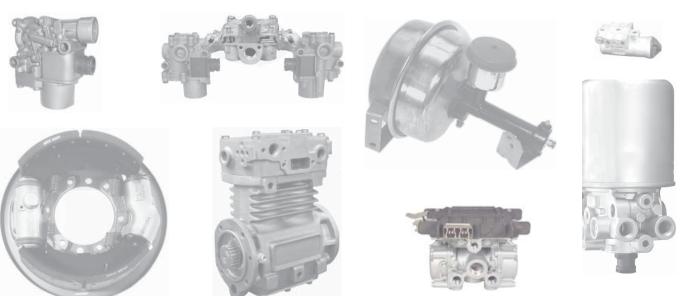
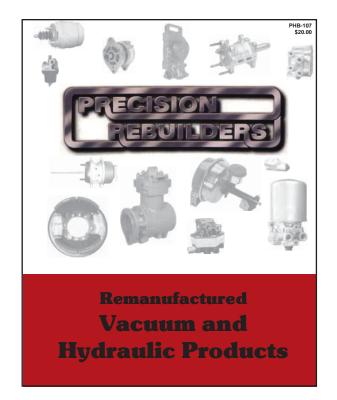


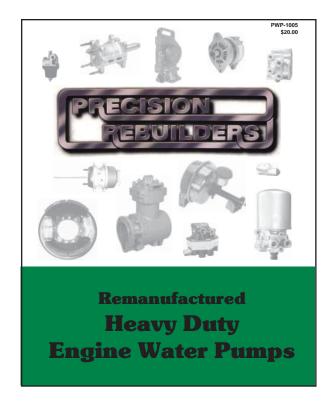
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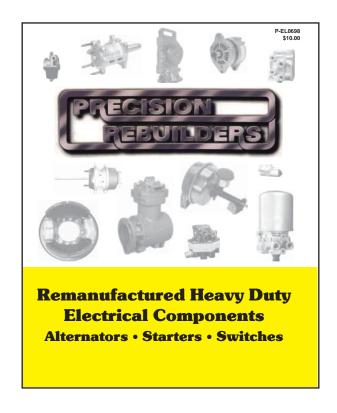


Remanufactured **Heavy Duty** Air Brake System Products

Other Catalogs Available







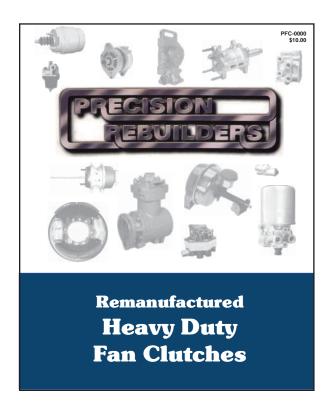


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The material contained in this publication has been carefully prepared to provide the latest and most accurate reference information from the most reliable sources at hand. This book is provided for your use as a sales aid. No warranty (expressed or implied) can be made as to its accuracy or completeness and Precision Rebuilders assumes no responsibility for any damages incurred as a result of reliance on the material it contains.

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All mention of manufacturer's names, numbers, etc. are for reference purposes only. Referral to those items does in no way imply that the parts listed are the product of those manufacturers.

Other catalogs available:

Vacuum and Hydraulic Products

Heavy Duty Remanufactured Electrical Components

Heavy Duty Engine Water Pumps

Heavy Duty Fan Clutches

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Section 1

Air Compressors

Basic Compressor Identification

In most cases a compressor can be identified by a tag located on either side of the crankcase. Normally, the tag will show the part number of the compressor, the type, and manufacturer or remanufacturer of the compressor. The location and the information given on the tag can vary. Sometimes the information will be on a tag that is bolted to the head of the compressor. The part number given on the tag should refer to one of the following. (1) Remanufactured Part Number- A number that is commonly used in the aftermarket. (2) Original Equipment Number- A number that is used by the original manufacturer of the compressor to identify a compressor made for a specific vehicle manufacturer. (3) Vehicle/Engine Manufacturers Part Numbers- In some instances the tag may have either the vehicle or engine manufacturers part number for the compressor. Part numbers that fall into category (2) or (3) should be interchanged to the basic number.

Bendix Compressors

Tu-Flo 300

TheTu-Flo 300 is remanufactured in an air cooled configuration and has a separate head, block and crankcase. It is available in engine lube or self lube configurations. It is a two cylinder, reciprocating type compressor with a displacement of 4 cu. ft. per min. at 1250 R.P.M. Belt driven only.

Tu-Flo 400

TheTu-Flo 400 is remanufactured in air-cooled, water-cooled or combination of water-cooled head and air-cooled block configurations, and has a separate head, block and crankcase. It is available in pulley driven vertical mount, side mount, and offset mount as well as direct drive flange mount applications. It is a two cylinder, reciprocating type compressor, and has a displacement of 7.25 cu. ft. per min. at 1250 R.P.M.

Tu-Flo 500

The Tu-Flo 500 is remanufactured in air-cooled, water-cooled or combination of water-cooled head and air-cooled block configurations, and has a separate head, block and crankcase. It is available in pulley driven vertical mount, side mount, and offset mount. Direct drive versions including both single and double flange mount are also available. It is a two cylinder, reciprocating type compressor, and has a displacement of 12 cu. ft. per min. at 1250 R.P.M.

Tu-Flo 501

The Tu-Flo 501 is remanufactured in an air cooled block and a water cooled head configuration, and has an integral block and crankcase, It is available in pulley driven vertical mount, side mount, and offset mount. Direct drive versions include both single and double flange mount. It is a two cylinder, reciprocating type compressor, and has a displacement of 12 cu. ft. per min. at 1250 R.P.M.

Tu-Flo 600

The Tu-Flo 600 is remanufactured in air-cooled, water-cooled or combination of water-cooled head and air-cooled block configurations, and has a separate head, block and crankcase. It is available in pulley driven vertical mount or direct drive configuration including both single and double flange mount. It is a two cylinder, reciprocating type compressor, and has a displacement of 14.5 cu. ft. per min. at 1250 R.P.M.

BX2150

The BX2150 has a water-cooled head and air cooled block, and has an integral block and crankcase. It is available in pulley driven vertical mount, and direct drive single and double flange mount configurations. It is a one cylinder, reciprocating type compressor, and has a displacement of 9.5 cu. ft. per min. at 1250 R.P.M.

Tu-Flo 550

The Tu-Flo 550 has a water-cooled head and air cooled block, and has an integral block and crankcase. It is available in pulley driven vertical mount, and direct drive single and double flange mount configurations. It is a two cylinder, reciprocating type compressor, and has a displacement of 13.2 cu. ft. per min. at 1250 R.P.M.

Tu-Flo 700

The Tu-Flo 700 has a water cooled head and block. It is available in pulley driven vertical mount, and direct drive single and double flange mount configurations. It is a two cylinder, reciprocating type compressor, and has a displacement of 15.5 cu. ft. per min. at 1250 R.P.M.

Tu-Flo 750

The Tu-Flo 750 has a water-cooled head and air cooled block, and has an integral block and crankcase. It is available in pulley driven vertical mount, and direct drive single and double flange mount configurations. It is a two cylinder, reciprocating type compressor, and has a displacement of 16.5 cu. ft. per min. at 1250R.P.M.

Tu-Flo 1000

The Tu-Flo 1000 can be either water-cooled or air-cooled. It is available in pulley driven vertical mount, and direct drive flange mount configurations. It is a four cylinder, reciprocating type compressor, and has a displacement of 24 cu. ft. per min. at 1250 R.P.M.

Tu-Flo 1400L

The Tu-Flo 1400L is a water-cooled compressor supplied for Mack in-line 6, Caterpillar and Detroit Diesel applications. It is available in a direct drive flange mount. It is a four cylinder, reciprocating type compressor, and has a displacement of 31 cu. ft. per min. at 1250 R.P.M.

BA921 & BA922 Compressors

The BA-921® compressor is a single-cylinder reciprocating compressor with a rated displacement of 15.8 cubic feet per minute at 1250 RPM. It consists of a water-cooled cylinder head assembly and an integral air-cooled crankcase assembly.

The BA-922® compressor is a 2 cylinder reciprocating compressor with a rated displacement of 31.6 cubic feet per minute at 1250 RPM. It consists of a water-cooled cylinder head assembly and an integral cylinder block and air-cooled crankcase assembly.

Midland Compressors

EL740

The EL740 is available in air cooled or water-cooled head and air-cooled block configurations. It can be either a pulley driven vertical mount or direct drive flange mount application. It is a 2 cylinder reciprocating type compressor, and has a displacement of 7.4 cu. ft. per min. at 1250 R.P.M.

EL850

The EL850 is available in water-cooled and air cooled configurations. It can be either a pulley driven vertical mount or direct drive flange mount application. It is a 1-cylinder reciprocating type compressor, and has a displacement of 8.5 cu. ft. per min. at 1250 R.P.M.

EL 1300*

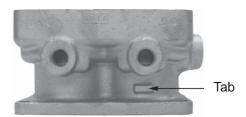
The EL1300 is remanufactured in a water-cooled configuration only. It can be a pulley driven vertical mount or direct drive single or double flange mount application. It is a 2 cylinder reciprocating type compressor, and has a displacement of 12.9 cu. ft. per min. at 1250 R.P.M.

EL 1600*

The EL1600 is remanufactured in a water-cooled configuration only. It can be a pulley driven vertical mount or direct drive single or double flange mount application. It is a 2 cylinder reciprocating type compressor, and has a displacement of 16.1 cu. ft. per min. at 1250 R.P.M.

EL3200

The EL3200 is a water cooled compressor and is available in direct drive single flange mount for Mack in-line 6 and Detroit Diesel applications. It is a 4-cylinder reciprocating type compressor, and has a displacement of 32.2 cu. ft. per min. at 1250 RPM.



*Note: Tab on block indicates EL1600 type. No tab = EL1300 type.

Note: Pulley driven vertical mount compressors are manufactured with a variety of base mounts including 4, 6 and no hole base configurations. Engine driven compressors are manufactured with a variety of flanges that are specific to the engine manufacturer's design.

Holset / Cummins Compressors

SS191

The SS191 is remanufactured in water cooled and air cooled configurations. It is available in gear driven configurations only with or without accessory drive. It is a one cylinder reciprocating type compressor with a displacement of 8.5 cu. ft. per min; at 1250 R.P.M. This unit is pictured in the Midland picture reference under the EL 850 classification.

SS296

The SS 296 is remanufactured in a water cooled configuration only. It is available in gear driven configurations only with or without accessory drive. It is a one cylinder reciprocating type compressor with a displacement of 13.2 cu. ft. per min; at 1250 R.P.M.

SS338

The SS 338 is remanufactured in a water cooled configuration only. It is available in gear driven configurations only with or without accessory drive. It is a one cylinder reciprocating type compressor with a displacement of 15.0 cu. ft. per min; at 1250 R.P.M.

QE296

The QE 296 is remanufactured in a water cooled configuration only. It is available in gear driven configurations only with or without accessory drive. It is a one cylinder reciprocating type compressor with a displacement of 13.2 cu. ft. per min. at 1250 R.P.M. The QE model is a newer style unit with an all cast iron head designed to reduce noise and improve efficiency.

QE338

The QE 338 is remanufactured in a water cooled configuration only. It is available in gear driven configurations only with or without accessory drive. It is a one cylinder reciprocating type compressor with a displacement of 15.0 cu. ft. per min. at 1250 R.P.M. The QE model is a newer style unit with an all cast iron head designed to reduce noise and improve efficiency.

HD650

The HD650 is remanufactured in a water cooled configuration only. It is available in gear driven configurations only with or without accessory drive. It is a one cylinder reciprocating type compressor with a displacement of 13.2 cu. ft. per min. at 1250 R.P.M. The HD model is a newer style unit like the QE model except that it is designed to pump continuously.

HD850

The HD850 is remanufactured in a water cooled configuration only. It is available in gear driven configurations only with or without accessory drive. It is a one cylinder reciprocating type compressor with a displacement of 15.0 cu. ft. per min. at 1250 R.P.M. The HD model is a newer style unit like the QE model except that it is designed to pump continuously.

ST676

The ST 676 is remanufactured in a water cooled configuration only. It is available in gear driven configurations only with or without accessory drive. It is a two cylinder reciprocating type compressor with a displacement of 30.0 cu. ft. per min. at 1250 R.P.M.

ST773

The ST773 is remanufactured in a water cooled configuration only. It is available in gear driven configurations only with or without accessory drive. It is a two cylinder reciprocating type compressor with a displacement of 34.0 cu. ft. per min. at 1250 R.P.M.

Wabco® Compressors

Wabco® compressors are remanufactured in a water cooled configuration only. They are used in a number of applications. One cylinder models are have a 15.2 and 18.7 cu. ft. per minute rated displacement at 1250 R.P.M.

Note: Many other compressors produced by various manufactures for domestic and imported vehicles not listed here are also available including ,but not limited to Clayton DeWandre, Diesel Kiki, Knorr, Scania, Wabco, etc.

REMANUFACTURED COMPRESSOR PICTURE REFERENCE

Abbreviation Key for Picture Reference Section

R.S. Right Side MT. Mount L.S. Left Side E.O. End Oil W.C. Water Cooled B.O. Base Oil

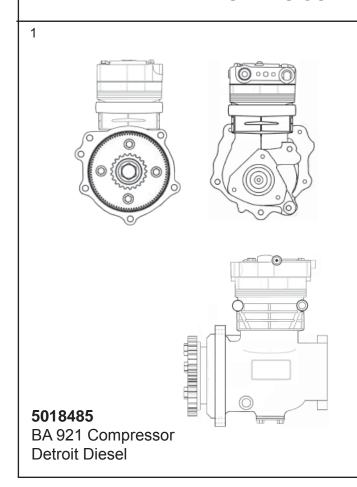
A.C. Air Cooled P.S. Power Steering

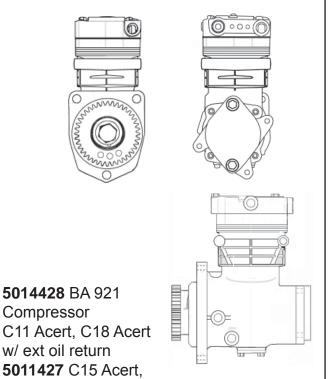
BA SERIES COMPRESSORS

2

C18 Acert

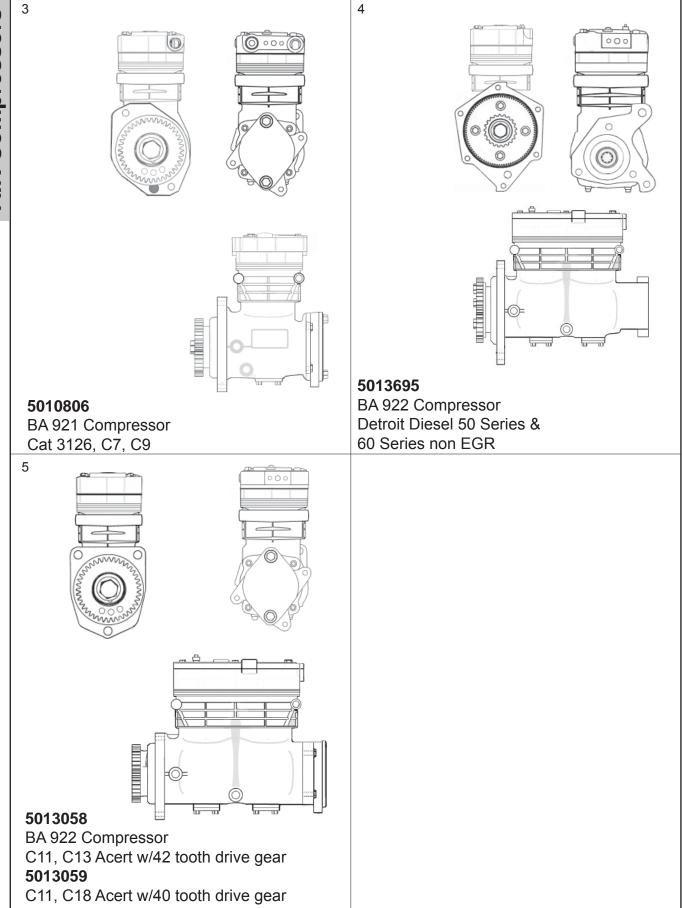
Oil Sump Pump





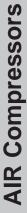
Note: Gear not supplied

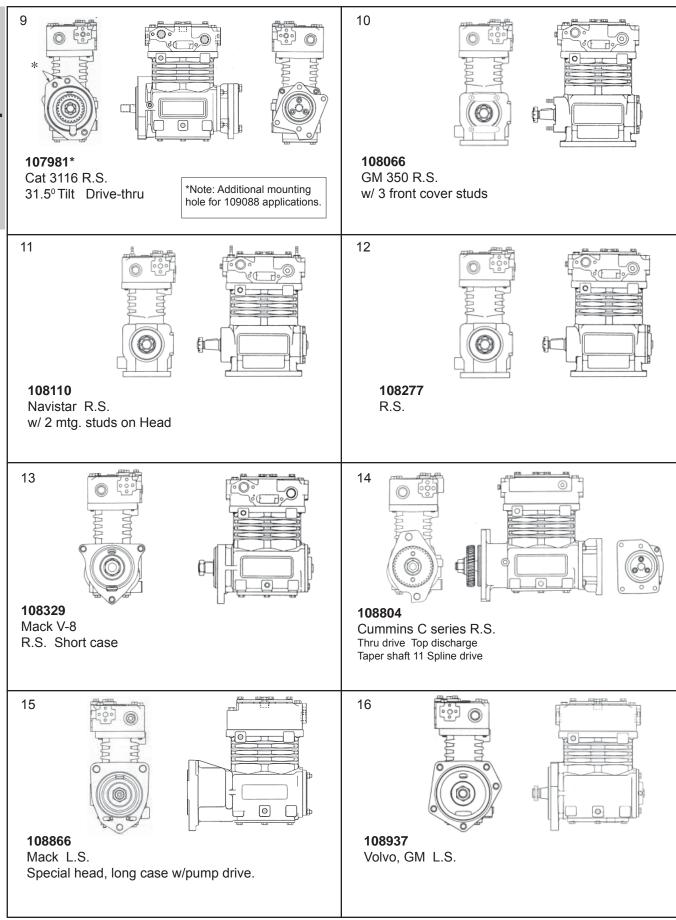
with compressor.



TU-FLO 550 COMPRESSORS

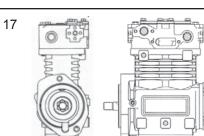
TU-FLO 550 COMPRESSORS

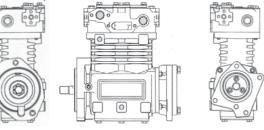




TU-FLO 550 COMPRESSORS







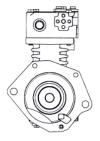
18

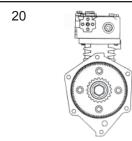
109088 Navistar R.S. 7º Tilt

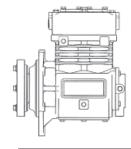
Note: For reference only. Can Use 107981.

109139 Cat 3406E R.S. M-20 threaded shaft

19





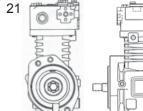


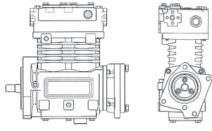
109251 Cat 3300 R.S. 22 Spline 4 Bolt mount 109429 Detroit L.S. 69 Tooth drive gear

22

24

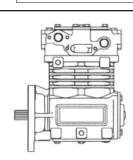
Note: This compressor is supplied with the drive gear. You must return a core with a good drive gear to receive full core credit.









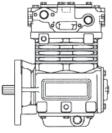


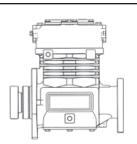
109451 Cat 3126 R.S. 31.5° Tilt Top discharge

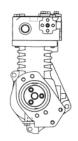
109603 Cat 3176 R.S. 22 Spline 3 Bolt mount

23



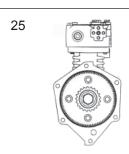




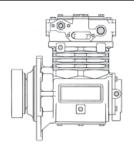


109809 Cat 3500 R.S. 22 Spline 3 Bolt mount

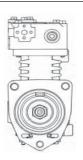
5000602 Detroit L.S.



5001911Detroit R.S.
48 Tooth drive gear

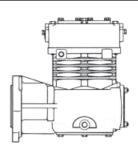


Note: This compressor is supplied with the drive gear. You must return a core with a good drive gear to receive full core credit.



5002865Mack Long Spline Case
W/ Pump Drive, L.S.

26

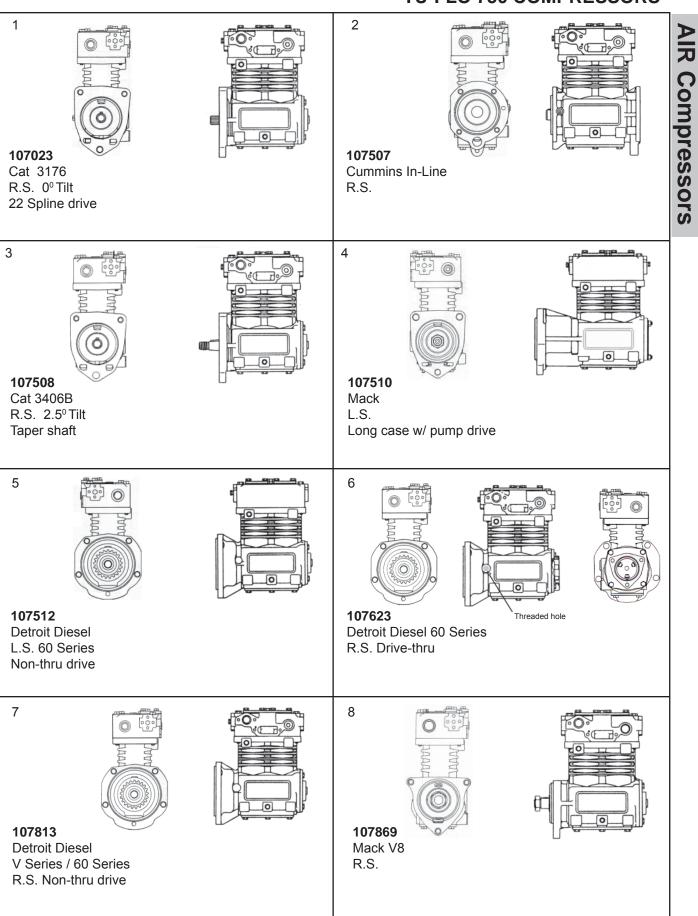


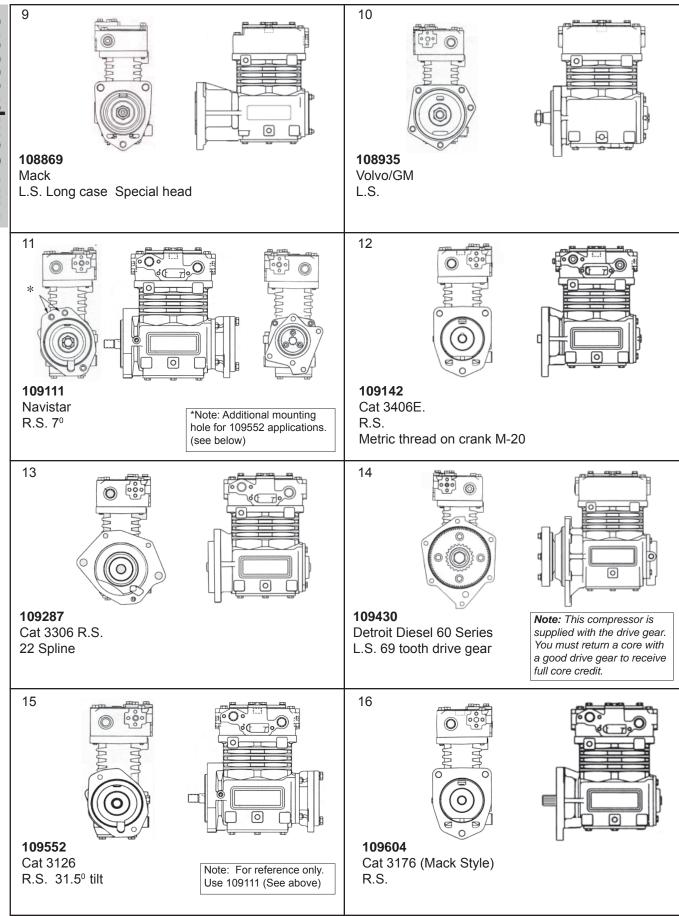
PRVSS250Pressure Relief Valve

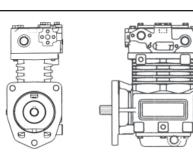


231081 (PRV250) Pressure Relief Valve

TU-FLO 750 COMPRESSORS





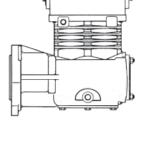


109659 Cat 3500 R.S. 22 Tooth spline







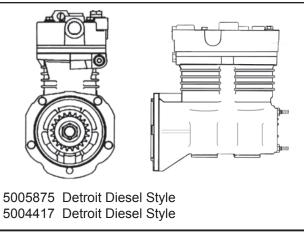


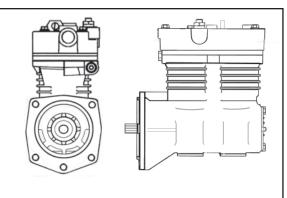


231081 Use our number PRV250 Pressure Relief Valve

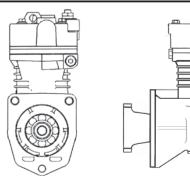
AIR Compressors

DURA-FLO 596 COMPRESSORS

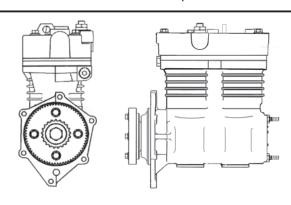




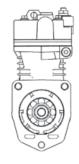
5006353 Cat 3500B w/ 14 tooth spline



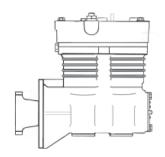
5007085 C10 / C12 Shown 5006570 Caterpillar 3406E Style



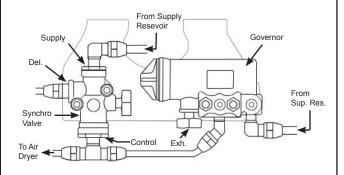
TBA Detroit Diesel Adapterless Style



5007099



Note: 1/2 X13Threaded mounting holes & no stud in the end cover.



