TECHNICAL CHEMICAL COMPANY

A/C LUBRICANT SPECIFICATION & REPLACEMENT GUIDELINES

When it comes to A/C compressors these days, you never know what to expect in terms of the type and amount of lubricant inside. Some A/C compressors are shipped with mineral oil, some with PAG and some with Ester. Some compressors are shipped dry, while others contain enough lubricant for the entire A/C system. To be safe, it is always best to refer to the OE manufacturer's specifications when installing a new or remanufactured compressor. In the event that OE specifications are not available, the following information may be used as a guide.

Recommended Service Procedures

When major repairs are being performed, or if the total amount of lubricant in the A/C system is in question, it is a good service practice to liquid flush the entire system. This procedure insures that all components are free of debris/sludge as well as removing all the original lubricant. The proper amount of lubricant may then be added back into the A/C system. When adding lubricant to the A/C system, it is recommended that ½ of the total system capacity be placed in the compressor and the other ½ be placed in the accumulator dryer (A/D) or receiver dryer (R/D). For example, if the total capacity of an A/C system calls for 8 oz. of lubricant, put 4 oz. into the compressor and 4 oz. into the A/D or R/D. This helps to insure that the compressor does not start up "dry" and that the lubricant is distributed evenly throughout the system. ***Once the lubricant is added to the compressor and the hoses are reattached, it is critical that the compressor shaft be rotated manually a minimum of 10 times.*** This procedure prevents "oil slugging" during startup which in turn prevents potential internal damage to the compressor.

Determine Lubricant Type

To determine the type of lubricant used in an A/C system, once again, it is best to refer back to the OE manufacturer's specifications. However, there are general guidelines that may be observed in their absence. If R-12 is the refrigerant being used, it is a safe bet that mineral oil is the lubricant. If the system being serviced is a 1993 or older vehicle, more than likely R-12 is the refrigerant being used and mineral oil is the lubricant. If the system is 1995 or newer, R-134a and PAG will be the factory fill. In 1994, the transition was in full swing from R-12 to R-134a so there were both R-12 and R-134a vehicles being produced. If the vehicle being serviced has been retrofitted from R-12 to R-134a, Ester has been the most popular lubricant choice. However, bear in mind that PAGs were recommended by the OE's for a retrofit lubricant so look for the retrofit service label under the hood of the vehicle to help identify which lubricant was used.

Determine Lubricant Viscosity

After determining the type of lubricant in the A/C system (mineral oil, Ester or PAG), it is important to determine the viscosity. There was one predominant viscosity of mineral oil used with R-12 A/C systems which was 525 SUS (Saybolt Universal Seconds). When R-134a was introduced to the A/C industry, synthetic lubricants known as PAGs and Esters were chosen that used viscosity ratings known as ISO (International Organization for Standardization). The most popular viscosity for Ester today is an ISO 100. PAG lubricants may be found in 3 different viscosities – ISO 46, 100 and 150. Depending on the auto manufacturer, the PAG to be used in a particular vehicle may vary. If the OE specifications are not available, some technicians have chosen to use PAG 100 in all factory R-134a A/C systems because of its universal viscosity and for the convenience of not having to stock 3 different viscosities. For additional information on the OEM recommendation for PAG viscosity by vehicle/compressor model, see the Johnsen's R-134a OEM A/C Lubricant Specifications Guide below.

3327 PIPELINE ROAD * CLEBURNE, TEXAS 76033 * PH 817-645-6088 * FAX 817-556-0694
WEBSITE: www.technicalchemical.com * EMAIL: tccmail@technicalchemical.com

TECHNICAL CHEMICAL COMPANY

A/C Lubricant Capacity Guide

Refer to the OEM specifications if available. If not, the chart listed below is a total system capacity guideline.

COMPRESSOR MFG.	*COMPRESSOR MODEL*	*TOTAL SYSTEM CAPACITY*
Bosch		6 oz.
Chrysler	C171	9 oz.
Chrysler	A590	9 oz.
Chrysler	6C17	8 oz.
Ford	FS6, FX15, FS10	10 oz.
Harrison	A6	11 oz.
Harrison	R-4	8 oz.
Harrison	HR6, DA6, HR6H	8 oz.
Harrison	V5	8 oz.
Hitachi	Axial	10 oz.
Hitachi	Radial	oz.
Matsushita		5 oz.
Mitsubishi		6 oz.
Nihon Calsonic		5 oz.
Nippondenso	6P	7 oz.
Nippondenso	10P	8 oz.
Nippondenso	6E	13 oz.
Nippondenso	2 Cyl. Upright	6 oz.
Panasonic	NA130	5 oz.
Sanden	SD508	6 oz.
Sanden	SD510, 709	5 oz.
Sanden	TR 70	4 oz.
Sanden	TR 105	7 oz.
Seiko-Seiki		5 oz.
Seltec		5 oz.
	HG 850	11 oz.
	HG 1000	11 oz.
York	206	11 oz.
York	209, 210	11 oz.
	DCV, DKV, KC-	5 oz.
	DCW, DKS	6 oz.

