiring harness. Harnesses 4, 5 and 6 should only be replaced if they are missing or damaged. Overlay harnesses required for other premium diesel engines in 1990 L-Series models are shown in the latest Parts Catalog.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 203000, 203100, 203200

• **Exhaust - Availability Of New Stronger Exhaust Bracket** • **Exhaust - Muffler Brackets - Failure On "DSO" Units With Horizontal Mufflers/Vertical Outlets**	**Article No. 90-17-14**

MEDIUM/HEAVY TRUCK:
1986-89 L SERIES

ISSUE:
A new stronger exhaust bracket is now available for service use to replace the old "DSO" bracket. This older "DSO" bracket has failed in some severe duty applications.

ACTION:
Install a new stronger exhaust bracket (E9HS-5A215-AA) if the old style "DSO" bracket has failed. This new bracket has been strengthened by doubling the thickness of the clamp in the area where the clamp attaches to the hanger, Figure 1.

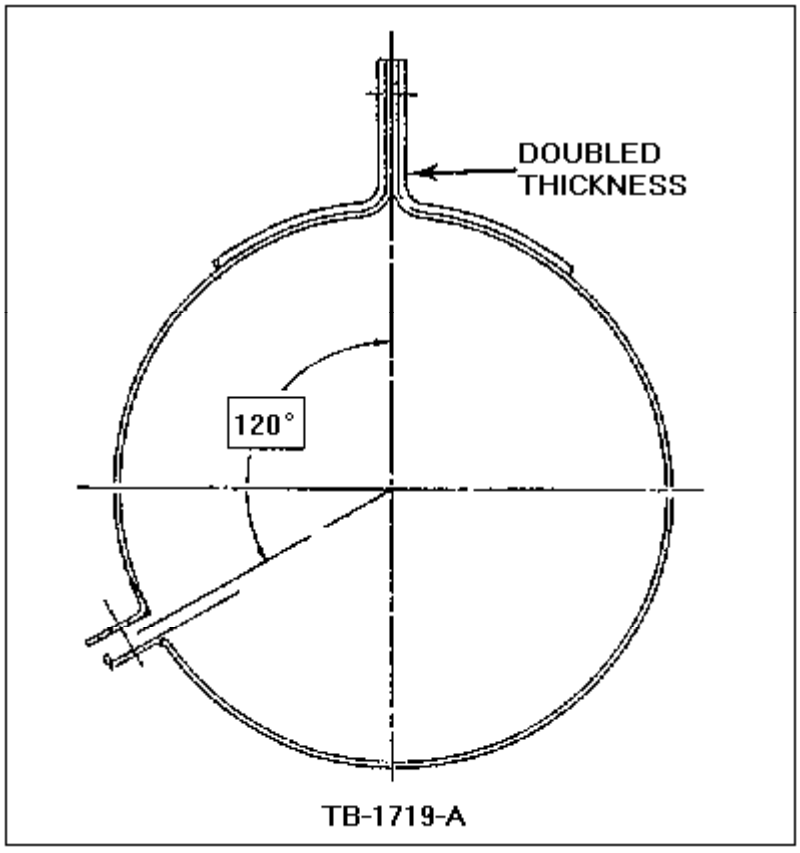


Figure 1 - Article 90-17-14

NOTE:
THERE IS NO NEED TO REPLACE A BRACKET WHICH HAS NOT FAILED.

NOTE:
ORDER THE REPLACEMENT BRACKET THROUGH THE "DSO" PARTS ORDERING PROCEDURE.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 403000

Fan Hub - Engine Cooling - 6.6L and 7.8L Ford Diesel Engines - Fan Pulley And Bracket Assembly Bearing Replacement Procedure	Article No. 90-17-15

MEDIUM/HEAVY TRUCK:
1987-89 F & B SERIES, L SERIES

ISSUE:
The bearings in the fan pulley and bracket assembly can be replaced on 6.6L and 7.8L Ford diesel engines. This eliminates the need to replace the entire fan pulley and bracket assembly in the event of bearing failures.

ACTION:
If service is required, install new fan and pulley bracket bearings. Refer to the following procedure for service details.

NOTE:
PERFORM THE FOLLOWING DISASSEMBLY AND ASSEMBLY PROCEDURES AFTER THE FAN PULLEY AND BRACKET ASSEMBLY HAS BEEN REMOVED FROM THE TRUCK.

Disassembly Procedure

1. Remove the center retaining bolt and washer, Figure 1.

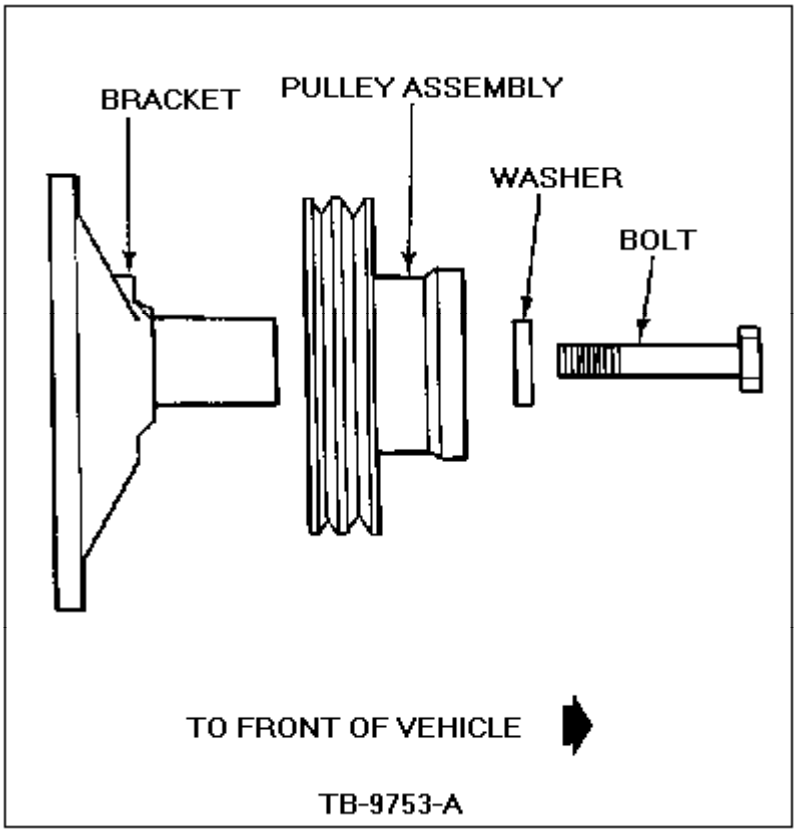


Figure 1 - Article 90-17-15

2. Press out the fan bracket from the fan pulley by using a 1 3/4" diameter arbor, Figure 1.

3. Place the fan pulley on its rear face and allow about 1" of clearance to remove the bearings.

4. Position the bearing spacer so the wall of the spacer is centered on the bearing inner race, Figure 2.

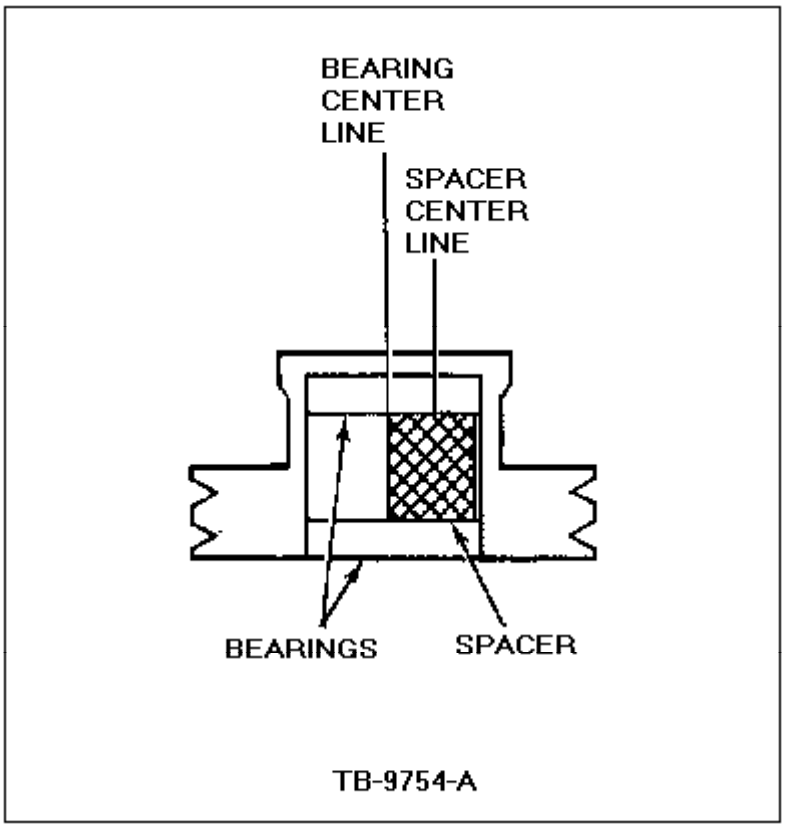


Figure 2 - Article 90-17-15

5. Slide a 1 3/4" arbor through the front bearing until it contacts the spacer.

6. Press out the fan pulley rear bearing.

NOTE:
DO NOT REUSE THE BEARING AFTER IT HAS BEEN PRESSED OUT. THE INNER BEARING RACE WILL BE DAMAGED DURING THE REMOVAL PROCESS.

7. Remove the fan pulley bearing spacer.

8. Remove the fan pulley retaining ring.

9. Using a 1 7/8" diameter arbor, press out the front bearing.

NOTE:
DO NOT REUSE THE BEARING AFTER IT HAS BEEN PRESSED OUT. THE INNER BEARING RACE WILL BE DAMAGED DURING THE REMOVAL PROCESS.

