

JUNE, 1966

Shop Tips

FROM



VOL. 4, NO. 6

Technical parts and service information published by Ford Division to assist servicemen in Service Stations, Independent Garages and Fleets.

FEATURING...

VACATION CHECKS AND SERVICES

See Index Page 2 For Other Timely Articles



From Your Ford Dealer

Be sure to file this and future bulletins for ready reference. If you have any suggestions for additional information that you would like to see included in this publication please write to: Ford Division of Ford Motor Company, Parts and Service Promotion and Training Dept., P. O. Box 598, Dearborn, Michigan 48121.



IN THIS ISSUE

Vacation Checks and Services	2-5
Tires	3
Towing	3-4
Trailer Hitches	5
Auxiliary Spring Kits	5
Fan Belts	5
Cooling System	5
Electrical System	5
Engine	5
Rotunda 6000-Mile Oil Filter	6
High Performance Book	6
Technical Service Briefs	7
Cylinder Head Gasket Chart..	7
Air Conditioning Checks	8

VACATION CHECKS AND SERVICES

Summertime is vacation time for millions of Americans. Many will seek your advice and help before leaving, and many others will need your services during their vacations. All Fords, of course, need very little special attention, since they are designed to operate under a wide range of conditions. However, extreme usage conditions exist when the car is loaded with the family and vacation gear, perhaps is pulling a trailer, and travels for long periods on turnpikes and thruways or secondary roads and trails. Under these conditions, a few special checks and services plus perhaps some optional equipment are necessary to insure a safe and trouble-free trip. Your nearby Ford dealer can assist with individual answers to any questions you may have regarding vacation travel.



SAFETY CHECKS

The best way to begin a vacation check up is with a general safety inspection of the whole car. The items shown in Figure 1 are part of a national Safety Check program and were featured in the April and May issues of Shop Tips along with diagnosis and inspection procedures. Be sure and question the owner about any unusual operating conditions which may be caused by a component being inoperative "intermittently". Thus these conditions which might ordinarily pass the safety check can be corrected, before they cause trouble.

Special attention should be given to vehicles towing trailers. If a trailer blocks the rear-view, the towing vehicle should have special oversize mirrors installed. All trailers should have auxiliary tail lights and turn signals in good operating conditions. Many trailers also have electric brakes which should be checked for proper operation.

In addition, all customers should be advised to carry a first aid kit, flares, a fire extinguisher, and a flashlight to meet any emergencies that may arise.



Figure 1
Safety Checks

TIRES

Tires probably require more special attention than any other item during vacation travel, because of the necessity of increasing their load carrying capacity. This can be accomplished by either increasing tire size, or tire pressure. Failure to adhere to this important principle can result in steering and stability problems due to weak sidewalls. See Figure 2. The tires specified as standard equipment on all Ford vehicles can be used under just about any condition by varying tire pressure. The exception, of course, is where extremely heavy loads are being carried, in which case oversize tires may be required. (See Towing Recommendations)

The owner's manual that is included with each new vehicle contains complete tire size, tire pressure and load carrying information. Much of this same information is also in the April Shop Tips.