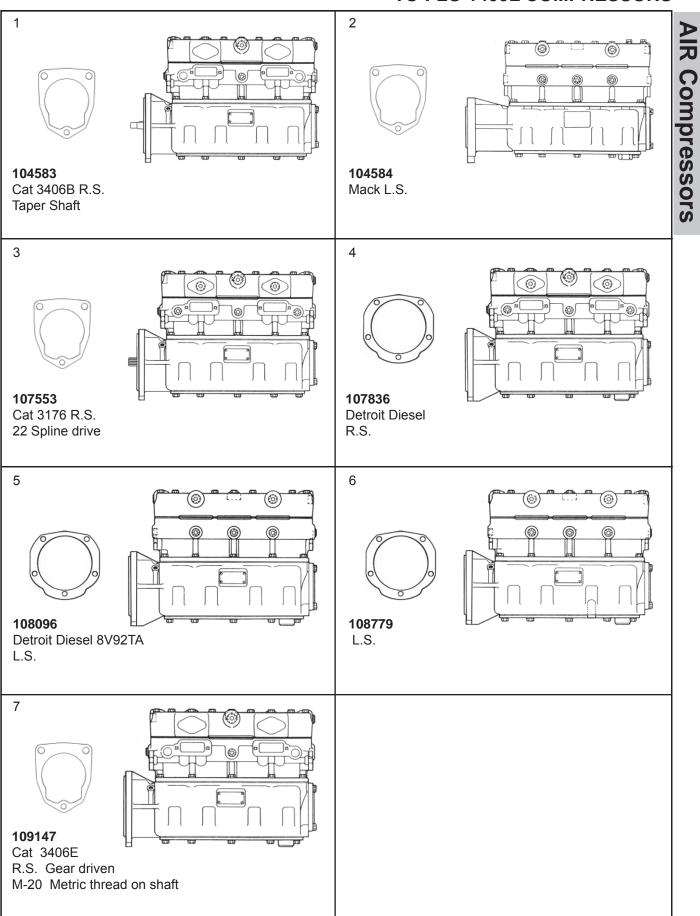
5007116 Governor Module

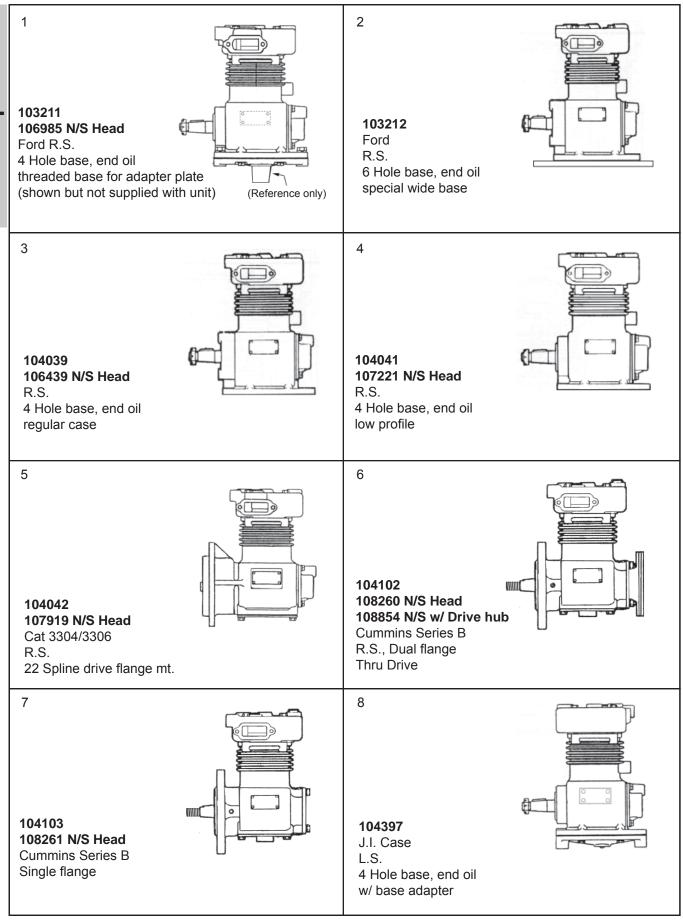


800361 Governor Pre-set @130 p.s.i.

The Dura-Flo 596 is available in a number of part numbers for various applications. Call for price and availability.

TU-FLO 1400L COMPRESSORS

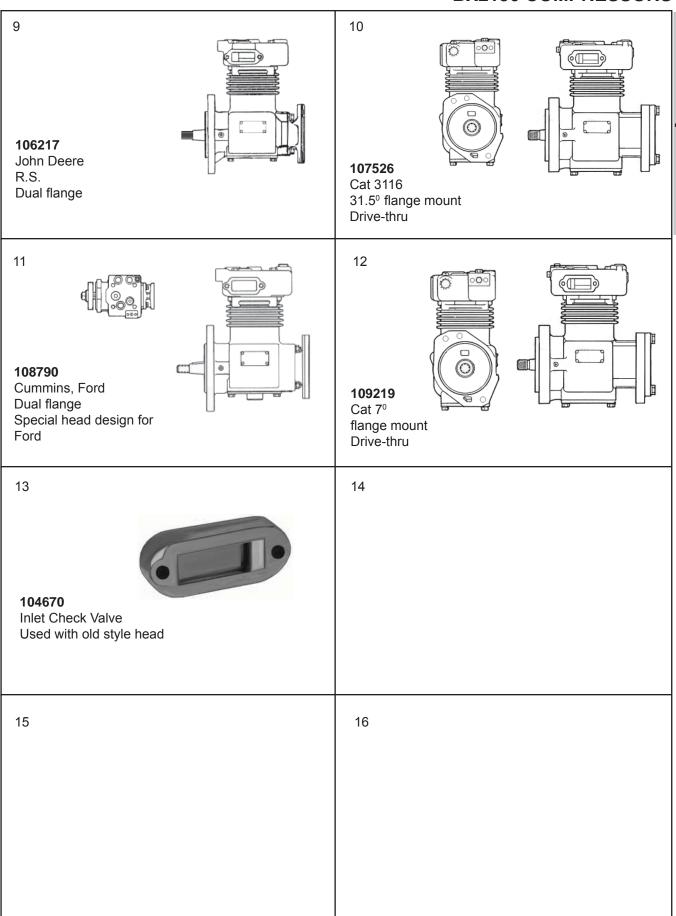




1-18 Note: 2150 heads are rotatable.

BX2150 COMPRESSORS

AIR Compressors

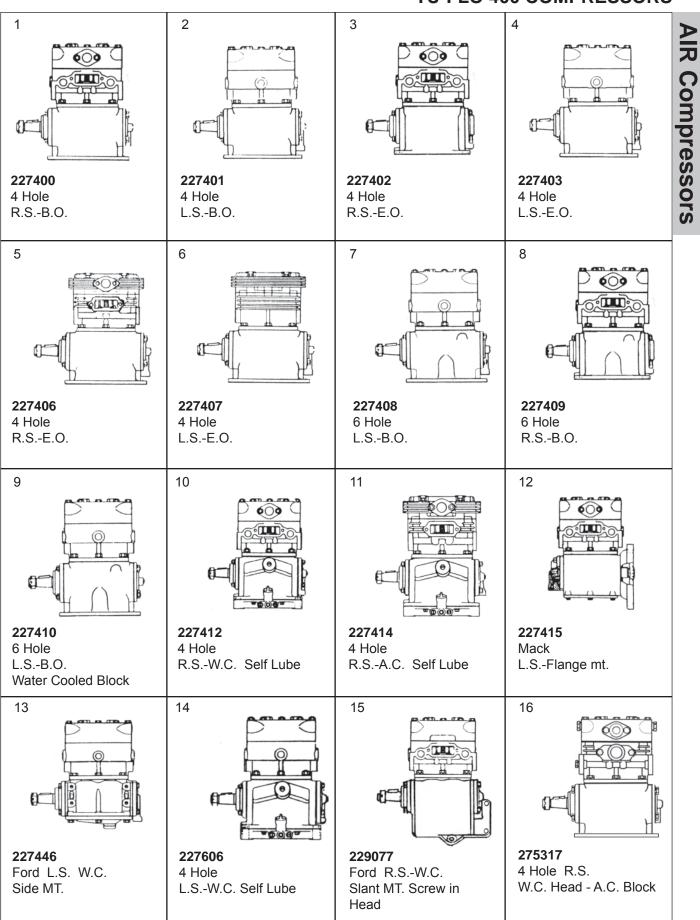


Note: BX2150 compressor heads are rotatable

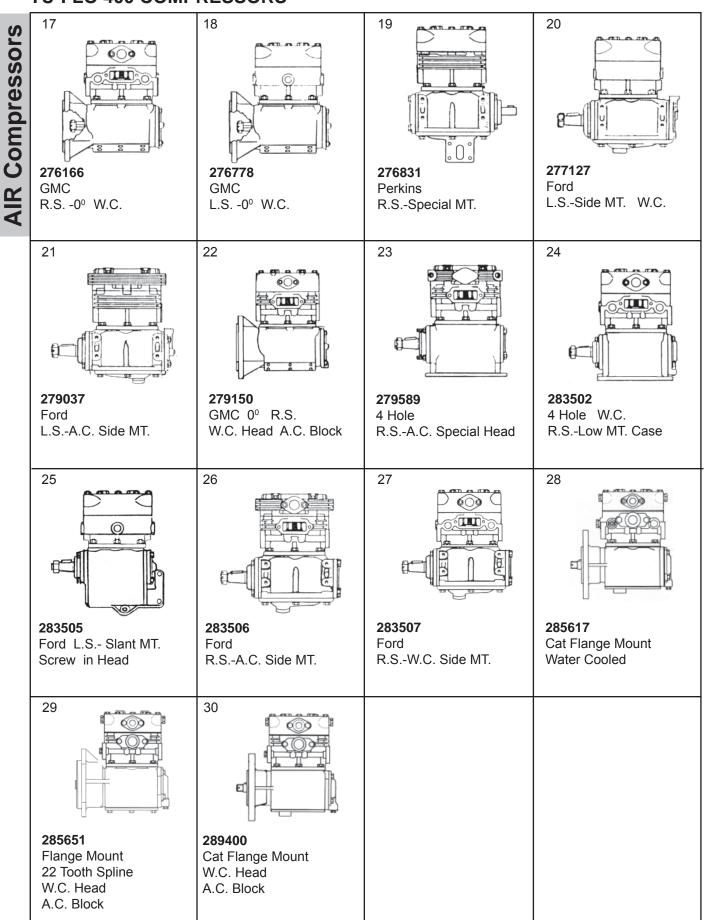
TU-FLO 300 COMPRESSORS

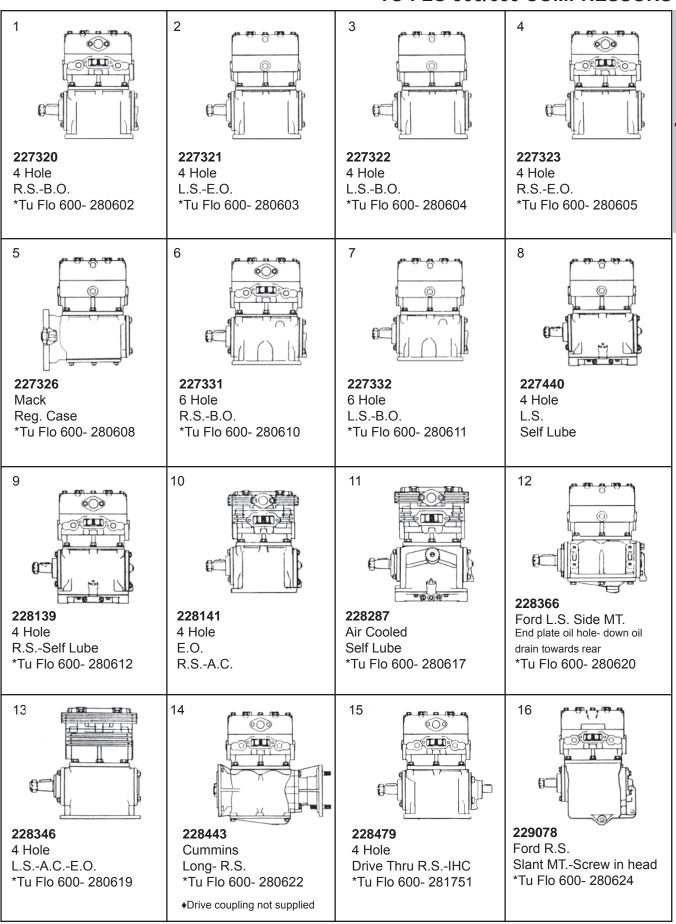
	10-FLO 300 COMPRESSORS				
rs	1	2	3	4	
AIR Compressors	275114 4 Hole Eng. lube R.S.	275115 4 Hole Eng. lube R.S. Threaded base for	275116 4 Hole Self lube R.S.	275117 4 Hole Self lube L.S.	
		adapter plate			
	284374 4 Hole Eng. lube L.S.				

TU-FLO 400 COMPRESSORS



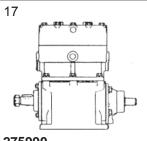
TU-FLO 400 COMPRESSORS





TU-FLO 500/600 COMPRESSORS

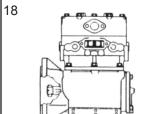
Compressors



275990

4 Hole

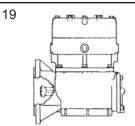
L.S.-Drive Thru *Tu Flo 600- 281713



276961

GMC R.S.- 0º

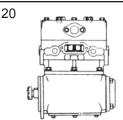
*Tu Flo 600- 280609



276962

GMC L.S.- 0º

*Tu Flo 600- 280570

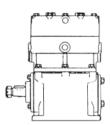


277122

Mack V-8 R.S.-Short MT.

*Tu Flo 600- 280860

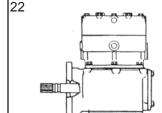




277694

4 Hole

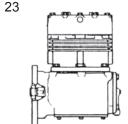
L.S.-E.O.Screw in Head *Tu Flo 600- 280540



277730

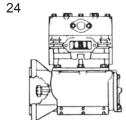
Cat L.S.

13 Spline Drive



278604

Mack L.S. W.C. Head w/angle port *Tu Flo 600- 283821

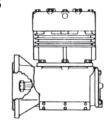


279068

GMC R.S.- 0º W.C. Head - A.C. Block

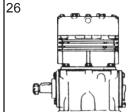
*Tu Flo 600- 280281

25



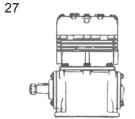
279069

GMC L.S.- 0º W.C. Head - A.C. Block *Tu Flo 600- 280282



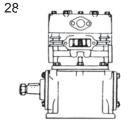
279072

6 Hole L.S.-E.O. W.C. Head - A.C. Block *Tu Flo 600- 280283



279073

4 Hole L.S.-B.O. W.C. Head - A.C. Block



279074

4 Hole R.S.-B.O. W.C. Head - A.C. Block

*Tu Flo 600- 280602

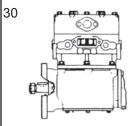
29

279707

Cummins **Short Case**

*Tu Flo 600- 280238

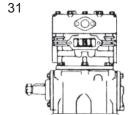
◆Drive coupling not supplied



279995

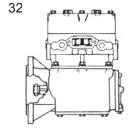
Oil Inlet

Cat R.S. **Tapered Shaft** *Tu Flo 600- 280556



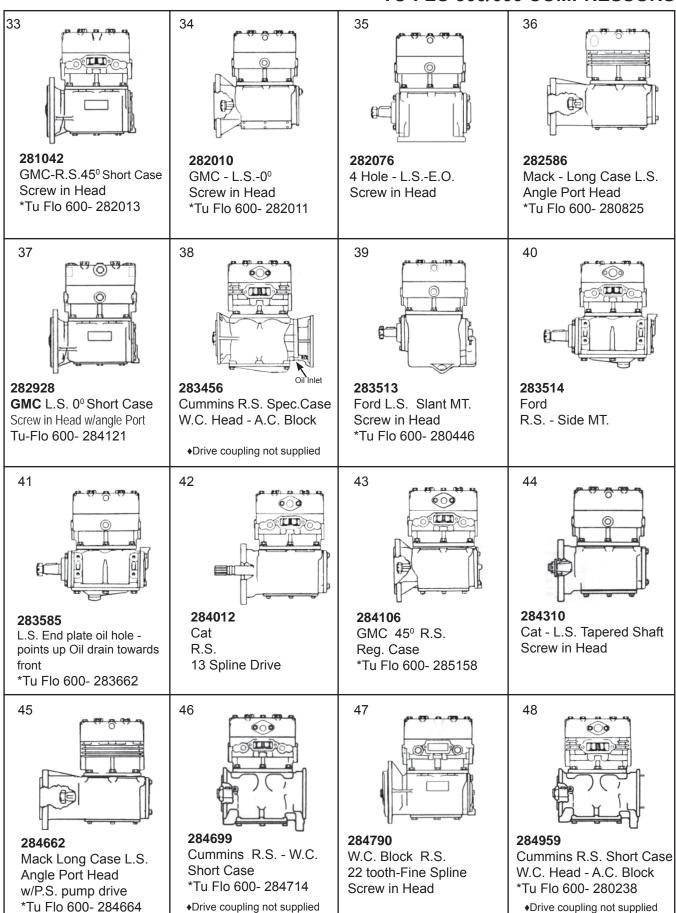
280280

6 Hole R.S.-E.O. W.C. Head - A.C. Block *Tu Flo 600- 280284

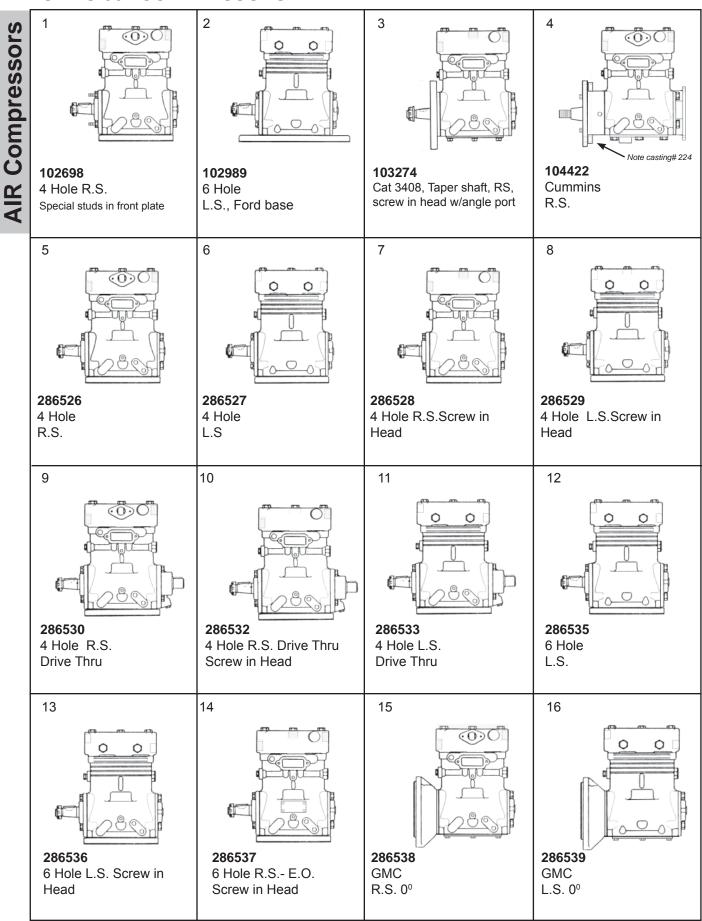


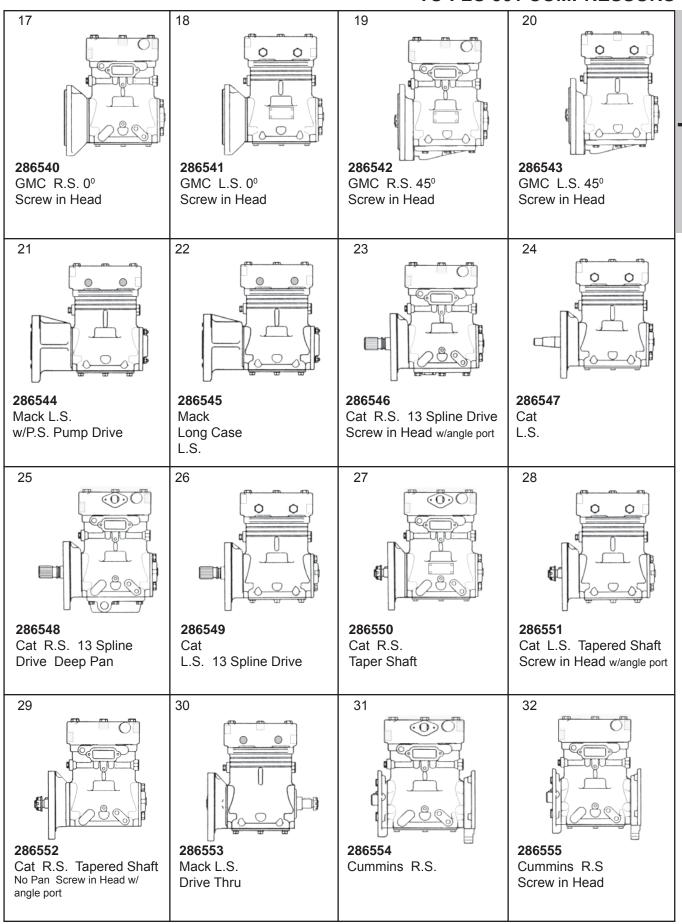
280963

GMC - R.S.-0° Screw in Head

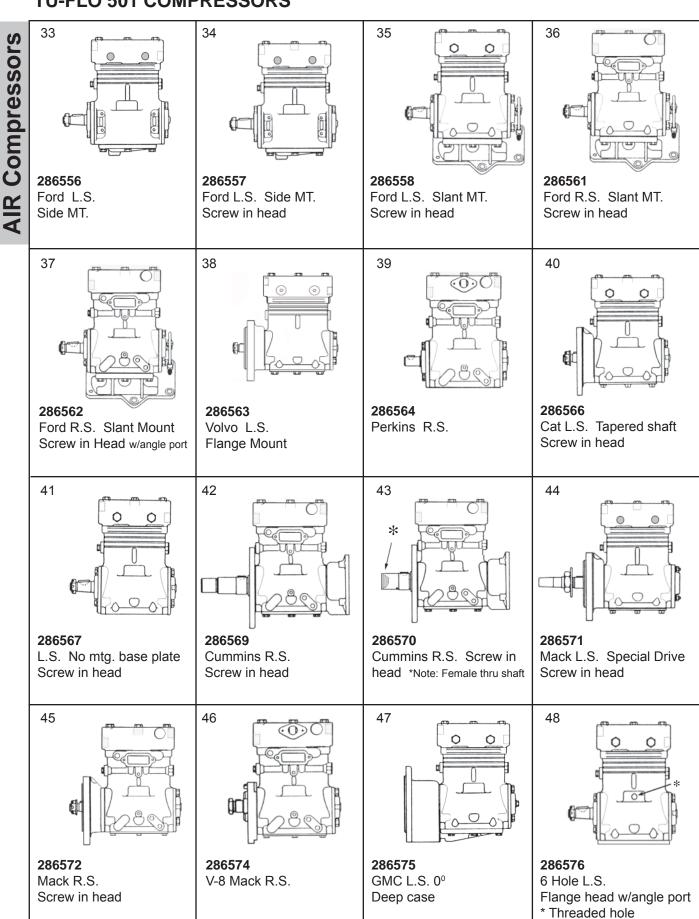


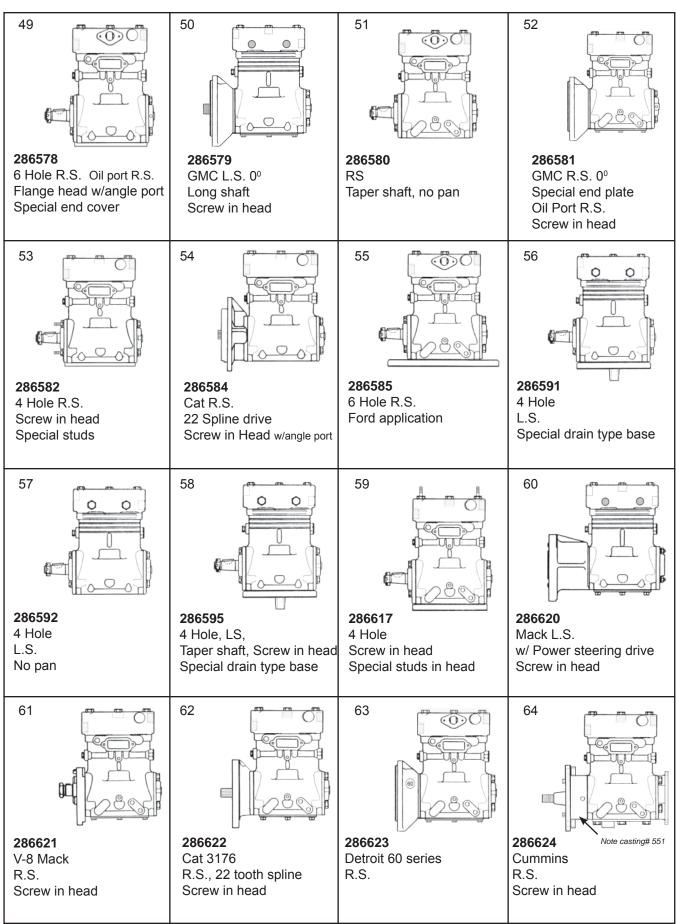
TU-FLO 501 COMPRESSORS





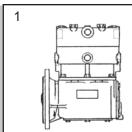
TU-FLO 501 COMPRESSORS



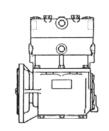


TU-FLO 700 COMPRESSORS

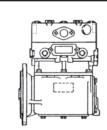
AIR Compressors



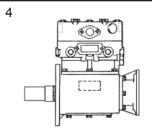
101158 Detroit Diesel 45° L.S. Short case Top & side discharge



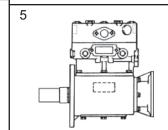
101282 Detroit Diesel 0° L.S. short case Top & side discharge



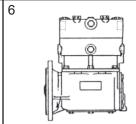
101554 Detroit Diesel 52° R.S. Top & side discharge



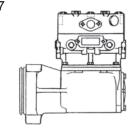
101589 Cummins R.S. VT903 Coach Left hand thread in crank Top & side discharge