Assembly Procedure

1. Place the front face of the fan pulley down on a flat surface, Figure 3.

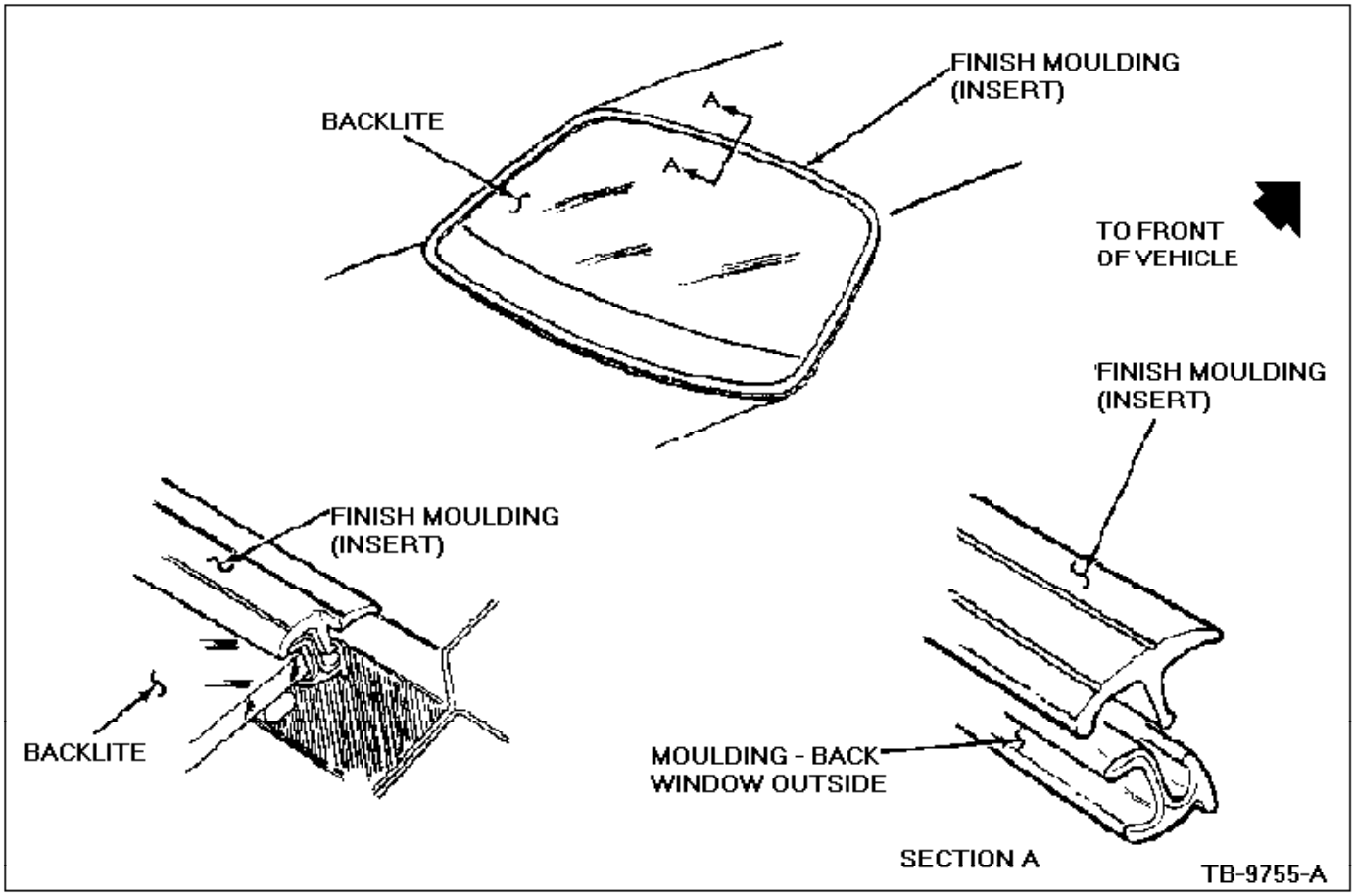


Figure 3 - Article 90-17-15

2. Using a solid 2 3/4" diameter arbor, press the front fan pulley bearing into the fan pulley.

   NOTE:
   APPLY EVEN PRESSURE ON THE OUTER AND INNER RACES OF THE BEARING TO MAKE SURE THE FRONT BEARING SEATS TO THE BOTTOM OF THE PULLEY BORE.

3. Install the retaining ring making sure it is fully expanded in the pulley bore groove.

4. Place a 1 3/4" diameter arbor that is not longer than 3" through the center of the front bearing. Slide the bearing spacer over the arbor until it rests on the front bearing inner race.

5. Using a solid 2 3/4" diameter arbor, press the rear fan pulley bearing into the fan pulley.

   NOTE:
   APPLY EVEN PRESSURE ON THE OUTER AND INNER RACES OF THE BEARING TO MAKE SURE THE FRONT BEARING SEATS TO THE BOTTOM OF THE PULLEY BORE.

6. Press the fan bracket into the fan pulley. Make sure the spacer remains centered, Figure 3.

7. Install the washer and center retaining bolt, Figure 1. Tighten the bolt to a torque of 80-100 lb.ft (109-136 N-m).

8. Turn the fan pulley by hand to make sure it spins freely on the bracket.

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 88-23-18

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 402000, 490000, 497000

90-18, ***Publication Date: August 29, 1990***

Tubocharger - Caterpillar 3406B Diesel Engine With Air-To-Air Aftercooler - Air Tube Hose T-Bolt Clamps - Revised Torque Specifications	**Article No. 90-18-12**

MEDIUM/HEAVY TRUCK:
1986-90 CL-9000, L-9000, LTL-9000

ISSUE:
New torque specifications are in effect for T-bolt clamps used in production and service air-to-air aftercooler tube and hose connections.

ACTION:
If service is required on the air-to-air charge cooler systems, tighten the hose clamps to the values shown in the following Hose Clamp Torque Chart and Figure 1.

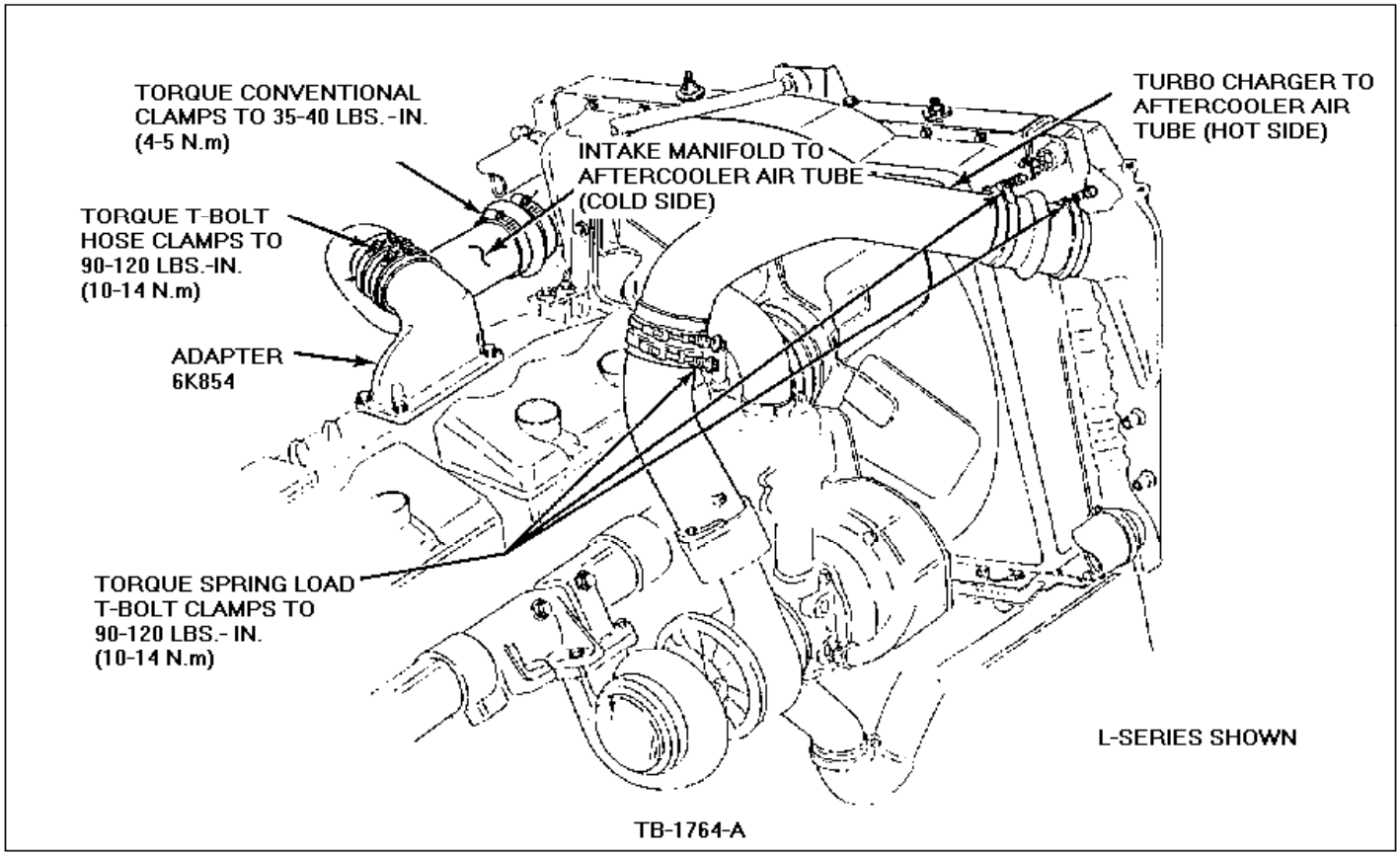


Figure 1 - Article 90-18-12

NOTE:
T-BOLT CLAMPS MAY BE USED TO REPLACE CONVENTIONAL HOSE CLAMPS IF THE AIR TUBES ARE REINFORCED WITH INSERT RINGS AS SHOWN IN FIGURE 2.

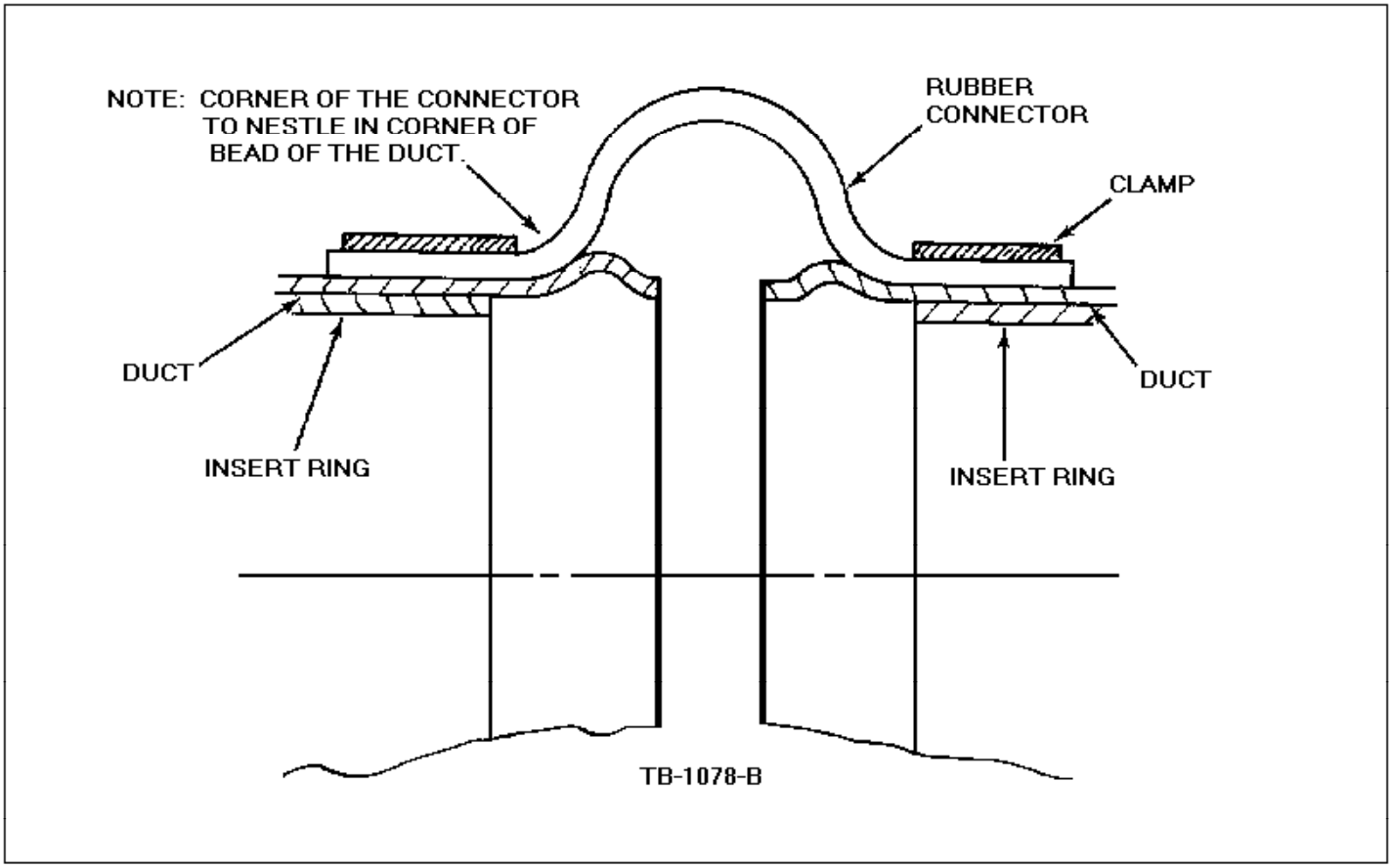


Figure 2 - Article 90-18-12

OTHER APPLICABLE ARTICLES:

89-9-19

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 490000, 497000, 614000, 614500, 614600

90-18, ***Publication Date: August 29, 1990***

Axle - Rear - Rockwell Two Speed Axles With Eaton Shift Motor - Durability Improvements	**Article No. 90-18-13**

MEDIUM/HEAVY TRUCK:
1984-90 C SERIES, F & B SERIES, L SERIES
1986-90 CARGO SERIES

ISSUE:
Rockwell has made rear axle carrier design changes to all axles with the Eaton shift motor. The design changes were made to the sun gear, low speed plate and left hand support case. The changes...