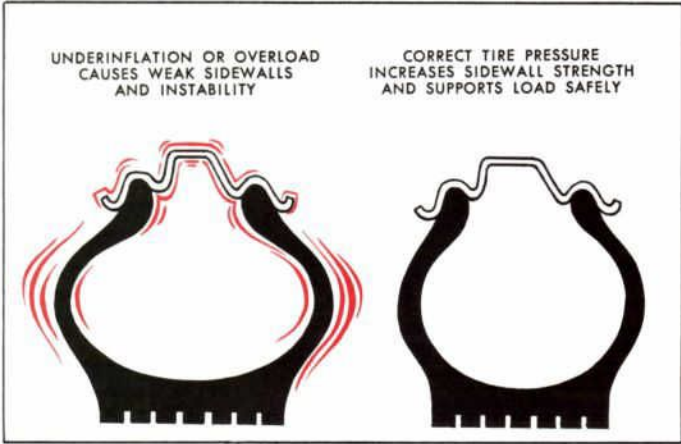


Figure 2 Effects of Tire Pressure

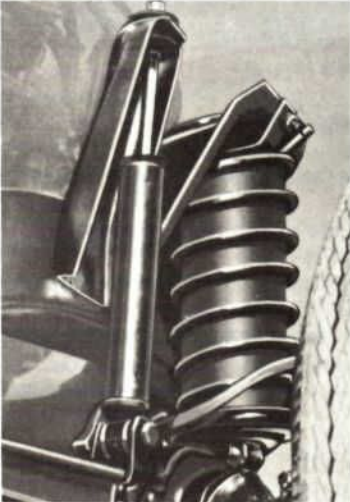


Figure 3 Air Lift Springs

TOWING

As can be seen from the following charts, all 1966 Ford cars can tow Class I trailers with very little special equipment. In most cases all that's needed is a Rotunda Hitch and a Rotunda Wiring Kit (which includes a 4-wire connector plug and a heavy-duty turn signal flasher). In a few cases, power brakes and extra cooling is also required.

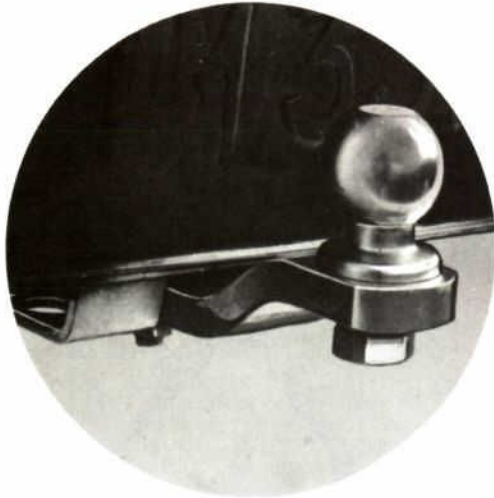
For larger size trailers, increased wheel and tire sizes, heavy-duty suspension, air lift springs, and a load equalizing trailer hitch are necessary. Air lift (Figure 3) assist springs maintain proper vehicle level attitude and improve handling characteristics under varied load conditions. Only a small amount of air is required. Never inflate with more air than is necessary to level the vehicle.

Automatic transmissions are preferred over manual transmissions for all towing conditions.

1966 FAIRLANE TOWING RECOMMENDATIONS

SAE TRAILER CLASS	CLASS I		CLASS II
MAXIMUM TRAILER WEIGHT STATIC TONGUE LOAD	Up to 1000 lb. Up to 100 lb.	1000 to 2000 lb. 100 to 200 lb.	2000 to 3500 lb. 200 to 500 lb.
Engine	200 Six or Larger	289 V-8 or Larger	289 V-8 or 390 V-8
Transmission	Cruise-O-Matic	Cruise-O-Matic	Cruise-O-Matic
Axle Ratios	Standard	Standard	3.00 (all models)
Cooling System	Standard	Extra-Cooling Package	Extra-Cooling Package
Tires:			
Station Wagon	Standard	Standard	Standard w/Additional Ply Rating
All other models	Standard	Standard	Next Size Larger
Suspension (springs and shocks)	Standard	Standard	Heavy Duty (front and rear)
Brakes	Standard	Power, and Heavy-Duty Lining	Power, and Heavy-Duty Lining
Steering	Standard	Power	Power
Alternator	Standard	Heavy Duty	Heavy Duty
Battery	Standard	Standard	Heavy Duty
Wiring	Rotunda Kit	Rotunda Kit	Rotunda Kit
Hitch	Rotunda	Rotunda	Load Equalizing