If simply replacing an A/C component, use this as a guideline for oil replacement:

Component	Amount Of Lubricant To Add
Accumulator	2 oz.
Condenser	1 oz.
Evaporator	2 oz.
Filter Drier	1 oz.

3327 PIPELINE ROAD * CLEBURNE, TEXAS 76033 * PH 817-645-6088 * FAX 817-556-0694
WEBSITE: www.technicalchemical.com * EMAIL: tccmail@technicalchemical.com

TECHNICAL CHEMICAL COMPANY

PAG CHART

Vehicle Manufacturer	Compressor Manufacturer	Compressor Model	Johnsen's PAG Lubricant
Acura	Nippondenso	10P	6812-6, 6813-6, 6814 PAG 46
Alfa Romeo	Nippondenso	SC8	6812-6, 6813-6, 6814 PAG 46
Alfa Romeo	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
Audi	Nippondenso	10P	6812-6, 6813-6, 6814 PAG 46
Audi	Diesel Kiki/Zexel	DCW	6812-6, 6813-6, 6814 PAG 46
Audi	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
BMW	Nippondenso	10P	6812-6, 6813-6, 6814 PAG 46
BMW	Bosch/Behr	Axial	6822-6, 6823-6, 6824 PAG 150
BMW	Seiko Seiki	SS	6812-6, 6813-6, 6814 PAG 46
BMW	Bosch/Behr	Wing	6812-6, 6813-6, 6814 PAG 46
Chrysler	Nippondenso	10PA	6812-6, 6813-6, 6814 PAG 46
Chrysler	Nippondenso	6C / 6CA	6812-6, 6813-6, 6814 PAG 46
Chrysler	Mitsubishi	FX	6812-6, 6813-6, 6814 PAG 46
Chrysler	Sanden	SD	6816-6, 6817-6, 6818 PAG 100
Chrysler	Sanden	TR / TRS	6812-6, 6813-6, 6814 PAG 46
Citroën	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Citroën	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
Citroën	Delphi/Harrison	V5	6822-6, 6823-6, 6824 PAG 150
Ferrari	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
Fiat	Nippondenso	SC8	6812-6, 6813-6, 6814 PAG 46
Fiat	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Ford	Nippondenso	10P / 10PA	6812-6, 6813-6, 6814 PAG 46
Ford	Delphi/Harrison	A6	6822-6, 6823-6, 6824 PAG 150
Ford	Visteon/Hanon	FS10 / FX15	6812-6, 6813-6, 6814 PAG 46
Ford	Panasonic	Rotary	6812-6, 6813-6, 6814 PAG 46
Ford	Sanden	SD	6816-6, 6817-6, 6818 PAG 100
Ford	Sanden	TR / TRS	6812-6, 6813-6, 6814 PAG 46
Geo	Nippondenso	10PO	6812-6, 6813-6, 6814 PAG 46
GM	Nippondenso	10PA	6812-6, 6813-6, 6814 PAG 46
GM	Delphi/Harrison	HR6 / HD6 / HT6	6822-6, 6823-6, 6824 PAG 150
GM	Delphi/Harrison	R4*	6822-6, 6823-6, 6824 PAG 150
GM	Sanden	SD5	6816-6, 6817-6, 6818 PAG 100
GM	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
GM	Delphi/Harrison	V5* R134a	6822-6, 6823-6, 6824 PAG 150

