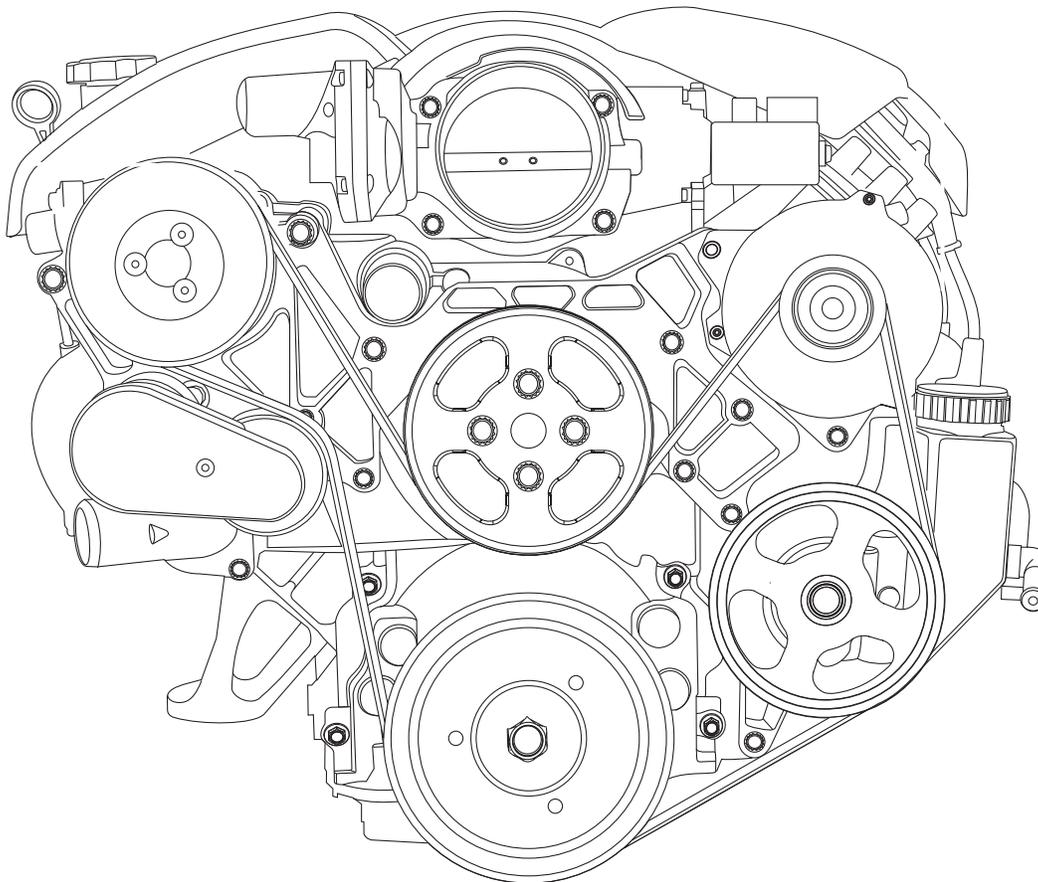




# **GM LS SERIES**

**SERPENTINE DRIVE SYSTEM**  
**w & w/o POWER STEERING**



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**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

## **IMPORTANT NOTICE-PLEASE READ**

**FOR MAXIMUM SYSTEM PERFORMANCE VINTAGE AIR RECOMMENDS THE FOLLOWING:**

### **SERVICE INFO:**

EVACUATE THE SYSTEM FOR 35-45 MINUTES WITH SYSTEM COMPONENTS (DRIER, COMPRESSOR, EVAPORATOR AND CONDENSER) AT A TEMPERATURE OF AT LEAST 85° F. ON A COOL DAY THE COMPONENTS CAN BE HEATED WITH A HEAT GUN OR BY RUNNING THE ENGINE WITH THE HEATER ON BEFORE EVACUATING. LEAK CHECK AND CHARGE TO SPECIFICATIONS.

**THE PROPER AMOUNT OF REFRIGERANT IS CRITICAL TO PROPER SYSTEM OPERATION. VINTAGE AIR RECOMMENDS OUR SYSTEMS BE CHARGED BY WEIGHT WITH A QUALITY CHARGING STATION OR SCALE.**

### **REFRIGERANT CAPACITIES FOR VINTAGE AIR SYSTEMS**

(FOR OTHER SYSTEMS, CONSULT MANUFACTURER GUIDELINES)

#### **134a SYSTEM**

CHARGE WITH 1.8 lbs. (1lbs. 12ozs) OF REFRIGERANT

### **LUBRICANT CAPACITIES**

NEW COMPRESSOR - NO ADDITIONAL OIL NEEDED

### **ENGINE DAMPER**

INSTALLATION REQUIRES SPECIALIZED TOOLS FOR REMOVAL AND INSTALLATION OF DAMPER. IF PROPER TOOLS CANNOT BE ACQUIRED VINTAGE AIR RECOMMENDS INSTALLATION TO BE PERFORMED BY TRAINED PROFESSIONAL. REFER TO DAMPER INSTRUCTIONS.

#### **REQ. TOOLS:**

(GM OEM #)	J 41816	CRANKSHAFT BALANCER REMOVER OR EQUIVALENT
	J 41816-2	CRANKSHAFT END PROTECTOR OR EQUIVALENT
	J 42386	CRANKSHAFT HOLDING TOOL OR EQUIVALENT

FOR DAMPER INSTALLATION PLEASE REFER TO MANUFACTURES INSTRUCTIONS- INCLUDED w/ DAMPER

### **MOUNTING PROVISIONS**

ALL THREADED HOLES USED AS MOUNTING PROVISIONS IN ENGINE BLOCK SHOULD BE CHECKED FOR THREAD DAMAGE AND CHASED/ REPAIRED AS NECESSARY.

### **THERMOSTAT**

WATER PUMP REQUIRES 97-03 LS1 STYLE THERMOSTAT ASSY. WATER PUMP IS NOT COMPATIBLE WITH OTHER THERMOSTAT HOUSINGS.



**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

**READ INSTRUCTIONS COMPLETELY AND THOROUGHLY BEFORE INSTALLING THE VINTAGE AIR FRONT RUNNER SYSTEM**  
**FOLLOW INSTRUCTIONS STEP-BY-STEP FOR PROPER INSTALLATION**

**REMOVAL OF OEM FRONT BELT SYSTEM (IF SO EQUIPPED)**

- DISCONNECT NEGATIVE BATTERY CABLE
- DRAIN RADIATOR FLUID
- REMOVE FAN AND BELTS
- REMOVE ALTERNATOR AND AC COMPRESSOR
- REMOVE HARMONIC DAMPER
- REMOVE OEM WATER PUMP AND THERMOSTAT ASSY. FROM OEM WATER PUMP (IF REUSING THERMOSTAT)

**FRONT RUNNER ENGINE DRIVE SYSTEM**

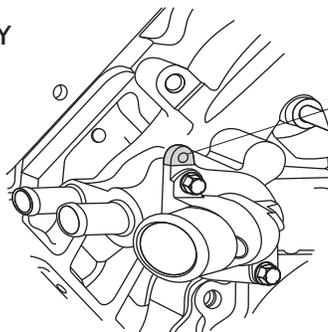
- CLEAN AND REMOVE ANY DIRT, GREASE OR BURRS ON ALL MATING SURFACES
- CLEAN DAMPER HUB AND SNOOT
- WIPE A THIN COAT OF OIL ON CRANK SNOOT

**INSTALLING MOUNTING STUDS AND DAMPER**

- INSTALL THE DAMPER AND NEW BOLT AS SHOWN IN FIGURE 1, PAGE 5. **(REFER TO INSTRUCTIONS INCLUDED WITH DAMPER)**
- USING A CLEAN MATING SURFACE, INSTALL THE (6) 8mm x 1.25 x 130mm SS STUDS AS SHOWN IN FIGURE 1, PAGE 5.
- INSTALL WATER PUMP GASKETS OVER STUDS AS SHOWN IN FIGURE 2, PAGE 5.  
**NOTE: 8mm STUDS SHOULD PROTRUDE APPROX 4.28" FROM FACE OF BLOCK**

**WATER PUMP INSTALLATION**

- INSTALL WATER PUMP OVER 8mm STUDS
- GASKET SEALER IS NOT REQUIRED ON GASKETS, COMPONENTS SHOULD BE INSTALLED DRY.
- THERMOSTAT HOUSING MUST BE MODIFIED FOR USE. MOUNTING EAR OF HOUSING MUST BE REMOVED. GRIND OR CUT EAR AS SHOWN BELOW. INSPECT O-RING SEAL AND REUSE OR REPLACE AS REQUIRED  
**NOTE: OEM THERMOSTAT ASSEMBLY CAN BE RE-USED OR ONE CAN BE PURCHASED FROM LOCAL AUTO PARTS RETAILER**
- RE-INSTALL MODIFIED T-STAT HOUSING ASSY ONTO NEW WATER PUMP. TORQUE TO 11 LB FT.