VACATION CHECKS



1966 THUNDERBIRD TOWING RECOMMENDATIONS

SAE TRAILER CLASS	CLASS I	CLASS II	CLASS III
Maximum Trailer Weight Static Tongue Load	Up to 2,000 lb. Up to 200 lb.	2,000 to 3,500 lb. 200 to 500 lb.	3,500 to 5,000 lb. 500 to 600 lb.
Engine.....	390 V-8 or Larger	390 V-8 or Larger	390 V-8 or 428 V-8
Transmission.....	Standard (Cruise-O-Matic)	Standard (Cruise-O-Matic)	Standard (Cruise-O-Matic)
Radiator and Fan.....	Standard	Standard	Extra-Cooling Package
Suspension.....	Standard	Standard	Heavy Duty (front and rear)
Battery.....	Standard	Heavy Duty	Heavy Duty
Wheels and Tires.....	Standard	Standard	Standard
Brakes.....	Standard	Standard	Standard
Alternator.....	Standard	Standard	Standard
Wiring.....	Rotunda Kit	Rotunda Kit	Rotunda Kit
Hitch.....	Rotunda	Load Equalizing	Load Equalizing

1966 FORD TOWING RECOMMENDATIONS

SAE TRAILER CLASS	CLASS I		CLASS II	CLASS III
MAXIMUM TRAILER WEIGHT STATIC TONGUE LOAD	Up to 1000 lb. Up to 100 lb.	1000 to 2000 lb. 100 to 200 lb.	2000 to 3500 lb. 200 to 500 lb.	3500 to 5000 lb. 500 to 600 lb.
Engine.....	240 Six or Larger	289 V-8 or Larger	390 V-8 or Larger	390 V-8 or 428 V-8
Transmission.....	Cruise-O-Matic	Cruise-O-Matic	Cruise-O-Matic	Cruise-O-Matic
Axle Ratios.....	Standard	3.50 w/289 V-8, standard other engines	Standard	Standard
Cooling System.....	Standard	Extra-Cooling Package	Extra-Cooling Package	Extra-Cooling Package
Tires:				
Station Wagon.....	Standard	Standard	Standard	Standard
All other models.....	Standard	Standard	Next Size Larger	Next Size Larger
Wheels.....	Standard	Standard	Heavy Duty	Heavy Duty
Brakes.....	Standard	Power	Power	Power
Brake Lining.....	Standard	Heavy Duty—riveted	Heavy Duty—riveted	Heavy Duty—riveted
Steering.....	Standard	Power	Power	Power
Suspension (springs & shocks).....	Standard	Standard	Heavy Duty with Rear Air Lifts	Heavy Duty with Rear Air Lifts
Alternator.....	Standard	Standard	Standard	Heavy Duty
Battery.....	Standard	Standard	Standard	Heavy Duty
Wiring.....	Rotunda Kit	Rotunda Kit	Rotunda Kit	Rotunda Kit
Hitch.....	Rotunda	Rotunda	Load Equalizing	Load Equalizing

1966 FALCON TOWING RECOMMENDATIONS

SAE TRAILER CLASS	CLASS I	
	Up to 1,000 lb. Up to 100 lb.	1,000 to 2,000 lb. 100 to 200 lb.
Engine.....	200 Six or Larger	289 V-8
Transmission.....	Cruise-O-Matic	Cruise-O-Matic
Radiator and Fan.....	Standard	Extra-Cooling Package
Axle Ratio.....	Standard	Standard
Wheels.....	Standard	Standard
Tires: Station Wagon.....	Next Size Larger	Next Size Larger
All Others.....	Next Size Larger	Next Size Larger
Steering.....	Standard	Power
Suspension.....	Standard	Standard
Brakes.....	Standard	Power
Alternator.....	Standard	Heavy Duty
Battery.....	Standard	Heavy Duty
Wiring.....	Rotunda Kit	Rotunda Kit
Hitch.....	Rotunda	Rotunda