- Increased the sun gear pilot to low speed plate clearance
- Increased the neutral travel
- Increased the low speed plate tooth backlash

The new carriers are identified with an "M" on the affected components near the part number. In addition, some earlier production carriers were reworked to include the new shift components. These are identified by an "R" stamped on the carrier tag and an "R" painted on the carrier. The revised components were effective in KTP production about Job #1, 1990.

ACTION:
If service is required, replace the clutch plate, sun gear, or left hand support case altogether as a kit. Refer to the appropriate Medium/Heavy Truck Shop Manual, Section 15 or the Rockwell Field Maintenance Manual No. 7A for service details. Refer to the following Rockwell Axle Parts Chart for correct parts usage.

Carriers with serial numbers equal to or higher than the following numbers have incorporated the modified shift components.

OTHER APPLICABLE ARTICLES:

89-3-15

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 509000, 590000

90-20, ***Publication Date: September 26, 1990***

Hood - Centerline Surface Cracks - Center Strip Installation Kit	Article No. 90-20-8

MEDIUM/HEAVY TRUCK:
1981-89 LTL-9000

ISSUE:
Centerline surface cracks may appear on some LTL-9000 hoods because of improper bonding during the manufacturing process.

ACTION:
Install a hood center strip installation kit. Refer to the following service procedure.

PAINT CENTER STRIP

1. Carefully finish sand the center strip with 360 grit sandpaper.

   CAUTION:
   DO NOT SAND THROUGH THE PRIMER.

2. Topcoat the center strip with two coats of color to match the truck color.

PREPARE HOOD TO INSTALL CENTER STRIP

1. Clean exterior and underside of hood.
2. Place truck in a well lit area.
3. Tilt hood to open position.
4. Remove hood stabilizer plate by drilling out three 1/4" rivets.
   a. Heat hood stabilizer with heat gun to soften adhesive.
   b. Pry hood stabilizer from hood to break adhesive bond.
5. Remove hood serial number tag by drilling out two 5/32" rivets.
6. Close hood.
7. With hood closed, proceed to drill holes as follows:
   a. Locate the center strip to top side of hood with the back edge of the strip even with the back edge of the hood at the centerline.
   b. Mark the location of the studs along the centerline of the hood.

c. Drill nine 7/16" holes at locations marked. Drill holes through both the outer surface and the inner reinforcements.

CAUTION:
BE CAREFUL NOT TO DRILL THROUGH ANY UNDER-HOOD COMPONENTS.

8. Enlarge the 7/16" holes on underside of the hood with a 1" hole saw. The 1" holes are required to allow clearance for the flange nuts and socket wrench.

INSTALL CENTER STRIP TO HOOD

1. Place the center strip on the top side of the hood.

   a. Align the strip side to side and install nine hex head flange nuts.

   b. Check fore-aft location to avoid interference with the radiator grille moulding assembly, if so equipped.

   c. Tighten hex head flange nuts to 20 lb-in (2 N-m).

2. Check alignment and fit. Loosen and adjust if necessary.

3. Reinstall the hood stabilizer plate. Use 1 oz. urethane or epoxy structural adhesive and three 1/4" pop rivets.

4. Install three 1" diameter hole plugs in the 1" holes on the underside of the hood air plenum duct.

5. Re-install the hood serial number tag with two 5/32" pop rivets.

6. Close the hood when finished.

7. Clean all dirt and smudges from the exterior of the truck.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 111000

• Engine - 6.6L And 7.8L Ford Diesel - Engine Oil Cooler - Service Tips • Leaks - Coolant Into Oil - 6.6L And 7.8L Ford • Leaks - Oil - From Oil Cooler Into Coolant - 6.6L And 7.8L Ford Diesel	Article No. 90-20-9

MEDIUM/HEAVY TRUCK:
1989 F & B SERIES, L SERIES

ISSUE:
Oil may leak into the coolant or coolant may leak into the oil if incorrect end cap "O" rings are installed in the engine oil cooler.

ACTION:
Check for "O" ring seal leakage and, if necessary, replace the end cap "O" rings.

CHECKING FOR LEAKAGE

1. Remove the oil drain plug from the bottom of the oil cooler. The drain plug is located near the center of the cooler, Figure 1.

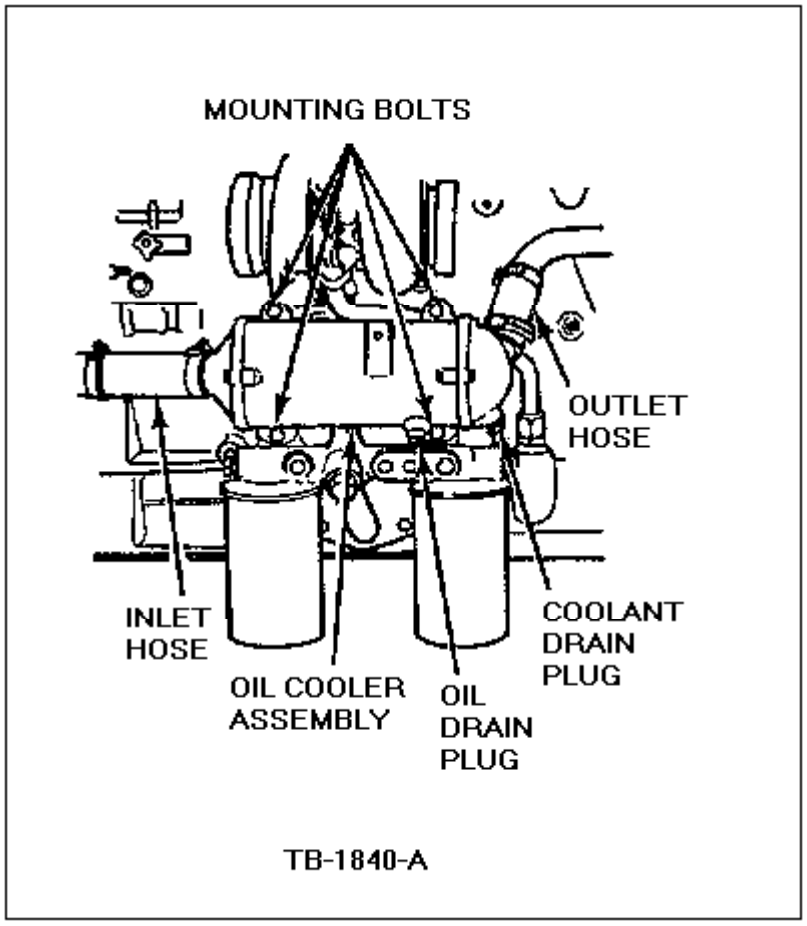


Figure 1 - Article 90-20-9

CAUTION:
DO NOT RUN THE ENGINE WITH THE PLUG OUT.

2. Pressurize the cooling system to 15 psi for 15 minutes.

3. Check for coolant appearing at the opening of the drain hole.

4. If coolant appears, change the end cap "O" rings.

5. If coolant does not appear, remove the oil pan and rocker cover for further definition of the leak source.

6. If coolant appears to be coming from behind the front engine cover, it may be a sign that the "O" rings in the cooler are leaking.

CHANGING "O" RINGS

1. Loosen the clamp on the oil cooler inlet front tube, Figure 1.

2. Remove the three (3) bolts at the front end cap of the oil cooler.

   a. Tap the cap loose with a brass hammer.

   b. Swing the cap to one side.

3. Remove and throw away the old "O" ring. Use a thin screwdriver, or equivalent for "O" ring removal.

4. Install new "O" ring (E7HZ-6K649-A) around the lip of the oil cooler core, Figure 2.

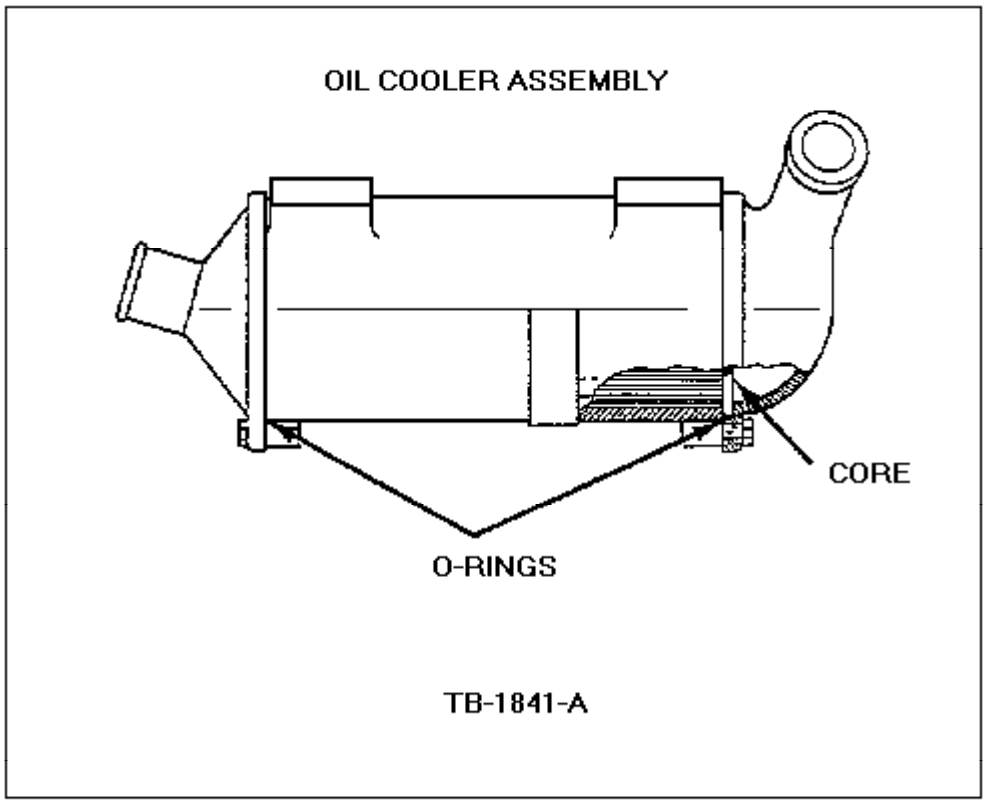


Figure 2 - Article 90-20-9

5. Position the end cap in place and secure with three (3) bolts. Tighten to 84-126 lb-in (10-14 N-m).

6. Reposition the hose clamp. Tighten to 40-50 lb-in (5-6 N-m).

7. Loosen the two (2) hose clamps on the cooler outlet rear tube. Slide the hose back to clear the cap neck.

8. Repeat Steps 3 through 7.

9. Replace the oil cooler rear end cap drain plug on the coolant side. Tighten to 18-25 lb-ft (24-34 N-m).

10. Check for coolant leaks.

    a. Fill the radiator with coolant to the operating level.

    b. Pressurize the cooling system to 15 psi for 15 minutes.

    c. Watch for coolant to appear at the oil cooler oil drain plug area.

11. If no leakage occurs, it confirms a satisfactory repair. If leakage continues, disassemble the oil cooler for inspection and testing of the cooler core for possible leaks. If necessary, install a new oil cooler core (E7HZ-6N783-A).

CLEANING THE COOLING AND LUBRICATION SYSTEMS

If the cooling system is contaminated with oil or the lubrication system is contaminated with coolant, thoroughly clean the system. Refer to the 1989 L Series or F & B Series Truck Shop Manual, Section 22-12, for cleaning and inspection details.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 401000, 402000

Bulletin Contents

TSB Article 90-21-13 has been superseded by Article 91-10-16.