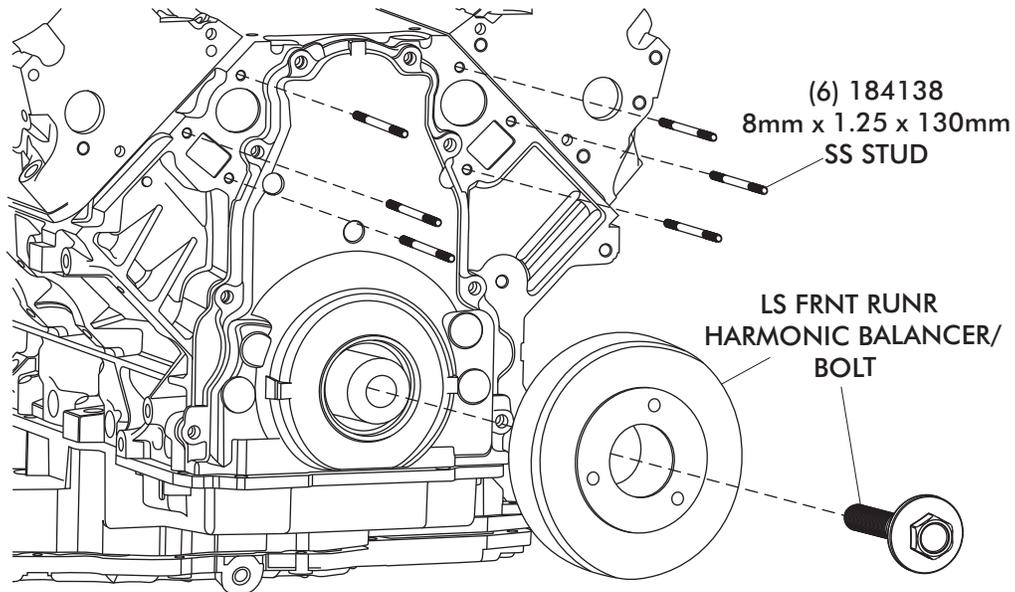
REMOVE SHADED AREA OF EAR

**NOTE: LS1 STYLE THERMOSTAT HOUSING & THERMOSTAT MUST BE USED. LS2,3,7 (GEN IV ENGINES) IS NOT COMPATIBLE. USE 97-03 LS1 STYLE THERMOSTAT**



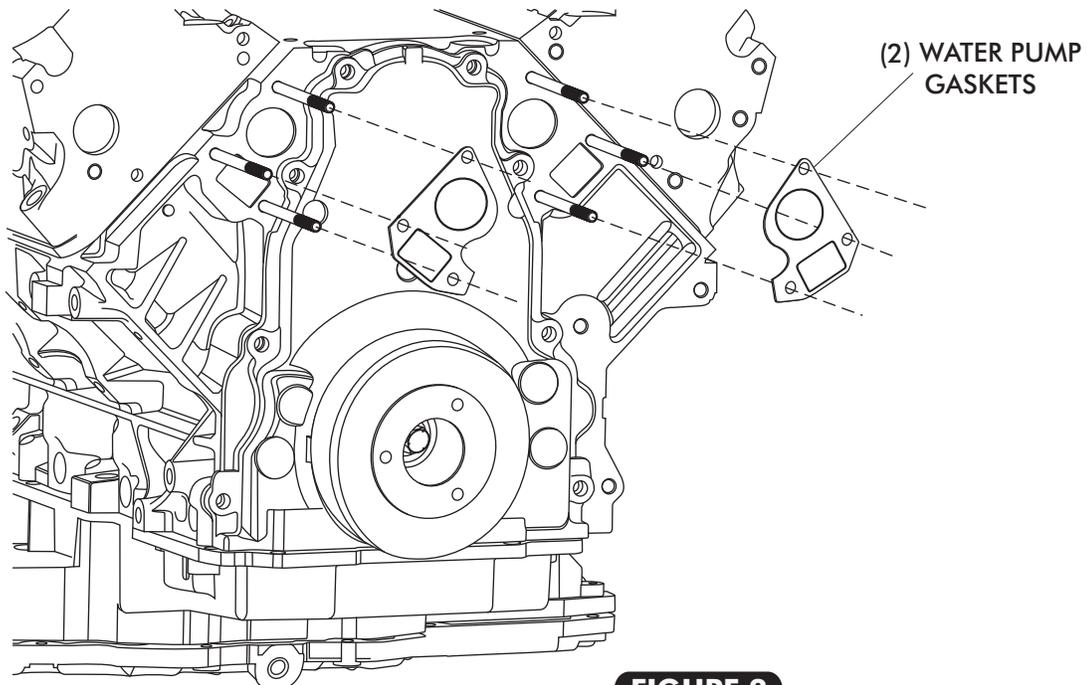
**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