101590 Cummins R.S. VT903 Coach Right hand thread in crank Top & side discharge

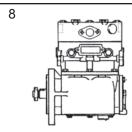


101636 Detroit Diesel 52º L.S. short case Top & side discharge

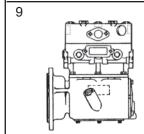


101884 Cat extended flange R.S. Taper shaft Top & side discharge

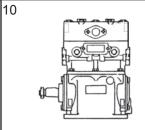
11



102089Volvo flange R.S.
Straight shaft
Base plate drain
Top & side discharge

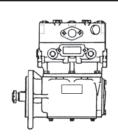


102137Detroit Diesel 15° R.S.
Top & side discharge

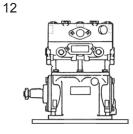


1022136 Hole R.S. - B.O.
Top & side discharge

14

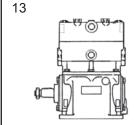


102290Volvo flange R.S.
Saab-Scania
Top & side discharge

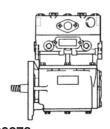


102598 6 Hole R.S.- E.O. Special wide base Top & side discharge

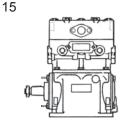
16



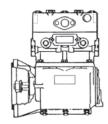
103051 4 Hole L.S. -E.O. Top & side discharge



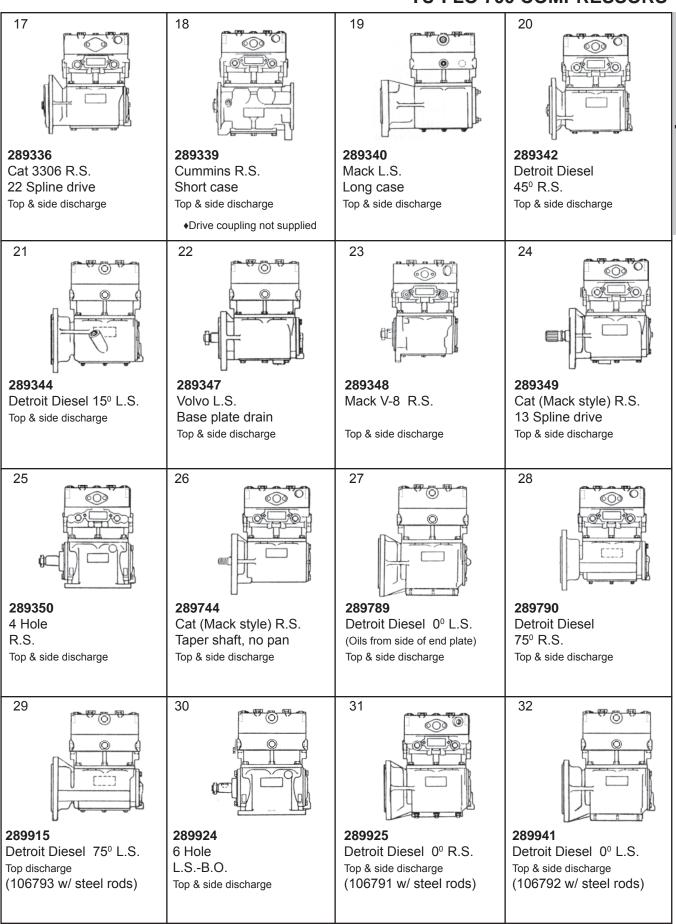
103278 Cat 3406B R.S. 2 .5º Tilt taper shaft Top & side discharge



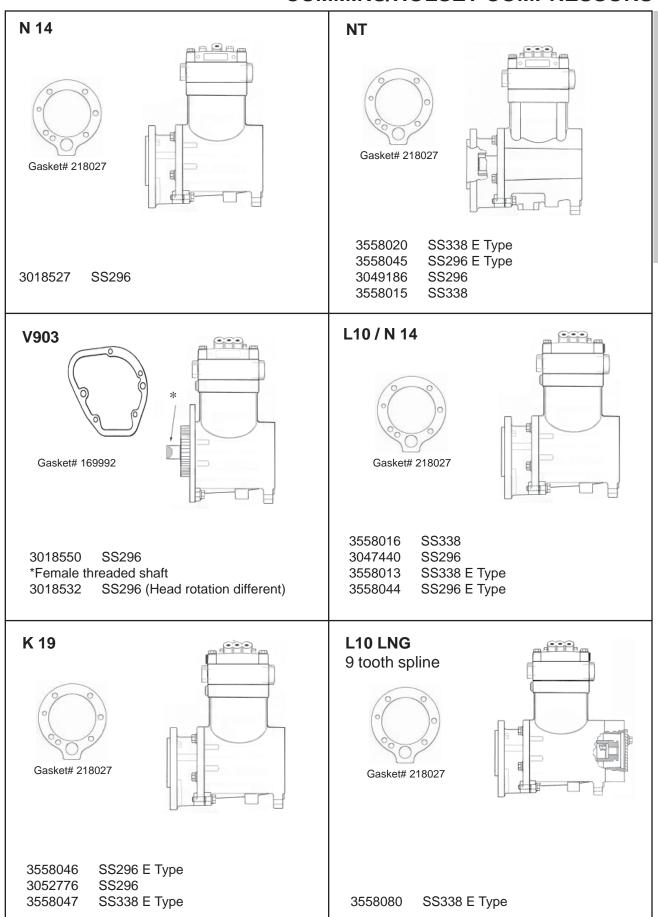
104189 4 Hole R.S.- E.O.w/ front end studs



106268
Detroit Diesel
Series 60 0º R.S.
Top & side discharge



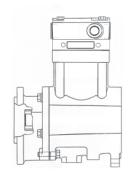
Since dillion viils	289964 Detroit Diesel 75° L.S. Top & Side Discharge	289969 4 Hole R.SE.O. Special threaded base Top & Side Discharge	



L10 / N14 / M11

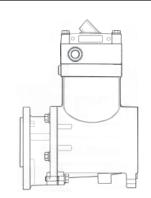


Gasket# 218027



Gasket# 218027

V 28



QE296 3558072 QE296 3558131 3558074 QE338

3558035 SS296

SS style Mack E6 / E7

thru drive 11 tooth spline



Gasket# 248510

3558029 SS296 3558000 **SS338**

SS style Mack E6 / E7

non thru drive



Gasket# 248510

3558042 SS296 3558043 **SS338**

HD & QE style Mack E6 / E7



non thru drive

Gasket# 248510

QE296 3558068 3558077 **QE338** 3558107 HD 650 3558110 HD 850

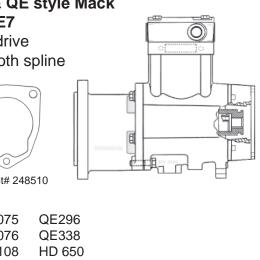
HD & QE style Mack E6 / E7

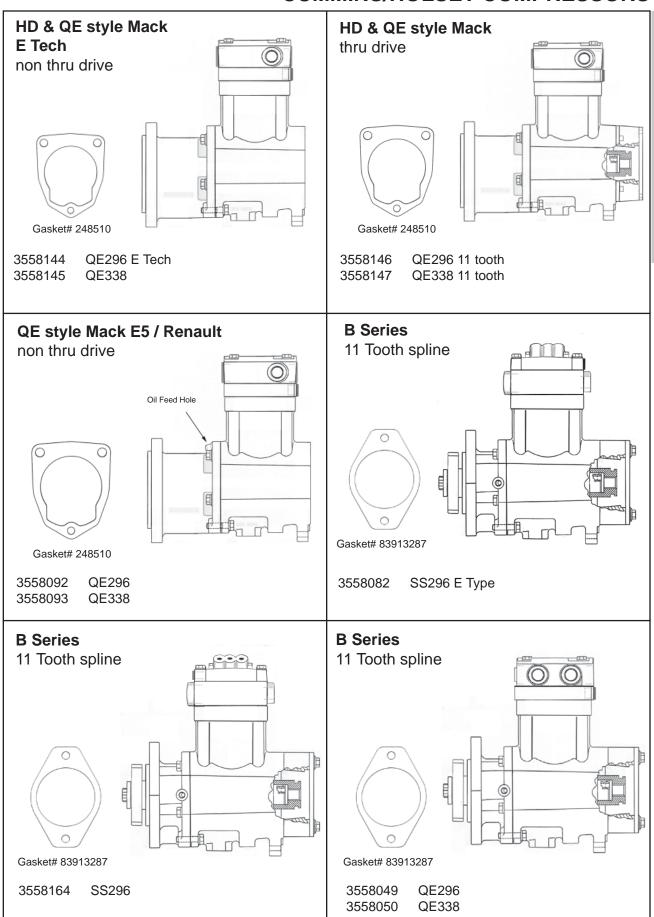
thru drive 11 tooth spline

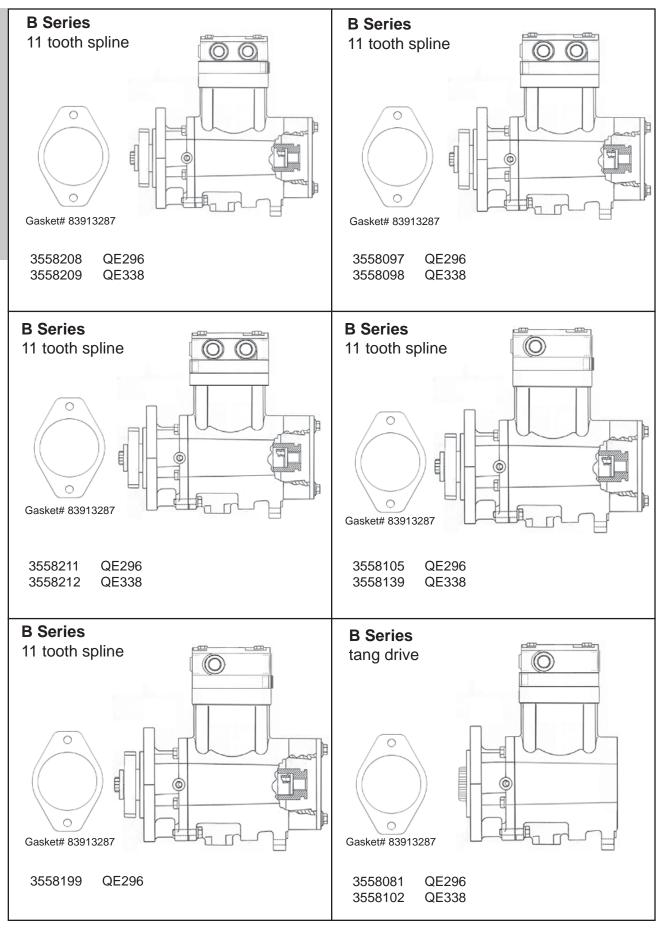


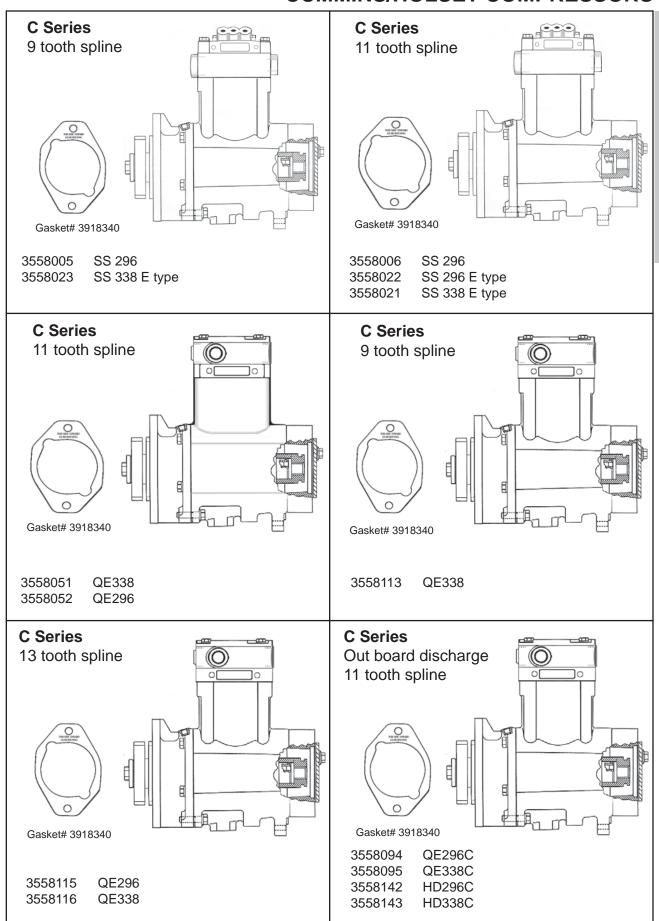
Gasket# 248510

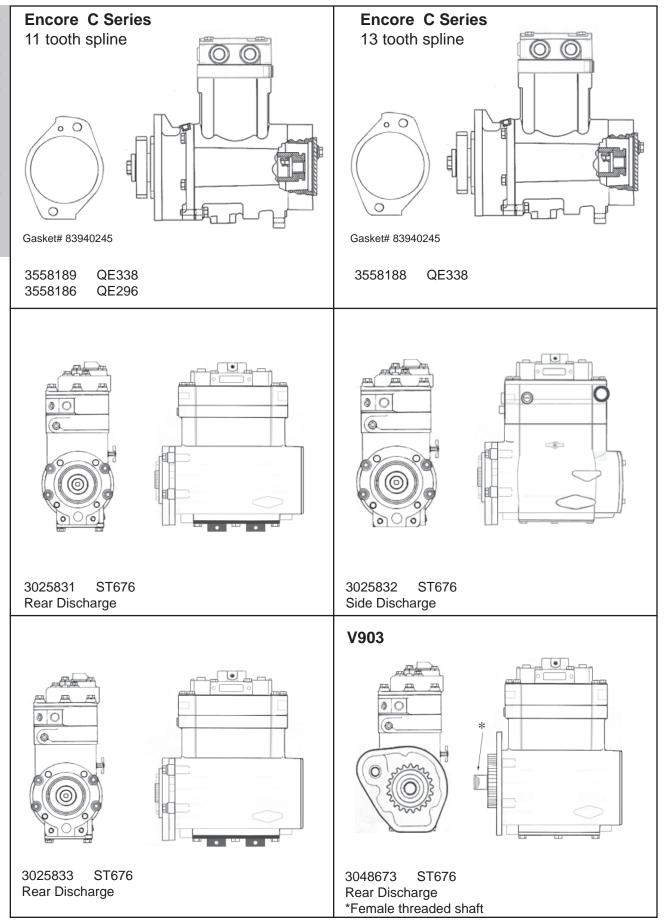
3558075 3558076 QE338 HD 650 3558108 3558109 HD 850

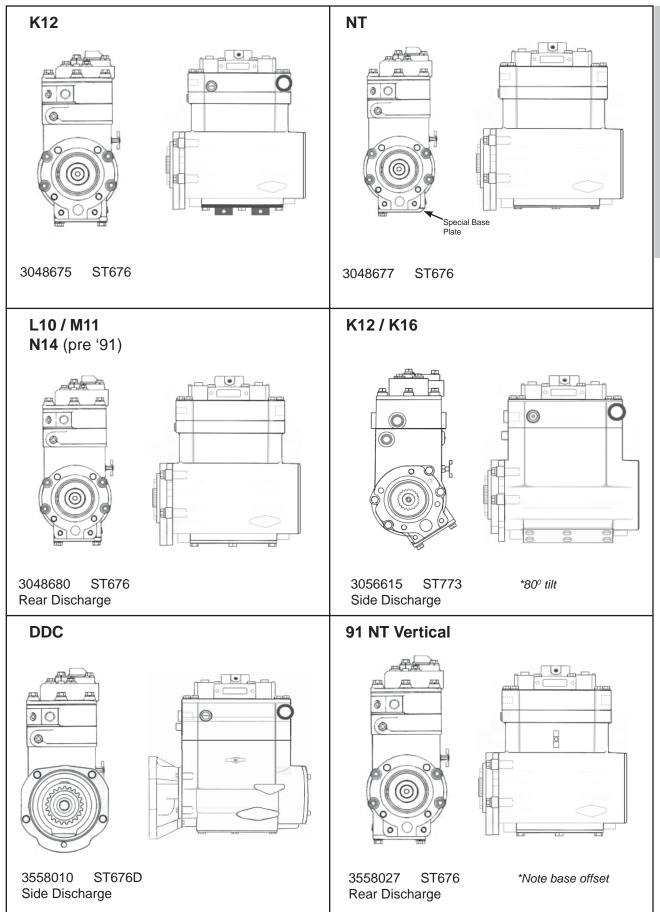


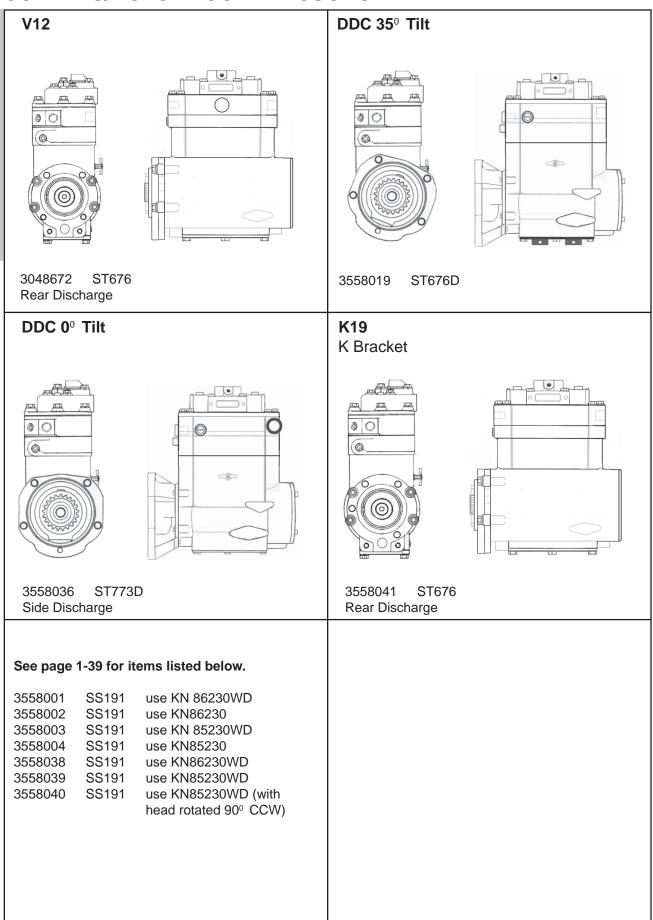








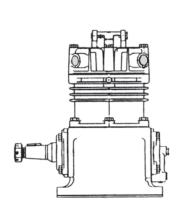


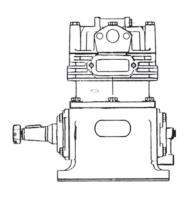


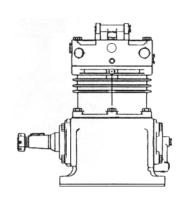
QE Manifold Identification

Compressor Number	Manifold Number	Color Code	Slot Location
B Series 3558049, 3558050	3559584	Yellow Band	
B Series 3558092, 3558093, 3558097, 3558098, 3558151, 3558152	3559582	Light Blue Band	
C Series 3558051, 3558052, 3558094, 3558095, 3558103, 3558113, 3558115, 3558116, 3558130, 3558149, 3558156	3559586	Light Green Band	
Standard 3558059, 3558072, 3558073, 3558074, 3558114, 3558119, 3558131, 3558132, 3558153, 3558154	3559571	Red Band	
Mack 3558068, 3558075, 3558076, 3558077	3559589	Purple Band	
Ford B Series 3558104, 3558105, 3558139, 3558140, 3558144, 3558145, 3558146, 3558147, 3558150, 3558158	3559581	No Band	1.41

Compressor Number	Manifold Number	Color Code	Slot Location
B Series 3558021, 3558127	3559021	Yellow Band	
B Series 3558121, 3558128	3559022	Dark Blue Band	
C Series 3558122, 3558129, 3558142, 3558143, 3558103, 3558113, 3558157, 3558159, 3558160, 3558161	3559006	Green Band	
Mack 3558107, 3558108, 3558109, 3558110, 3558111, 3558112	3559002	Red Band	







Rotatable Head Air cooled head

End cap oil feed only

KN7010

Air Ports right side (shown)
Air cooled head

KN7020

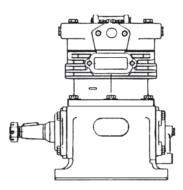
Air Ports left side Air cooled head

Bottom oil feed option (Plug if end cap oil feed is used)

KN7030

Rotatable water cooled head

Bottom oil feed option (Plug if end cap oil feed is used)



KN7040

Air Ports right side (shown)

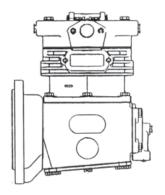
KN7041

Special 4 hole mount for Ford gas engine application End oil feed only

KN7050

Air Ports left side

Water cooled head Bottom oil feed option (Plug if end cap oil feed is used)



KN7060

Air Ports right side Tachometer drive

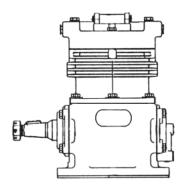
KN7070

Air Ports right side

KN7080

Air Ports left side

Water cooled head



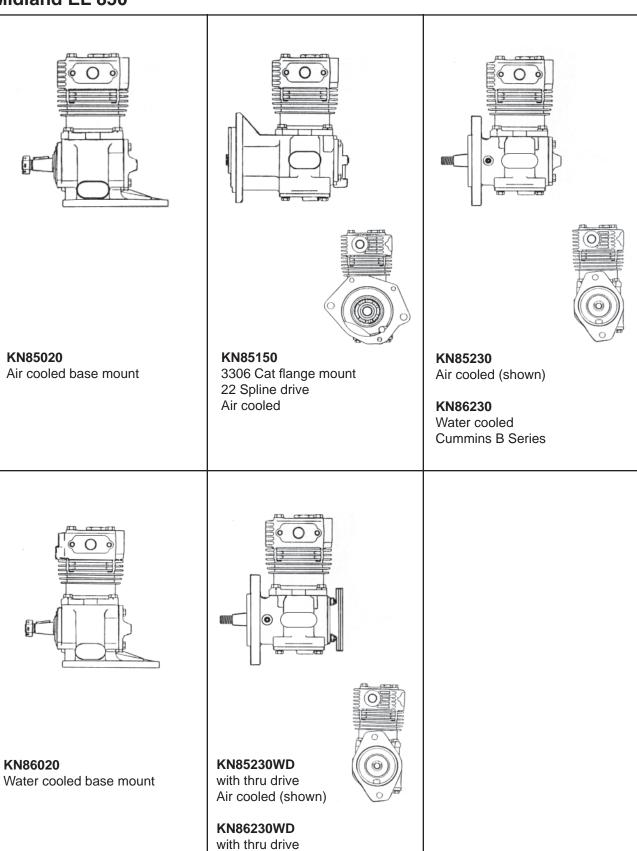
KN7170

Air Ports right side

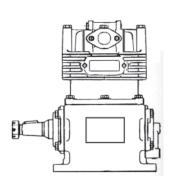
KN7180

Air Ports left side (shown) six hole base mount

Water cooled head Bottom oil feed option (Plug if end cap oil feed is used)



Water cooled Cummins B Series



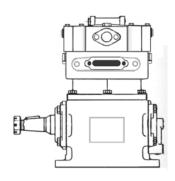
Air ports right side (shown)

KN12020

Air ports left side

4 hole base mount Air cooled Special studs (not shown) In front end cap for bracket

End cap oil feed only



KN12030

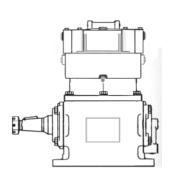
KN12031 1/2" water ports Air ports right side (shown)

KN12040

KN12041 1/2" water ports Air ports left side

4 hole base mount Water cooled

Bottom oil feed option (Plug if end cap oil feed is used)

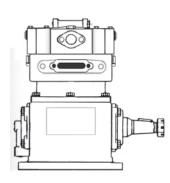


KN12050

Rotatable head Intake in head

4 hole base mount Water cooled

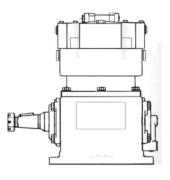
Bottom oil feed option (Plug if end cap oil feed is used)



KN12060 (shown) Air ports left side

KN12070 Air ports right side Water cooled Six hole base mount

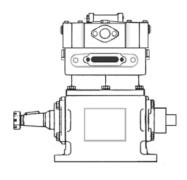
Bottom oil feed option (Plug if end cap oil feed is used)



KN12081

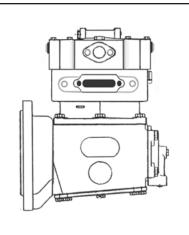
Air ports left side (shown)
Water cooled
Six hole base mount
Tachometer drive provision

Bottom oil feed option (Plug if end cap oil feed is used)



KN12091

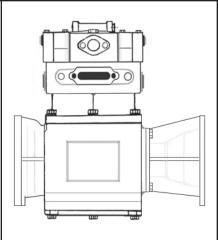
Air ports right side Special oil feed thru drive



Air ports right side (shown)

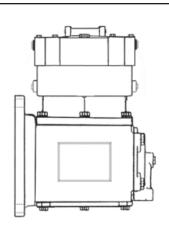
KN12111

Air ports left side Water cooled 0° 4 hole flange mount, gear drive, Detroit Diesel special block no front water port



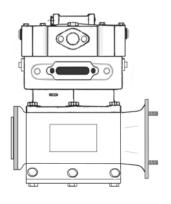
KN12131

Air ports right side Water cooled Long double flange mount Cummins



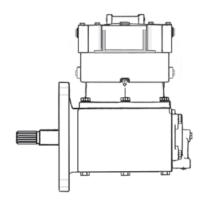
KN12140

Air ports left side Water cooled 3 hole flange mount (Mack style) Base pan drain



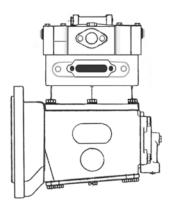
KN12151

Water cooled Air ports right side Double flange mount Short (Cummins) Base pan drain



KN12160

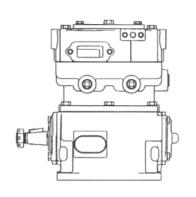
Rotatable head Water cooled Intake in head 3 hole flange mount (Mack style) 13 spline crankshaft (Caterpillar)



KN12171

Air ports right side Water cooled Tachometer drive provision 0° 4 hole flange mount gear drive, Detroit Diesel Special block- no front water port

		 12
KN12190 Rotatable head Water cooled Intake in head 0° 4 hole flange mount, gear drive, Detroit Diesel	KN12200 Rotatable head Water cooled Intake in head 3 hole flange mount (Mack style) Caterpillar	



KN13020 Basic Compressor

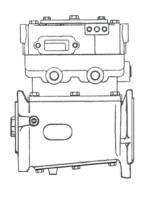
KN16020 Basic Compressor

KN13020A Special Case threaded for mounting to Ford 6.1 liter gas engine

KN13021

Block rotated 180° for Ford w/3208 Cat engine

All end cap oil feed only

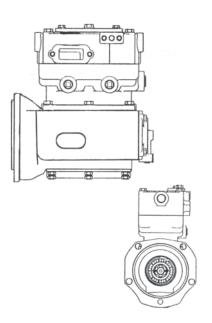




KN13040

KN16040

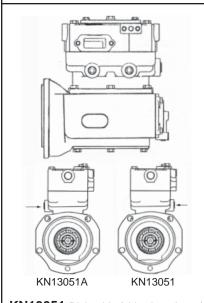
Cummins In-Line



KN13050

KN16050

0º Flange mount, Gear drive, Detroit Diesel, Truck applications 3/8" water ports



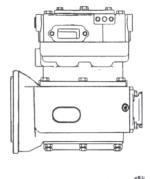
KN13051 Right side (side view shown)