90-22, ***Publication Date: OCTOBER 24, 1990***

• **Suspension - Front - Right Hand Upper Shock Absorber Bracket Contacts Turbocharger - Trucks With 3406B Catepillar Engine** • **Noise - Front Suspension - Right Hand Upper Shock Absorber Bracket Contacts Turbocharger - Trucks With 3406B Catepillar Engines**	**Article No. 90-22-18**

MEDIUM/HEAVY TRUCK:
1989-90 L SERIES

ISSUE:
A noise coming from the right front of the truck may be caused by the turbocharger contacting the right hand upper shock absorber bracket. This concern is present under high torque conditions.

ACTION:
Install new right and left hand upper shock absorber brackets. The new brackets are shorter, with the mounting pin lowered 1/2", to increase the clearance between the shock mount and turbocharger.

NOTE:
REFER TO THE L-SERIES SHOP MANUAL FOR REMOVAL AND INSTALLATION INSTRUCTIONS.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 304000, 702000, 702100

Bulletin Contents

TSB Article 90-23-18 has been superseded by Article 90-26-14.

Bulletin Contents

TSB Article 90-23-19 has been superseded by Article 91-5-14.

Bulletin Contents

TSB Article 90-24-12 has been superseded by Article 91-15-13.

Bulletin Contents

TSB Article 90-24-13 has been superseded by Article 94-11-23.

90-24, ***Publication Date: NOVEMBER 21, 1990***

Climate Control - Air Conditioning And Heating Systems - Servicing Tips - A/C System Released 12/03/90	**Article No. 90-24-14**

MEDIUM/HEAVY TRUCK:
1991 L SERIES

ISSUE:
The ventilating, heating and air conditioning portion of the 1991 L-Series Heavy Truck Shop Manual, Section 36, pertains only to 1991 model year units built on or after December 3, 1990.

ACTION:
When servicing the ventilating, air conditioning or heater systems on 1991 L-Series units built before December 3, 1990, use the 1990 L-Series Heavy Truck Shop Manual, Section 36.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 208000, 290000

Radiator - Module Mounting Hardware And Brace Rods Loosen And Break	**Article No. 90-24-15**

MEDIUM/HEAVY TRUCK:
1988 and after L SERIES

ISSUE:
The radiator module mounting hardware and brace rods may eventually loosen or break. Some of the more typical concerns are:

- Mounting Bolts may loosen and either fall out or damage the threads in the removal process.
- Brace Rods may break when used with the Cummins NTC engines using the offset coolant supply tank mounting bracket.
- Upper Insulator Steel Inserts may collapse.

ACTION:
If service is required, use the new mounting hardware and stronger braces. Refer to Figure 1 and the following parts block for correct parts usage.

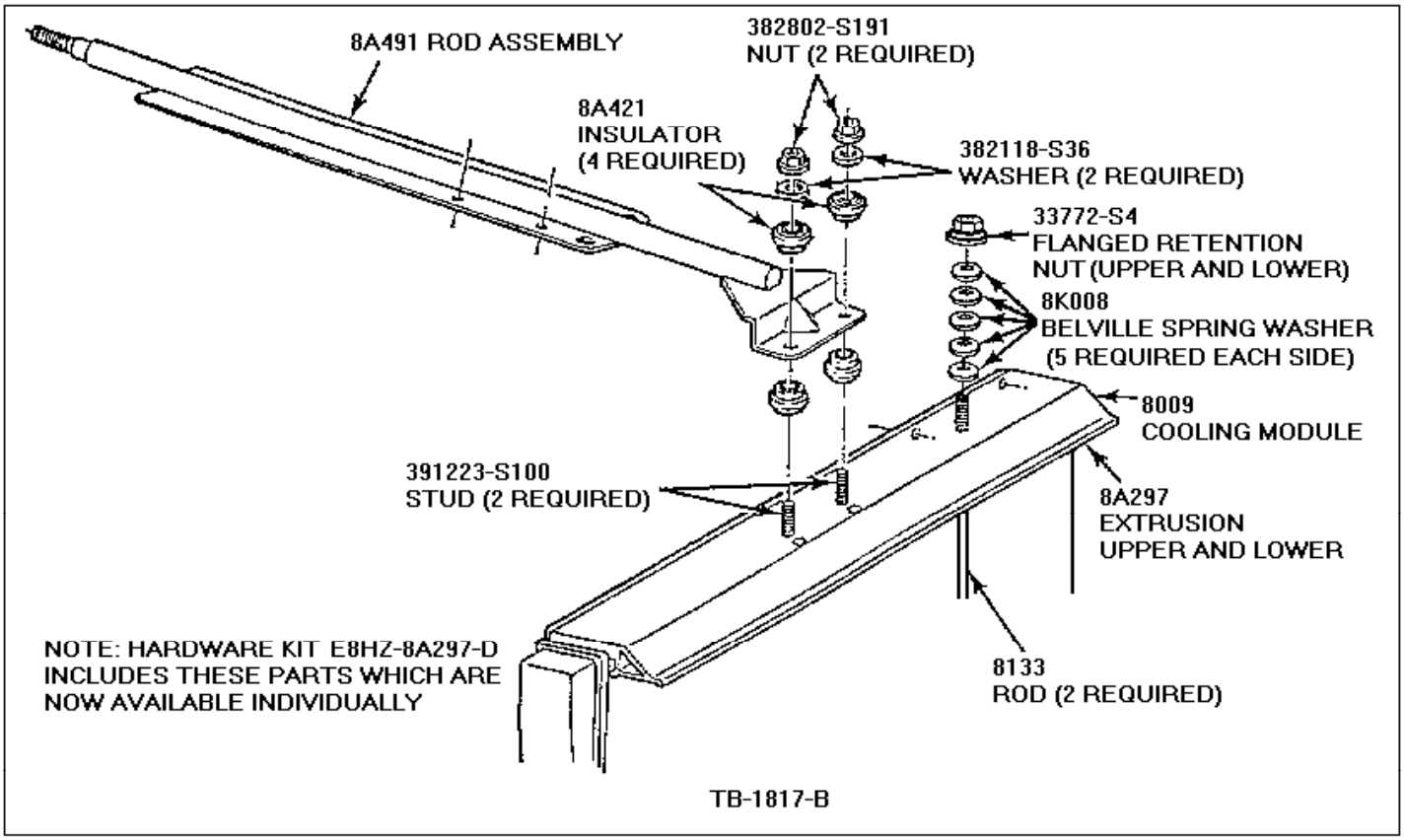


Figure 1 - Article 90-24-15

WARNING:
MAKE SURE THE STUDS ARE MOUNTED IN THE SAME POSITION AS THE ORIGINAL EXTRUSION. THIS WILL MAINTAIN THE CORRECT FAN CLUTCH TO RADIATOR CLEARANCE.

These new radiator mounting components will prevent most of the breakage and loosening concerns. Some important points to consider are...

- The new stud, along with the nut, replaces the previously used bolt and resists loosening. The washer is used with either the old bolt or the new stud.
- The new brace rods are strengthened to resist breakage. They are also used in Non-Cummins NTC applications to reduce complexity. They are interchangeable with the old brace rods.
- The new insulators are designed to withstand full torque without collapse. They are interchangeable with the old insulators.
- Four (4) new insulators are required to replace the two (2) old insulators per truck.
- The new insulators insert from both the top and bottom of the two holes in the brace rods. (The old insulators insert from the bottom into the two holes in the brace rods.)

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 402000

90-25, ***Publication Date: DECEMBER 7, 1990***

• **No Start - Will Not Crank - 6.6L And 7.8L Ford Diesel And Cummins L-10 - Floor Mounted "FELSTEAD" Shift Tower** • **Transmission - Allison MT-653 And MT-654 - Floor Mounted "FELSTEAD" Shift Tower Service Parts**	**Article No. 90-25-18**

MEDIUM/HEAVY TRUCK:
1985-91 L-8000, L-9000

This TSB article is being republished in its entirety to expand the model year coverage to include 1990 and 1991 trucks.

ISSUE:
An engine that will not start due to a no crank condition may be caused by broken or failed components in the floor mounted "FELSTED" shift tower. Since service kits are now available for the switch, switch pin and shift handle, it is no longer necessary to replace the complete shifter.

ACTION:
Use one or more of the following service kits. Refer to the following procedures for service details.

SWITCH PIN KIT (E7HZ-7A474-A) REMOVAL

1. Loosen nut, Figure 1.

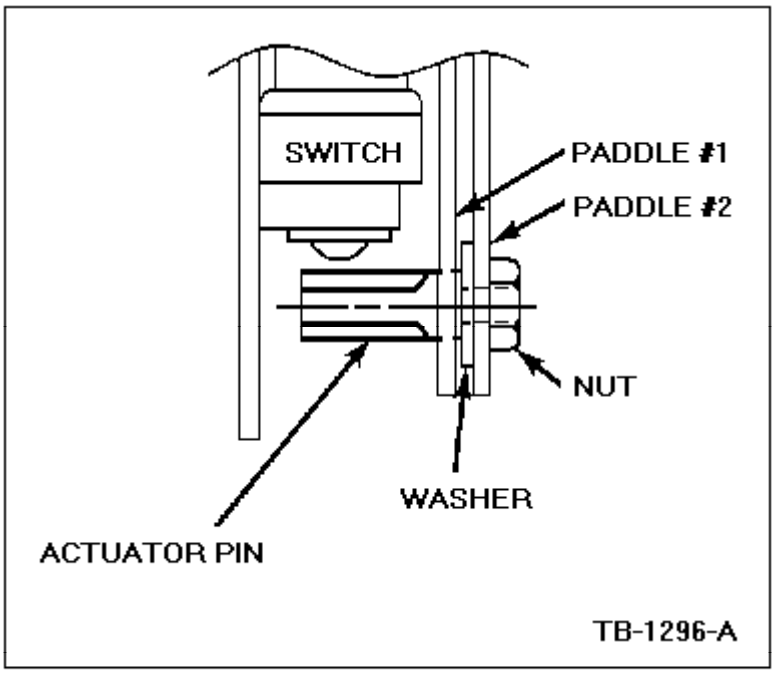


Figure 1 - Article 90-25-18

2. Remove the hair pin (between the paddles) from the actuator pin.

3. Slide the actuator pin out.

INSTALLATION

1. Start the threaded end of the actuator pin, Figure 1, through the rectangular slot in paddle #1.

2. Slip the washer between the paddles and slide the threaded end of the actuator pin through the rectangular slot in paddle #2.