**MOUNTING STUDS AND HARMONIC BALANCER INSTALLATION**



**FIGURE 1**

**WATER PUMP GASKET INSTALLATION**

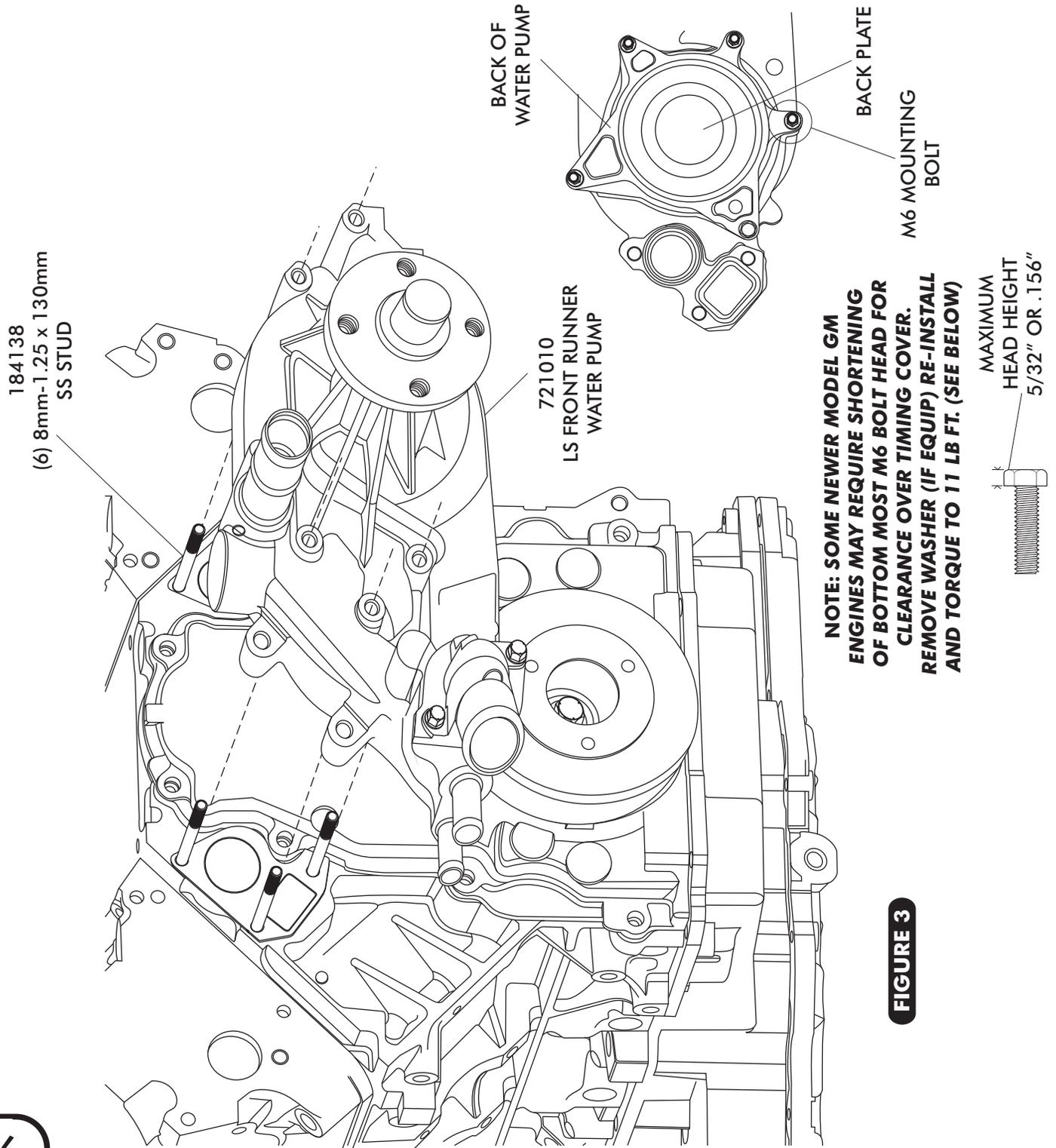


**FIGURE 2**



**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

**WATER PUMP INSTALLATION**



**NOTE: SOME NEWER MODEL GM ENGINES MAY REQUIRE SHORTENING OF BOTTOM MOST M6 BOLT HEAD FOR CLEARANCE OVER TIMING COVER. REMOVE WASHER (IF EQUIP) RE-INSTALL AND TORQUE TO 11 LB FT. (SEE BELOW)**

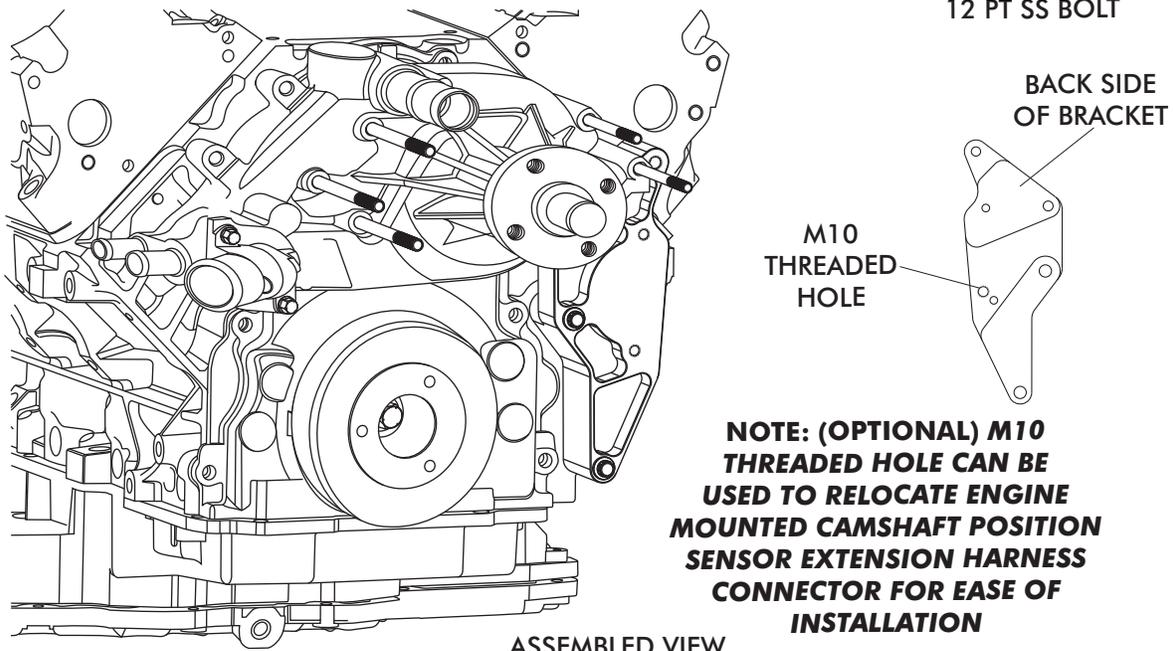
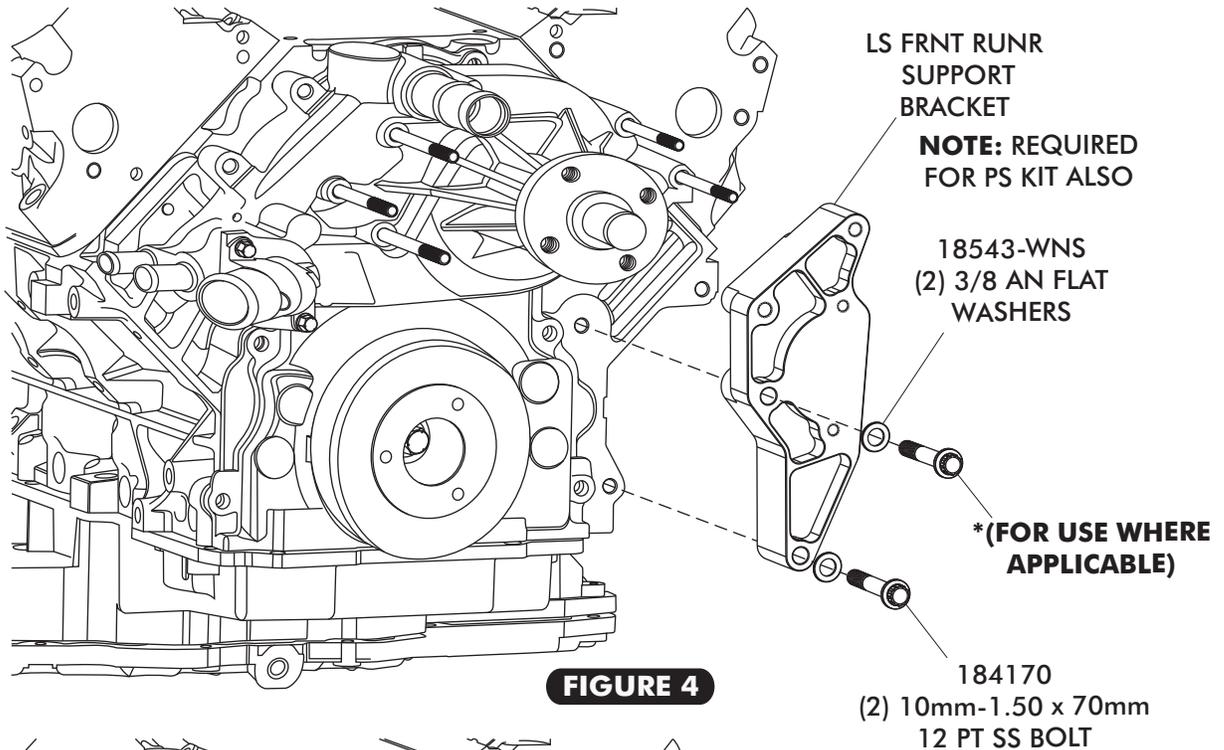
**FIGURE 3**



**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

**SUPPORT BRKT**

- INSTALL SUPPORT BRACKET ONTO BLOCK USING (2) 10mm-1.50 x 70mm 12PT SS BOLTS WITH (2) 3/8 AN FLAT WASHERS AS SHOWN IN FIGURE 4 BELOW. **\*NOTE: GM BLOCKS VARY IN # OF MOUNTING PROVISIONS PROVIDED DEPENDING ON APPLICATION, SUPPORT BRACKET WILL ACCOMMODATE VARIANCE. HAND TIGHTEN FASTENERS ONLY, DO NOT TORQUE. SEE FIGURE 4 BELOW.**