KN13051A Left side

KN16051 Right side (side view shown)

KN16051A Left side

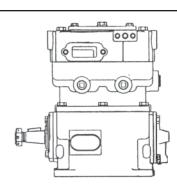
 $0^{\rm 0}$ Flange mount, Gear drive, Detroit Diesel, Truck applications 1/2" water ports





KN13053 KN16053

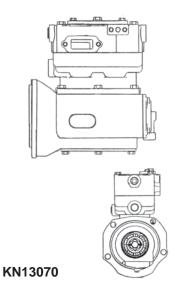
Detroit Diesel Series 60 Flange mount thru drive 1/2" water ports



KN13060

KN16060

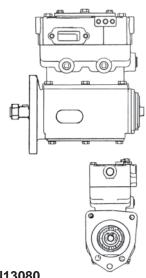
Bottom oil feed option (plug if end cap oil feed port is used)



1º Flange mount, Gear drive, Detroit Diesel, Truck applications (Block rotated 180°)

KN16072

4º Flange mount



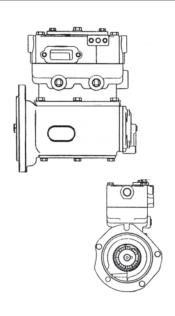
KN13080

KN16080

For Caterpillar 1674

KN13080A

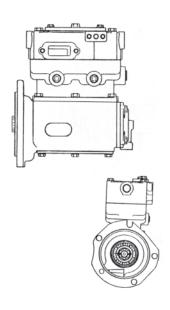
For Caterpillar 3408 (Block rotated 180°)



KN13090

KN16090

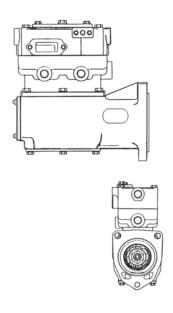
41° Flange mount, Gear drive, **Detroit Diesel**



KN13100

KN16100

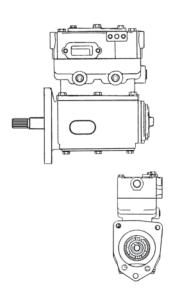
50° Flange mount, Gear drive, **Detroit Diesel**



KN13111

KN16111

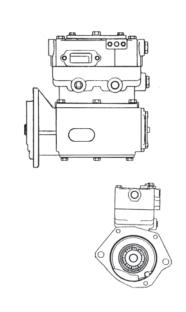
Mack In-Line Six



KN13120

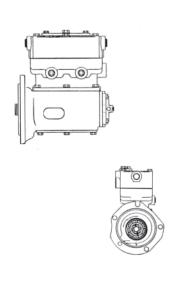
KN16120

Caterpillar 3406A 13 Spline drive



KN16151

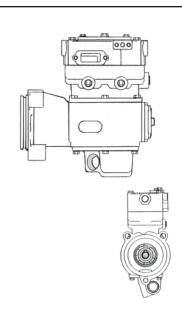
Caterpillar 3306 Flange mount, 22 Spline drive



KN13160

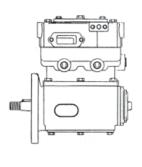
KN16160

45° Flange mount, Gear drive, **Detroit Diesel**



KN13190

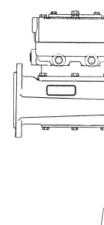
3408 Caterpillar Flange mount Gear drive





KN13220

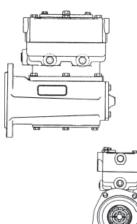
Cummins C Series Flange mount Gear drive



KN13200

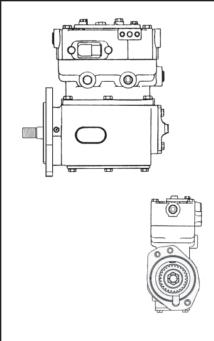
KN16200

3406B Caterpillar Flange mount, Gear drive



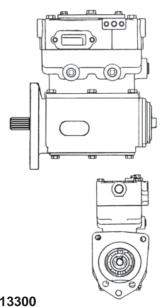
KN16250

75° Flange mount, Gear drive, **Detroit Diesel**



KN16280

Caterpillar Flange Mount



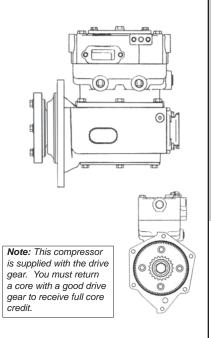
KN13300

KN16300

Caterpillar 3176 Flange mount, 22 Spline drive

KN13330

Caterpillar 3406E M-20 threaded shaft

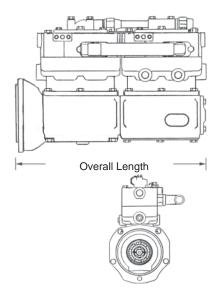


KN13310

KN16310

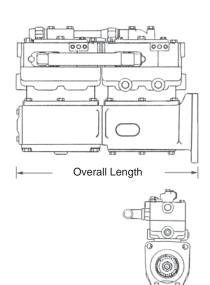
Detroit Diesel Series 60 New style (Integrated drive) 1/2" water ports

EL-3200



KN14050

0º Flange mount, Gear drive, Detroit Diesel, Truck applications Overall length - 17.30"



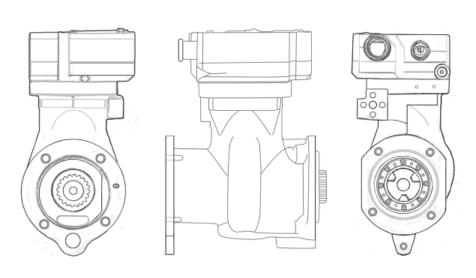
KN14110

Mack In-Line Six Overall length - 16.63"

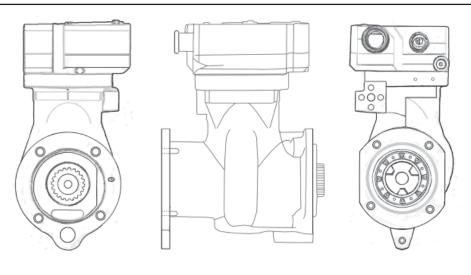
KN14111

Mack In-Line Six Overall length - 18.25"

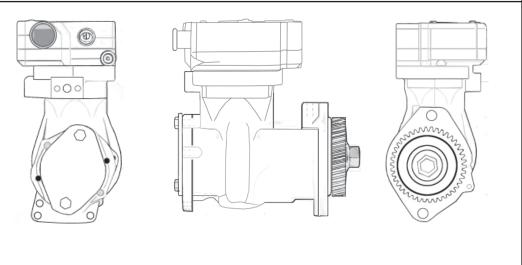
WABCO AIR COMPRESSORS



9111535100 ISX / SIG 11 tooth 85mm 18.7 cfm

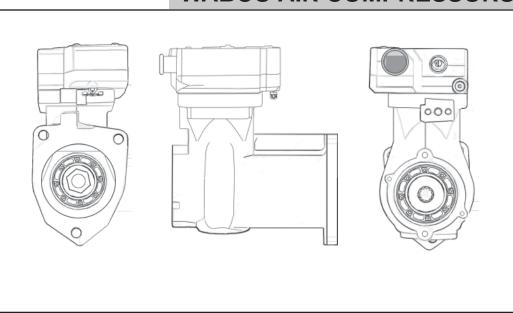


9111535200 N-14 / ISMTang Drive
85mm 18.7 cfm

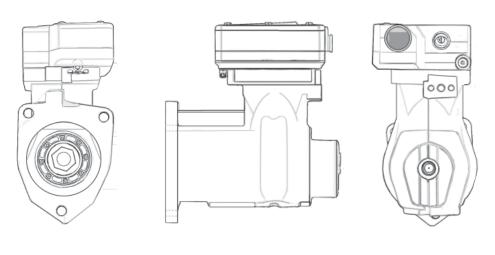


9111535300 ISC / ISL 11 tooth 85mm 18.7 cfm

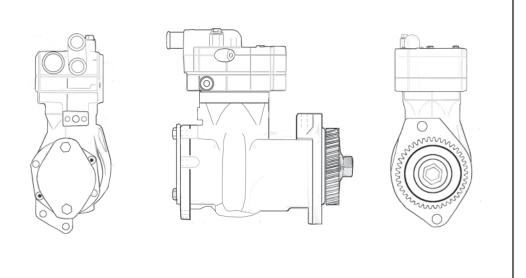
WABCO AIR COMPRESSORS



9111535400 MackThru Drive
85mm 18.7 cfm



9111535410 Macknon-thru drive
85mm 18.7 cfm

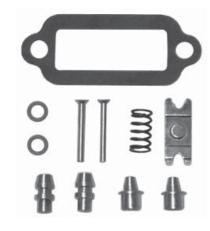


9111545000 ISB / QSB (HD) 75mm 15.2 cfm 107515



Bendix[©] 550 & 750 Compressors

279614



Bendix[©] 400 Compressors

279615



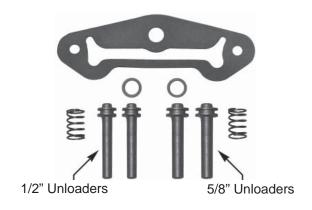
Bendix[©] 500, 501, 600, 700 Compressors

3559544

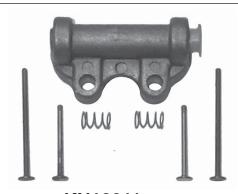


Cummins/Holset[©] 1 Cyl. Unloader Kit

3-T26B

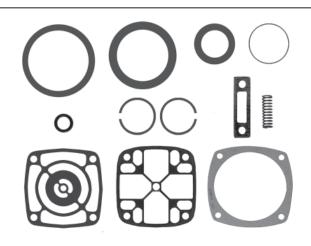


Midland[©] 1300, 1600 Universal Unloader Kit



KN18011

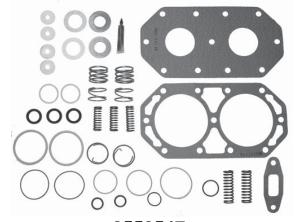
Midland[®]
7' & 12' Compressors
Kit# RN33C



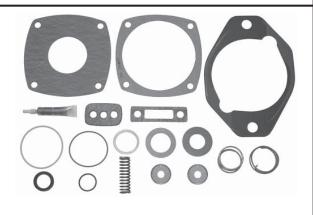
3559576 Cummins/Holset[©] QE Head Kit



3559544E 1 Cylinder Unloader Head Kit



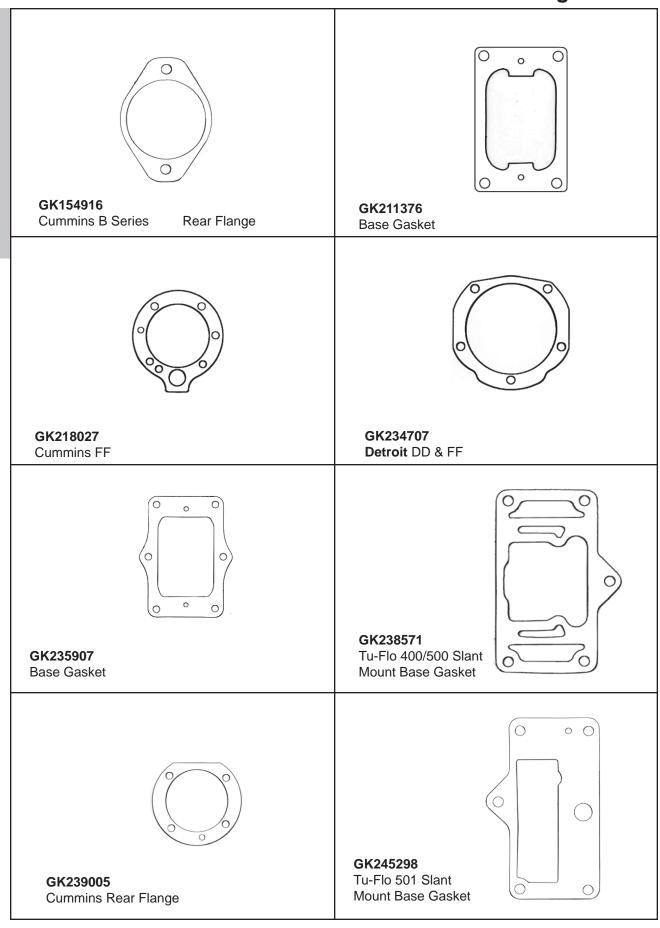
3559547Cummins/Holset®
2 Cylinder Compressors



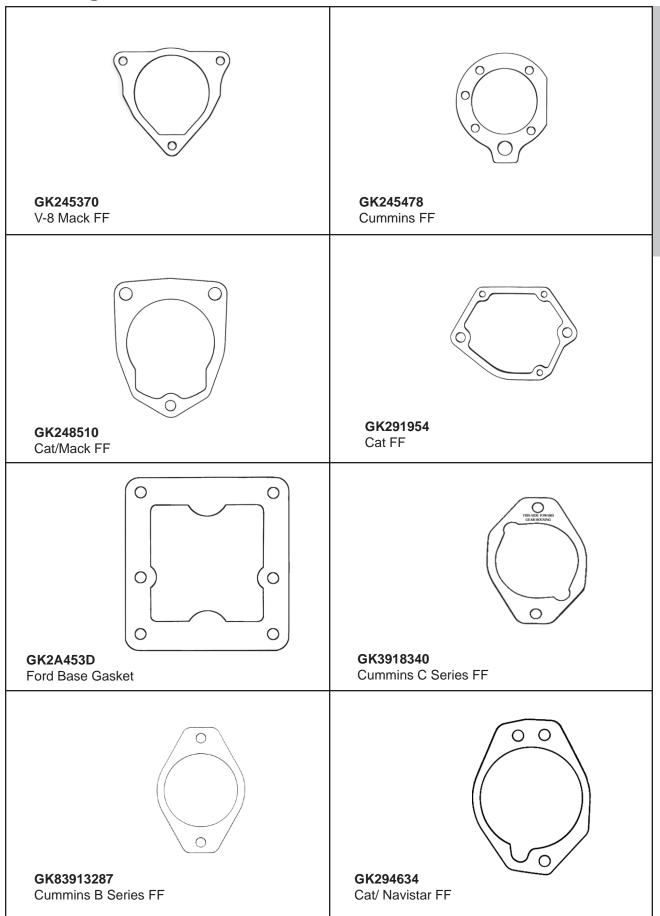
362522Cummins/Holset® SS Style
1 Cylinder Compressors



KN23500N Econ Valve



Mounting Gaskets



AD-2©







286875





102657

Bracket Kit 247954

Dryer Part#	Cartridge Part#	Purge Valve	Purge Valve Kit Part#	End Cover Part#	Thermostat Kit	Check Valve Kit	Volts
286934	101900	286873	287053	286875	102657	287298	12
286936	101900	286873	287053	286876	102657	287298	24

AD-4[©]





065044

103818

102657

Bracket Kit 104674

ge Valve Part#	End Cover Part#	Thermostat Kit	Volts
818	065043	102657	24
818	065044	102657	12

Dryer Part#	Port Size	Terminal	Cartridge Part#	Purge Valve Kit Part#	End Cover Part#	Thermostat Kit	Volts
065040	3/4" PT	Single	104358	103818	065043	102657	24
065041	1/2" PT	Single	104358	103818	065044	102657	12
065042	M22X1.5	Double	104358	103818	065045	103982	12
065057	3/4" PT	Single	104358	103818	065058	102657	12

AD-9[©]











107794

6004341

107799

065231

Dryer Part#	Port Size	Cart Part#	Purge Valve Assy#	Purge Valve Maint. Kit	Check Valve	End Cover Part#	Volts
065224	3/4" PT	107794	109695	107798	107799	065229	24
065225	1/2" PT	107794	109686	107798	107800	065231	12
065226	3/4" PT	107794	109686	107798	107799	065230	12
065647¹	1/2" PT	107794	5004341 ²	5005893	107800	N/A	12
109685 ²	1/2" PT	107794	5004341 ²	5005893	107800	N/A	12

¹ Holset QE & E type application (Drop-in)

Note: Hard seat kit also available

Bracket Kit 107695 Wiring Harness 109869







109994









Wabco 065677 Bendix



109993





Dryer Part#	Supply Port Size	Control Port Size	Cartridge Part#	Purge Valve Kit Part#	Delivery Check Valve	Turbo Cut-off	Volts
109991	1/2"	1/4"	109994	109995	5005624	109993	12
109992	1/2"	1/4"	109994	109995	5005624	109993	24
109991	1/2"	1/4"	109994	109995	5005624	109993	12
109999	1/2"	1/4"	109994	109995	5005624	109993	24
800042*	1/2"	1/4"	109994	109995	5005624	109993	12
800043*	1/2"	1/4"	109994	109995	5005624	109993	24

Wiring Harness 109869

*Holset QE & E type application (Drop-in)

	AD-SP Heater Kits Available:	12V - 109495	24V - 109496
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² Soft Seat Assembly

AD-IP©









109494

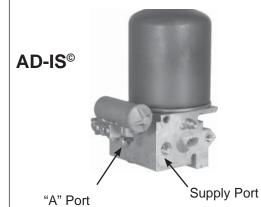
800404 PR22105

Dryer Part#	Supply Port Size	Delivery Port Size	Cartridge Part#	Check Valve	Volts
109477	1/2"	1/2"	109493	109494	12
109478	1/2"	1/2"	109493	109494	24
5000709 ¹	1/2"	1/2"	109493	109494	12
5000985 ²	1/2"	1/2"	109493	109494	12

¹ Drop in style

Wiring Harness 109869

AD-IP Heater Kits Available: 12V - 109495 24V - 109496





109994





800404



12V - 109495 24V - 109496

Dryer Part#	Supply Port Size	Primary Port Size	Second Port Size	Cartridge Part#	"A" Port Plug	Suspension Port	1/4" NPT Acc. Ports
5004050	1/2"	1/4"	Plugged	109994	No	1/4" NPT	4
5008871	1/2"	1/2" PTC	1/2" PTC	109994	No	1/4" NPT	4
5010696	1/2"	1/4"	1/4"	109994	Yes	1/4" NPT	4
5011075	1/2"	1/4"	1/4"	109994	No	N/A	N/A

Service Kit 5004049

Del. Check 5004052

AD-IP Heater Kits Available: 12V - 109495 24V - 109496

² 1/8"PT ECON port

Wabco



System Saver[©] 1200

R955205

R955206

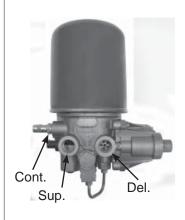
System Saver[©] 1200U

R955210

R955211



System Saver[©] 1200P R955300 R955315



System Saver[©] 1200E R955207 R955208



Cartridge R950011

Kits







R950015 R950013 R950014 R950017

Dryer Part#	Sup.	Del.	Cont.	Cart Part#	Purge Valve	Turbo Valve Kit	Heater Kit	Check Valve	Volts
R955205	1/2"-14	1/2"-14	1/4"-18	R950011	R950014	R950013	R950015	R950017	12
R955206	1/2"-14	1/2"-14	1/4"-18	R950011	R950014	R950013	N/A	R950017	24
R955207	1/2"-14	1/2"-14	1/4"-18	R950011	R950014	N/A	R950015	R950017	12
R955208	1/2"-14	1/2"-14	1/4"-18	R950011	R950014	N/A	N/A	R950017	24
R955300	1/2"-14	1/2"-14	1/4"-18	R950011	R950014	R950013	R950015	R950017	12
R955315	1/2"-14	1/2"-14	1/4"-18	R950011	R950014	R950013	N/A	R950017	24
R955210	1/2"-14	1/2"-14	1/4"-18	R950011	R950014	R950013	R950015	R950017	12
R955211	1/2"-14	1/2"-14	1/4"-18	R950011	R950014	R950013	N/A	R950017	24

Chicago Rawhide /SKF



T224 CR Turbo 2000[®] Cartridge



T2000 T3000



62



CR228 Turbo Valve Kit



CR235 Unloader Kit



CR238 Check Valve Kit



CR248 Heater Kit w/short element



CR248
Heater Kit w/long element



5000457K Make up line kit

For converting standard ADIP, ADSP and AD-9 dryers to a drop-in style compatible with QE and E type Holset compressors.

Miscellaneous dryers and components are also available. Call for price and availability.







286873Type 2 Purge Valve Kit



109686Type 9 Purge
Valve
Hard Seat Style



5004341Type 9 Purge Valve
Soft Seat Style



107800 Type 9 Check Valve 1/2" NPT Port



107799 Type 9 Check Valve 3/4" NPT Port



109495 12V 109496 24V Type IP/SP Heater Kit



109578 12V 109579 24V Type 9 Heater Kit



R950015 Wabco Style Heater Kit



109494Type IP
Check Valve Kit



109993Type SP
Check Valve Kit



R950014 Wabco Style Purge Valve Kit



R950013 Wabco Style Turbo Kit



5005037

Type 9 Repair Kit - Major Note: Kit does not include purge piston bolt. Keep & re-use original.



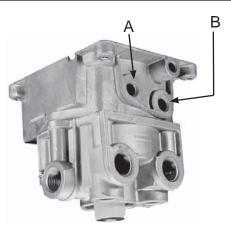
109995Type SP Purge Valve Kit



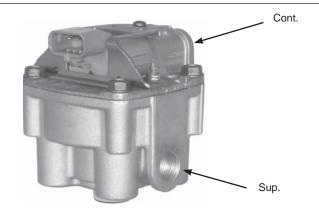
287053Type 2 Purge Valve Kit

Section 2

Air Valves



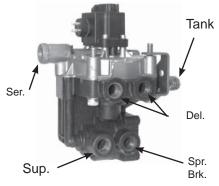
Part#	Description	
800179	Relay "A" Control	
800163	Relay "B" Control	



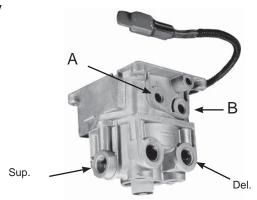
Part#	Description
800736	Shown

Full Function Relay

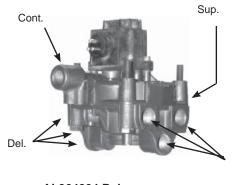
Del.



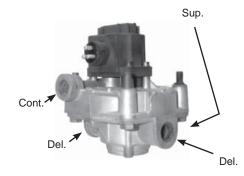
AL430611	1/2" Pipe	Serv. Priority
AL430614	3/4" Pipe	Serv. Priority
AL430624	3/4" Pipe	Spring Brake Priority



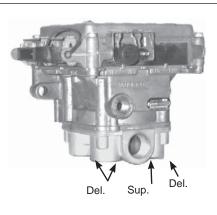
Part#	"A" Port	"B" Port
065509	1/8" NPT	1/4" NPT
065516	None	1/4" NPT



AL364004 Relay 6 Del. ports



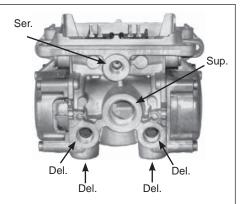
AL364003 Relay 2 Del. ports



4725000120 4725000210 Relay Valve AssemblyValve only



4729000670 Solenoid Valve





400 500 101 0 2S/1M Basic MSH w/ECU

For use with standard trailers manufactured after March 1st 2001

400 500 104 0 2S/1M Basic MAR
For use with turntables, steerables & dollies
manufactured after March 1st 2001
472 195 033 0 valve only



400 500 102 0 2S/2M Standard w/ECU

For use with trailers manufactured after March 1st 2001

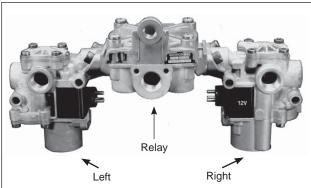
400 850 602 0 valve only



400 500 103 0 2S/2, 4S/2M, 4S/3M Premium w/ECU

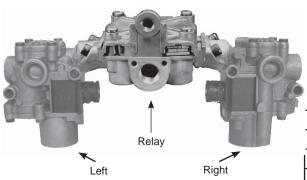
For use with trailers manufactured after March 1st 2001.

400 500 602 0 valve only



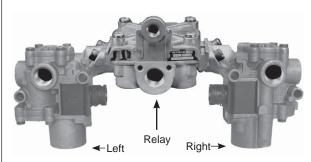
Wabco ABS Valve Package Threaded Connector

Booksgo#	Polov	Left	Right
Package#	Relay	Leit	Kigiit
4725001000	9730110210	4721950800	4721950810
4725001010	9730110220	4721950800	4721950810
4725001020	9730110210	4721950820	4721950830
4725001030	9730110220	4721950820	4721950830
4725004030	9730110220	4721950830	4721950820
4725004050	9730110240	4721950830	4721950820



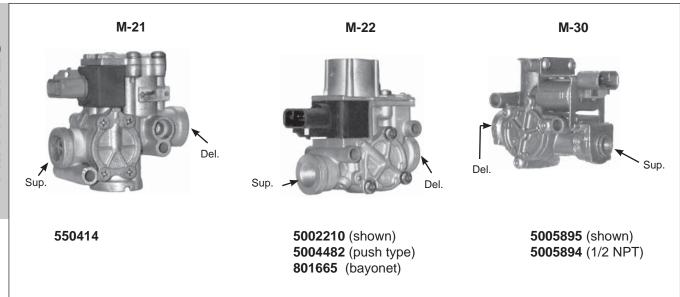
Wabco ABS Valve Package Bayonet Style

	Package#	Relay	Left	Right
	4725001200	9730110210	4721950760	4721950770
١	4725001210	9730110220	4721950760	4721950770
ĺ	4725001240	9730110230	4721950760	4721950770
	4725001250	9730110240	4721950760	4721950770
- [
	4725004200	9730110210	4721950770	4721950760
	4725004210	9730110220	4721950770	4721950760
	4725004240	9730110230	4721950770	4721950760



Wabco ABS Valve Package Bayonet Style

Package#	Relay	Left	Right
4725001220	9730110210	4721950780	4721950790
4725001230	9730110220	4721950780	4721950790
4725001320 (24V)	9730110210	4721950740	4721950750
4725004220	9730110210	4721950790	4721950780
4725004230	9730110220	4721950790	4721950780
4725004250	9730110240	4721950790	4721950780

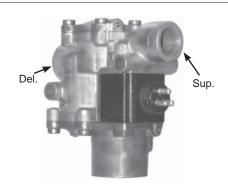




4721700790 ATC Automatic Traction Control



4721361010 ATC Automatic Traction Control



4721950050 (12V) (Threaded) (Shown) **4721950060** (24V) (Threaded) (Shown) **4721950520** (12V Bayonet Style Modulator



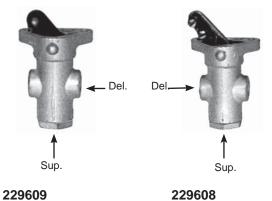
Eaton ABS Modulator 300387 (Bayonet) (Shown) 300386 (Threaded)



14000 Calm Valve

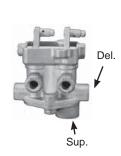


1/8" NPT Ports No handle selection available

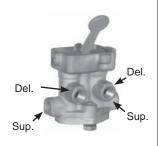




225892 1/4" NPT Ports



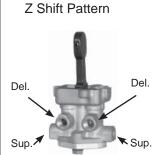
281208 Two lever positions



281560- Positioning **280904-** Centering 280905- Red Lever

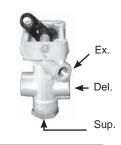


065019 4 mtg. holes **065115** 2 mtg. holes



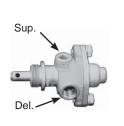
285551





Firewall Mount 104475- Shown **065316**-Cable

Dash Mount 104474- Lever 065356- Lever



Retarder Valve

"Push & hold" emergency release for spring brakes

286211

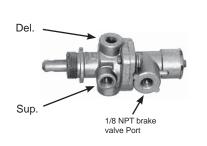
104644- 1/4-28 male threaded shaft.