1966 MUSTANG TOWING RECOMMENDATIONS

SAE TRAILER CLASS	CLASS I	
	Up to 1,000 lb. Up to 100 lb.	1,000 to 2,000 lb. 100 to 200 lb.
Engine.....	200 Six or Larger	289 V-8
Transmission.....	Cruise-O-Matic	Cruise-O-Matic
Axle Ratio.....	Standard	Standard
Radiator and Fan.....	Standard	Extra-Cooling Package
Wheels and Tires.....	Standard	Standard
Brakes.....	Standard	Power
Steering.....	Standard	Power
Alternator.....	Standard	Heavy Duty
Battery.....	Standard	Heavy Duty
Wiring.....	Rotunda Kit	Rotunda Kit
Hitch.....	Rotunda	Rotunda

TIPS ON TRAILER HITCHES

Although many varieties of coupling devices are available, each with special applications, Ford recommends the use of frame hitches only. Detailed hitch drawings for all Ford vehicles are available at your nearby Ford dealer.

For static tongue loads under 200 pounds, the connection can be a simple hitch attached to the frame. With a heavier load, the hitch must spread the load between the trailer and towing vehicle. Then it is necessary to install a load-equalizing-type hitch that attaches to the frame and distributes part of the trailer hitch weight to each wheel of the car, and part of it back to the trailer wheels. It thus equalizes the tongue load (weight resting on the car hitch) to both the trailer and car (or truck) wheels. This helps keep the towing vehicle and trailer level for easier handling, more comfortable and safer driving.

Most equalizing-type frame hitches can be adjusted for height when installed so that the trailer will ride level with the towing vehicle.

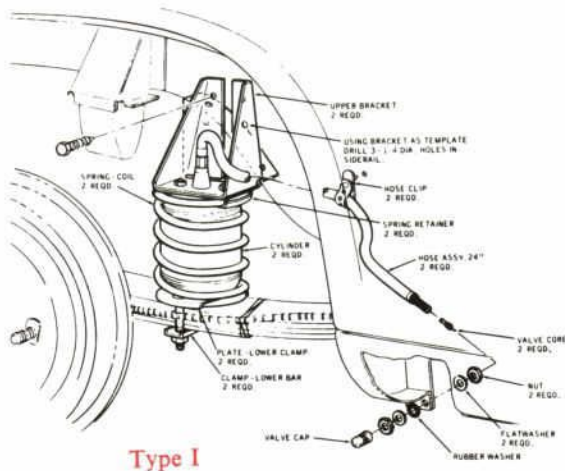
NOTE: Axle hitches are not recommended in any case.

Safety Chains should always be crossed under the tongue to prevent the tongue from dropping to the ground in the event of a coupling failure. The following coil-steel welded chains are recommended:

- CLASS I Trailers . . . trade size $\frac{3}{16}$ inch
- CLASS II Trailers . . . trade size $\frac{1}{4}$ inch
- CLASS III Trailers . . . trade size $\frac{5}{16}$ inch

AUXILIARY AIR LIFT SPRING KITS

Auxiliary Air Lift Spring Kits provide extra support for heavy luggage loads or pulling a trailer, by simply adding air to raise the rear of the vehicle. The air cylinders are easily installed and any tire pump or similar air supply can be used to fill the cylinders. Type I is used on cars with leaf spring rear suspension (Falcon, Fairlane, Mustang) and includes air bags, auxiliary helper springs and necessary extension hoses. Type II is used on vehicles with coil spring suspensions.



Type I

FAN BELTS

Check each fan belt for signs of fraying or breaks. If any belt appears to be of doubtful condition, replace it with the proper size belt. This is important because if one belt flips, or breaks it may damage other belts resulting in an inoperative car. Be sure each belt is adjusted to the proper tension.

All Belts except Alternator	110-140 New	80-110 Used
Alternator Belts	Six Cylinder	Eight Cylinder
	110-140 New	110-140 New
	60-90 Used	80-110 Used

A used belt is one that has been in operation more than 10 minutes.