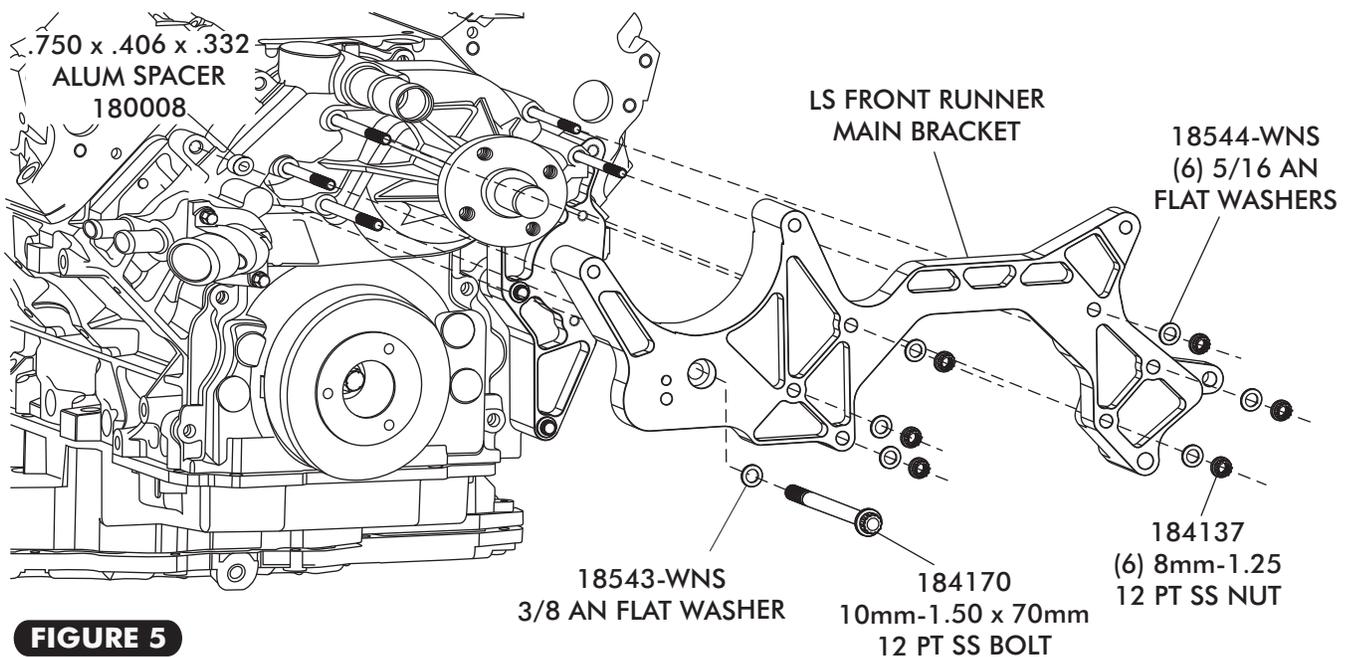




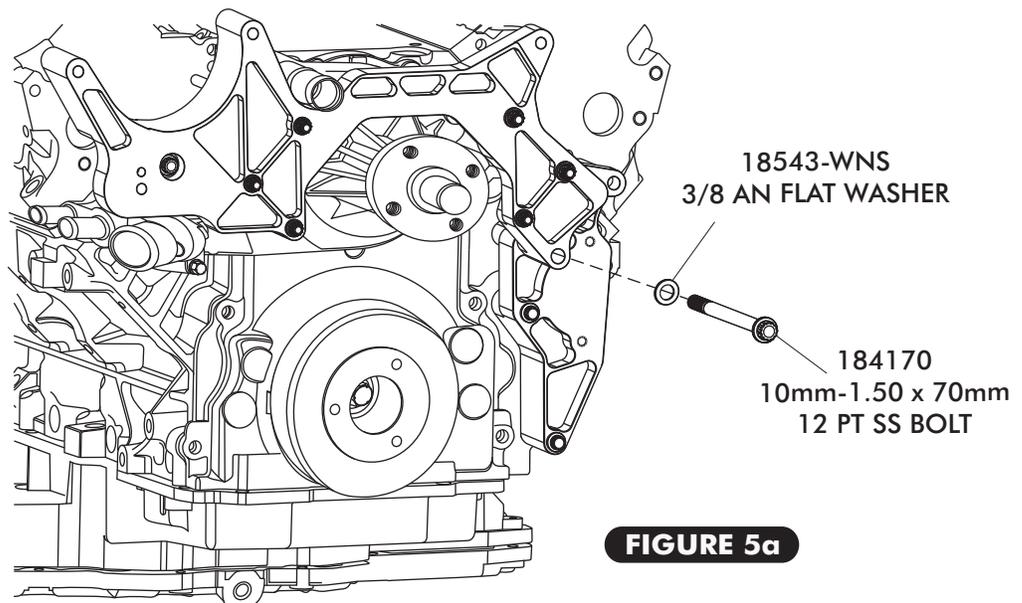
**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

**FRONT RUNNER MAIN BRACKET ASSEMBLY INSTALLATION**

- ❑ INSTALL FRONT RUNNER MAIN BRACKET ASSEMBLY OVER WATER PUMP AND 8mm MOUNTING STUDS USING 5/16 AN FLAT WASHERS AND 8mm-1.25 12 PT SS NUT. SEE FIGURE 5 BELOW. **NOTE: DO NOT TORQUE FASTENERS AT THIS TIME.**
- ❑ INSTALL .750 x .406 x .332 ALUM SPACER BETWEEN MAIN BRACKET AND WATER PUMP, USING A 10mm-1.50 x 70mm 12 PT SS BOLT AND 3/8 AN FLAT WASHER AS SHOWN IN FIGURE 5.
- ❑ INSTALL A 10mm-1.50 x 70mm 12 PT SS BOLT AND A 3/8 AN FLAT WASHER THROUGH MAIN BRACKET AND SUPPORT BRACKET AS SHOWN IN FIGURE 5a BELOW.
- ❑ DO NOT TORQUE FASTENERS AT THIS TIME.



**FIGURE 5**



**FIGURE 5a**



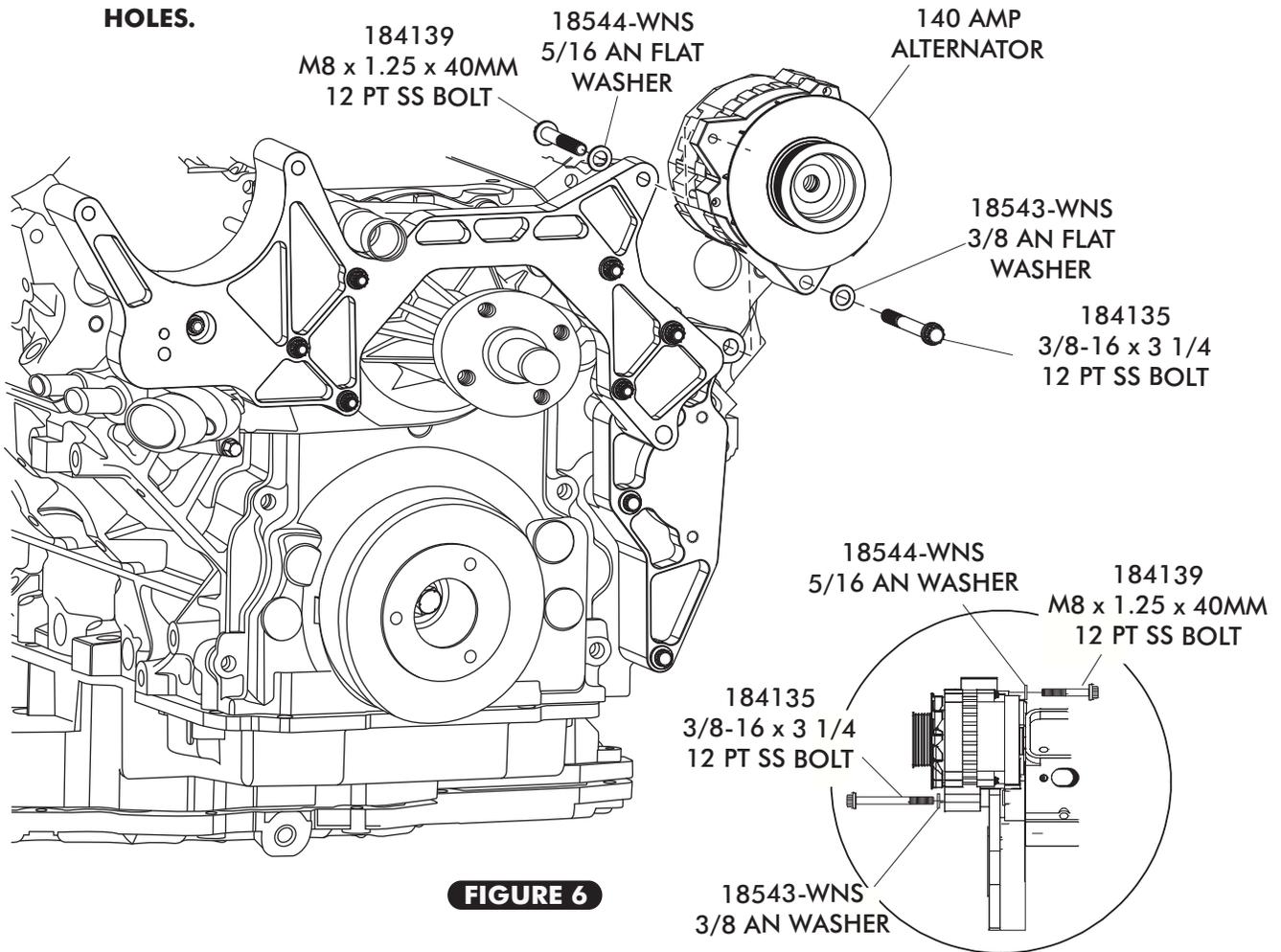
**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