(Shorter travel than PP-1 type)

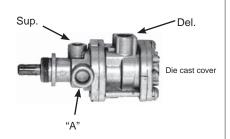


Push Pull Valve

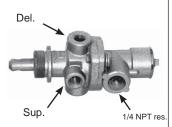
don'i dii vaivo		
Part#	Description	Rel. Pres.
276566	3/8" shaft, 1/8" NPT Del	20 psi.
276567	3/8" shaft, 1/8" NPT Del	40 psi
287417	3/8" shaft, 1/4" NPT Del	30 psi
287600	3/8" shaft, 1/4" NPT Del	40 psi
281587	w/female thread in shaft,	40 psi
278450	3/8" shaft, 1/8" non-auto. (no spring)	
287637	1/4" shaft, 1/8" non-auto. (no spring)	



Part#	Description	Auto Rel. Pres.
276462	3/8" shaft	40 psi
280454	w/ 1/4" female thread in shaft	40 psi



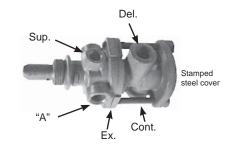
Part#	Description	"A" Port Thread
288746	shown	none
279787	w/ 1/4" female thread in shaft	none
289477		1/8 NPT
289512	w/ 1/4" female thread in shaft	1/8 NPT



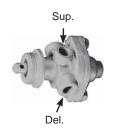
278425



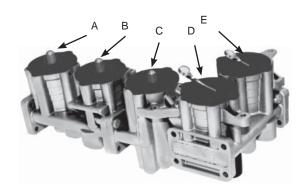
Part#	Description	Rel. Press.
281946		40 psi.
104107	Not automatic (no spring)	



Part#	Description	Thread. Ex.
288241	5/16" shaft	yes
288239	3/8" shaft	no
288240	w/ 1/4-20 fem. thread in shaft	no
288721	3/8" shaft	yes
102192	5/16" shaft w/ threaded "A"	yes



Part#	Description
287238	1/8" del.
287418	1/4" del.
287240	1/8" del. fem. thread in shaft



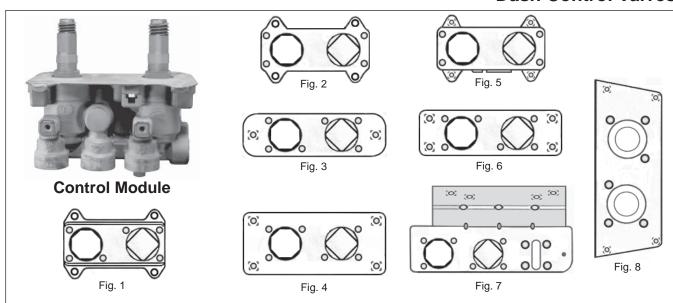
Ford Control Module

Valves A,B,C		101175
Valves D, E	Opt. (lever type)	101171



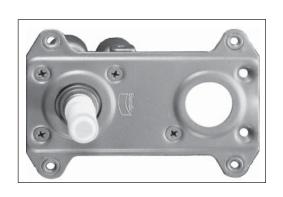
Control Module

Part#	Mounting holes
101437	1/4" unthreaded
101890	1/4-20 threads
102027	10-24 threads

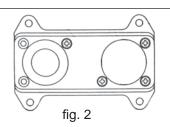


Mounting Plate Detail

Service Part#	Pic. Ref	Mounting Hole	Aux. Port	Ex. Port	Application	Comments
800257	Fig. 1	.275"		PTC	Peterbilt	PTC
800516	Fig. 1	.275"				
800518	Fig. 1	.275"	1/8" NPT			
800520	Fig. 1	1/4-20			Navistar	
800526	Fig. 1	1/4-20				
800573	Fig. 1	1/4-20		1/8" Thred	Freightliner	
065523	Fig. 1	.275"		PTC		PTC
800036	Fig. 2	1/4-20		PTC		PTC
800039	Fig. 2	M5 x 8.0-6H				
800260	Fig. 2	M5 x 8.0-6H		PTC	Kenworth	PTC
800353	Fig. 2	#10-24		PTC	Peterbilt	PTC
800515	Fig. 2	M6 x 1-6H			Mack	
800519	Fig. 2	1/4-20			Western Star	
800522	Fig. 2	M6 x 1-6H	1/8" NPT	1/8" Thred	Mack	
800521	Fig. 2	1/4-20			Ford	
800523	Fig. 2	#10-24			Peterbilt	
800525	Fig. 2	.365"			Kenworth	
800529	Fig. 2	1/4-20			Freightliner	
800530	Fig. 2	1/4-20				
800584	Fig. 2	M6 x 1-6H	1/8" NPT			
800258	Fig. 3	M6 x 1-6H		PTC	Ford	PTC
800527	Fig. 3	M6 x 1-6H			Ford	
800528	Fig. 3	#10-24				
800545	Fig. 3	1/4-20			Ford	
800531	Fig. 4	.285"				
800517	Fig. 5	M6 x 1-6H			Kenworth	
800553	Fig. 5	#10-24				
800445	Fig. 6	.270"			Mack	
800532	Fig. 7	1/4-20			Sterling	
800259	Fig. 8	.200"		PTC	Freightliner	PTC
801631	Fig. 8	.200		PTC 45°		
298817-18		Knob Kit	See page 2-8			







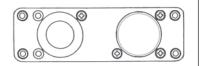


fig. 1

fig. 3

Control Valve	Port Type	Mounting Hole	Mounting Plate
065643	3/8" OD Push to Connect	.27" dia.	fig. 2
065661	3/8" OD Push to Connect	1/4"-20 Thread	fig. 1
065690	3/8" OD Push to Connect	.27" dia.	fig. 1
800034	1/4"-18 NPT	.27" dia.	fig. 2
800142	1/4"-18 NPT	1/4"-20 Thread	fig. 1
800309	3/8 PTC	m6X1-6H	fig. 3
800620	3/8" OD Push to Connect	1/4"-20 Thread	fig. 3
800841	3/8" PTC	m6X1-6H	fig. 2
801315	3/8" PTC 45 ⁰	.27 dia.	fig. 2



Type-2 Control Module Spool

101569 101570 Trailer Control
Parking Control

Knobs not included



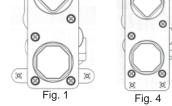


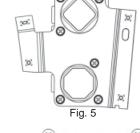
Control Module Knobs

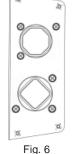
290655 Trailer Control (Red)
248433 Parking Control (Yellow)

298817-18 Type 3











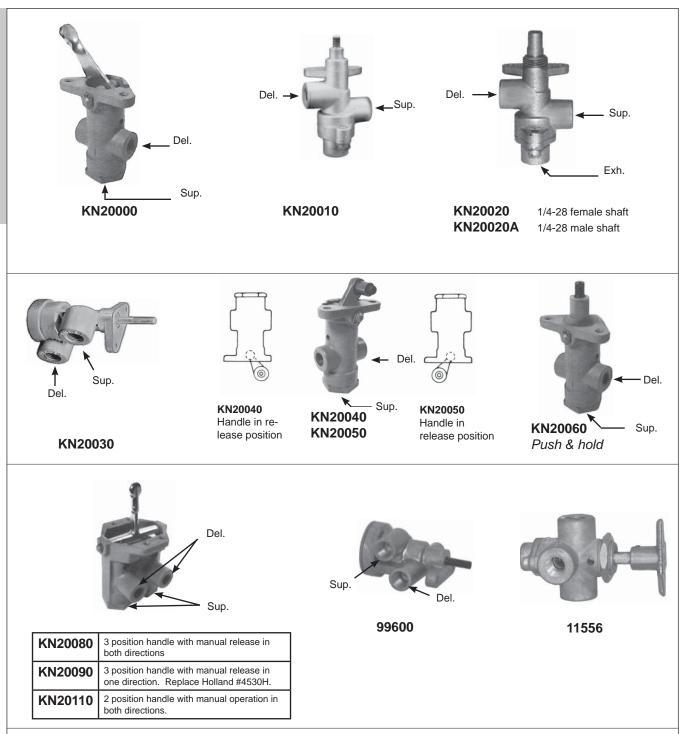
(80)	(10)
0 0	0
0	0 0
×	Fig. 3

	_	0,
Fig.	6	

Service Number	OEM Number	Spls	Me	ounting	Fig.	Body Style	TIr. Del.	Res #1	Res #2	Exh.	Tractor. Del.	Aux. Supply
KN20616	N4400D	2	Vert.	1/4-20 (4) well nuts in body	1	А	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
KN20601	N4400EA	2	Horiz.	M6 Metric (4)	2	Α	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
	N4400			nuts on cover								
KN20602	N4400EB	2	Horiz.	1/4-20" (4)	2	А	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
	N4400E			nuts on cover								
KN20621	N4400EN	2	Horiz.	1/4" hole (4)	2	В	3/8" 450	3/8" 450	3/8" 450	3/8" 450	3/8" 45°	
	N4400BB			in cover			PTC	PTC	PTC	PTC	PTC	
KN20603	N4400EC	2	Horiz,	M6 Metric (4)	3	Α	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
	N4400G			nuts in body								
KN20606	N4400EE	2	Horiz.	1/4"-20 (4)	3	Α	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
	N4400M			nuts on cover								
KN20608	N4400EG	2	Horiz.	1/4"-20 (4) well	3	Α	3/8"	3/8"	3/8"	1/4"	3/8"	1/4"
	N4400R			nuts in body			PTC	PTC	PTC	PTC	PTC	PTC
KN20611	N4400EH	2	Horiz.	1/4"-20 (4) well	3	Α	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
	N4400B			nuts in body								
KN20612	N4400EJ	2	Horiz.	10-24 (4) well	3	Α	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
	N4400A	_		nuts in body	_							
KN20615	N4400EK	2	Horiz.	1/4" hole (4)	3	А	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
14100000	N4400			in body			0 (01)	0 (01)	0./011	0 (0)	0 (01)	0 (0)
KN20626	N4400EV	2	Horiz.	M5 Metrc (4)	3	В	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
1/1/20007	N4400BD			nuts on cover		5	PTC	PTC	PTC	PTC	PTC	PTC
KN20627	N4400EW	2	Horiz.	1/4" hole (4)	3	В	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
IANIOOCOO	N4400BE	2	Horiz.	nuts on cover	3	В	9TC 3/8"	PTC	PTC	PTC	PTC	PTC
KN20628	N4400EY	2	HOIIZ.	10-24 nuts (4)	3	В	PTC	3/8" PTC	3/8"	3/8"	3/8"	3/8"
KN20605	N4400CB N4400ED	2	Vert.	in cover M6 Metric (4)	4	A	1/4'	1/4"	PTC 1/4"	PTC 114"	PTC 1/4"	PTC 1/4"
KIN20005	N4400ED N4400J		vert.	nuts on cover	4	^	1/4	1/4	1/4	114	1/4	1/4
KN20607	N44005 N4400EF	2	Vert.	M6 Metrc (4)	4	Α	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
KIN20007	N4400EF		vert.	nuts on cover	4	^	PTC	PTC	PTC	PTC	PTC	PTC
KN20619	N4400EL	2	Vert,	1/4" hole (4)	5	В	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
1(1/20019	N4400BA		vert,	In cover		, , , , , , , , , , , , , , , , , , ,	PTC	PTC	PTC	PTC	PTC	PTC
KN20620	N4400EM	2	Vert.	1/4" hole (4)	5	В	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
14120020	N4400CA	_	VOIT.	In cover			PTC	PTC	PTC	PTC	PTC	PTC
KN20623*	N4400ER	1	Vert.	1/4" hole (4)	5	В	110	3/8"	3/8"	3/8"	3/8"	110
14120020	N4400DA	· ·	VOIT.	In cover				PTC	PTC	PTC	PTC	
KN20625*	N4400ET	1	Vert.	1/4" hole (4)	5	В		3/8"	3/8"	3/8"	3/8"	
	N4400DB			In cover				PTC	PTC	PTC	PTC	
KN20622*	N4400EP	2	Vert.	3/16" hole (4)	6	В	3/8" 90	3/8" 450	3/8" 45°	3/8" 90°	3/8" 45°	
	N4400BC			In cover			PTC	PTC	PTC	PTC	PTC	
KN20624*	N4400ES	1	Vert.	3/16" hole (4)	6	В	-	3/8" 45°	3/8" 45°	3/8" 90°		
	N4400DC			In cover				PTC	PTC	PTC	PTC	
KN20629**	N4400EZ	1	Vert.	3/16" hole (4)	6	В		3/8" 450	3/8" 45°	3/8" 900	3/8" 45º	
	N4400DD			In cover				PTC	PTC	PTC	PTC	
293510-11	Knob Kit			See page 2-8								

^{*} Yellow knob (tractor spool) located in bottom position.

^{**} Yellow knob (tractor spool) located in bottom position. Tractor supply port below exhaust.

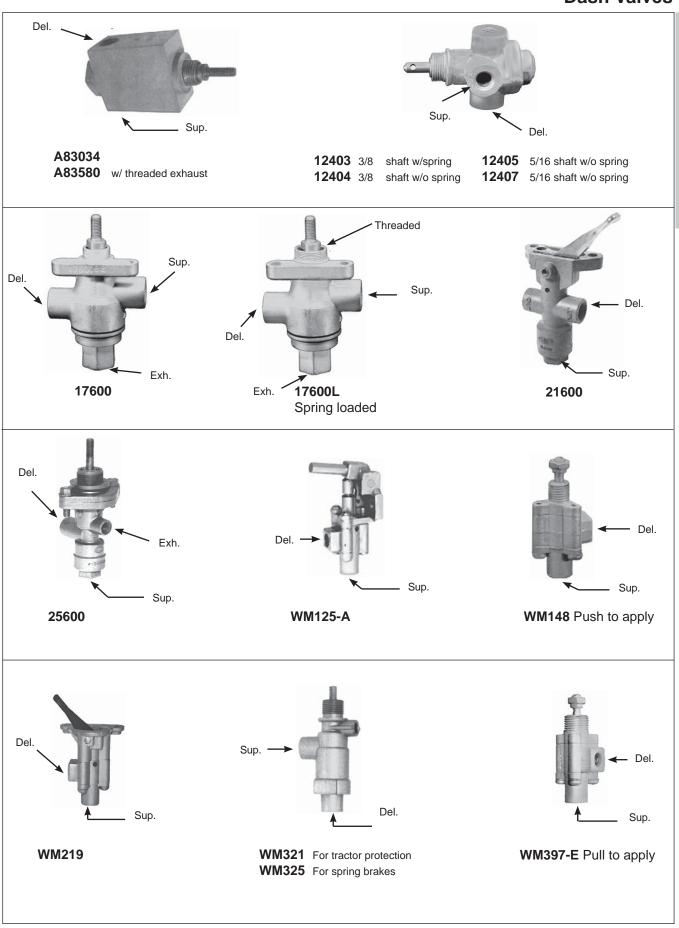




GT134N Seat Valve



BAX040 4 Way Push Pull Valve

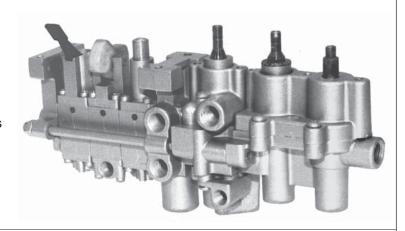


Air Control Panel WM498-XXX etc.

Typical Assembly

WM498-XXX Etc.

Order by series number plus control letter as panel will be assembled from left to right



WM 498 Series Air Control Panel Units



A End Cap



B Lever Toggle



C Push Button



D Manifold



E Trailer Emergency Valve



F Spring Brake Valve



G Spring Brake Valve



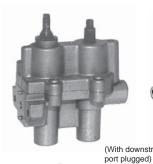
H Safety Toggle



Trailer Emergency Valve



P Spring Brake Valve



R Spring Brake Valve

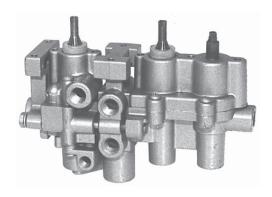


" S Trailer Emergency Valve



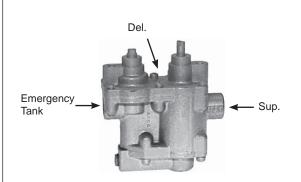
WM 498-107

Safety brake control panel assembly, including a tractor protections valve, dual spring brake valve and a common supply manifold with four 1/4" N.P.T. ports and one 3/8" N.P.T. port.



WM 498-108

Same as WM 498-107 except for an additional 1/4" N.P.T> supply port on the left end of the panel assembly.



WM 621 Dual spring brake control



WM 672-A



WM 673-A



WM 674-A
Dual spring brake control



WM762Parking Brake Control



WM 763







WM 764 Trailer Supply Valve

WM 781 Two Position Control Valve

WM 782 **DualControl Valve**







5000 DualControl



6000 Lever Control

Check Valves



KN25010 **Double Check Valve**



227870 KN23010 3/8" Single Check Valve



227871 KN23000 1/2" Single Check Valve

Double Check Valves-Drain Valves

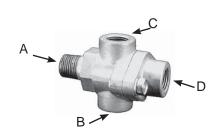
Double Check Valves



217698



Part#	Port
278614	3/8"
278615	1/4"



Pipe Thread Dimensions

	Α	В	С	D
278595	1/2"	1/4"	1/4"	1/4"
278596	1/2"	3/8"	3/8"	1/4"
278598	3/8"	3/8"	3/8"	1/4"
280809	3/8"	3/8"	3/8"	3/8"
287180	3/8"	1/4"	3/8"	1/4"

Drain Valves





281923 w/o heater **284412** w/heater 12V



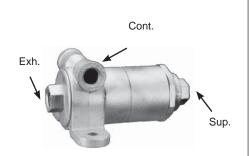
KN24000 KN24001 w/heater 12V



307 *Manual Drain Valve*



A-21857 Moisture Ejection Valve



6300 Sludge Remover

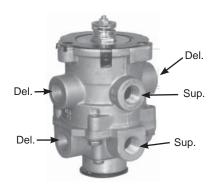
Foot Control Valves



229500	3/8" Delivery
229501	1/2" Delivery
276330	1/2" Delivery w/ 1/4" Aux.
277863	1/2" Delivery

279750 1/2" Sup. & Del. ports

279950	Basic Valve		
281004	Threaded "A" port		
285148	Threaded Exh.		



286171	3/8" Sup. & Del. ports	
289380	1/2" N.P.T. Exh. Cover	
104309	1/4" Sup. & Del. ports	

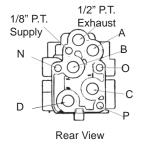


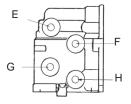
Ford application

103996	3/8" Sup. & Del. ports
104308	1/4" Sup. & Del. ports



Port Sizes	Α	В	С	D	Е	F	G	Н	J	K	L	М	Exh.**
101818	1/2	1/2	1/2	1/2	1/4	3/8	1/4	3/8	1/4	3/8	1/4	3/8	D
102006	1/2	1/2	1/2	1/2	1/4		1/4		1/4	1/4	1/4	1/4	D
284760*	0	0	0	0	1/4		1/4						D
286774	1/2	1/2	1/2	1/2	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	T
287411	1/2	1/2	1/2	1/2	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	T
287440	1/2	1/2	1/2	1/2	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	T
287564	1/2	1/2	1/2	1/2	1/4	3/8	1/4	3/8	1/4	1/4	1/4	1/4	D
287856	0	0	0	0	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	T
288267	1/2	1/2	1/2	1/2	1/4	1/4	1/4	1/4	3/8	3/8	3/8	3/8	D
288383	1/2	1/2	1/2	1/2	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	D
* O = O'ring	mour	nt		** T:	=thre	aded		** [)=dia	phrag	gm		



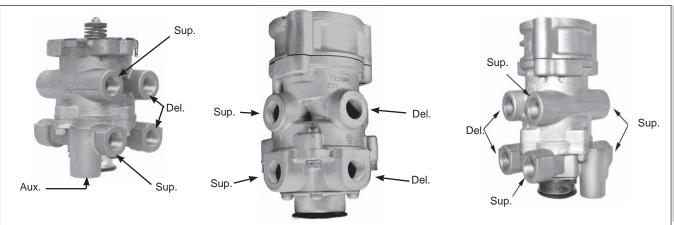


J K L

Right Side View

Left Side View

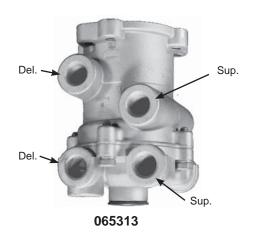
Foot Control Valves

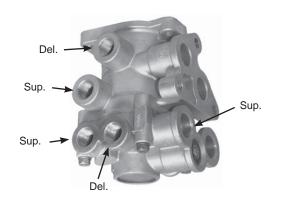


800629	w/aux. port	
800633	w/o aux. port	

101100

800632





065314	all ports threaded
065317	w/ Threaded Exh.
065395	use w/manifold





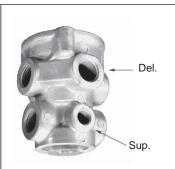


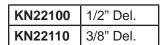
228429

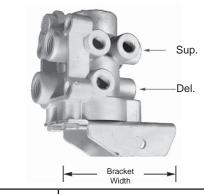


223192 Foot Control223511 Foot Control w/ supply elbow

Foot Control Valves





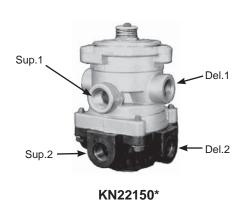


	4-1/16" Bracket Width
KN22130	4-9/16" Bracket Width

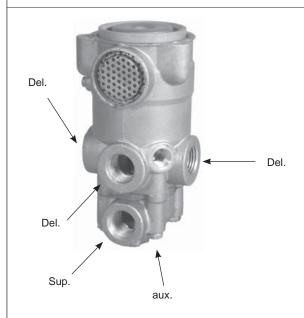


KN22140

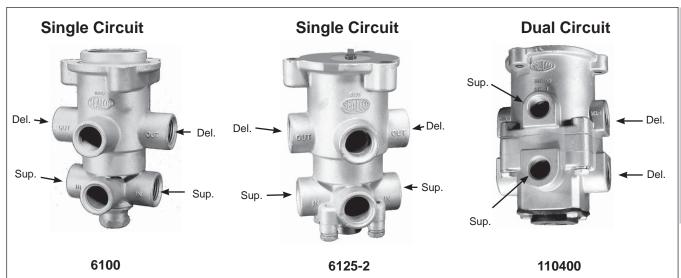




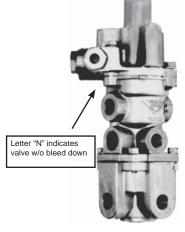
*Bottom half made of EGP (Engineering Grade Plastic)



- KN22080
- * no ports on bottom
- KN22090
- * threaded aux. ports on bottom







The Type DAA-2 valve lower body has type 2 shown in raised letters around the periphery or the exhaust port lip (bottom of valve) and has one reservoir port threaded 1/2"-14 NPTF. The earlier type DAA lower valve body is not labeled and all ports are threaded 3/8" NPTF.

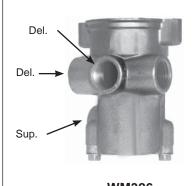


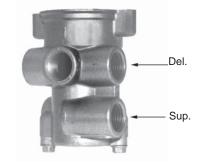


A80270 Basic DA-2

A72878	
Basic Valve T	ype FGB

A75554	Basic w/bleed down- DAA
A76701	Basic w/o bleed down- DAA
A80279 Basic w/ bleed down- DAA-2	
A80276	Basic w/o bleed down- DAA-2





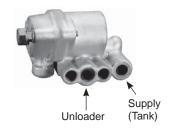
WM326 Treadle Valve

WM472

Governors



275491	Standard	120psi
284358	High Temp	125psi
800361	(non-Adjust- able)	130 psi



12600 *Berg Governor*



KN18500



KN18530	
KN18531	w/1/4 NPT Supply
KN18534	High Temp



2P7809 Clayton DeWandre Governor



Wabco* Unloader Valve 9753034730BN



Wabco* Unloader Valve



Bosch* Unloader Valve

Hand Control Valves



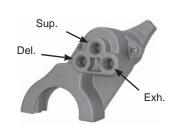




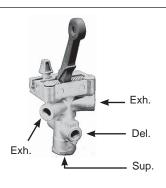
Trailer **Control Valve** 283931

Note: Handle not shown and not furnished with replacement unit.