COOLING SYSTEM

All Fords are filled at the factory with Rotunda Permanent Anti-Freeze, which is good for two full years or 36,000 miles. If any other type has been used since the original, fill and has been in the car more than one year, recommend a complete drain and flush. Be sure and add a rust inhibitor. The coolant level should be maintained at about 1" below the bottom of the inlet filler neck ring.

The cooling system should maintain a pressure of 12-15 psi. If the system will not hold 12-15 lbs., check the cap, radiator filler neck, hose connections, and other areas for leakage.

ELECTRICAL SYSTEM

A check of the electrical system is important, because of the extensive use of accessories during vacations. The most important component in the electrical system is the battery. Check for cracks or buckling that can lead to failure. The top should be clean and dry. If wet, dirty, or acid soaked the battery will constantly discharge. Also, check the cables for looseness, corrosion and wear. Lastly, but most important check battery capacity. See January 1966 Shop Tips, for complete testing and charging procedures.

ENGINE

To obtain peak performance and top efficiency during the many miles of vacation travel, the engine should be in good running order. If several thousand miles have elapsed since the last tune-up, recommend one.

If the vehicle is near the oil and filter change interval, recommend a new Rotunda 6000-Mile Oil Filter and Rotunda 6000-Mile Motor Oil. This is the combination that every new Ford leaves the factory with.



Type II

AIR LIFT SPRING KITS

PART NUMBER	APPLICATION
C6DZ-5A589-A	1966 Falcon Sedan
C6OZ-5A589-A	1966 Fairlane Sedan
C6AZ-5A589-A	1966 Ford
C6ZZ-5A589-A	1966 Mustang
C6TZ-5A589-A	1966 Bronco (Front)



Rotunda 6000-Mile Oil Filter

In 1962 when Ford initiated the extended interval oil change, it also introduced the only original equipment two-stage, depth-type filter. Ford could have chosen other types, such as a paper, surface-type filter, but extensive testing revealed then and still does today, that: "No paper, surface-type filter meets ALL Ford requirements for capacity, efficiency over the 6000-mile interval, and greater ability to filter when water is present due to condensation."

Paper is inherently less effective as a filter media for extended intervals. Paper filters that are designed to filter effectively, form a sludge-bed, plug up, and must be replaced frequently. Paper filters that are designed to last longer, are too porous, don't do as good a job of filtering and thus offer less protection. That's why Ford Engineering and Research chose the two-stage, depth-type filter.

The first stage of molded rayon fiber, filters the fine abrasive particles that do the most damage to engine surfaces, yet allows instant full-flow lubrication when the engine is started. The second stage filter of cellulose, carefully blended with 100% soft white cotton, cleans the thinner, warmed oil of water, oxidation products and similar super-fine abrasive, sludge-forming particles.



FEATURES OF THE ROTUNDA 6000-MILE OIL FILTER

- 1. Filter Shell**—Distinctive "ROTUNDA" styled and engineered to resist deformation and leaks due to high pressure surges.
- 2. Hold Down Spring**—Designed to provide a positive load on filter parts, and provide a positive stop should a high pressure surge lift the element momentarily from its seat.
- 3. Center Tube and Media Migration Barrier**—Lock seam construction and an open flow area of sixty percent is covered by a knit-type sock wrap, providing exceptional media migration protection.
- 4. First-Stage Filter Media**—Controlled density rayon molded rayon filter providing long full-flow life and positive, immediate removal of wear producing particles.
- 5. Element Shell**—Closely spaced, prick punched openings provide passage for oil into filtering media. Each hole "grabs" the filtering media and prevents settling.
- 6. Second-Stage Filter Media**—100% soft white cotton, blended with cellulose in carefully controlled proportions to provide the highest degree of filtering efficiency.
- 7. Anti-Drainback Valve and Spring**—This soft rubber valve and its disc spring give the drainback protection needed to prevent "dry starts."
- 8. "Up-Front" Safety Relief Valve**—Provides bearing protection due to a plugged element. Its position in front of the element prevents bypass oil from washing contamination from the element surface into the oil stream. Exploded view of valve shows the seal is a steel backed molded rubber disc that provides positive sealing against two concentric rings formed into the steel of the valve bottom plate. The unit is spotwelded together.
- 9. Graphite Impregnated Gasket**—For easier, positive installation and removal of filter.