**ALTERNATOR INSTALLATION**

- INSTALL ALTERNATOR ONTO MAIN BRACKET USING 8mm-1.25 x 40mm 12 PT SS BOLT AND 5/16 AN FLAT WASHER FOR THE TOP MOUNT AND USE A 3/8-16 x 3 1/4 12 PT SS BOLT AND 3/8 AN FLAT WASHER FOR THE BOTTOM MOUNT AS SHOWN IN FIGURE 6 BELOW.

**NOTE: ONCE ALTERNATOR HAS BEEN INSTALLED FASTENERS CAN BE TORQUED IN PLACE USING CRISS-CROSS PATTERN. TORQUE 5/16, 8mm BOLTS/STUDS TO 22 LB FT, AND TORQUE 3/8, M10 BOLTS TO 37 LB FT.**

**TIP: WITH FASTENERS LEFT LOOSE, BRACKETS CAN BE MOVED TO ALIGN ALTERNATOR WITH BRACKET MOUNTING HOLES.**



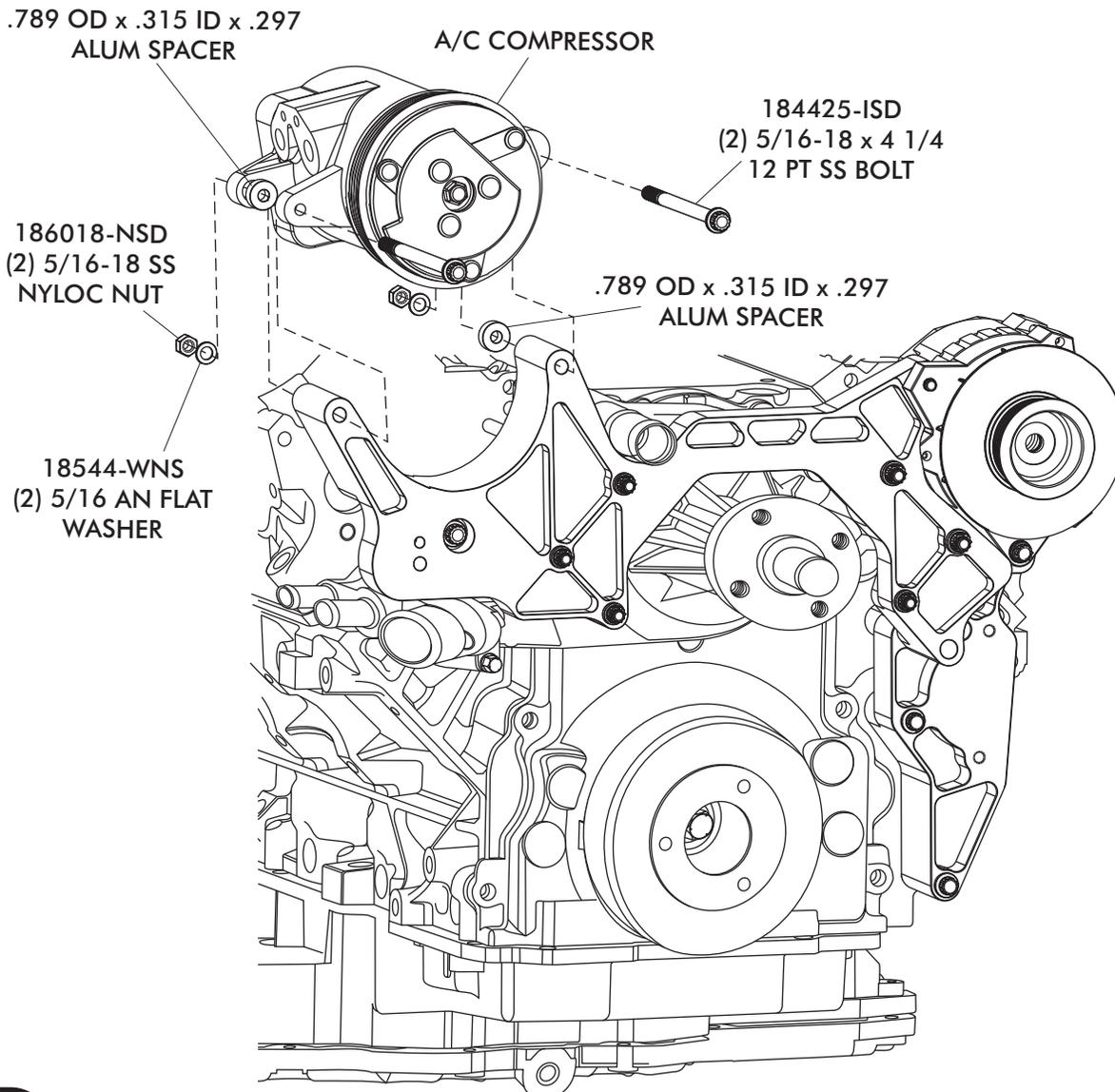
**FIGURE 6**



**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

### A/C COMPRESSOR INSTALLATION

- INSTALL A/C COMPRESSOR AS SHOWN IN FIGURE 7 BELOW.
- INSTALL (2) .789 OD x .315 ID x .297 ALUM SPACER BETWEEN COMPRESSOR AND BRACKET, ALONG w/ (2) 5/16-18 x 4 1/4 12 PT SS BOLTS, (2) 5/16 AN FLAT WASHERS, AND (2) 5/16-18 SS NYLOC NUTS. SEE FIGURE 7.
- COMPRESSOR MOUNTING EARS CONTAIN SLIDING BUSHINGS THAT ARE DRAWN-IN AND CLAMP TO BRACKET WHEN COMPRESSED.