02/13/2017 REM

TECHNICAL CHEMICAL COMPANY

PAG CHART

GM	Delphi/Harrison	V5* Retro	6822-6, 6823-6, 6824 PAG 150
GM Saturn	Diesel Kiki/Zexel	DCV	6822-6, 6823-6, 6824 PAG 150
GM Saturn	Diesel Kiki/Zexel	DKV	6822-6, 6823-6, 6824 PAG 150
Honda	Nippondenso	10P	6812-6, 6813-6, 6814 PAG 46
Honda	Nippondenso	HADSYS. 7 Cyl.	6812-6, 6813-6, 6814 PAG 46
Honda	Sanden	SD	6816-6, 6817-6, 6818 PAG 100
Honda	Sanden	TR	6812-6, 6813-6, 6814 PAG 46
Hyundai	Hanon Sys	FS10	6812-6, 6813-6, 6814 PAG 46
Hyundai	Hanon Sys	FX15 / HS10	6812-6, 6813-6, 6814 PAG 46
Infiniti	Zexel	-	6822-6, 6823-6, 6824 PAG 150
Infiniti	Zexel	-	6812-6, 6813-6, 6814 PAG 46
Infiniti	Calsonic	CVW	6812-6, 6813-6, 6814 PAG 46
Isuzu	Zexel	-	6812-6, 6813-6, 6814 PAG 46
Isuzu	Diesel Kiki/Zexel	KC50	6812-6, 6813-6, 6814 PAG 46
Isuzu	Diesel Kiki/Zexel	Rotary	6812-6, 6813-6, 6814 PAG 46
Isuzu	GM	V5*	6822-6, 6823-6, 6824 PAG 150
Jaguar	Sanden	SD7H	6816-6, 6817-6, 6818 PAG 100
Jaguar	Sanden	SD7H	6816-6, 6817-6, 6818 PAG 100
Jeep / Eagle	Nippondenso	10P / 10PA	6812-6, 6813-6, 6814 PAG 46
Jeep / Eagle	Sanden	SD	6816-6, 6817-6, 6818 PAG 100
Jeep / Eagle	Sanden	TR	6812-6, 6813-6, 6814 PAG 46
Lamborghini	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Lancia	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Land Rover	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Land Rover	Sanden	TRS	6812-6, 6813-6, 6814 PAG 46
Lexus	Nippondenso	10PA	6812-6, 6813-6, 6814 PAG 46
Lotus	Sanden	SD	6816-6, 6817-6, 6818 PAG 100
Mazda	Hanon Sys	FS10	6812-6, 6813-6, 6814 PAG 46
Mazda	Panasonic	Rotary	6812-6, 6813-6, 6814 PAG 46
Mazda	Sanden	SD	6816-6, 6817-6, 6818 PAG 100
Mazda	Nippondenso	TV	6816-6, 6817-6, 6818 PAG 100
Mazda	Zexel	-	6812-6, 6813-6, 6814 PAG 46
Mercedes-Benz	Nippondenso	10P / 10PA	6812-6, 6813-6, 6814 PAG 46
Mercedes-Benz	Nippondenso	6CA	6812-6, 6813-6, 6814 PAG 46
Mitsubishi	Nippondenso	10P / 10PA	6812-6, 6813-6, 6814 PAG 46
Mitsubishi	Mitsubishi	FX / MSC	6812-6, 6813-6, 6814 PAG 46

TECHNICAL CHEMICAL COMPANY

PAG CHART

Nissan	Diesel Kiki/Zexel	DKS / Rotary	6812-6, 6813-6, 6814 PAG 46
Nissan	Diesel Kiki/Zexel	DKV / DCV	6822-6, 6823-6, 6824 PAG 150
Nissan	Diesel Kiki/Zexel	DKV / Rotary	6822-6, 6823-6, 6824 PAG 150
Nissan	Calsonic	Rotary	6812-6, 6813-6, 6814 PAG 46
Opel	Nippondenso	6CA	6812-6, 6813-6, 6814 PAG 46
Opel	Sanden	7SB	6812-6, 6813-6, 6814 PAG 46
Opel	Delphi / Harrison	V5*	6822-6, 6823-6, 6824 PAG 150
Porsche	Nippondenso	10P	6812-6, 6813-6, 6814 PAG 46
Peugeot	Sanden	SD	6816-6, 6817-6, 6818 PAG 100
Peugeot	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Renault	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Renault	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
Renault	Sanden	TRS	6812-6, 6813-6, 6814 PAG 46
Rolls Royce	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
Rover	Nippondenso	10P	6812-6, 6813-6, 6814 PAG 46
Rover	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Rover	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
Saab	Seiko Seiki	SS	6812-6, 6813-6, 6814 PAG 46
Seat	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
Škoda	Sanden	SD7	6816-6, 6817-6, 6818 PAG 100
Subaru	Diesel Kiki	15CH	6812-6, 6813-6, 6814 PAG 46
Subaru	Zexel	Rotary	6822-6, 6823-6, 6824 PAG 150
Suzuki	Nippondenso	10P	6812-6, 6813-6, 6814 PAG 46
Suzuki	Sanden	SD	6816-6, 6817-6, 6818 PAG 100
Toyota	Nippondenso	10P / 10PA	6812-6, 6813-6, 6814 PAG 46
Toyota	Nippondenso	TV	6816-6, 6817-6, 6818 PAG 100
Vauxhall	Delphi / Harrison	V5*	6822-6, 6823-6, 6824 PAG 150
Volkswagen	Sanden	7SB	6812-6, 6813-6, 6814 PAG 46
Volkswagen	Zexel	DCW	6812-6, 6813-6, 6814 PAG 46
Volkswagen	Sanden	SD / SD7	6816-6, 6817-6, 6818 PAG 100
Volkswagen	Sanden	SDV	6812-6, 6813-6, 6814 PAG 46
Volvo	Sanden	SD / SD7	6816-6, 6817-6, 6818 PAG 100
Volvo	Seiko Seiki	SS	6812-6, 6813-6, 6814 PAG 46