2 1/16"



Trailer Control Valve 289953



Trailer Control Valve

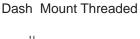
Del. Pres. 86-100

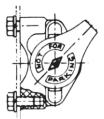
282368 LH shown 282381 RH 86-100 284291 LH 105-120

229666

31/32"

275509 276270 w/handle



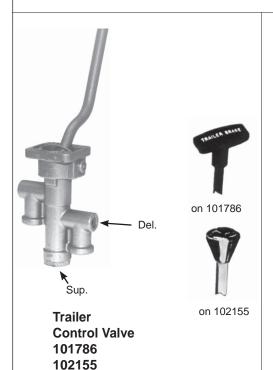


280364

Special Mount Thru holes not threaded



276211





Trailer Control Valve 101860 Holding 102394 Self Return



WM606C2C w/adjustment stops WM606C1C (Shown)

Hand Control Valves



KN20520 Shown KN20530 I.H. Deep Bracket



KN20541 Base unit
Handle holds in applied position. I.H. in column
KN20542
Base unit Automatic return



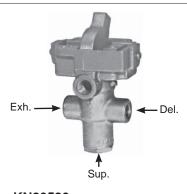
KN20551 Base unit Handle holds in applied position. G.M. in column

KN20552

Base unit Automatic return. G.M. in column



KN20561Base unit steering column mount for TC2



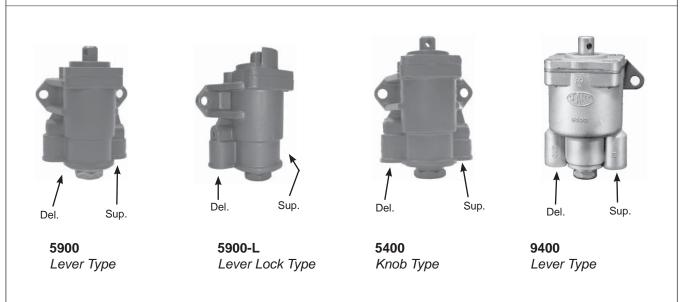
Sup.

Del.

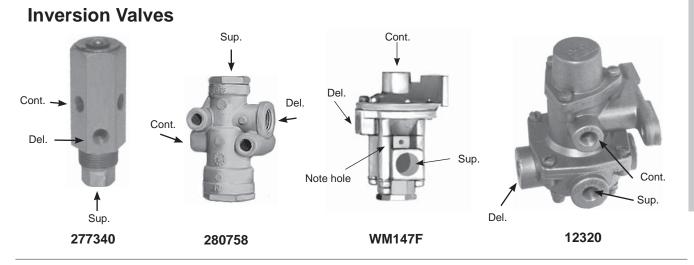
KN20580Mack panel mount 80 p.s.i. max delivery. Base unit only.

KN20590

Mack panel mount 50 p.s.i. max delivery. Base unit only.



Inversion Valves- Leveling Valves



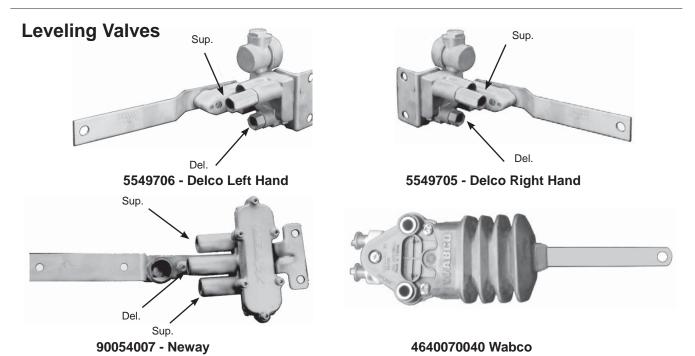




H600N

New Leveling Valve

90054079N New Leveling Valve



Pressure Control Valves

Pressure Reducing and Protection Valves Both have the same external appearance

Pressure Relieving

Part#	Delivery Pres. (Lbs.)
277144*	80
277214	75
277215	30
277544	110
277558	100

A= Supply

B=Delivery



* Std Exchange

Pressure Protection

Part#	Closing Pres. (Lbs.)
277147*	65
277148	85
277222	95
277226	60
277227	75

A=Delivery B=Supply

Pressure Protection



286460 has removable cap used only in conjunction with SR-4

Part#	Closing Pressure	Ports
286500	85 psi	1/4
288323	70 psi	1/4
103976*	45psi	1/2

^{*} For use in aftercooler or air dryer installaitons when compressor is turbocharged

Shutoff Valve



Shutoff Valve	А	В
278824	42 psi	31 psi
279163	65 psi	53 psi

Synchronizing Valve	Α	В
278825	42 psi	28 psi
282472	21 psi	11 psi
283700	62 psi	50 psi

Inlet opens at "A" Exhaust opens at "B"

Trailer Release



Pressure Protection Valve



Part#	Crack Pres.	
KN31000	(Factory set) 65psi	
KN31010	(Factory set) 94psi	
KN31020	(Factory set) 80psi	
KN31040	(Factory set) 55psi	



WM778AN 70 psi



Part#	Crack Pres.	
KN31040	20 psi	
KN31050	45 psi	
KN31060	65 psi	

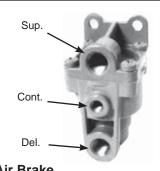


217380 65 p.s.i.



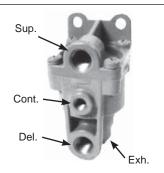
800333N

Quick Release Valves



Air Brake Proportioning Valve

Part#	Nominal Hold Off	Nominal Equalizing
104598 (front)	4 psi	50 psi
106284 (Rear)	8 psi	105 psi

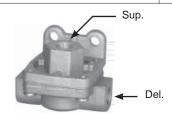


Bobtail Limiting Valve

065154 (front)



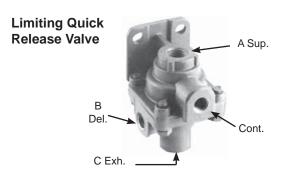
Part#	Туре	Nominal Hold Off	Nominal Equalizing	NPT
286289	3	4 psi	60 psi	1/4"
287276	3A	10 psi	65 psi	1/4"
289144	4	4 psi	60 psi	3/8"
289145	4	10 psi	65 psi	3/8"
101311	4	20 psi	70 psi	3/8"



QR-1 Type Quick Release Valve

Part#	Del.	Sup.	Crack Pres.
229813	1/4"	3/8"	1 psi
229844	1/4"	1/2"	1 psi
229859	3/8"	3/8"	1 psi
229860	3/8"	1/2"	1 psi
281024	1/4"	1/4"	1 psi
288251*	3/8"	3/8"	1 psi
278483	3/8"	1/2"	5-8 psi
102344	3/8"	3/8"	10-16 psi

^{* 3/8&}quot; Exhaust port

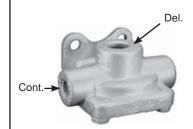


Part#	Α	В	С
229505	3/8"	3/8"	
229507	1/2"	1/4"	
229509	3/8"	1/4"	
288417	3/8"	3/8"	3/8"



Front Wheel Limiting Valve

12300



12310Stamped Steel Cover



Hold & Release Valve

7800N 1/4" Ports **780210N** 3/8" Ports



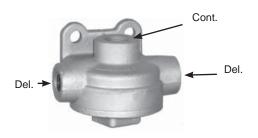
Type 1C Quick Release Valve w/dbl. check

Part#	Del. Port	Crack Pres.
109094*	3/8" PT	6.5 psi
289182	1/4" PT	1 psi
289714	3/8" PT	1 psi

^{* 3/8&}quot; Control port



Part#	A Supply	B Delivery	Crack Pressure	Mounting
065066	1/2"	3/8"	1 psi	.34 hole
065067	3/8"	3/8"	1 psi	.34 hole
065068	3/8"	3/8"	5-8 psi	.34 hole
065212	3/8"	3/8"	1 psii	.34 slot
065213	3/8"	3/8"	5-8 psi	.34 slot
065214	3/8"	3/8"	2-5 psi	.34 slot
065215	1/2"	3/8"	5-8 psi	.34 hole



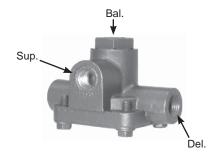
Part#	A Control	B Delivery
		-
205000	3/8"	1/4"
221992	1/2"	1/4"
228691	1/2"	3/8"
280076	1/4"	1/4"



Quick Release Valve

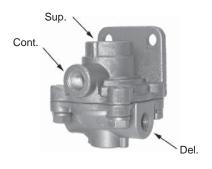
KN32000	1/4" delivery ports
KN32010	3/8" delivery ports
KN32020*	1/4" delivery ports

*w/ 6 lb. high pressure differential (pictured)

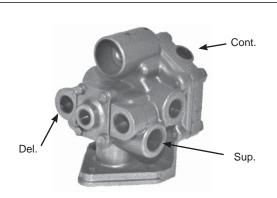


Quick Release Double Check Valve

KN32040	1/4" delivery ports
KN32041	3/8" delivery ports



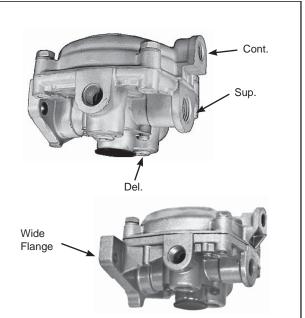
Limiting & Quick Release Valve KN32030



Part#	Crack Pres.	
229467	2 psi	
275861	5 psi	

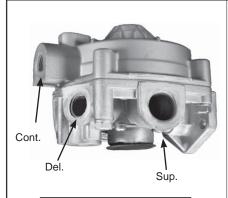


Part#	Notes	Crack Pres.
286370	w/ ex. cover	3 psi
287260	w/o ex. cover	3 psi
287421	w/3/4" port in flange	3 psi
288755		5 psi



Part#	Notes	Crack Pres.
279180		2 psi
279952	3/4" NPT in flange	2 psi
280243		10 psi
280375	1/2" NPT Sup.*	2 psi
281182	Special top cover	2 psi
282346	Special top cover & 1/2" NPT Sup.*	2 psi
283033	3/4" NPT in flange &	
	1/2" NPT Sup.*	2 psi
283940	Wide flange for Louisville See above	2 psi

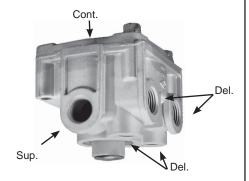
*3/8" NPT unless otherwise noted



Part#	Crack Pres.	
287114	0 psi	

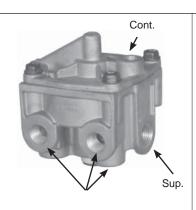


Part#	Del. Port	Crack Pres.
065104	3/8" NPT	4 psi
102626	1/2" NPT	4 psi
103912	1/2" NPT	7.5 psi
104561	3/8" NPT	5.5 psi

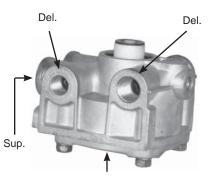


Part#	Del. Port	Crack Pres.	
065206	3/8" NPT	5.5 psi	
065303	3/8" NPT	4 psi	
800485	1/2" NPT	4 psi	
800508	1/2" NPT	5.5 psi	

Has both horizontal & vertical ports



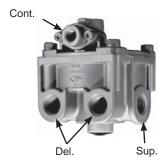
109264 *0 Crack Pressure*



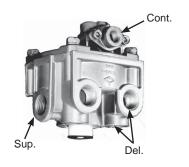
801123 Type 12 801629 Type 14



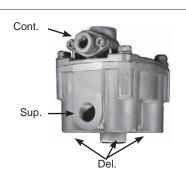
065430 Mack Application



w/2 Horizontal Delivery Ports



w/2 Horizontal & 2 Vertical Delivery Ports

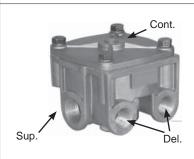


w/4 Vertical Delivery Ports

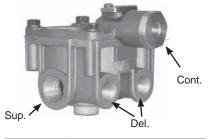
Part Number	Crack Pres.	Supply Ports	Del. Ports
800470	4	1/2	1/2
800471	5.5	1/2	1/2
800474	5.5	3/4	1/2
800475	7.5	3/4	1/2
800476	4	3/4	1/2
800554	4	1/2	3/8
800625	7.5	1/2	1/2

Part Number	Crack Pres	Horiz. Del. Ports	Vert. Del. Ports
800480	4	3/8	3/8
800481	4	1/2	3/8
800559	7.5	1/2	3/8
800848	5.5	1/2	3/8

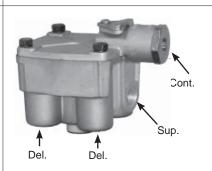
Part Number	Crack Pres.	Vert. Del. Ports
800477	4	1/2
800478	4	3/8



Part Number	Sup. Port	Crack Pres.
103009	3/4" NPT	4 psi
103195	3/4" NPT	10 psi
104165	3/4" NPT	7.5 psi
065125	1/2" NPT	5.5 psi

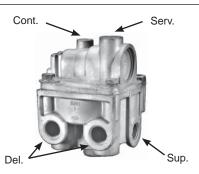


Part Number	Crack Pres.	Sup. Port
103010	4 psi	3/4" NPT
103139	10 psi	3/4" NPT
103294	5.5 psi	3/4" NPT
103835	7.5 psi	3/4" NPT
104574	4 psi	1/2" NPT



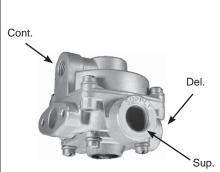
Part Number	Crack Pres.
103028	4 psi
103833	7.5 psi
106313	5.5 psi

Relay Valves

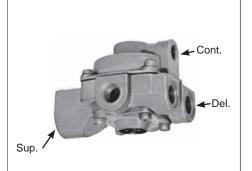


Bobtail Brake Proportioning Relay

Part#	Crack Pres
065145	4 psi
065146	5.5 psi

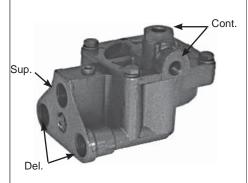


Part#	Notes	
12340	w/ mounting bracket	
12341 w/o mounting bracket		

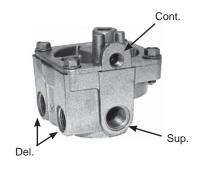


Part#	Notes	
12345	4 Delivery Ports	
12346	2 Delivery Ports	

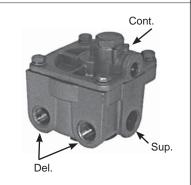
Attention: Do not attempt to use an anti-compounding relay in place of a regular relay by plugging one of the service ports. This will cause the brakes to lock up.



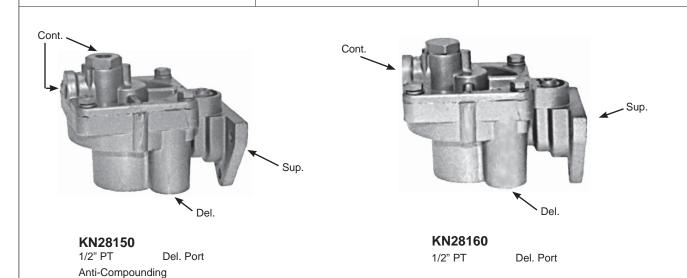
Del. Port Crack Pres. **KN28130** 1/2" PT **7** psi

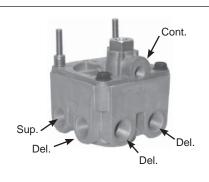


Del. Crack Pres. **KN28131** 1/2" PT **7** psi

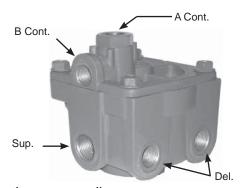


Del. Port Crack Pres. **KN28140** 1/2" PT 4 psi



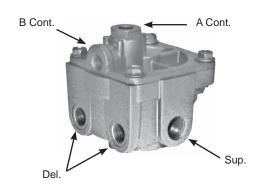


Part#	Del.	Sup.	Cont.	Crack Pres.
KN28042 KN28041	1/2" PT (4)	1/2" (2)	1/4" (1)	4.6 psi
KN28055	1/2" PT (4)	1/4" (2)	1/4" (2)	4.6 psi 9.6 psi



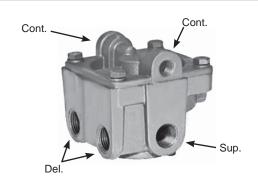
Anti-compounding

Part#	Del. Port	A Cont.	B Cont.	Crack Pres.
KN28070	3/8" PT	1/4"	3/8"	4 psi
KN28071	1/2" PT	1/8"	1/4"	4 psi

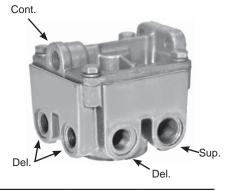


Anti-compounding

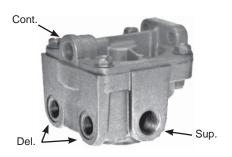
Part#	Del.	A	B	Crack
	Port	Cont.	Cont.	Pres.
KN28070B	3/8" PT	1/4"	1/4"	4 psi



	Del.	Α	В	Crack
Part#	Port	Cont.	Cont.	Pres.
KN28065	1/2" PT	1/4"	1/4"	4 psi



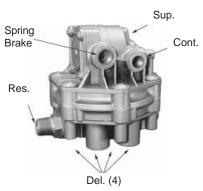
Part#	Crack Pres.	Del. Port
KN28080	7 psi	3/8"
KN28085	4.6 psi	3/8"



Part#	Del. Port	Crack Pres.
KN28060	3/8" PT	4 psi
KN28061	1/2" PT	4 psi
KN28132	1/2" PT	7 psi
KN28300	1/2" PT	0 psi

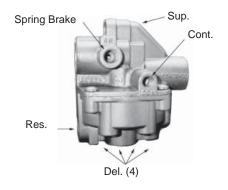
Relay Valves

Full Function Trailer Valve



Part#	Res. Port
KN28600A	3/4" NPT
KN28601A	1/2" NPT

Late Style

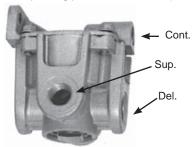


Part#	Res. Port
KN28600	3/4" NPT
KN28601	1/2" NPT

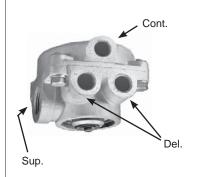
Early Style
All aluminum housing

Attention: Do not attempt to use an anti-compounding relay in place of a regular relay by plugging one of the service ports. This can cause the brakes to lock up.

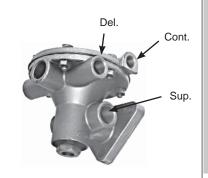
Make sure cover mounting bracket lines up with corresponding port from old valve. (Res./Del.)



			Crack	Supercedes
Part#	Del.	Res.	Pres.	Wagner#
KN28500	3/8"	3/8"	5 psi	A78880
KN28520	1/2"	1/2"	5 psi	A78887
KN28510	3/8"	1/2"	5 psi	A78889



Part#	Description	
12342	W/ Tri-angular mtg. bracket	
12343	W/o mounting (Shown)	
12344	W/ Side mounting	
12347	3/8" NPTF Delivery (2)	



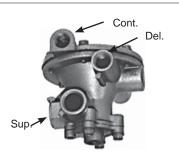
Part#	Crack Pressure
9100	5.5 psi



Part#	Control	Crack Pressure
9125	1/4" NPT	5.5 psi
110207	3/8" NPT	5.5 psi

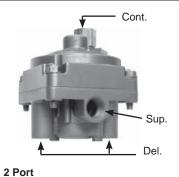


Part#		Crack Pressure
110139	Ratio Relay	4.5 psi
110450	Non-Ratio Relay	4.5 psi

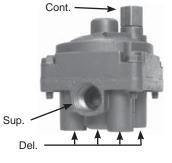


Part#	Crack Pressure	
110197	4.0 psi	
110198*	4.0 psi	

*With 1/2" close nipple in supply port.

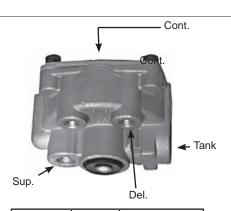


Part#	Crack Pressure
110360 (LOV2)	1.5 psi
110410	4.0 psi

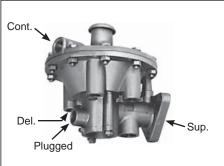


4 Port

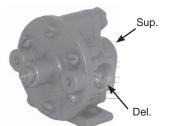
Part#	Crack Pressure
110380 (LOV4)	1.5 psi
110415	4.0 psi



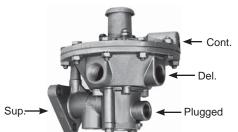
Part#	Del.	Crack Pres.
A86477	1/2"	4.5 psi
A103600	3/8"	4.5 psi



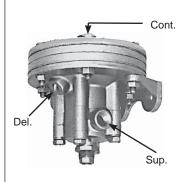
WM 227 Vertical Delivery Ports Crack Pressure: 3 psi



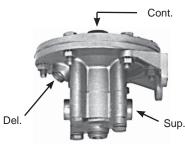
WM 271 BP Brake Control Valve



WM 292 Horizontal Delivery Ports Crack Pressure: 3 psi



WM 318 Brake Ratio Valve Crack Pressure: 1.5 psi

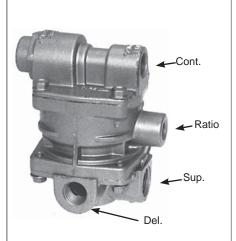


WM 320 Crack pressure 1.5 psi

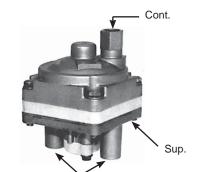
	Cont	
p.		
	Sup.	

Part#	Cont.
A-83335	1/4"
A-83336	3/8"

CONTROL LINE VALVE

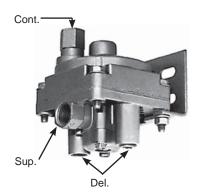


Part#	Cont.
A-83337	3/8"



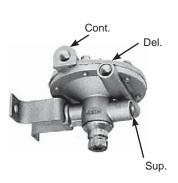
Part#		Crack Pres.
110375 (LOV-C)	Nipple mount	1.5 psi
110370 (LOV-CF)	Frame mount	1.5 psi

Del.



Del.

Part#		Crack Pres.
110463 (LOV-2F)	Nipple mount	1.5 psi
110464 (LOV-2F)	Frame mount	1.5 psi

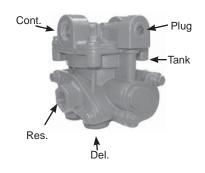


Part# *Crack Pres.* 3100 Mini Valve 2.5 psi

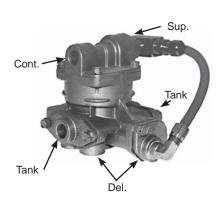
Cont. Tank Del. Res.

A98730 With Anti-Compound **A99370** W/o Anti-Compound

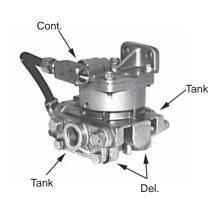
MULTI-FUNCTION RELAY



Part#	Plug	Supercedes Wagner#
KN26000	Υ	A104001
KN26010	Υ	A104010
KN26020	N	



A-88802 With Anti-Compound



A-88812 W/o Anti-Compound

Note: Comes with by-pass tube. Do not remove from old core

Control | Del. | Dash | Valve Sup. | Res. | Sup. |

KN28080 Inversion Valve



AC574 Knorr-Bremse Relay w/metric threads

Trailer Spring Brake Valve



Part# Cont./Bal 5010392 PTC 5010393 1/4" NPT PR21560 90° PTC Modulating Relay





6900 Air Starter Relay

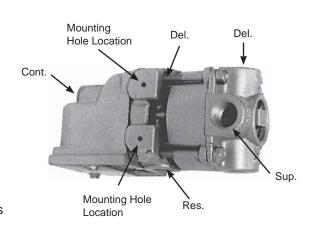
Air Starter Relays



Tandem Relay

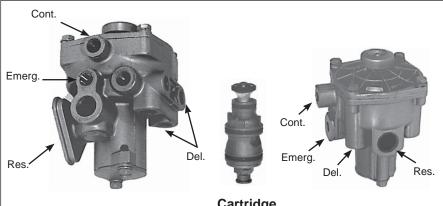
Ingersol Rand

SRV125



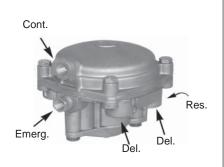
A-85490 A-85493 A-97600 Tank Mounting With Mounting Holes Solenoid actuated

Relay Emergency Valves



RE-4 (Old Style) 229434 Cartridge Insert 228499

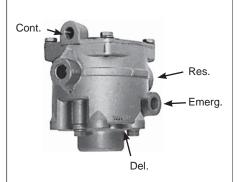
RE-4 (New Style) 277446



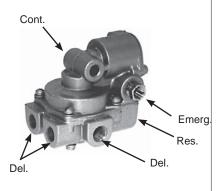
Part# Del. 101197 (4) 3/8" NPT

281865 (2) 3/8" NPT & (2) 1/4" NPT

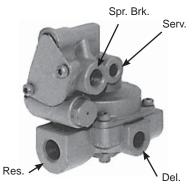
281860 (4)1/4" NPT

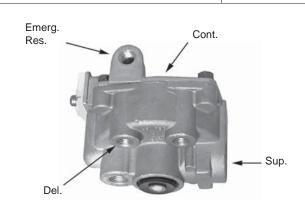


11675

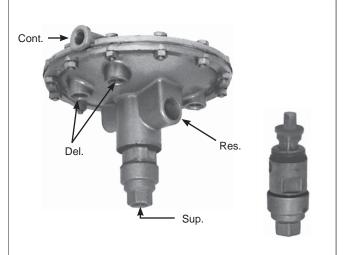


12350





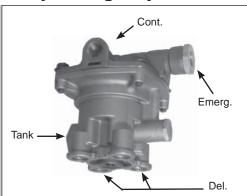
	S	upercedes Wagner#
KN30300	Pre 121	A71890
KN30200	121 Converter Dolly	A71891
KN30100	w/ Bleed down (Hyd. Trailer)	A37480 & A46229
KN30400	3/8" Del. w/3/8" aux. sup. port	A99036



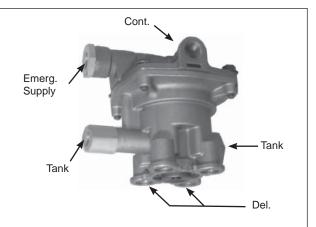
12352

A1000 Crack Pressure: 1.5 1000-5 Cartridge

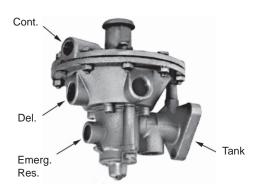
Relay Emergency Valves



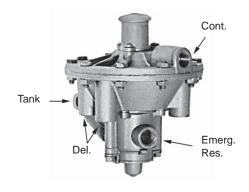
Single Supply	Port A&B	Crack Pressure
110200	1/4" NPT Ratio R. E.	4.5 psi
110205	3/8" NPT Ratio R. E.	4.5 psi
110268	3/8" NPT Dolly Valve	5.5 psi
110460	1/4" NPT Non-Ratio	4.5 psi
110470	3/8" NPT Non-Ratio	4.5 psi



2 Tank Ports	Crack Pressure	
110267	5.5 psi	Dolly Valve
110338	4.5 psi	Dolly Valve
110475	4.5 psi	



WM101R Horizontal Delivery Ports

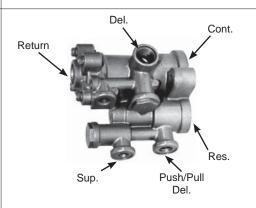


WM101 Vertical Delivery Ports

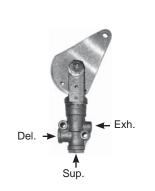
Spring Actuated Hydraulic Parking Brakes

Del. Sup.