NEW FORD "HIGH PERFORMANCE" GUIDE

Available **FREE** at Your Ford Dealer

This newly revised "Ford High Performance" booklet is designed to appeal to seasoned veterans as well as beginners. Written in simple everyday language, it features:

- 40 pages—4 colors
- Over 100 illustrations
- How to select components and modify for high performance
- Tuning for maximum performance
- Easy-to-understand "performance fundamentals" to aid the novice
- Cobra Kits and other performance equipment

TECHNICAL SERVICE BRIEFS

CRANKSHAFT IDENTIFICATION

(352, 390, and 428 CID Engines)

Due to the similarity of the crankshafts used in the 1966 352, 390 and 428 CID engines, there is a possibility of intermixing these components. The following information will aid in proper identification of these crankshafts.

352 CID Engine

1. Ford Part Number . . . C4AZ-6303-L
2. "2T" cast on the edge of the number 3 counterweight.
3. 3.500" crank stroke.

390 CID Engine

1. Ford Part Number . . . C6AZ-6303-A
2. "2U" cast on the edge of the number 3 counterweight.
3. 3.784" crank stroke.

428 CID Engine

1. Ford Part Number . . . C6AZ-6303-B
2. "1U" cast on edge of the number 7 crank cheek.
3. 3.984" crank stroke.

STEERING WHEEL AND HORN BUTTON OR HORN RING REMOVAL

Whenever the steering wheel, horn button or horn ring are removed, it is *essential* that the battery be disconnected before such operation is performed.

Disconnecting the battery is required to prevent shorting out electrical components in the steering column.

CYLINDER HEAD GASKET CHART

The following chart is published as an aid in selecting the correct cylinder head gasket. On high mileage cars where steel, and steel and asbestos gaskets are optional, it is recommended that the steel and asbestos gasket be used. This gasket is thicker than the all steel gasket resulting in a little

less compression, reducing the possibility of pre-ignition and detonation especially if regular grade fuels are used. It also has slightly better sealing characteristics when irregularities exist in the block or cylinder head.

6 CYLINDER

STEEL	STEEL AND ASBESTOS	140	170	200	223	262	240	300	APPLICATION	REMARKS		
CODE-6051-C		X	X						1960-1966, Fairlane, Mustang, Falcon, Econoline & Truck Bronco	Opt. w /C3OZ-6051-A for 170 CID only		
	C3OZ-6051-A	X	X						1961-1966 Fairlane, Mustang, Falcon, Bronco, Econoline & Truck	Opt. w /CODZ-6051-C for 170 CID only		
COAE-6051-B					X				1954-1960 Ford and Truck	Opt. w /COAZ-6051-A		
	COAZ-6051-A				X				1954-1960 Ford and Truck	Opt. w /COAE-6051-B		
	C3AZ-6051-A			X	X				1961-1964 Ford and Truck			
	C5AZ-6051-B					X	X		1965-1966 Ford, Econoline & Truck			
8 CYLINDER												
		221	260	289	272	292	352	390	406	427	428	430
	COAZ-6051-B	X										
	C3AZ-6051-C		X	X								
C3TZ-6051-D					X	X						
	C3TZ-6051-G				X	X						
B9AE-6051-A							X	X				
	C6AZ-6051-A						X	X		X		
C2AZ-6051-A								X				
C3AZ-6051-B									X			
C1VE-6051-A											X	
TRUCK ONLY												
		220-D	330-D	302	332	330	361	391	401	477	534	
	C3TZ-6051-B	X										
	C2TZ-6051-B		X									
	C3TZ-6051-C			X	X							
	C4TZ-6051-A				X	X	X					
	C3TZ-6051-F							X	X	X		

AIR CONDITIONING

The air conditioning system comes in for extensive use during the summer months. Although special tools and equipment are required to completely check-out and overhaul a unit, the following diagnosis chart indicates malfunctions and possible cause, many of which can be corrected by minor repairs or adjustments. Obstructed air passages, broken belts, disconnected or broken wires, loose clutch, loose or broken mounting brackets may be determined by a simple visual inspection. If diagnosis indicates that major repair work is needed, it should only be performed by those familiar with the special tools, and corrective procedures.