3. Apply one drop of Ford Stud and Bearing Mount Sealer (EOAZ-19554-BA) to each thread surface on the actuator pin.

4. Install the nut on the actuator pin. Tighten it to 100 in-lb (11 N-m).

HANDLE REPAIR KIT (E7HZ-7A082-A) REMOVAL

1. Remove and throw away both existing knob inserts, Figure 2.

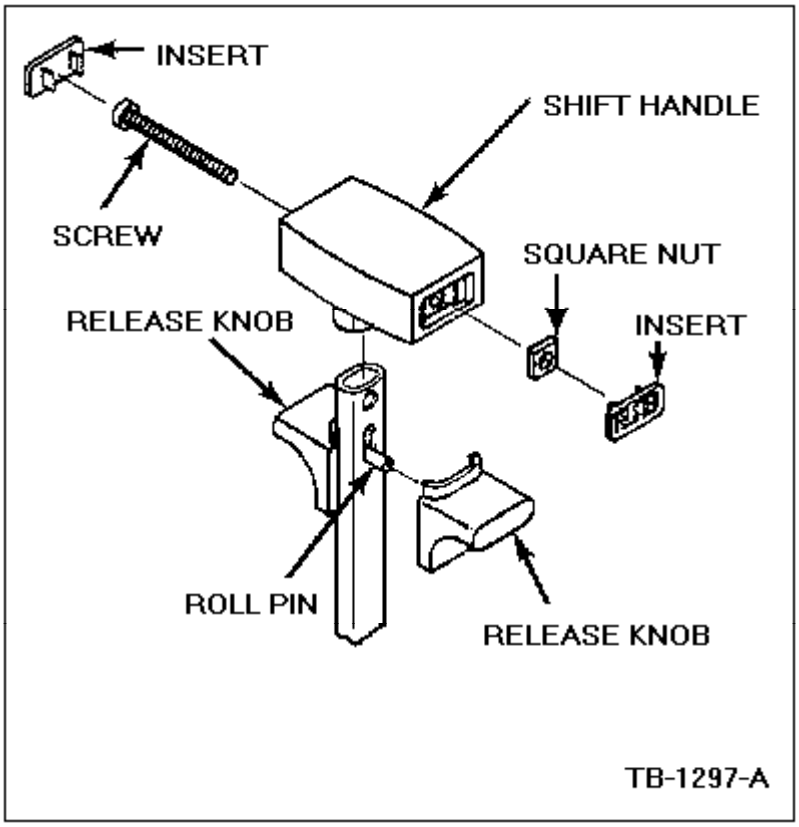


Figure 2 - Article 90-25-18

2. Remove and save screw, nut and shift handle.

3. Remove and throw away existing release knobs and roll pin.

INSTALLATION

1. Install the new roll pin. The pin must extend equally from both sides of the handle assembly.

2. Locate new release knobs AS FOLLOWS:

   - Apply two drops of Ford Instant Adhesive (E8AZ-19554-A) into each .16" diameter hole

- Remove any excess adhesive from the surface around the hole

NOTE:
DO NOT APPLY ADHESIVE TO THE ROLL PIN.

3. Assemble both release knobs onto the the roll pin at the same time and completely seat them.

4. Reassemble shift handle onto shifter shaft as follows:

   - Install screw and square nut
   - Align the nut vertically with the handle assembly

5. Install the new inserts.

SWITCH KIT (E7HZ-7A247-B) REMOVAL

1. Disconnect the wire assembly from the switch by sliding the wire connector parallel to the switch base.

2. Remove the two mounting screws, Figure 3.

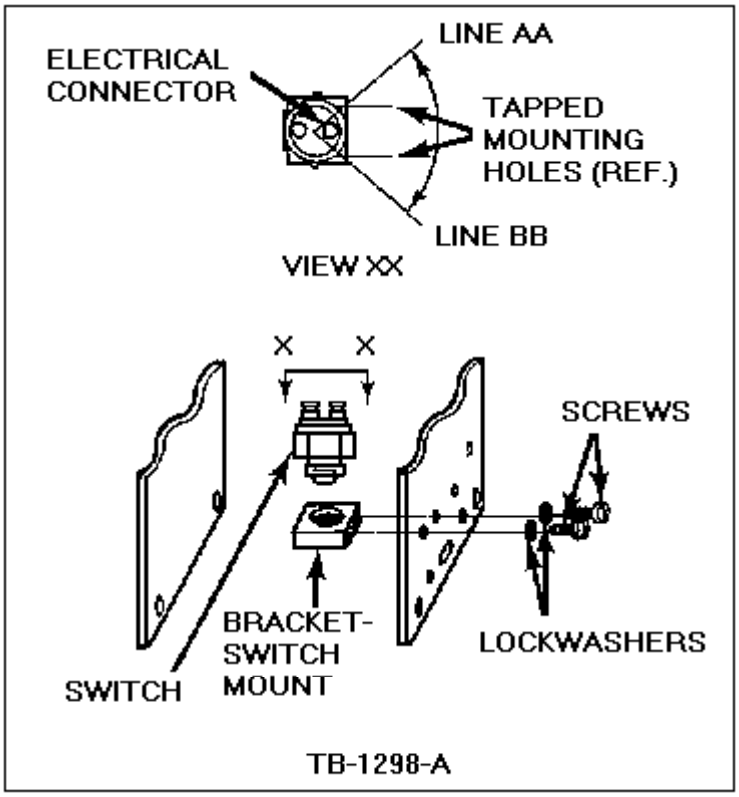


Figure 3 - Article 90-25-18

3. Throw away the old switch, mounting bracket and attaching hardware.

INSTALLATION

1. Install the new switch mount bracket onto the new switch, Figure 1. Tighten finger tight.

2. Further tighten bracket until first flat on the switch hex aligns with the flat part of the bracket containing the tapped mounting holes, Figure 3.

3. Make sure that one of the switch electrical connectors lies between line AA and BB as shown in Figure 3. It may be necessary to tighten the bracket to align with the second hex flat surface to obtain this position.

4. Install the new switch-bracket assembly onto the shift control side flange using the two screws and lockwashers.

5. Locate the new assembly in the same position as the old assembly.

6. Reconnect the wire assemblies to the new switch.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 505200, 601300

90-26, ***Publication Date: DECEMBER 19, 1990***

Pre-Delivery Forms - New Items For 1991 And 1992 Models	Article No. 90-26-9

FORD:
1991-92 CROWN VICTORIA, ESCORT, FESTIVA, MUSTANG, PROBE, TAURUS, TEMPO, THUNDERBIRD

LINCOLN MERCURY:
1991-92 CAPRI, CONTINENTAL, COUGAR, GRAND MARQUIS, MARK VII, SABLE, TOPAZ, TOWN CAR, TRACER

LIGHT TRUCK:
1991-92 AEROSTAR, BRONCO, ECONOLINE, EXPLORER, F SUPER DUTY, F-150-350 SERIES, RANGER

MEDIUM/HEAVY TRUCK:
1991-92 C SERIES, CARGO SERIES, CL-CLT-9000 SERIES, F & B SERIES, L SERIES

ISSUE:
New vehicle pre-delivery forms have been developed for 1991 and early release 1992 model year vehicles.

ACTION:
Use the new pre-delivery forms immediately. The information also applies to prior model year vehicles.

Changes to the new pre-delivery form are...

- No model and model year designations, which allow the form's use for prior and early release model years.
- No second page for customer review to improve dealership paper flow. The new delivery checklist has a summary of pre-delivery checks plus an area for customer signature.
- Simplified description of inspection check items.
- Reordering of forms is now done by calling a toll-free telephone number: 1-800-622-4511. No order form is required.
- New Quality Concern Feedback System, either through the use of an EDSR (Electronic Dealer Service Report) or telephone number: 1-800-322-5621.

If the new pre-delivery forms have not been readily located at the dealership, look for the shipping box identified by the fluorescent green sticker with the word "PRE-DELIVERY" shown. The delivery forms to be used by the Sales Department will have a fluorescent orange sticker with the word "DELIVERY" shown.

If the forms cannot be found, call 1-800-622-4511 for assistance. Have your dealer sales code available.

Dealers also should have received extra copies of the Pre-delivery, Maintenance & Lubrication Shop Manuals. These should be distributed to the pre-delivery technicians.

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 190000, 290000, 390000, 490000, 590000, 690000, 790000

Instrument Panel - Cracked - Repair Procedure	**Article No. 90-26-13**

MEDIUM/HEAVY TRUCK:
1987-90 L SERIES

ISSUE:
Cracks may appear in the instrument panel beginning from the mounting screws below the windshield. This may occur if the panel installation causes localized stress around the mounting screws.

ACTION:
Install an instrument panel reinforcement strip by using the following service procedure.

SERVICE PROCEDURE

1. Remove the eight instrument panel installation bolts below the windshield.

2. Lay the reinforcement strip on top of the instrument panel as shown in Figure 1.

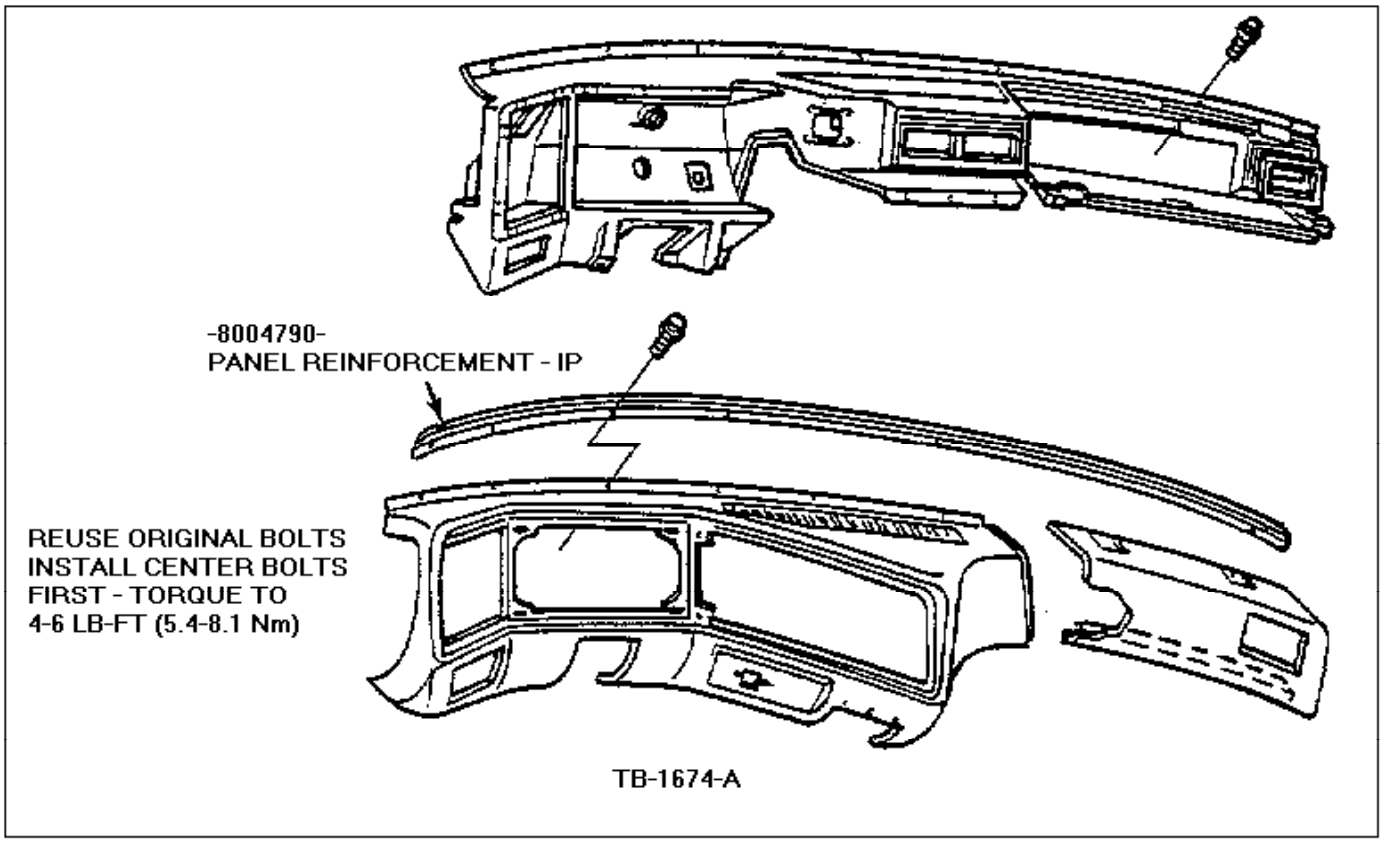


Figure 1 - Article 90-26-13

3. Align the attaching bolt holes.

4. Reinstall the original bolts. Start with the center bolt first and work out towards each end of the strip.
5. Tighten bolts to 4-6 lb-ft (5.4-8.1N-m).