**FIGURE 7**



**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

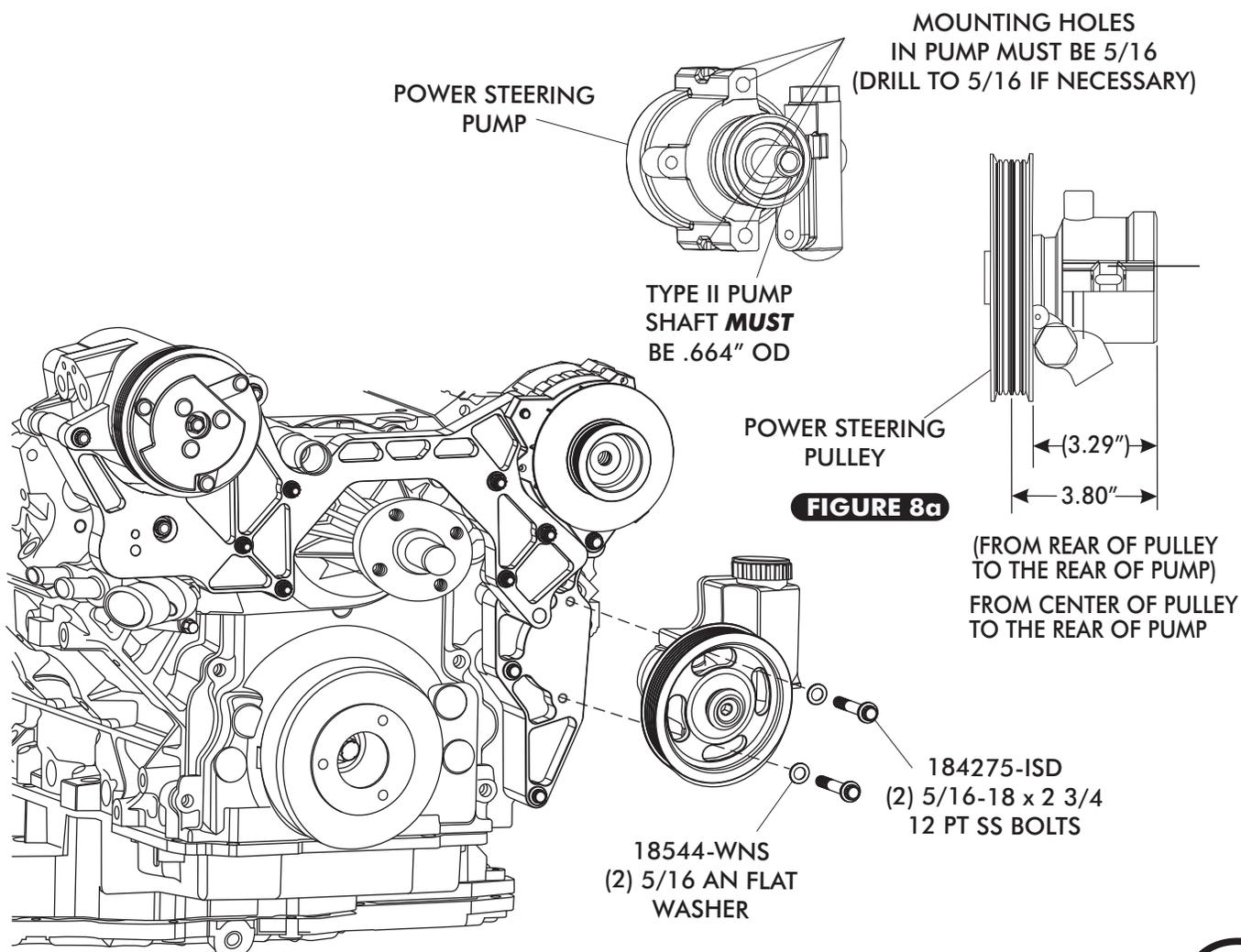
**POWER STEERING PUMP INSTALLATION (POWER STEERING ONLY)**

NOTE: SOME TYPE II GM POWER STEERING PUMPS HAVE THREADED MOUNTING BASES. THESE MUST BE DRILLED OUT TO ALLOW FRONT RUNNER MOUNTING BOLTS TO PASS THROUGH THE HOLES AND THREAD INTO THE BRACKET. SEE FIGURE 8a, BELOW.

- USING A POWER STEERING PUMP PULLEY INSTALLER, INSTALL THE POWER STEERING PULLEY ON POWER STEERING PUMP. SEE FIGURE 8a.

**NOTE PULLEY MUST BE INSTALLED WITH PROPER TOOL. (K-D TOOL #2897 OR EQUIVALENT) DO NOT ATTEMPT TO HAMMER OR PRESS PULLEY ON POWER STEERING PUMP SHAFT !**

- INSTALL POWER STEERING PUMP USING (2) 5/16-18 x 2 3/4 12 PT SS BOLTS WITH (2) 5/16 AN WASHERS AS SHOWN IN FIGURE 8 BELOW. TORQUE TO 28 LB FT.



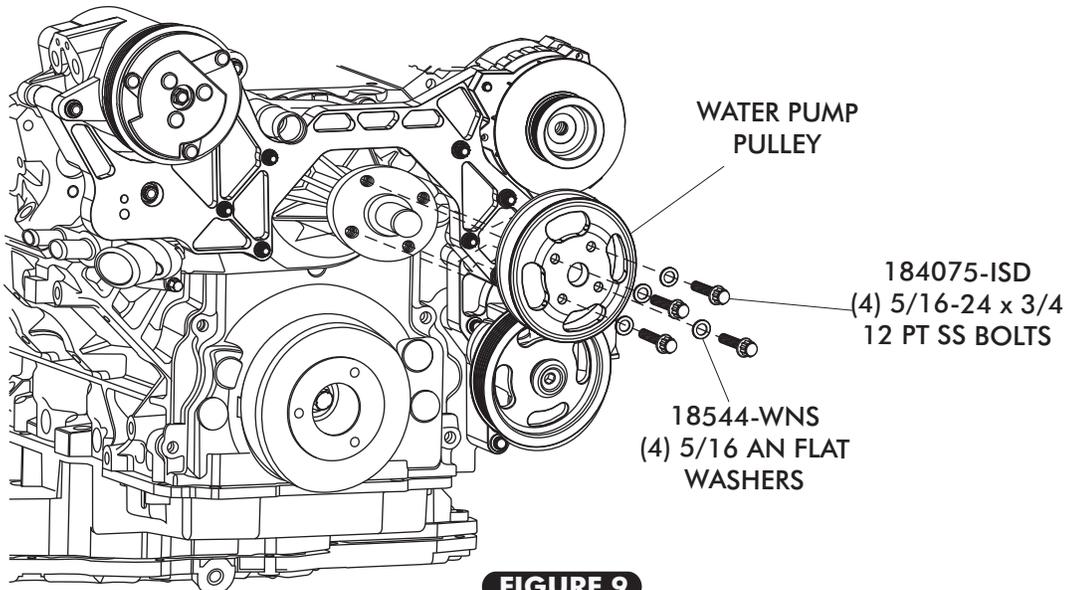
**FIGURE 8**



**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

### WATER PUMP PULLEY INSTALLATION

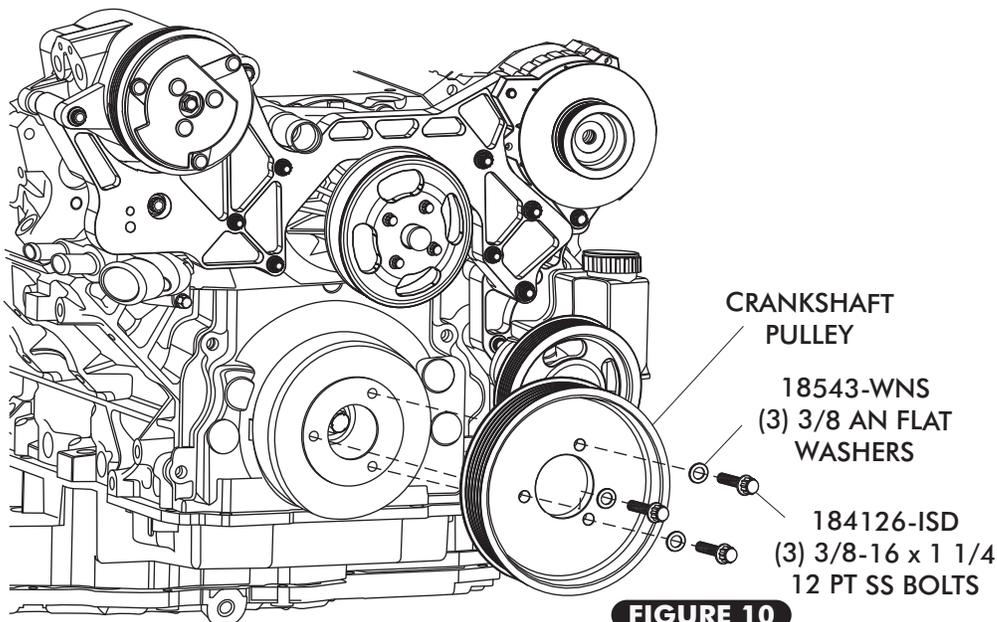
- INSTALL WATER PUMP PULLEY ONTO WATER PUMP USING (4) 5/16-24 x 3/4 BOLTS AND (4) 5/16 AN FLAT WASHERS AS SHOWN IN FIGURE 9 BELOW. TORQUE TO 22 LB FT.