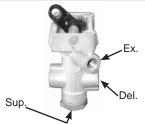
Hydraulic Parking Brake Dash Valve 065075



Hydraulic Parking Brake Valve 065060



Dash Control Valve 106479



Firewall Mount Cont. Valve 104475 - Cable (Shown) 065316 - Cable

Dash Mount Cont. Valve 104474- Lever 065356- Lever

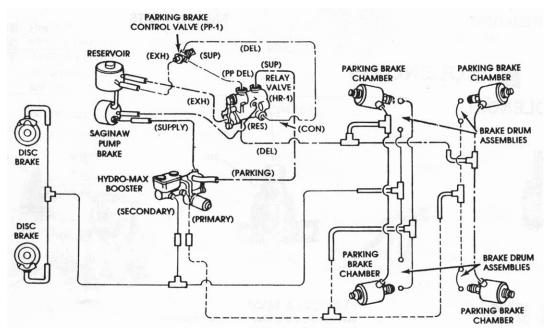


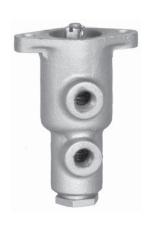
Maxibrake H Spring Actuated Parking Brake Chamber

101H Hydraulically Released101A Air Pressure Release

Ford Medium Truck

Typical Hydraulic Brake Schematic (LN, LNT Series Shown)





224930 Throttle Valve



284335 Throttle Valve



Part#	Max Output Pres.	
WM90D	60 psi	
WM90DT	95 psi	
WM90A	Tank	



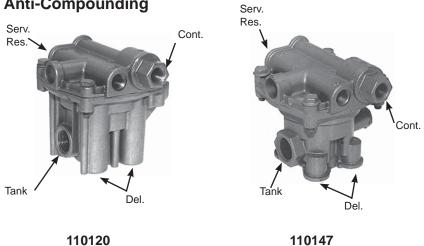
279374 Clutch Valve 284335 Clutch Valve

Brake Pressure Distribution Valve

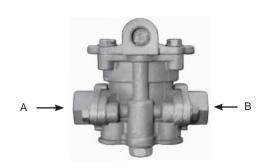


A80150 3/8" Port A83517 1/4" Port

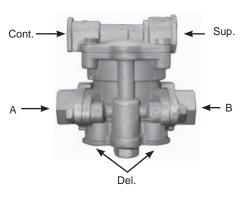
Spring Brake Control Anti-Compounding



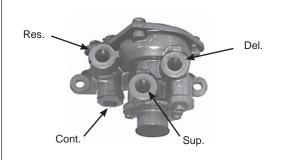
Spring Brake Control Valves



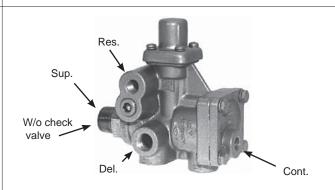
Part#	Res. Port A	Res. Port B
110170	1/2" NPT	1/2" NPT
110310	3/8" NPT	1/2" NPT
110315	1/2" NPT	3/8" NPT



Part#	Res. Port A	Res. Port B
110171	1/2" NPT	3/8" NPT
110191	3/8" NPT	1/2" NPT

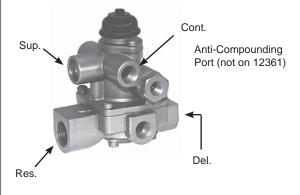


Part#	Description
286364	55 psi Res. trip press.
288063	30 psi Res. trip press.



Part#	Trailer Spring Brake Valve	
287376	3/4" Mounting nipple (Shown)	
102761	3/4" Mounting nipple wAnti Comp port	
103061	1/2" Mounting nipple wAnti Comp port	
288497	1/2" Mounting nipple	

TASK VALVE



Part#	Description
12360	with anti-compounding
12361	without anti-compounding

MODULATING RELAY



Part#	Description
283932	Adjustable (shown)
103081	Pre-set w/o Adjusting bolt

Stop Light Switches- Tractor Protection Valves







Stoplight Switch		
228600	1/4" NPT	
228687	3/8" NPT	





Part#	Terminal
279416	Single terminal
228750	Double terminal



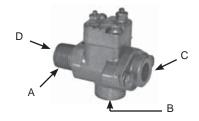
Low Pressure Switch 223578

Trailer Emergency Stop Light Switch



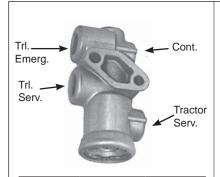
Trailer Stop Light Switch 228477

Stop Light Switch and Double Check Valve

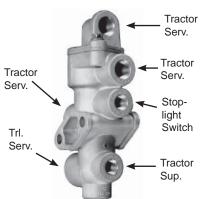


Pipe Thread Size						
Part#	A B C D					
228050	1/2"	1/4"	1/4"			
228165	3/8"	1/4"	1/4"			
228520	1/2"	3/8"	1/4"			
229493	1/2"	1/4"	1/4"	1/4"		
276728	3/8"	3/8"	1/4"			
280810	3/8"	3/8"	3/8"			

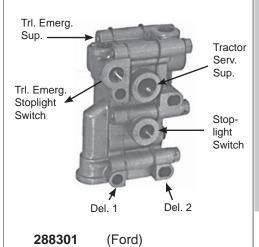
Tractor Protection Valves

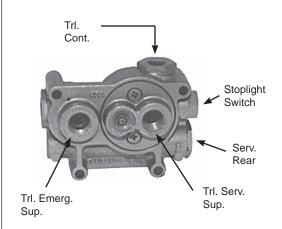


	2 Line System		
Part#	Trl. Emerg. Trl. Serv.		
279000	1/2"	1/2"	
279692	3/8"	3/8"	

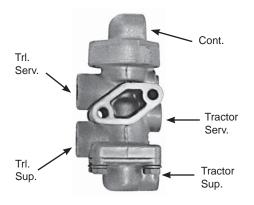


065706 w/double check valve





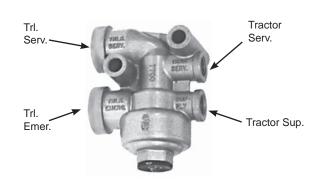
288605 With check valve	
289253 W/o check valve in trailer cont. port	
106941	Mack style w/ ports on opposite side.



	Pipe Threa		
Part#	Trl. Serv.	Trl. Sup.	Stop Light Switch
227661	3/8"	3/8"	none
227672	1/2"	1/2"	none
283090	1/2"	1/2"	1/8"

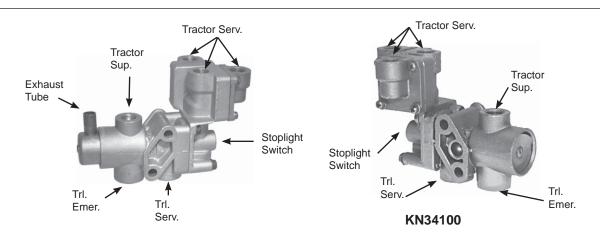


Manifold Valve 288645

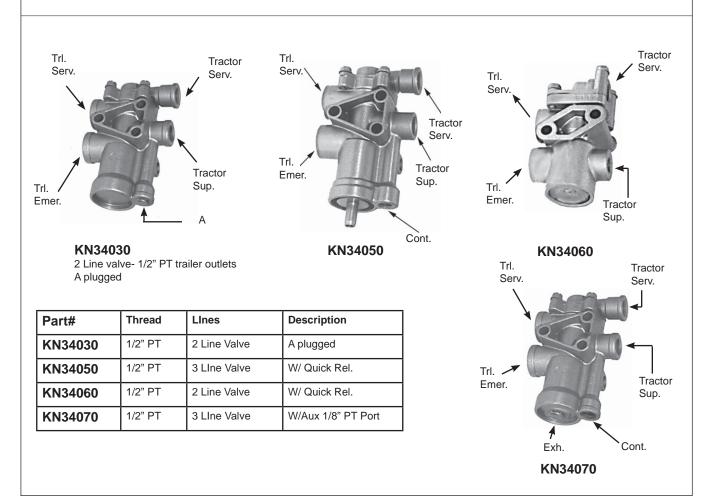


7700

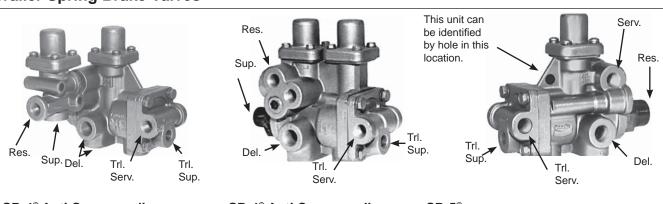
Tractor Protection Valves



Part#	Tractor Emerg.	Foot Control	Trailer Hand	Stop Light Switch	Trailer Service	Trailer Emerg. Out	Exhaust Tube
KN34101	3/8" PC	(1) 1/2" PC (1) 3/8" PC	3/8" PC	(1) 1/4"	1/2"	1/2"	No
KN34103	3/8"	(2) 3/8"	3/8"	(1) 1/4"	1/2"	1/2"	Yes
KN34110	3/8"	(2) 3/8"	3/8"	(1) 1/4"	1/2"	1/2"	Yes
KN34111	3/8"	(2) 3/8"	3/8"	(1) 1/4"	1/2"	1/2"	No
KN34130	3/8"	(2) 3/8"	3/8"	(1) 1/4", (1) 1/8" plug	1/2"	1/2"	Yes
KN34131	3/8"	(2) 3/8"		(1) 1/4"	1/2"	1/2"	No
KN34100	3/8"	(2) 3/8"	3/8"	(1) 1/4"	3/8"	3/8"	No



Trailer Spring Brake Valves



SR-4[®] Anti Compounding

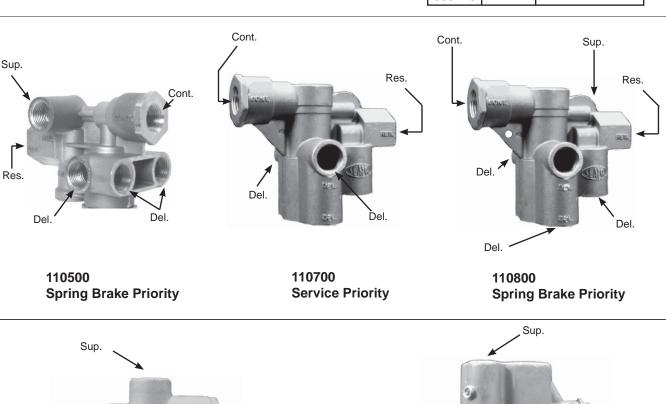
101112	3/4" Mounting nipple
101622	1/2" Mounting nipple

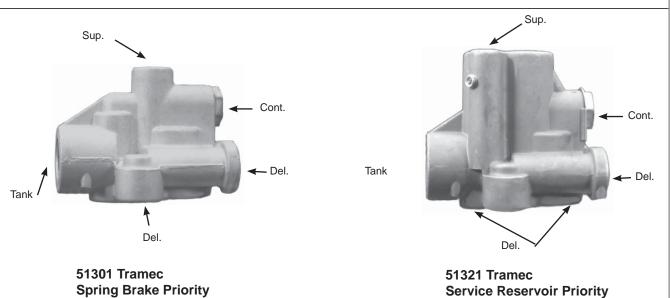
SR-4[®] Anti Compounding (New style)

107539	3/4" Mounting nipple
108076	1/2" Mounting nipple

SR-5[©]

065437	3/4" NPT	w/anti-compounding
065438	3/4" NPT	
065439	1/2" NPT	w/anti-compounding
065440	1/2" NPT	





Transmission Control Valves

EATON



47653 Diaphragm Type Air Shifter



41058 (2 Hole Mount) 69884 (3 Hole Mount) Electric Shift

Piston Type Air Shifter



73503



73507



113770 (2 Hole Mount) 113752 (3 Hole Mount) Electric 2 Speed Shifter

Eaton Air Shifter Module Piston Type





Transmission Control Valves

FULLER

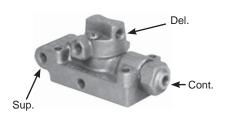
Del.



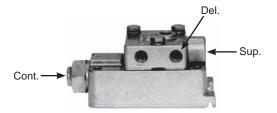


A-3546

A-3547



A-3991 A-4688



A-5000



A-3280-Q-9455 Meritor Slave Valve Kit# 5385N



313630NDana Transmission
Slave Valve



A-4491 13 Speed



A-4900 13 Speed



A-5010 7,8,9 Speed



A-5015 3 Speed, RH



A-6909



A-6913 LH

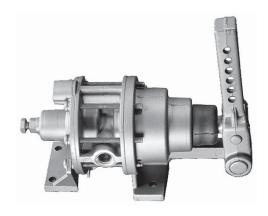


A-6915



A-6918 LH 18 Speed





WM388U1C1D WM388U1C3D



Commonly used to control throttle control valves shown above

Part# Max Output Pres.

WM90D 60 psi **WM90DT** 95 psi **WM90A** Tank

Trailer Air Brake Kits--

For connecting an air brake equipped straight truck to pull a trailer with air brakes.



TAK-1	Universal Trailer Air Brake Kit (shown)
TAK-2	Ford Trailer Air Brake Kit
TAK-3	IH Trailer Air Brake Kit
TAK-4	GMC Trailer Air Brake Kit
TAK-5	Trailer Air Kit (Does not include hand valve)
TAK-6	Trailer Air Kit (Universal)

Synchronizing Valve



KN35070

Hydraulic Over Air



Vacuum Relay Valve



A56301

C20117F

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Section 3

Actuators

Bendix ADB 22X Caliper Part Number





Haldex Air Disk Caliper Type DB22





Kelsey Hayes Air Disk Caliper





Knorr Bremse Air Disk Caliper Type SN7





Meritor
Type DX195 Caliper





Shutter Controls - Spring Brakes



SS **Shutter Control Specify Temperature** Ex. SS180



D-36000 Shutterstat (Reference Only) Can use SS shutter control



D-24000 Shutterstat Specify Temperature Setting: Part Number & 70-80-90, etc.



D-25000 Fan Clutch Actuator Specify Temperature Setting: Part Number & 70-80-90, etc.

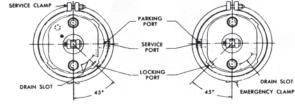
Safety Actuators

Ex. CA185

Identification

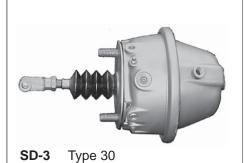


DD-3



Vertical Left Hand 285068 SD-3 284995 DD-3 Type 30 285042 DD-3 Type 24

Vertical Right Hand 277924 SD-3 285008 DD-3 Type 30 DD-3 Type 24 285041



Horizonal Left Hand Horizonal Right Hand 285073 SD-3 285072 SD-3 285024 DD-3 Type 30 DD-3 Type 30 285022 DD-3 Type 24 285047 DD-3 Type 24 285046

Roto Safety Actuator

Roto Chambers- Dimensions include head bolts



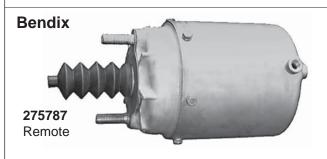




Туре	Dia.	Part#
36	8 3/16"	278907
50	9 7/16"	281667

Туре	Dia.	Part#
9	4 3/4"	288022
12	5 5/16"	288838
16	5 7/8"	229816
20	6 7/16"	288835

Type	Dia.	Part#
24	6 5/16"	288836
30	7 1/2"	288829
36	8 3/16"	288827
50	9 7/16"	288821



MGM

410-B

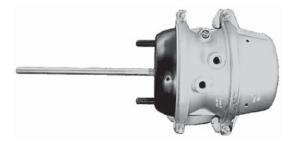
Remote Mount

Anchorloc

For 3/8" ports add 3/8 after the part number



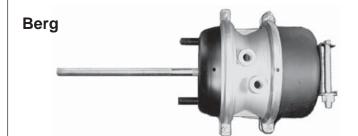




Wedge Type 912PB Single 1216PB 1212PB

Piggy Back 2024PB 2424PB 3030PB 3636PB

Complete 2024T 2424T 3030T 3636T



Brake Assembly Size& Model: 30" Assembly

Spring Brake Part# 15431



Piggy Back 15435

Spring Brakes

MGM Stopgard - Double Diaphragm Spring Brakes (Cam)



Part		Port		
Number	Size	Size	Model	Type
SG24ES	24	3/8	SG24E	Piggy
SG24ET	24	3/8	SG24E	Tandem



Part		Port		
Number	Size	Size	Model	Type
SG30ES	30	3/8	SG30ET	Piggy
SG30ET	30	3/8	SG30ET	Tandem



Part		Port		
Number	Size	Size	Model	Type
SG24LDS	24	3/8	SG24LD	Piggy
SG24LDT	24	3/8	SG24LD	Tandem



Part	Port			
Number	Size	Size	Model	Type
SG30LDS	30	3/8	SG30LD	Piggy
SG30LDT	30	3/8	SG30LD	Tandem



Part		Port		
Number	Size	Size	Model	Type
SG36LDS	36	3/8	SG36LD	Piggy
SG36LDT	36	3/8	SG36LD	Tandem

Wedge Type Spring Brakes

Shortstop SS9A-Std. & SS12A-Std.





Shortstop SS9A-XHD & SS12A-XHD





SS9AS Type 9 Single SS12AS Type 12 Single SS9AT Type 9 Tandem SS12AT Type 12 Tandem SS9HAS Type 9 Single SS12HAS Type 12 Single SS9HAT Type 9 Tandem SS12HAT Type 12 Tandem

Stopgard SGW12A





SGW12AS Type 12 Single **SGW12AT** Type 12 Tandem

Rockwell Wedge Type Spring Brakes - 1/4" Ports







S12RW Piggy T12RW S12RWC T12RWC S12RWS T12RWS

Maxibrake









Ports 3060DI 1/4" 3075DI 1/4"



Ports KSM2060DC 3/8"



KSM2460DC KSM2475DC



Ports 3/8" 3/8"

Ports 3/8" KSM3060DC KSM3075DC 3/8"



3675DI KSM3660DC KSM3675DC

1/4"

3/8"

3/8"



KSD2430PB **KSD2430T** KSD3030PB **KSD3030T**

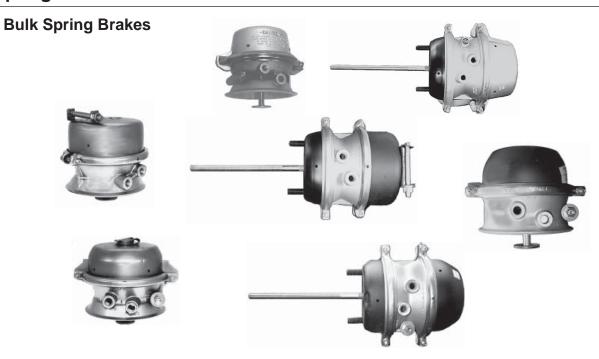




Maxibrake H **Spring Actuated Parking** Brake Chamber

Hydraulically Released 101H 101A Air Pressure Release

Spring Brakes



SBU30PB - Piggy Backs

3030PB 1/4" (Anchorloc) 3030PB 3/8" (Anchorloc) 15435 (Berg) KSD3030PB (Maxi) SG30ES (MGM) TMR3030PB (TMR) TSE3030PB (TSE)

SBU30T- Tandems

3030T 1/4" (Anchorloc) 3030T 3/8" (Anchorloc) 15431 (Berg) KSD3030T (Maxi) SG30ET (MGM) TMR3030T (TMR) TSE3030T (TSE)

Service Chambers



24SC Type 24 Service Chamber

30SC

Type 30 Service Chamber



AH-4 Master Cylinder (Right Hand Shown)

286755 LH output port w/remote reservoir (brake fluid)287069 RH output port w/remote reservoir (brake fluid)



AH-4 Master Cylinder

286746 RH w/reservoir (brake fluid)
288398 RH w/reservoir (mineral oil)



Air Hydraulic Intensifier AH-4

 Type
 Dia.
 Part#

 36
 8 3/16"
 288856

 50
 9 7/16"
 289542



AH-4 Air Chamber

 Type
 Dia.
 Part#

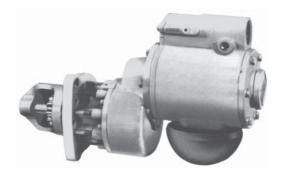
 36
 8 3/16"
 286757

 50
 9 7/16"
 289517

Air Starters



Ingersol Rand 150BMCRH RH 150BMCLH LH



Startmaster 250







Trico APMS Type

Trico FSC Type

Trico FPDP Type



Sprague HP-100 Type



Sprague HP-200 Type HP225



Sprague AP-Type 2 (Air Push)



Sprague Challenger Type



Trico P91317-2





Trico F1650



Trico F1690





Trico F1720



BM6997312 BM6997324 3017993 3062108 12 Volt 24 Volt w/1/4" ports for K-series w/ 3 total 1/4" ports



KN68230
A-68230 (Superceded to KN68230)
Wires pulled out of solenoid render it useless.
Damage charges apply.



GK-4N Wiper Control

Section 4

Reference

Section 4

Reference

The following trouble shooting guide and accompanying glossary of terms is reprinted, with permission, from CCJ's (Commercial Carrier Journal) Air Brake Book, an excellent reference for overall understanding of the air brake system. The authors of this condensed trouble shooter's guide have a more complete (30 pg.) version available. Contact Chip Magner at 1-800 633-5953 ext. 1208.

PROBLEM #1

Air leak at brake (foot) valve exhaust port with service and parking brakes released.

Note: For air to leak at the exhaust port of any valve: * The valve is bad, or * Tank pressure is getting to the delivery port from other components.

POSSIBLE CAUSES:

- 1. Tractor Protection Valve
- 2. Trailer Components
- 3. Tractor Parking System Components
 - A. Anti-Compound Valve (if equipped, and depending on plumbing)
 - B. Spring Brake Control
 - C. Spring Brake Chambers
- 4. Brake (Foot) Valve

TRACTOR PROTECTION VALVE TESTS

STEP #1

- 1. Pull Trailer Supply (red knob on dash).
 - A. If leak continues, go to STEP #6.
 - B. If leak stops, go to STEP #2.

STEP #2

- Disconnect Glad Hands and connect to holder on tractor.
- 2. Push Trailer Supply.
 - A. If Exhaust Port of Foot Valve leaks, replace Tractor Protection Valve.
 - B. If Exhaust Port of Foot Valve does not leak, problem is in Trailer. Go to STEP #3.

TRAILER COMPONENT TESTS STEP #3

- 1. Connect Glad Hands.
- 2. Release Trailer Brakes.
- Disconnect Control Line from Service Port of Relay.
 - A. If leak continues, go to STEP #4.
 - B. If leak stops, go to STEP #5.

STEP #4

- 1. Disconnect Anti-Compound Line (if equipped).
- 2. Leak at Exhaust Port of Foot Valve should stop.
 - A. Replace Trailer Spring Brake Valve.

STEP #5

- 1. Disconnect Delivery Lines to Service Side of Spring Brake Chamber, one at a time.
 - A. If there is a leak out of the Service Side of Chamber, replace Spring Brake Chamber. (Remember, there may be more than one bad chamber)
 - B. With all Delivery Lines disconnected and leak continues, replace Relay Valve.

TRACTOR PARKING SYSTEM COMPONENT TESTS STEP #6

- 1. Pull Park Control.
 - A. If leak continues, go to STEP #9.
 - B. If leak stops, go to STEP #7.

ANTI-COMPOUND VALVE TEST

STEP #7

- 1. Release Park Brakes.
- 2. Disconnect Anti-Compound Line.
 - A. If leak stops, replace Anti-Compound Valve.
 - B. If leak continues, go to STEP #8.
 - C. If not equipped with Spring Brake Control Valve, go to STEP #9.

SPRING BRAKE CONTROL VALVE TEST

STEP #8

- Disconnect Delivery Line from Secondary Signal Line.
 - A. If leak stops, replace Spring Brake Control Valve.
 - B. If leak continues, go to STEP #9.

SPRING BRAKE CHAMBER TEST STEP #9

- 1. Disconnect Delivery Line to Service Side of Spring Brake Chambers, one at a time.
 - A. If there is a leak out of the Service side of the Spring Brake Chamber, replace Spring Brake Chamber (Remember, there may be more than one bad chamber).

BRAKE (FOOT) VALVE TEST STEP #10

- 1. After completing Steps #1 though #9, and leak continues, disconnect all Delivery Lines.
 - A. If leak continues, replace Brake (Foot) Valve.
 - B. If leak stops, recheck Steps #1 through 9.

PROBLEM #2

Air leak at exhaust port of rear axle tractor relay with service and parking brakes released

POSSIBLE CAUSES:

- 1. Spring Brake Chamber
- 2. Relay
- 3. Anti-Compound Valve (depending on plumbing)

SPRING BRAKE CHAMBER & RELAY TEST STEP #1

- 1. Pull Park Control Valve (yellow or blue knob on dash).
 - A. If leak continues, go to STEP #2.
 - B. If leak stops, go to STEP #3.

STEP#2

1. Replace Relay.

STEP#3

- 1. Release Parking Brakes.
- 2. Disconnect Delivery Lines to Service Side of Spring Brake Chamber, one at a time.
 - A. If there is a leak out of the Service Side of the Spring Brake Chamber, replace Chamber (Remember, there may be more than one bad chamber)
 - B. If Chambers do not leak, go to STEP #4.

ANTI-COMPOUND VALVE TEST

STEP#4

- 1. Disconnect service side of Anti-Compound Valve.
- 2. Release Parking Brakes.
- If air leaks out of Anti-Compound Valve, replace valve.

PROBLEM #3

Air leak at exhaust port of relay in front axle system with service brakes released

POSSIBLE CAUSES

- 1. Relay
- 2. Bad or dirty inlet

PROBLEM #4

Air leak in parking system relay

POSSIBLE CAUSES

- 1. Relay
- 2. Bad or dirty inlet

PROBLEM #5

Air leak at exhaust port of quick release valve in rear axle tractor with service and parking brakes released

POSSIBLE CAUSES

1. Spring brake chamber

STEP #1

- 1. Release Parking Brakes.
- 2. Disconnect Delivery Lines to Service Side of

Spring Brake Chamber, one at a time.

A. If there is a leak out of the Service Side of the Spring Brake Chamber, replace Chamber.

PROBLEM #6

Air leak at exhaust port of trailer hand control with tractor and trailer brakes released

POSSIBLE CAUSES:

- 1. Tractor Protection Valve
- 2. Trailer Components
- 3. Trailer Hand Control

STEP #1

- 1. Pull Trailer Supply.
 - A. If leak continues, go to STEP #2.
 - B. If leak stops, go to STEP #3.