OTHER APPLICABLE ARTICLES: NONE

WARRANTY STATUS: Eligible Under Basic Warranty Coverage

LABOR ALLOWANCE

DEALER CODING

OASIS CODES: 107000

90-26, ***Publication Date: DECEMBER 19, 1990***

Radiator - "Ad-Tech" - Radiator And Cooling Module Component Parts List	Article No. 90-26-14

MEDIUM/HEAVY TRUCK:
1988-91 CL-CLT-9000 SERIES, F & B SERIES, L SERIES

This TSB is being republished in its entirety to change the part's class for one radiator assembly (FOHZ-8005-U) and to add a drain cock (E8HZ-8115-A) to the Parts Block.

ISSUE:
An "Ad-Tech" radiator and cooling module component parts list is now available for service use.

ACTION:
If service is required, refer to Figures 1 through 5 for identifying the correct "Ad-Tech" radiator and cooling module components.

AD-TECH RADIATOR AND COOLING MODULE COMPONENT PARTS (1988-1989)

RADIATOR & SUPPORT END ITEM PART NUMBER	COMPONENT PARTS[d]									USAGE			
	SUPPORT KIT/ SIDE KIT	HOOP KIT	COOLER ASSY	SHUTTER ASSY/ SUPPORT ASSY	RADIATOR ASSY	CORE/HEADER ASSY	TANK	GASKET[a] KIT	VNT[b] PER	DRN[c] RAD	MODEL YEARS	TRUCK SERIES	ENGINE	SHUT
*ANY LETTER			USA, CANADA	KYSOR P/N										
E8HT-8009-A*	E8HZ-8A297-D◈	NA	F0HZ-6K775-A	NA	E8HZ-8005-N	E8HZ-8010-A	E8HZ-8061-A(LH) 5S51774G	ONE KIT REQ'D PER TANK, TWO KITS PER RADIATOR	ONE	ONE	88-89	L-LT-LS-LTS-	CAT 3406	NA
	3S38510A		1B125, 1E3246		3S40716D	3S40720C	E8HZ-8061-A(RH) 5S51774G					LN-LNT-9000		
E8HT-8009-B*	E8HZ-8A297-D◈	E8HZ-8A297-E	F0HZ-6K775-A	NA	E8HZ-8005-N	E8HZ-8010-A	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	87-89	LL-LTL-9000	CAT 3406	NA
	3S38510A	3S38511A	1B125, 1E3246		3S40716D	3S40720C	E8HZ-8061-A(RH) 5S51774G							
E8HT-8009-C*	E8HZ-8A297-D◈	NA	NA	E8HZ-8475-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	88-89	L-LT-LS-LTS-	CUMMINS	YES
	3S38510A			1034-07184	3S40718D	3S40722C	E8HZ-8061-C(RH) 5S51804G					LN-LNT-9000	NTC/L10	
E8HT-8009-D*	E8HZ-8A297-D◈	NA	NA	E8HZ-8A297-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	88-89	L-LT-LS-LTS-	CUMMINS	NO
	3S38510A			4020-39795	3S40718D	3S40722C	E8HZ-8061-C(RH) 5S51804G					LN-LNT-9000	NTC/L10	
E8HT-8009-E*	E8HZ-8A297-D◈	E8HZ-8A297-E	NA	E8HZ-8475-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	88-89	LL-LTL-9000	CUMMINS	YES
	3S38510A	3S38511A		1034-07148	3S40718D	3S40722C	E8HZ-8061-C(RH) 5S51804G						NTC-OA	
E8HT-8009-F*	E8HZ-8A297-D◈	E8HZ-8A297-E	NA	E8HZ-8A297-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	88-89	LL-LTL-9000	CUMMINS	NO
	3S38510A			4020-39795	3S40718D	3S40722C	E8HZ-8061-C(RH) 5S51804G						NTC-OA	
E8HT-8009-G*	E8HZ-8A297-D◈	NA	NA	E8HZ-8A297-A	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	89	L-LT-LS-LTS-	FORD DSL	NO
	3S38510A			4020-39795	3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7/8000	6.6/7.8L	
E8HT-8009-H*	E8HZ-8A297-D◈	NA	NA	E8HZ-8475-A	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	89	L-LT-LS-LTS-	FORD DSL	YES
	3S38510A			1034-07148	3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7/8000	6.6/7.8L	
E8HT-8009-J*	E8HZ-8A297-D◈	NA	F0HZ-6K775-D	NA	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	89	L-LT-LS-LTS-	FORD DSL	NA
	3S38510A		1B127, 1E3248		3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7/8000	6.6/7.8L	
E8HT-8009-K*	E8HZ-8A297-D◈	NA	F0HZ-6K775-C	NA	E9HZ-8005-B	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	89	L-LT-LS-LTS-	CAT 3306	NA
	3S38510A		1B128, 1E3249		3S40717D	3S40721C	E8HZ-8061-A(RH) 5S51774G					LN-LNT-9000		
E8HT-8009-L*	E8HZ-8A297-D◈	NA	NA	E8HZ-8475-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	88-89	L-LT-LS-LTS-	CUMMINS	YES
	3S38510A			1034-07148	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G					LN-LNT-9000	NTC/L10	
E8HT-8009-M*	E8HZ-8A297-D◈	NA	NA	E8HZ-8A297-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	88-89	L-LT-LS-LTS-	CUMMINS	NO
	3S38510A			4020-39795	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G					LN-LNT-9000	NTC/L10	
E8HT-8009-N*	E8HZ-8A297-D◈	E8HZ-8A297-E	NA	E8HZ-8475-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	89	LL-LTL-9000	CUMMINS	YES
	3S38510A	3S38511A		1034-07148	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G						NTC/L10	
E8HT-8009-R*	E8HZ-8A297-D◈	E8HZ-8A297-E	NA	E8HZ-8A297-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	89	LL-LTL-9000	CUMMINS	NO
	3S38510A	3S38511A		4020-39795	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G						NTC/L10	
E8HT-8005-C*	E8HZ-8A297-F	NA	NA	NA	E8HZ-8005-R	E8HZ-8010-A	E8HZ-8061-B(UR) 5S51807G		ONE	ONE	88-89	CL-CLT-9000	CAT 3406	NA
	3S38513A				3S38507C	3S40720C	E8HZ-8061-B(LR) 5S51807G							
E8HT-8005-D*	E8HZ-8A297-F	NA	NA	NA	E9HZ-8005-A[f]	E8HZ-8010-B	E9HZ-8061-A(UR) 5S53581G		TWO	TWO	89	CL-CLT-9000	CUMMINS	NA
	3S38513A				3S38509C	3S40722C	E9HZ-8061-A(LR) 5S53581G						L10-OA	
E8HT-8005-F*	E8HZ-8A297-F	NA	NA	NA	E9HZ-8005-C[e]	E8HZ-8010-B	E8HZ-8061-D(UR) 5S51809G		ONE	ONE	88-89	CL-CLT-9000	CUMMINS	NA
	3S38513A				3S40341C	3S40722C	E9HZ-8079-A(LR) 5S51808G						NTC/L10	

[a] GASKET STRIP KIT NO. - E8HZ-8C261-A (3S38375A)
[b] VENT ASSY. NO. - E8HZ-8W004-A (5S51778A)
[c] DRAIN COCK NO. - E8HZ-8115-A (5S53554A)
[d] ALL PART NUMBERS ARE FORD OR MODINE EXCEPT AS NOTED
[e] 2 - PASS RADIATOR
[f] 3 - PASS RADIATOR

◈ SINGLE SUPPORT - F0HZ-8A297-E (5S53628D)
◈ SINGLE TIE ROD - F0HZ-8133-A (5S55662A)
◈ KIT OF 5 BELLEVILLE SPRING WASHERS - E8HZ-8K008-A (3S40672A), 2 KITS FOR L MODELS, 1 KIT FOR LL MODELS

TB-1917-A

Figure 1 - Article 90-26-14

AD-TECH RADIATOR AND COOLING MODULE COMPONENT PARTS (1990)

RADIATOR & SUPPORT END ITEM PART NUMBER	COMPONENT PARTS[d]										USAGE			
	SUPPORT KIT/ SIDE KIT	HOOP KIT	COOLER ASSY	SHUTTER ASSY/ SUPPORT ASSY	RADIATOR ASSY	CORE/HEADER ASSY	TANK	GASKET[a] KIT	VNT[b] PER	DRN[c] RAD	MODEL YEARS	TRUCK SERIES	ENGINE	SHUT
			USA, CANADA	KYSOR P/N										
E8HT-8009-AG	E8HZ-8A297-D*	NA	F0HZ-6K775-A	NA	E8HZ-8005-N	E8HZ-8010-A	E8HZ-8061-A(LH) 5S51774G	ONE KIT REQ'D PER TANK, TWO KITS PER RADIATOR	ONE	ONE	89-90	L-LT-LS-LTS-	CAT 3406	NA
	3S38510A		1B125, 1E3246		3S40716D	3S40720C	E8HZ-8061-A(RH) 5S51774G					LN-LNT-9000		
E8HT-8009-BF	E8HZ-8A297-D*	E8HZ-8A297-E	F0HZ-6K775-A	NA	E8HZ-8005-N	E8HZ-8010-A	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	89-90	LL-LTL-9000	CAT 3406	NA
	3S38510A	3S38511A	1B125, 1E3246		3S40716D	3S40720C	E8HZ-8061-A(RH) 5S51774G							
E9HT-8009-AB	E8HZ-8A297-D*	NA	F0HZ-6K775-A	NA	E9HZ-8005-B	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	90	L-LT-LS-LTS-	CAT 3176	NA
	3S38510A		1B125, 1E3246		3S40717D	3S40721C	E8HZ-8061-A(RH) 5S51774G					LN-LNT-9000		
E9HT-8009-BB	E8HZ-8A297-D*	E8HZ-8A297-E	F0HZ-6K775-A	NA	E9HZ-8005-B	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	90	LL-LTL-9000	CAT 3176	NA
	3S38510A	3S38511A	1B125, 1E3246		3S40717D	3S40721C	E8HZ-8061-A(RH) 5S51774G							
E8HT-8009-KB	E8HZ-8A297-D*	NA	F0HZ-6K775-C	NA	E9HZ-8005-B	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	89-90	L-LT-LS-LTS-	CAT 3306	NA
	3S38510A		1B128, 1E3249		3S40717D	3S40721C	E8HZ-8061-A(RH) 5S51774G					LN-LNT-9000		
E8HT-8009-JO	E8HZ-8A297-D*	NA	F0HZ-6K775-D	NA	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(RH) 5S51803G		ONE	ONE	89-90	L-LT-LS-LTS-	FORD DSL	NA
	3S38510A		1B127, 1E3248		3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7.8000	6.6/7.8L	
E9HT-8009-GA	E8HZ-8A297-D*	NA	NA	E8HZ-8A297-A	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	89-90	L-LT-LS-LTS-	FORD DSL	NO
	3S38510A			4020-39795	3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7.8000	6.6/7.8L	
E9HT-8009-HA	E8HZ-8A297-D*	NA	NA	E8HZ-8475-A	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	89-90	L-LT-LS-LTS-	FORD DSL	YES
	3S38510A			1034-07148	3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7.8000	6.6/7.8L	
E9HT-8009-SA	E8HZ-8A297-D*	NA	NA	E8HZ-8475-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	89-90	L-LT-LS-LTS-	CUMMINS	YES
	3S38510A			1034-07148	3S40718D	3S40722C	E8HZ-8061-C(RH) 5S51804G					LN-LNT-9000	NTC-OA	
E9HT-8009-TA	E8HZ-8A297-D*	NA	NA	E8HZ-8A297-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	89-90	L-LT-LS-LTS-	CUMMINS	NO
	3S38510A			4020-39795	3S40718D	3S40722C	E8HZ-8061-C(RH) 5S51804G					LN-LNT-9000	NTC-OA	
E9HT-8009-UA E8HT-8009-EC	E8HZ-8A297-D*	E8HZ-8A297-E	NA	E8HZ-8475-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	89-90	LL-LTL-9000	CUMMINS	YES
	3S38510A	3S38511A		1034-07148	3S40718D	3S40722C	E8HZ-8061-C(RH) 5S51804G						NTC-OA	
E9HT-8009-VA E8HT-8009-FC	E8HZ-8A297-D*	E8HZ-8A297-E	NA	E8HZ-8A297-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	89-90	LL-LTL-9000	CUMMINS	NO
	3S38510A	3S38511A		4020-39795	3S40718D	3S40722C	E8HZ-8061-C(RH) 5S51804G						NTC-OA	
E9HT-8009-LA	E8HZ-8A297-D*	NA	NA	E8HZ-8475-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	89-90	L-LT-LS-LTS-	CUMMINS	YES
	3S38510A			1034-07148	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G					LN-LNT-9000	NTC/L10	
E9HT-8009-NA	E8HZ-8A297-D*	NA	NA	E8HZ-8A297-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	89-90	L-LT-LS-LTS-	CUMMINS	NO
	3S38510A			4020-39795	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G					LN-LNT-9000	NTC/L10	
E8HT-8009-NA	E8HZ-8A297-D*	E8HZ-8A297-E	NA	E8HZ-8475-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	89-90	LL-LTL-9000	CUMMINS	YES
	3S38510A	3S38511A		1034-07148	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G						NTC/L10	
E8HT-8009-RA	E8HZ-8A297-D*	E8HZ-8A297-E	NA	E8HZ-8A297-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	89-90	LL-LTL-9000	CUMMINS	NO
	3S38510A	3S38511A		4020-39795	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G						NTC/L10	
E8HT-8005-CC	E8HZ-8A297-F	NA	NA	NA	E8HZ-8005-R	E8HZ-8010-A	E8HZ-8061-B(UR) 5S51807G		ONE	ONE	89-90	CL-CLT-9000	CAT 3406	NA
	3S38513A				3S38507C	3S40720C	E8HZ-8061-B(LR) 5S51807G							
E8HT-8005-DA	E8HZ-8A297-F	NA	NA	NA	E9HZ-8005-A[f]	E8HZ-8010-B	E9HZ-8061-A(UR) 5S53581G		TWO	TWO	90	CL-CLT-9000	CUMMINS	NA
	3S38513A				3S38509C	3S40722C	E9HZ-8061-A(LR) 5S53581G						L10-OA	
E9HT-8005-YB	E8HZ-8A297-F	NA	NA	NA	E9HZ-8005-C[e]	E8HZ-8010-B	E8HZ-8061-D(UR) 5S51809G		ONE	TWO	89-90	CL-CLT-9000	CUMMINS	NA
	3S38513A				3S40341C	3S40722C	E9HZ-8079-A(LR) 5S54256G						NTC/L10	