SIGHT GLASS

The sight glass is used to check whether or not there is enough refrigerant in the system. Foam seen in the sight glass while the compressor is operating, is an indication of loss of refrigerant. However, foam or bubbles will appear at start up and should disappear if the system is properly charged.

When observing the sight glass for foam, run the engine at 1500 rpm with the thermostatic switch control lever set for maximum cooling, and the blower on high. Foam indicates an undercharged system. Check the system for leaks, repair if necessary and charge the system with the proper amount of Refrigerant-12.

No foam in the sight glass indicates either a full charge, or a complete loss of refrigerant. Clean the sight glass. If the system is fully charged, the sight glass will be perfectly clear and the discharge air should be cool. If the system is completely empty of refrigerant, the sight glass will look

oily and will not be as clear as when refrigerant is flowing through it.

When the compressor is not operating and when the system is completely charged, an occasional large bubble of Refrigerant-12 vapor will normally be seen in the sight glass.

Under conditions of extremely high temperature, occasional foam or bubbles may appear.

SAFETY PRECAUTIONS

Refrigerant-12 is non-explosive, nonflammable, noncorrosive, has practically no odor, and is heavier than air. It is classified as a safe refrigerant, but certain precautions are necessary to protect components and the person working on the unit.

Liquid Refrigerant-12 at normal atmospheric pressures and temperatures, evaporates so quickly that it tends to freeze anything that it contacts. For this reason, extreme care must be taken to prevent any liquid refrigerant from coming in contact with the skin, especially the eyes. Should any refrigerant get into the eyes, use a few drops of mineral oil to wash them out, then wash the eyes clean with a weak solution of boric acid. Seek a doctor's aid immediately even though irritation may cease. Always wear safety goggles when servicing any part of the refrigerating system.

To avoid a dangerous explosion, never weld, use a blow torch, solder, steam clean, bake body finishes, or use any excessive amount of heat on or in the immediate area of any part of the air cooling system or refrigerant supply tank, while they are closed to the atmosphere whether filled with refrigerant or not.

AIR CONDITIONING DIAGNOSIS CHART

<p>INSUFFICIENT OR NO COOLING</p>	<ol style="list-style-type: none"> 1. Inoperative magnetic clutch. 2. Inoperative blower motor, or switch. 3. Obstructed air passages. 4. Complete loss of charge. (No bubbles in sight glass at system start up.) 5. Partial loss of charge. (Continuous bubbles in sight glass after start up.) 6. Service valves improperly set. (Should be maximum counterclockwise.) 7. Inoperative vacuum servo. 8. Compressor defective, or loose or broken compressor belt. 9. Vacuum lines kinked, clogged, loose, or off. 10. A/C thermostat defective. 11. Clutch lead disconnected or broken. 12. Expansion valve inoperative—stays open or closed. 13. Plugs left in compressor under service valve (both gauges indicate the same pressure). 14. Moisture in system. 15. Inoperative vacuum selector valve. 16. Improper installation to the dash panel.
<p>NOISY COMPRESSOR</p>	<ol style="list-style-type: none"> 1. Loose, torn or misaligned belt. 2. Loose clutch. 3. Foreign material or damaged parts in compressor. 4. Compressor loose on bracket.
<p>COMPRESSOR VIBRATION</p>	<ol style="list-style-type: none"> 1. Broken or loose mounting bracket, or compressor brace. 2. Loose clutch. 3. Loose belt.