**FIGURE 9**

### CRANKSHAFT PULLEY INSTALLATION

- INSTALL CRANKSHAFT PULLEY ONTO DAMPER USING (3) 3/8-16 x 1 1/4 BOLTS AND (3) 3/8 AN FLAT WASHERS AS SHOWN IN FIGURE 10 BELOW. TORQUE TO 25 LB FT.



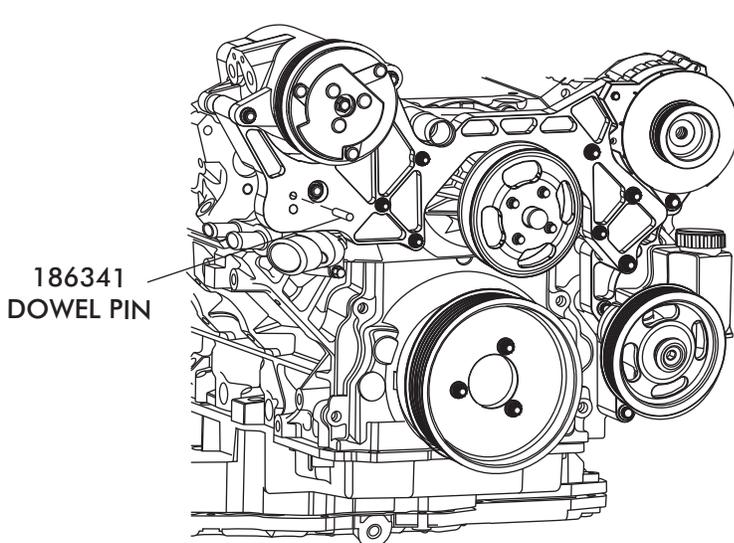
**FIGURE 10**



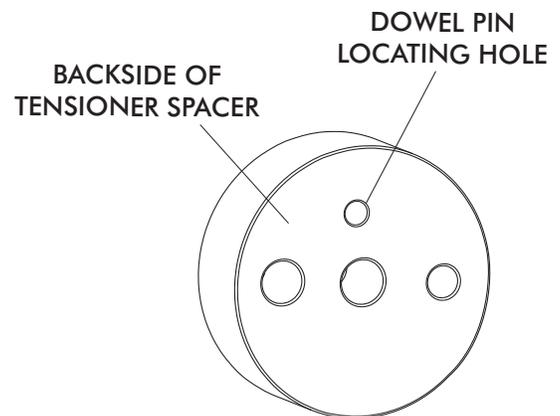
**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

**DOWEL PIN AND TENSIONER SPACER INSTALLATION**

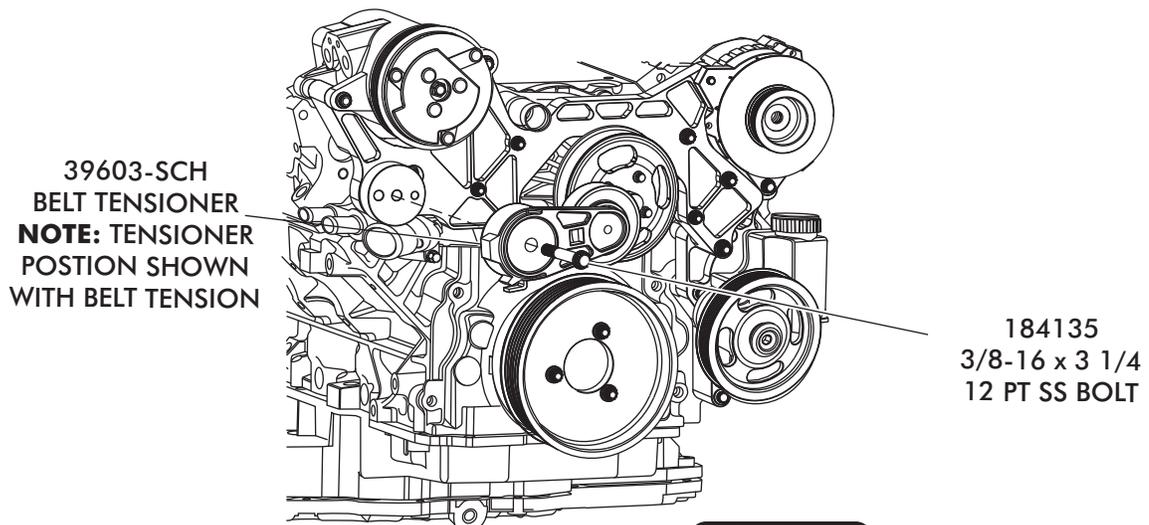
- INSTALL .250 x 1.00 SS DOWEL PIN INTO MAIN BRACKET AS SHOWN IN FIGURE 11 BELOW.  
**NOTE: DOWEL PIN IS A PRESS FIT, USE A HAMMER AND CAREFULLY TAP DOWEL PIN IN LOCATING HOLE.**
- INSTALL TENSIONER SPACER ON BACKSIDE OF BELT TENSIONER. SEE FIGURE 11b BELOW.  
**NOTE: BE SURE TO INSERT DOWEL PIN IN CORRECT LOCATING HOLE OF THE TENSIONER SPACER. SEE FIGURE 11a BELOW. TAP SPACER TO BRACKET IF NECESSARY.**
- ALIGN TENSIONER AND TENSIONER SPACER TO MAIN BRACKET USING 3/8-16 x 3 1/4 12 PT SS BOLT AS SHOWN IN FIGURE 11b BELOW. TORQUE TO 37 LB FT.



**FIGURE 11**



**FIGURE 11a**



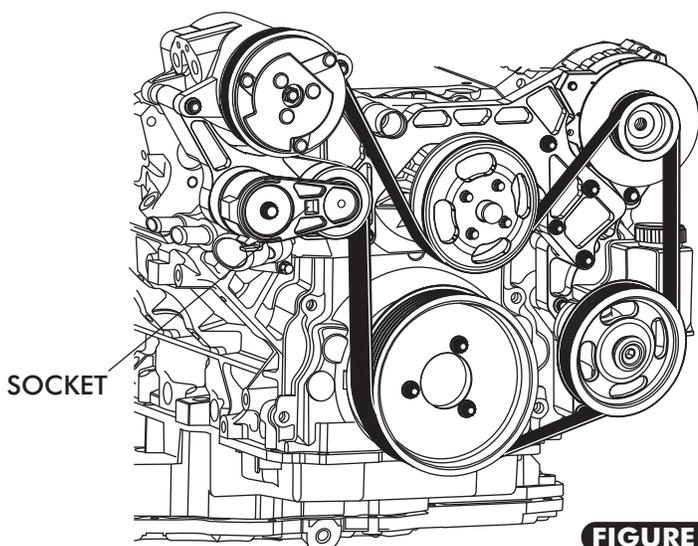
**FIGURE 11b**



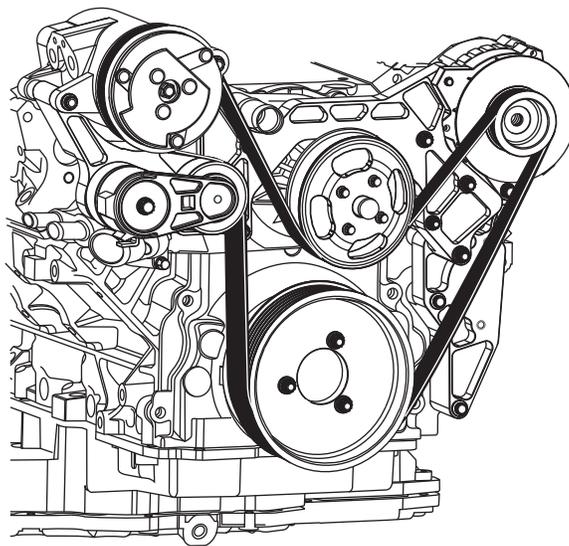
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**BELT INSTALLATION**