Figure 2 - Article 90-26-14

AD-TECH RADIATOR AND COOLING MODULE COMPONENT PARTS (1990-1/2)

RADIATOR & SUPPORT END ITEM PART NUMBER	COMPONENT PARTS[d]									USAGE			
	SUPPORT KIT/ SIDE KIT	HOOP KIT	COOLER ASSY	SHUTTER ASSY/ SUPPORT ASSY	RADIATOR ASSY	CORE/HEADER ASSY	TANK	GASKET [a] KIT	VNT [b] PER	DRN [c] RAD	MODEL YEARS	TRUCK SERIES	ENGINE	SHUT
			USA, CANADA	KYSOR P/N										
FOHT-8009-AB	E8HZ-8A297-D*	NA	F0HZ-6K775-A	NA	E8HZ-8005-N	E8HZ-8010-A	E8HZ-8061-A(LH) 5S51774G	ONE KIT REQ'D PER TANK, TWO KITS PER RADIATOR	ONE	ONE	1990-1/2	L-LT-LS-LTS-	CAT 3406	NA
	3S38510A		1B125, 1E3246		3S40716C	3S40720C	E8HZ-8061-A(RH) 5S51774G					LN-LNT-9000		
FOHT-8009-BB	E8HZ-8A297-D*	E8HZ-8A297-E	F0HZ-6K775-A	NA	E9HZ-8005-N	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	1990-1/2	LL-LTL-9000	CAT 3406	NA
	3S38510A	3S38511A	1B125, 1E3246		3S40716C	3S40720C	E8HZ-8061-A(RH) 5S51774G							
FOHT-8009-EB	E8HZ-8A297-D*	NA	F0HZ-6K775-A	NA	E9HZ-8005-B	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CAT 3176	NA
	3S38510A		1B125, 1E3246		3S40717C	3S40721C	E8HZ-8061-A(RH) 5S51774G					LN-LNT-9000		
FOHT-8009-FB	E8HZ-8A297-D*	E8HZ-8A297-E	F0HZ-6K775-A	NA	E9HZ-8005-B	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	1990-1/2	LL-LTL-9000	CAT 3176	NA
	3S38510A	3S38511A	1B125, 1E3246		3S40717C	3S40721C	E8HZ-8061-A(RH) 5S51774G							
FOHT-8009-DB	E8HZ-8A297-D*	NA	F0HZ-6K775-C	NA	E9HZ-8005-B	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CAT 3306	NA
	3S38510A		1B128, 1E3249		3S40717C	3S40721C	E8HZ-8061-A(RH) 5S51774G					LN-LNT-9000		
FOHT-8009-CB	E8HZ-8A297-D*	NA	F0HZ-6K775-D	NA	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	FORD DSL	NA
	3S38510A		1B127, 1E3248		3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7/8000	6.6/7.8L	
FOHT-8009-JA	E8HZ-8A297-D*	NA	NA	E8HZ-8A297-A	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	FORD DSL	NO
	3S38510A			4020-39795	3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7/8000	6.6/7.8L	
FOHT-8009-HA	E8HZ-8A297-D*	NA	NA	E8HZ-8475-A	E8HZ-8005-U	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	FORD DSL	YES
	3S38510A			1034-07148	3S41059D	3S40721C	E8HZ-8061-F(RH) 5S51803G					LN-LNT-7/8000	6.6/7.8L	
FOHT-8009-SA	E8HZ-8A297-D*	NA	NA	E8HZ-8475-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CUMMINS	YES
	3S38510A			1034-07148	3S40718C	3S40722C	E8HZ-8061-C(RH) 5S51804G					LN-LNT-9000	NTC-OA	
FOHT-8009-TA	E8HZ-8A297-D*	NA	NA	E8HZ-8A297-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CUMMINS	NO
	3S38510A			4020-39795	3S40718C	3S40722C	E8HZ-8061-C(RH) 5S51804G					LN-LNT-9000	NTC-OA	
FOHT-8009-UA	E8HZ-8A297-D*	E8HZ-8A297-E	NA	E8HZ-8475-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	1990-1/2	LL-LTL-9000	CUMMINS	YES
FOHT-8009-YA	3S38510A	3S38511A		1034-07148	3S40718C	3S40722C	E8HZ-8061-C(RH) 5S51804G						NTC-OA	
FOHT-8009-VA	E8HZ-8A297-D*	E8HZ-8A297-E	NA	E8HZ-8A297-A	E8HZ-8005-P[e]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	1990-1/2	LL-LTL-9000	CUMMINS	NO
FOHT-8009-ZA	3S38510A	3S38511A		4020-39795	3S40718C	3S40722C	E8HZ-8061-C(RH) 5S51804G						NTC-OA	
FOHT-8009-LA	E8HZ-8A297-D*	NA	NA	E8HZ-8475-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CUMMINS	YES
	3S38510A			1034-07148	3S40719C	3S40722C	E8HZ-8061-E(RH) 5S53580G					LN-LNT-9000	NTC/L10	
FOHT-8009-MA	E8HZ-8A297-D*	NA	NA	E8HZ-8A297-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CUMMINS	NO
	3S38510A			4020-39795	3S40719C	3S40722C	E8HZ-8061-E(RH) 5S53580G					LN-LNT-9000	NTC/L10	
FOHT-8009-KA	E8HZ-8A297-D*	E8HZ-8A297-E	NA	E8HZ-8475-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	1990-1/2	LL-LTL-9000	CUMMINS	YES
	3S38510A	3S38511A		1034-07148	3S40719C	3S40722C	E8HZ-8061-E(RH) 5S53580G						NTC/L10	
FOHT-8009-RA	E8HZ-8A297-D*	E8HZ-8A297-E	NA	E8HZ-8A297-A	E8HZ-8005-T[f]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	1990-1/2	LL-LTL-9000	CUMMINS	NO
	3S38510A	3S38511A		4020-39795	3S40719D	3S40722C	E8HZ-8061-E(RH) 5S53580G						NTC/L10	
E8HT-8005-CC	E8HZ-8A297-F	NA	NA	NA	E8HZ-8005-R	E8HZ-8010-A	E8HZ-8061-B(UR) 5S51807G		ONE	ONE	1990-1/2	CL-CLT-9000	CAT 3406	NA
	3S38513A				3S38507C	3S40720C	E8HZ-8061-B(LR) 5S51807G							
E8HT-8005-DA	E8HZ-8A297-F	NA	NA	NA	E9HZ-8005-A[f]	E8HZ-8010-B	E9HZ-8061-A(UR) 5S53581G		TWO	TWO	1990-1/2	CL-CLT-9000	CUMMINS	NA
	3S38513A				3S38509C	3S40722C	E9HZ-8061-A(LR) 5S53581G						L10-OA	
E9HT-8005-YB	E8HZ-8A297-F	NA	NA	NA	E9HZ-8005-C[e]	E8HZ-8010-B	E8HZ-8061-D(UR) 5S51809G		ONE	TWO	1990-1/2	CL-CLT-9000	CUMMINS	NA
	3S38513A				3S40341C	3S40722C	E9HZ-8079-A(LR) 5S54256G						NTC-OA	

[a] GASKET STRIP KIT NO. - E9HZ-8C261-A (3S40310A)
[b] VENT ASSY. NO. - E8HZ-8W004-A (5S51778A)
[c] DRAIN COCK NO. - E8HZ-8115-A (5S53554A)

[d] ALL PART NUMBERS ARE FORD OR MODINE EXCEPT AS NOTED
[e] 2 - PASS RADIATOR *SINGLE SUPPORT - F0HZ-8A297-E (5S53628D)
[f] 3 - PASS RADIATOR *SINGLE TIE ROD - F0HZ-8133-A (5S55662A)

* KIT OF 5 BELLEVILLE SPRING WASHERS - E8HZ-8K008-A (3S40672A)
2 KITS FOR L MODELS, 1 KIT FOR LL MODELS

TR-1919-A

Figure 3 - Article 90-26-14

AD-TECH RADIATOR AND COOLING MODULE COMPONENT PARTS (1991)

RADIATOR & SUPPORT END ITEM PART NUMBER	COMPONENT PARTS[1]										USAGE			
	SUPPORT KIT/ SIDE KIT	HOOP KIT	COOLER ASSY	SHUTTER ASSY/ SUPPORT ASSY	RADIATOR ASSY	CORE/HEADER ASSY	TANK	GASKET [2] KIT	VNT [b] PER	DRN [c] RAD	MODEL YEARS	TRUCK SERIES	ENGINE	SHUT
			USA, CANADA	KYSOR P/N										
F1HT-8009-GB	E8HZ-8A297-D[x]	NA	F0HZ-6K775-A	NA	F1HZ-8005-C	E8HZ-8010-A	E8HZ-8061-A(LH) 5S51774G	ONE KIT REQ'D PER TANK, TWO KITS PER RADIATOR	ONE	ONE	1991	L-LT-LS-LTS-	CAT 3406	NA
	3S38510A		1B125, 1E3246		3S40993C	3S40720C	F1HZ-8061-A(RH) 5S55920G					LN-LNT-9000		
F1HT-8009-FB	E8HZ-8A297-D[x]	E8HZ-8A297-E	F0HZ-6K775-A	NA	F1HZ-8005-C	E8HZ-8010-A	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	1991	LL-LTL-9000	CAT 3406	NA
F1HT-8009-JB	E8HZ-8A297-D[x]	NA	F0HZ-6K775-C	NA	F1HZ-8005-B	E8HZ-8010-C	E8HZ-8061-A(LH) 5S51774G		ONE	ONE	1991	L-LT-LS-LTS-	CAT 3306	NA
	3S38510A		1B128, 1E3249		3S40992C	3S40721C	F1HZ-8061-A(RH) 5S55920G					LN-LNT-9000		
F1HT-8009-KB	E8HZ-8A297-D[x]	NA	F0HZ-6K775-D	NA	F1HZ-8005-D	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	1991	L-LT-LS-LTS-	FORD DSL	NA
	3S38510A		1B127, 1E3248		3S40994C	3S40721C	F1HZ-8061-A(RH) 5S55920G					LN-LNT-7.8000	6.6/7.8L	
F1HT-8009-MB	E8HZ-8A297-D[x]	NA	NA	E8HZ-8A297-A	F1HZ-8005-D	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	1991	L-LT-LS-LTS-	FORD DSL	NO
	3S38510A			4020-39795	3S40994C	3S40721C	F1HZ-8061-A(RH) 5S55920G					LN-LNT-7.8000	6.6/7.8L	
F1HT-8009-LB	E8HZ-8A297-D[x]	NA	NA	E8HZ-8475-A	F1HZ-8005-D	E8HZ-8010-C	E8HZ-8061-F(LH) 5S51803G		ONE	ONE	1991	L-LT-LS-LTS-	FORD DSL	YES
	3S38510A			1034-07148	3S40994C	3S40721C	F1HZ-8061-A(RH) 5S55920G					LN-LNT-7.8000	6.6/7.8L	
F0HT-8009-SA	E8HZ-8A297-D[x]	NA	NA	E8HZ-8475-A	E8HZ-8005-P[d]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CUMMINS	YES
	3S38510A			1034-07148	3S40718C	3S40722C	E8HZ-8061-C(RH) 5S51804G				-1991	LN-LNT-9000	NTC-OA	
F0HT-8009-TA	E8HZ-8A297-D[x]	NA	NA	E8HZ-8A297-A	E8HZ-8005-P[d]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CUMMINS	NO
	3S38510A			4020-39795	3S40718C	3S40722C	E8HZ-8061-C(RH) 5S51804G				-1991	LN-LNT-9000	NTC-OA	
F0HT-8009-UA	E8HZ-8A297-D[x]	E8HZ-8A297-E	NA	E8HZ-8475-A	E8HZ-8005-P[d]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	1990-1/2	LL-LTL-9000	CUMMINS	YES
F0HT-8009-YA	3S38510A	3S38511A		1034-07148	3S40718C	3S40722C	E8HZ-8061-C(RH) 5S51804G				-1991		NTC-OA	
F0HT-8009-VA	E8HZ-8A297-D[x]	E8HZ-8A297-E	NA	E8HZ-8A297-A	E8HZ-8005-P[d]	E8HZ-8010-B	E8HZ-8080-A(LH) 5S51805G		ONE	ONE	1990-1/2	LL-LTL-9000	CUMMINS	NO
F0HT-8009-ZA	3S38510A	3S38511A		4020-39795	3S40718C	3S40722C	E8HZ-8061-C(RH) 5S51804G				-1991		NTC-OA	
F0HT-8009-LA	E8HZ-8A297-D[x]	NA	NA	E8HZ-8475-A	E8HZ-8005-T[d]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CUMMINS	YES
	3S38510A			1034-07148	3S40719C	3S40722C	E8HZ-8061-E(RH) 5S53580G				-1991	LN-LNT-9000	NTC/L10	
F0HT-8009-MA	E8HZ-8A297-D[x]	NA	NA	E8HZ-8A297-A	E8HZ-8005-T[d]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	1990-1/2	L-LT-LS-LTS-	CUMMINS	NO
	3S38510A			4020-39795	3S40719C	3S40722C	E8HZ-8061-E(RH) 5S53580G				-1991	LN-LNT-9000	NTC/L10	
F0HT-8009-KA	E8HZ-8A297-D[x]	E8HZ-8A297-E	NA	E8HZ-8475-A	E8HZ-8005-T[d]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	1990-1/2	LL-LTL-9000	CUMMINS	YES
	3S38510A	3S38511A		1034-07148	3S40719C	3S40722C	E8HZ-8061-E(RH) 5S53580G				-1991		NTC/L10	
F0HT-8009-RA	E8HZ-8A297-D[x]	E8HZ-8A297-E	NA	E8HZ-8A297-A	E8HZ-8005-T[d]	E8HZ-8010-B	E8HZ-8061-E(LH) 5S53580G		ONE	ONE	1990-1/2	LL-LTL-9000	CUMMINS	NO
	3S38510A	3S38511A		4020-39795	3S40719C	3S40722C	E8HZ-8061-E(RH) 5S53580G				-1991		NTC/L10	
E8HT-8005-CC	E8HZ-8A297-F	NA	NA	NA	E8HZ-8005-R	E8HZ-8010-A	E8HZ-8061-B(UR) 5S51807G		ONE	ONE	1990-1/2	CL-CLT-9000	CAT 3406	NA
	3S38513A				3S38507C	3S40720C	E8HZ-8061-B(LR) 5S51807G				-1991			
E8HT-8005-DA	E8HZ-8A297-F	NA	NA	NA	E9HZ-8005-A[d]	E8HZ-8010-B	E9HZ-8061-A(UR) 5S53581G		TWO	TWO	1990-1/2	CL-CLT-9000	CUMMINS	NA
	3S38513A				3S38509C	3S40722C	E9HZ-8061-A(LR) 5S53581G				-1991		L10-OA	
E9HT-8005-YB	E8HZ-8A297-F	NA	NA	NA	E9HZ-8005-C[d]	E8HZ-8010-B	E8HZ-8061-D(UR) 5S51809G		ONE	TWO	1990-1/2	CL-CLT-9000	CUMMINS	NA
	3S38513A				3S40341C	3S40722C	E9HZ-8079-A(LR) 5S54256G				-1991		NTC-OA	

Figure 4 - Article 90-26-14

AD-TECH RADIATOR AND COOLING MODULE COMPONENT PARTS

RADIATOR & SUPPORT END ITEM PART NUMBER	COMPONENT PARTS[d]								USAGE					
	SUPPORT KIT/ SIDE KIT	ENGINE OIL COOLER KIT	RADIATOR ASSY	CORE/HEADER ASSY	TANK	GASKET [a] KIT	VNT [b] PER	DRN [c] RAD	MODEL YEARS	TRUCK SERIES	ENGINE	WITH CHARGE AIR COOLER	TRANS	PTO
FOHT-8005-CB	FOHZ-8A297-A	NA	FOHZ-8005-B	FOHZ-8010-D	FOHZ-8061-A (UR) 5S52251G	ONE KIT REQ'D PER TANK, TWO KITS PER RADIATOR	ONE	ONE	1990	F/FT	GAS ENG	NO	MAN	NO
	3S38549B		3S38541C	3S36980C[e]	FOHZ-8080-C (LR) 5S52309G					600-800	370/429			
FOHT-8005-DB	FOHZ-8A297-A	NA	FOHZ-8005-C	FOHZ-8010-D	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT/B	FORD DSL	NO	MAN	NO
	3S38549B		3S38543C	3S36980C	FOHZ-8080-D (LR) 5S51806G					600-900	6.6L/7.8L			
FOHT-8005-EB	FOHZ-8A297-B	NA	FOHZ-8005-A	FOHZ-8010-C	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT/B	FORD DSL	YES	MAN	NO
	3S38550B		3S38544C	3S36981C	FOHZ-8080-D (LR) 5S51806G					700-900	7.8L			
FOHT-8005-FB	FOHZ-8A297-B	NA	FOHZ-8005-D	FOHZ-8010-C	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT/B	FORD DSL	YES	AUTO	NO
	3S38850B		3S38547C	3S36981C	FOHZ-8080-E (LR) 5S52385G					700-900	6.6L/7.8L			
FOHT-8005-GB	FOHZ-8A297-C	NA	FOHZ-8005-F	FOHZ-8010-B	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT	FORD DSL	YES	MAN	YES
	3S38551B		3S38545C	3S36982C	FOHZ-8080-D (LR) 5S51806G					700-900	7.8L			
FOHT-8005-HB	FOHZ-8A297-C	NA	FOHZ-8005-G	FOHZ-8010-B	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT	FORD DSL	YES	AUTO	YES
	3S38551B		3S38546C	3S36982C	FOHZ-8080-E (LR) 5S52385G					700-900	7.8L			
FOHT-8005-JB	FOHZ-8A297-D	NA	FOHZ-8005-F	FOHZ-8010-B	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT	FORD DSL	NO	MAN	YES
	3S38552B		3S38545C	3S36982C	FOHZ-8080-D (LR) 5S51806G					700-900	7.8L			
FOHT-8005-KB	FOHZ-8A297-D	NA	FOHZ-8005-G	FOHZ-8010-B	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT	FORD DSL	NO	AUTO	YES
	3S38552B		3S38546C	3S36982C	FOHZ-8080-E (LR) 5S52385G					700-900	7.8L			
FOHT-8005-LB	FOHZ-8A297-A	NA	FOHZ-8005-D	FOHZ-8010-C	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT/B	FORD DSL	NO	AUTO	NO
	3S38549B		3S38547C	3S36981C	FOHZ-8080-E (LR) 5S52385G					600-900	6.6L/7.8L			
FOHT-8005-MB	FOHZ-8A297-A	NA	FOHZ-8005-J	FOHZ-8010-C	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT	GAS ENG	NO	AUTO	NO
	3S38549B		3S38548C	3S36981C	FOHZ-8080-E (LR) 5S52385G					600-800	370/429			
FOHT-8005-NB	FOHZ-8A297-A	NA	FOHZ-8005-K	FOHZ-8010-C	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT	GAS ENG	NO	MAN	NO
	3S38549B		3S38542C	3S3698A1[f]	FOHZ-8080-C (LR) 5S52309G					600-800	370/429			
FOHT-8005-RB	FOHZ-8A297-A	FOHZ-8L005-A	FOHZ-8005-T	FOHZ-8010-C	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT	GAS ENG	NO	MAN	NO
	3S38549B	3S39740C	3S40329C	3S36981C	FOHZ-8080-A (LR) 5S55047G					600-800	370/429			
FOHT-8005-UB	FOHZ-8A297-A	FOHZ-8G005-A	FOHZ-8005-N	FOHZ-8010-C	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/FT	GAS ENG	NO	AUTO	NO
	3S38549B	3S39740C	3S40328C	3S36981C	FOHZ-8080-B (LR) 5S54901G					600-800	370/429			
FOHT-8005-YB	FOHZ-8A297-B	NA	FOHZ-8005-U	FOHZ-8010-A	FOHZ-8061-A (UR) 5S52251G		ONE	ONE	1990	F/B	FORD DSL	YES	MAN	NO
	3S38550B		3S40327C	3S39961C	FOHZ-8080-D (LR) 5S51806G					700-800	6.6L			

[a] GASKET STRIP KIT NO. - E9HZ-8C261-A (3S40310A)
[b] VENT ASSY. NO. - E8HZ-8W004-A (5S51778A)
[c] DRAIN COCK NO. - E8HZ-8115-A (5S43554A)
[d] ALL PART NUMBERS ARE FORD OR MODINE EXCEPT AS NOTED
[e] STANDARD COOLING (2 ROW RADIATOR CORE)
[f] WITH EXTRA COOLING OPTION (3 ROW RADIATOR CORE)

TB-1929-A

Figure 5 - Article 90-26-14

OTHER APPLICABLE ARTICLES: NONE

SUPERSEDES: 90-23-18

WARRANTY STATUS: INFORMATION ONLY

OASIS CODES: 402000