- INSERT A 1/2" DRIVE RATCHET OR BREAKER BAR INTO SOCKET ON TENSIONER, ROTATE CLOCKWISE UNTIL TENSIONER STOP. ROUTE BELT AROUND CRANKSHAFT PULLEY, POWER STEERING PULLEY, ALTERNATOR AND OVER COMPRESSOR. PULL BELT DOWN AND SLIDE UNDER WATER PUMP PULLEY LAST. SEE FIGURE 12



w/PS 66" BELT

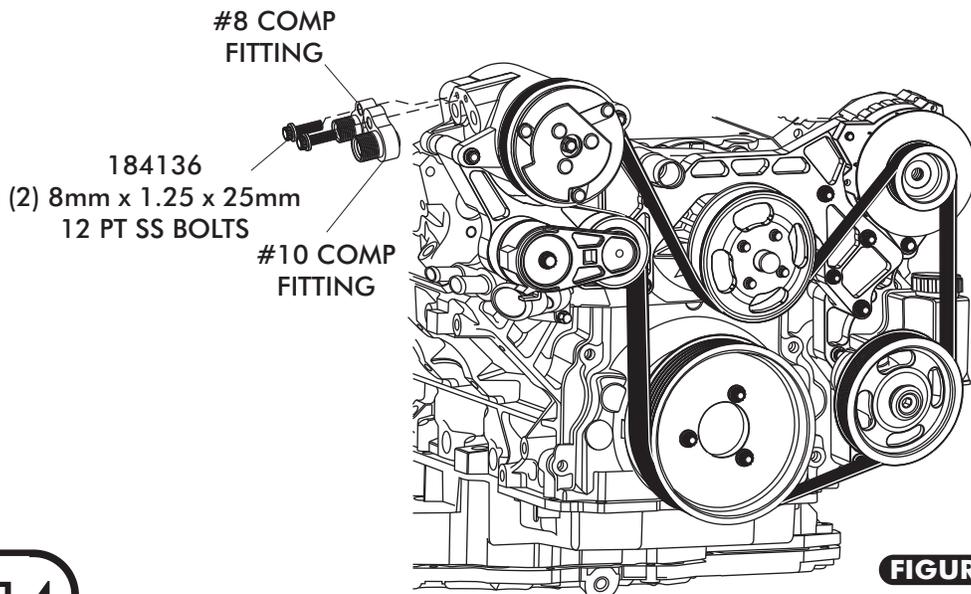


w/o PS 63" BELT

**FIGURE 12**

**A/C COMPRESSOR FITTING INSTALLATION**

- INSTALL THE #8 AND #10 A/C COMPRESSOR FITTINGS ON COMPRESSOR USING (2) 8mm x 1.25 x 25mm 12 PT SS BOLTS AS SHOWN IN FIGURE 13 BELOW. KEEP PORTS SEALED WITH CAPS UNTIL A/C CIRCUIT HAS BEEN COMPLETED.



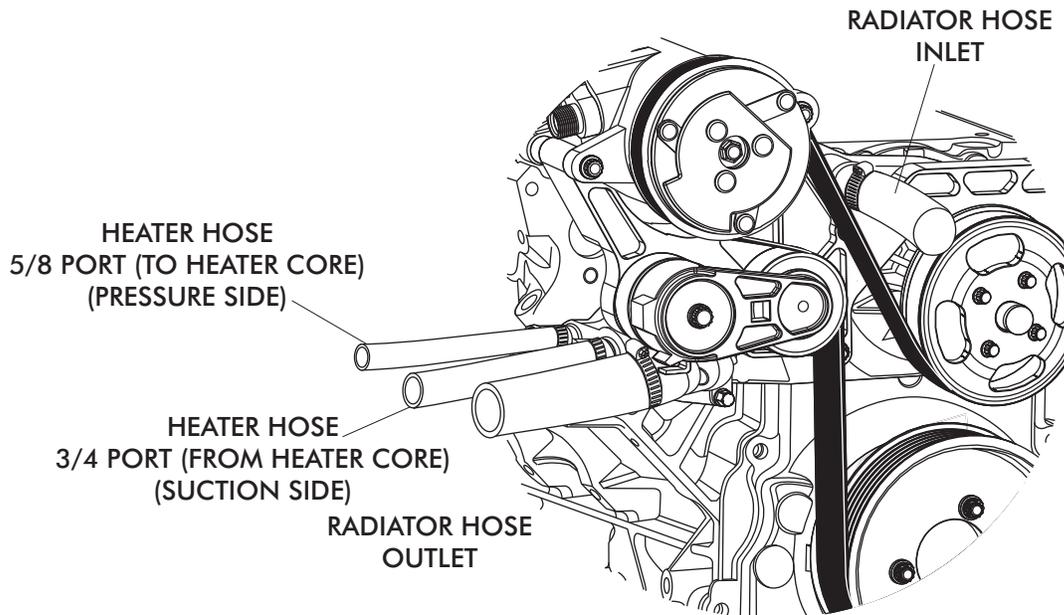
**FIGURE 13**



**WARNING: ANTI-SEIZE MUST BE USED ON THREADS OF BOLTS OR MECHANICAL LOCKING WILL OCCUR PREVENTING REMOVAL OF NUT FROM BOLT AND DAMAGE TO FASTENERS.**

## HEATER HOSE & RADIATOR HOSE INSTALLATION

- INSTALL THE (2) HEATER HOSES ON TO THE WATER PUMP, NOTE HOSE CLAMP LOCATION AND POSITION AS SHOWN IN FIGURE 14 BELOW.
- INSTALL THE (2) RADIATOR HOSES ON THE WATER PUMP, NOTE HOSE CLAMP LOCATION AND POSITION AS SHOWN IN FIGURE 14 BELOW.



**FIGURE 14**

## FINAL STEPS

- RE-INSTALL ALL PREVIOUSLY REMOVED ITEMS (RADIATOR, FAN BLADE, RADIATOR HOSES ETC.)
- RECONNECT ALL ELECTRICAL CONNECTORS.

**NOTE: CHARGING SYSTEM MUST BE PROPERLY WIRED TO ACCEPT ONE- WIRE INTERNALLY REGULATED ALTERNATOR.**

- CONNECT NEGATIVE BATTERY CABLE
- FILL RADIATOR WITH AT LEAST A 50/50 MIXTURE OF APPROVED ANTIFREEZE AND DISTILLED WATER. **IT IS THE OWNER'S RESPONSIBILITY TO KEEP THE FREEZE PROTECTION AT THE PROPER LEVEL FOR THE CLIMATE IN WHICH THE VEHICLE IS OPERATED. FAILURE TO FOLLOW ANTIFREEZE RECOMMENDATIONS WILL CAUSE HEATER CORE TO CORRODE PREMATURELY AND POSSIBLY BURST IN AC MODE AND/OR FREEZING WEATHER, VOIDING YOUR WARRANTY.**
- DOUBLE CHECK ALL FITTINGS, BRACKETS AND BELTS FOR TIGHTNESS.
- VINTAGE AIR RECOMMENDS THAT ALL AC SYSTEMS BE SERVICED BY A CERTIFIED AUTOMOTIVE AIR CONDITIONING TECHNICIAN.
- EVACUATE THE SYSTEM FOR A MINIMUM OF 45 MINUTES PRIOR TO CHARGING AND LEAK CHECK PRIOR TO SERVICING. CHARGE THE SYSTEM TO THE CAPACITIES STATED ON THE INFORMATION PAGE (PAGE 3) OF THIS INSTRUCTION MANUAL.