STEP#2

- 1. Replace Trailer Hand Control
 - A. Bad or dirty Inlet

STEP#3

- Disconnect Glad Hands and connect to holder on tractor.
- 2. Push Trailer Supply.
 - A. If Exhaust Port of Trailer Hand Control leaks, replace Hand Control.
 - B. If Exhaust Port does not leak, go to Steps #3 through #5 of Problem #1.

PROBLEM #7

Air leak at exhaust port of tractor protection valve with tractor and trailer brakes released

POSSIBLE CAUSES:

1. Tractor protection valve

PROBLEM #8

Air leak at exhaust port of park control and trailer supply with tractor and trailer brakes released

POSSIBLE CAUSES:

- If air leak is out of park control, park control is had
- 2. If air leak is out of trailer supply, trailer supply is bad.

PROBLEM #9

Air leak at exhaust port of the following valves with the service brakes applied

POSSIBLE CAUSES:

- 1. Brake (foot) valve
 - A. Bad or dirty exhaust seat
- Relay
 - A. Bad or dirty exhaust seat
- 3. Quick release valve

- A. Bad or dirty exhaust seat
- 4. Ratio valves
 - A. Bad or dirty exhaust seat
- 5. Trailer hand control valve
 - A. Bad or dirty exhaust seat

PROBLEM #10

High pressure in air system

POSSIBLE CAUSES:

- 1. Stuck Unloader Plunger (valves)
- 2. Bad Governor
- 3. Plugged or broken Governor Signal Line

STEP #1

- 1. Build pressure to 140 psi.
- Loosen mounting bolts of Governor. Disconnect Unloader Line if Governor is remotely mounted.
- 3. If air leaks, go to STEP #2.
- 4. If air does not leak, go to STEP #3.

STEP #2

- 1. Remove and inspect Unloader Plungers (valves).
- 2. Replace if necessary.

STEP#3

- 1. Remove and inspect Governor.
- 2. Replace if necessary.

PROBLEM #11

No pressure build-up in air system

POSSIBLE CAUSES:

- 1. Plugged Air Filter
- 2. Broken Drive Belt (if equipped)
- 3. Air Leaks
- 4. Restricted Discharge Line
- 5. Restricted One-Way Check Valve or Valves
- 6. Governor
- 7. Unloader Plungers (valves)
- 8. Air Compressor

STEP #1

- 1. Visually inspect belts, lines and connections.
 - A. If broken, frayed, worn or loose, repair as necessary.
 - B. If belts, lines and connections are okay, go to STEP #2.

STEP#2

- Disconnect Discharge Line at Supply Tank and Compressor.
 - A. If plugged, clean or replace as necessary.
 - B. If not plugged, go to STEP #3.

STEP#3

- 1. Remove and inspect One-way Check Valves.
 - A. If bad, replace the valve.
 - B. If good, go to STEP #4.

STEP#4

- 1. Remove Governor.
 - A. Check for stuck piston.
 - B. Check for restricted exhaust.
 - C. Check for a restricted unloader line (if equipped).
- 2. If bad, repair or replace as necessary.
- 3. If good, go to STEP #5.

STEP #5

Inspect plunger movement:

- 1. Remove intake connection. (Filter or Elbow)
- 2. Start engine.
 - A. If air is pushed out of intake, remove and inspect Unloader Plungers. Replace if necessary.
 - B. If air pressure starts to build, check for a restricted intake.
 - C. If there is no air movement, go to STEP #6.

STEP#6

Replace or rebuild Air Compressor.

PROBLEM #12

Excessive oil in air system

POSSIBLE CAUSES:

- 1. Restricted Intake
 - A. Hose between Air Compressor Intake and Engine Intake Manifold.
 - B. Plugged Air Strainer (filter)
- 2. Flooding
 - A. Plugged drain to engine from Air Compressor
- 3. Bad Piston and/or Rings in Air Compressor

STEP #1 1.

Check hose or filter to Air Compressor.

A. If plugged, repair or replace as necessary.

B. If good, go to STEP #2.

STEP#2

If Air Compressor is:

- 1. Belt-driven with oil drain to engine, check for a plugged drain.
- 2. Gear driven, remove Air Compressor and check drain ports.
- 3. If drain is plugged, replace or repair as necessary.
- 4. If drain is not plugged, replace Air Compressor.

PROBLEM #13

Slow or no release of brakes

POSSIBLE CAUSES:

- 1. Hinge Pin on Brake Pedal
- 2. Air Delivery Lines restricted
- 3. Control Line restricted (Delivery of Brake (Foot) Valve to Service Port of Relay restricted
- 4. Relay Valve not exhausting
- 5. Quick Release Valve not exhausting
- 6. Brake (Foot) Valve not exhausting
- 7. Binding parts in the Foundation Brake

STEP #1

1. Check Hinge Pin in Brake Pedal. If free, go to Step #2.

STEP #2

- Have an assistant make a brake application and release.
- Listen for exhaust noise from the exhaust ports of: *Relay Valve * Quick Release Valve * Brake (Foot) Valve.
 - A. If there are no exhaust noises, go to STEP #3.
 - B. If exhaust is normal, go to STEP #4.

STEP#3

- 1. Check for restrictions in all Delivery Lines from the Valve that is not exhausting.
 - A. If a kink or dent is not found, remove and check internally.

NOTES: * Line could be plugged or may have been crimped with vice grips or pliers. * If line is free of restrictions, replace or repair valve.

STEP#4

- 1. Check S-Cam. It should rotate freely (Cam Brakes).
- 2. Check Anchor-Pins (Cam Brakes).
- Check Wedge Assembly and Actuation Housing (Wedge Brakes).
- 4. Check Clevis Pin in Slack Adjuster. It should rotate freely (Cam Brakes).

COMPONENT PERFORMANCE TESTS

STEP #1

- 1. Build system to cut out pressure.
- 2. Drain Wet (supply) Reservoir.
- 3. Watch Primary and Secondary Air Gauge.
 - A. If 3-Reservoir system, and if Primary or Secondary Reservoir loses pressure, replace Single Check Valve to that Reservoir.
 - B. If Reservoir(s) have more than one compartment, and if either Reservoir loses pressure, there is a hole between Reservoir compartments.
- If no leakage, Single Check Valves are good. Go to STEP #2.

TWO-WAY CHECK VALVE AND SPRING BRAKE CONTROL TESTS STEP #2

- 1. Drain Primary Reservoir.
- 2. Watch Secondary Gauge
 - A. If Secondary Gauge loses pressure, replace Two-way Check Valve.
 - B. If Secondary Gauge holds pressure, Two-way Check Valve is working. Go to STEP #3.

STEP#3

If equipped with a Spring Brake Control, with Parking Brakes released:

- 1. Make a Brake application.
- 2. Watch Rear Spring Brake Chamber.
 - A. If Rear Spring Brake applies, go to STEP #5.
 - B. If Rear Brakes do not apply, go to STEP #4.

STEP#4

- Check Secondary Delivery Line to see if it's kinked or plugged.
 - A. If line is restricted, replace or repair line.
 - B. If line is not restricted, replace Spring Brake

STEP #5

- 1. Build system to Governor cut out pressure.
- 2. Drain Secondary Tank.
- 3. Watch Primary Gauge.
 - A. If Primary Gauge loses pressure, replace Twoway Check Valve.
 - B. If Primary Gauge holds pressure, Two-way Check Valve is working. Go to STEP #6.

STEP#6

- 1. Apply Service Brakes.
- 2. Secondary Brakes should apply.
 - A. If not, check delivery lines and Secondary Delivery Port of Brake (Foot) Valve.

NOTE: Stop Lights should light in Steps #3 and #6.

TWO-WAY CHECK VALVE WITH TRAILER HAND CONTROL TEST

STEP #1

- 1. Apply brakes with Hand Control Valve.
- 2. If there is air exhausting from Brake (Foot) Valve Exhaust Port, check to see if Primary or Secondary Tractor Brakes are applying.
 - A. If yes, go to STEP #2.
 - B. If no, go to STEP #3.
- 3. If only Trailer Brakes apply and there aren't any Exhaust Port leaks, Two-way Check Valves are working.

STEP#2

- 1. If Primary Brakes are applying, Two-way Check Valve to which Primary Delivery Line is connected is bad.
- 2. If Secondary Brakes are applying, Two-way Check Valve in Secondary Delivery Line is bad.

STEP#3

- 1. Disconnect Primary Delivery Line from Two-way Check Valve.
 - If air leaks out of Two-way Check, the Two-way Check Valve is bad.
- B. If air does not leak, the Two-way Check Valve is good.
- 2. Disconnect Secondary Delivery Line from other Two-way Check Valve.
 - A. If air leaks out of Two-way Check Valve, the valve is bad.
 - B. if air does not leak, the Two-way Check Valve is good.

GLOSSARY OF AIR BRAKE TERMS

ABA: The abbreviation for automatic brake adjuster. Also called an automatic slack adjuster, this is a lever connecting the brake chamber push rod with the foundation brake camshaft. It provides torque to rotate the brake camshaft when the brake treadle is depressed. It also provides a means of adjusting clearance between brake shoes and the drum to compensate for lining wear. Some brake adjusters require manual adjustment.

ABS: The abbreviation for anti-lock brake system." ABS electronically monitors wheel speed and prevents wheel lock-up by rapidly cycling the brakes during panic stops and when stopping on low-friction surfaces.

ABS control valves: Control valves that are actuated by the ABS electronic control unit (ECU) to ensure wheels are optimally braked. On a tractor, they are called ABS modulator valves. On a trailer, they're called ABS relay valves.

Actuate: To initiate mechanical motion of a brake system component.

Actuator: A device that physically initiates mechanical motion of a brake system component.

Aftercooler: Optional device that condenses and eliminates water from air pressurized by the compressor.

Air build-up: Process of compressor building (increasing) pressure to a predetermined maximum level (usually 100-120 psi) within the brake system air tanks.

Air compressor: Engine-driven via a belt or direct gear, the compressor pressurizes the air tank.

Air compressor cut-out: Predetermined point at which the air governor halts compression of air by the compressor.

Air disc brakes: Air-actuated brakes that, upon application, employ a caliper to clamp two brake pads against a rotor. Air discs, compared with drum-type brakes, have superior ability to resist fade.

Air dryer: A filter, typically containing a desiccant, which is installed between the compressor and service reservoir to remove water and vapor plus oil blow-by from the compressor.

Air gauge: Dash-mounted gauge indicating air pressure in terms of pounds per square inch (psi).

Air governor: Controls the compressor unloader mechanism and also maintains system air pressure between predetermined minimum and maximum levels (usually, between 90-120 psi).

Air tank: A reservoir for compressed air. Typically, a combination vehicle has several tanks: three in the tractor and two per trailer. The tractor's supply air tank (formerly "wet tank") receives air from the compressor and delivers it to the primary and secondary air tanks in the tractor. Most trailers also have primary and secondary tanks. A check valve on each tank prevents total air loss in the event of a leak.

Alcohol evaporator: Optional device, installed in compressor discharge line between the compressor and supply air tank, which injects alcohol mist into the air flow to reduce the risk of freezeup. It's not normally used in a vehicle with an air dryer.

AL factor: A mathematical expression of the brake adjuster and brake chamber combination. "A" equals the effective area, in square inches, of the brake chamber (ex. Type 30 chamber has effective area of 30 sq.in.). "L" equals the effective length, in inches, of the slack adjuster. For example, 30 X 6 in. = 180 AL factor.

Analog processing: A method of processing information used in older ABS control units. Today's electronic control units (ECUs) use digital processing, which is many times faster and more reliable.

Anchor pin: A pin or pins used to retain brake shoes within the brake assembly.

Anti-compounding: Basically, an optional system that prevents application of service brakes from adding to the force exerted by parking brakes. Functionally, this guards against brake cracking and lining damage.

Anti-lock: Currently optional, a safety-oriented system which senses wheel rotation (at one or more axles) during braking and cycles the brakes to prevent locking those wheels.

Application time: Time elapsed between depression of the brake treadle and engagement of the linings with the drums (or, per FMVSS 121, the point at which all service chambers reach 60 psi).

Application valve: Air valve, such as foot valve or trailer control valve, which controls the pressure delivered to brake chambers.

Automatic slack adjuster: This is a lever connecting the brake chamber push rod with the foundation brake camshaft. It provides torque to rotate the brake camshaft when the brake treadle is depressed. It also provides a means of adjusting clearance between brake shoes and the drum to compensate for lining wear. Some slack adjusters require manual adjustment.

Automatic traction control (ATC): An optional system that is available on 4 and 6-channel ABS systems. Automatic traction control minimizes wheel slipping during acceleration by controlling both the engine throttle and brake pressures.

Bell-mouthed drum: Drum with variation of inner diameter (i.e. greater at open end), preventing full contact with brake lining.

Blue drum: Brake drum with friction surface blued from high temperature. High temperature may result, for example, from dragging of brakes caused by weak return springs. Blue drum also may result from lack of brake balance.

Brake adjuster: (See Slack adjuster).

Brake balance: Basically, balance is achieved when all brakes on all axles do their fair share of the work.

Brake block: Friction material or lining attached to a brake shoe. Disc brakes use pads with friction material.

Brake chamber: Device inside which a diaphragm converts air pressure to mechanical force, via a push rod, for brake actuation.

Brake chamber diaphragm: Bellows-type device within brake chamber that converts air pressure to mechanical force via a push rod.

Brake drag: Failure of one or more brakes to release immediately and/or completely after a driver removes his foot from the brake treadle. (See Quick Release Valve.) Constant drag, unrelated to a brake application, also can exist.

Brake fade: There are many types and causes of braking fade. Fade may result, for example, from a reduction in friction between linings and drums caused by exposure to water. Most typically, however, fade involves a reduction in braking force experienced when dragging brakes on a long grade. If brakes are maladjusted, an overheated drum may expand to the degree that push rod travel is insufficient to fully actuate the brakes. This is one example of mechanical fade, which also may result from various mechanical defects (ex. scored drums) within the foundation brake system. In contrast, heat fade occurs when linings overheat and become less aggressive. Gradual and predictable fade is desirable as a warning.

Brake proportioning: Optional safety-oriented system, often called "bobtail proportioning," for limiting drive-axle brakes while a tractor is operated without a trailer. Also, system that varies individual axle braking effort in response to weight or other variable.

Brake treadle: Functionally, the brake pedal ... a mechanical lever attached to the foot brake valve.

Breakaway valve: Upon accidental separation of trailer(s), a tractor protection system which prevents air loss from the power unit. (See Tractor protection valve.)

Burnish: The "conditioning or seasoning" of a brake lining by wear and temperature via a test procedure or in-service operation.

Caliper: In an air disc brake system, the clamping device containing friction material mounted to pads. When actuated, the caliper applies braking force to both sides of the rotor.

Channel/ABS: The number of channels in an individual-wheel-control system refers to the number of individual brakes its electronic control unit (ECU) is capable of independently controlling.

2-Channel ABS: A system design that uses two wheel-speed sensors and one control valve. The ABS monitors wheel speed and avoids wheel lock-up on one axle while braking on low-friction surfaces or in emergency situations by rapidly cycling the brakes on the wheel ends of two axles. Commonly used on trailers. This system is the most economical but provides the least control of all ABS systems.

4-Channel ABS: A system design that uses four wheel-speed sensors and four ABS control valves on a two-axle truck or tractor. A 4-channel system can also be used on a three-axle vehicle, controlling the left and right side drive axle wheels in pairs. This popular system offers an optimum blend of performance and economy.

6-Channel ABS: A system design that features six wheelspeed sensors and six ABS control valves to individually monitor and control all six wheel of a three-axle truck or tractor. This type of system provides the highest available level of ABS control.

Check valve: A one-way check valve is used, for example, to prevent air from bleeding back into a reservoir. A two-way check valve activates selectively; for instance, by drawing air for brake application from the most-highly-pressurized reservoir (primary or secondary).

Clevis pin: Pin connecting the arm of a slack adjuster to a brake chamber push rod yoke.

Connectors/ABS: Sealed, corrosion-resistant plugs that link the ABS wiring system to the electronic control unit (ECU), wheel-speed sensors and modulator or relay valves using a shielded wiring harness.

Control algorithm: The computer commands programmed into the electronic control unit ECU to control brake actuation under impending wheel lock-up.

Cracked drum: Brake drum cracked all the way through by excessive heat build-up (perhaps signifying inadequate drum weight, and/or driver abuse and/or resurfacing of a drum beyond the manufacturer's limit).

Crack pressure: Minimum air pressure, expressed in pounds per square inch (psi), required to open an air valve.

Diagnostics/ABS: A component-by-component self check performed each time the truck's ignition is turned on. An independent microprocessor also checks the system continuously during vehicle operation.

Diagonal system/ABS: A brake system design that divides the ABS into two circuits (front wheel on one side with rear on the other side, and vice versa) to allow partial system function should one diagonal malfunction.

Digital processing/ABS: The latest processing technology that is many times faster and more reliable than analog processing.

Drain valve: Used to drain oil and water from wet tank. Valve may be manual or automatic in operation. Automatic versions, which may be heated electrically to prevent the valve freezing open, often are referred to as spitter valves.

Dual brake system: A dual air system -primary and secondary designed to retain braking ability in the event one system fails.

Duplex gauge: Essentially, a diagnostic device incorporating two separate air gauges with a common housing and utilizing indicator needles of different colors. Device is used to diagnose brake system imbalance within a combination vehicle via simultaneous connection to two points (such as the tractor gladhand and a trailer brake chamber).

Dust shield: Plate made of metal or polyethylene that's mounted behind a brake drum to minimize entry of dirt and road splash.

ECU/ABS: Electric control unit is a microprocessor that evaluates how fast a wheel is rotating. The electrical signals generated by the inductive sensors pick up impulses from toothed rings that spin with the wheel.

Edge codes: Developed by Friction Materials Standards Institute, a double letter code (ex. EE, FF, GG, FG) printed on the edge of a brake block to designate its range of aggressiveness. Currently, this coding system is being revised.

Emergency brake system: Not a separate system, emergency braking (in the event of air loss) involves various portions of the parking and service brake systems (See Parking Brake.)

Engine brake: Optional device that converts a diesel engine into a power-absorbing air compressor to slow a vehicle on downgrades. (See Jake Brake.)

Exhaust brake: Optional device that uses engine exhaust back pressure to slow a vehicle on downgrades.

Fail-safe/ABS: If anti-lock brake system should fail during vehicle operation, a dash light warns driver that ABS is disengaged. Meanwhile, the tractors pneumatic system returns to normal relay valve functions and maintains standard air brake performance.

Fault codes/ABS: A series of codes displayed by the self-diagnostic portion of the ABS unit, isolating the section of the system that is now or has malfunctioned.

Foot valve: A foot-operated valve controlling air pressure delivered to the brake chambers.

Foundation brake system: Term inclusive of mechanical components involved in providing braking force (i.e. brake chambers, slack adjusters, brake drums and brake linings).

Front axle limiting valve: (See Ratio limiting valve.)

GCW: Gross combination weight is the total weight-carrying capacity of a combination vehicle as determined by axle ratings.

Gladhand: Mechanical connector used to attach a tractor's or converter dolly's service (i.e. control) and emergency (i.e. supply) air lines to those on a trailer.

Greased-stained drum: A brake drum with discoloration of friction surface caused by, for example, improper greasing of brake camshaft.

GVW: Gross vehicle weight is the total weight-carrying capacity of one vehicle, (such as a straight truck, bus, tractor or trailer) as determined by axle ratings.

Hand valve: (See Trailer control valve.)

Heat-checked drum: Brake drum with hairline cracks on friction surface caused by thermal cycling. Mild checking normally does not require drum replacement.

Heat-spotted drum: Brake drum with a pattern of hard, slightly raised dark spots of martinsite on its friction surface. Caused by localized overheating and sudden cooling, those spots should be ground off to prevent drum cracking, uneven lining wear and loss of braking efficiency. If spots cannot be removed, the drum should be discarded. Heat spotting is promoted by light and steady braking on downgrades.

Hold-off spring: A spring within a relay valve or quick release valve that's designed to retard valve operation until a predetermined amount of air pressure is exerted. (See Crack pressure.)

Hysteresis: Difference between the amount of pressure needed to open a valve and the pressure drop needed to close it.

Inversion valve: Normally open, an air control valve often used in inter-locking applications where components must operate in a specific sequence.

Jackknife: Uncontrollable articulation of a tractor-trailer typically resulting from lock-up of tractor drive axle(s). The risk of jackknife is greatest on a slippery road with an empty or lightly-laden trailer in tow.

Jake Brake: Trade mark of engine brakes by the Vehicle Equipment Division of The Jacobs Manufacturing Co.

Leak-down test: A common method of checking for air leaks. With the engine off, vehicle stationary, the air system at maximum governed pressure and all service brakes fully applied, there should be no more than a 3 psi/min. air loss noted on the dash-mounted pressure gauge for straight trucks; 4 psi/min. for combination vehicles.

Lining growth: Permanent swelling of brake lining resulting from heat exposure.

Long-stroke chamber: A brake chamber designed to permit longer-than-normal push rod travel without exceeding its readjustment limit. For example, a regular, clamp-type, Type 30 chamber has a readjustment limit of 2 in. A long-stroke version of that chamber has a readjustment limit of 2 1/2 in.

Low pressure warning device: Pressure-sensitive electrical switch that actuates an in-cab buzzer and warning light when air pressure falls below a predetermined level (typically, 60 psi).

Out-of-round drum: Brake drum with variations in its inner diameter, causing reduced braking efficiency. An out-of-round drum often can be machined, within manufacturer's limits, to restore concentricity.

Oversized drum: Refers to a brake drum having an inner diameter greater than the discard diameter marked on the drum by its manufacturer.

Parking brake: (See Spring brake.)

Parking brake priority: A type of trailer brake control valve which prioritizes delivery of air for quick release of a trailer's parking brakes after being hooked to a tractor. Charging a trailer's service reservoirs, to provide braking ability, is a secondary concern.

Pawl: A mechanical device allowing rotation in only one direction. One type consists of a hinged tongue, the tip of which engages the notches of a cogwheel, preventing backward motion.

Pneumatic balance: Achieved when individual air chambers receive the air pressure required for each brake in the system to do its fair share of the work. Lack of pneumatic balance is most likely at low brake application pressures, rarely during panic stops.

Pneumatic timing balance: Achieved when individual air chambers sequentially receive air within a time frame that ensures each brake in the system will do its fair share of the work. In a combination vehicle, lack of proper timing is likely to occur because tractor brakes receive air faster than trailer brakes. (See Trailer push.)

Polished drums: A brake drum with a friction surface polished to a mirror-like finish by unsuitable brake linings. Remove gloss from drum with eighty grit emery cloth.

Pop-off valve: Jargon for a pressure-relief valve, installed in the service reservoir or wet tanks as insurance against over-pressurization.

Pressure differential: Difference between the inlet and outlet air pressure of an open brake valve. Also, difference in air pressure between any two points within a brake system.

Pumping the brakes: Phrase denoting a rapid series of brake applications (a.k.a. fanning) used to avoid locking brakes on axles during sudden stops. Phrase also may apply to a slower series of heavy brake applications (a.k.a. snubbing) used in an attempt to prevent brake overheating and resultant fade on long downgrades.

Push rod: A rod, protruding from a brake chamber, which is connected to the arm of a slack adjuster via a clevis pin.

Quick release valve: Designed to reduce the chance of brake drag, a valve that speeds the process of exhausting air from brake chambers when driver releases the brake treadle.

Radio frequency interference (RFI): External interference or false signals from such sources as radar, citizens-band radio, other types of radio transmissions and television signals. While the effects of this interference on ABS was a concern during the 1970's, today's technology has virtually eliminated the problem. Ratio limiting valve: Prevents locking of front brakes by automatically limiting application pressure to steer axle during normal braking. Progressively harder braking, however, will progressively increase steer-axle braking until maximum torque is applied.

Relay valve: Used to speed the application of brakes, especially in multiple-trailer applications.

Release time: Time between release of brake treadle and total disengagement of brake linings and brake drums. Or, per FMV121, that time required to reduce pressure to 5 psi from 95 psi within all service chambers.

Retarder: Auxiliary braking device such as engine brake, exhaust brake, hydraulic retarder or electric retarder.

Return springs: Springs which retract brake shoes upon release of the brake treadle.

Roll-over: Jargon denoting that an S-cam has traveled beyond its designed stopping position during brake application.

S-cam brake: Type of brake where mechanically-induced rotation of an S-shaped cam forces brake linings against the brake drum.

Scored drum: Brake drum with a grooved friction surface, resulting in excessive lining wear. Severe scoring requires that a drum be machined, within manufacturer's limits, before replacing the linings.

Service brakes: As opposed to parking brakes, that portion of the brake system used for normal brake applications.

Service brake priority: A type of trailer brake control valve which prioritizes delivery of air to a trailer's service reservoirs, to provide braking ability, after being hooked to a tractor. Releasing a trailer's parking brakes is a secondary concern.

Slack adjuster: Also called a brake adjuster, this is a lever connecting the brake chamber push rod with the foundation brake camshaft. It provides torque to rotate the brake camshaft when the brake treadle is depressed. It also provides a means of adjusting clearance between brake shoes and the drum to compensate for lining wear. Some models are automatic while others require manual adjustment.

Speed sensor/ABS: An electromagnetic device that, in conjunction with a rotating toothed wheel, generates an electrical signal proportional to the wheel speed and transmits the information to the ABS electronic control unit (ECU).

Spitter valve: Slang for automatic drain valve, pressure relief valve, or possibly quick release valve.

Split-coefficient surface: Also called split-U (Mu), a road condition where one side of a lane has low friction and the other has high friction (example, the left side of the lane is ice covered, the right side is dry). A 4- or 6-channel ABS system (anti-lock brake system) with individual wheel control will provide optimum stability and stopping-distance performance under these conditions.

Spring brake: Generally refers to a tandem-chamber brake actuator that incorporates an air-applied service brake chamber and an air release/spring-applied parking or emergency brake chamber. Spring brakes apply upon sudden air loss (emergency mode) or activation of a dash-mounted parking brake control. Spring brakes remain applied until that chamber is recharged with air or the spring is manually compressed or caged. DIS-ASSEMBLY OF A SPRING BRAKE IS DANGEROUS, SO ONLY TRAINED MECHANICS SHOULD

ATTEMPT THE PROCEDURE. The spring portion often is referred to as the piggyback. Some spring brake actuators do not incorporate a service air chamber and are solely parking and emergency brakes. For example, some parking brakes are applied by air pressure and subsequently held mechanically by a pin which drops into a notch on the brake chamber push rod.

Stopping distance: The distance traveled by a vehicle on a road between the initial brake application and a full stop.

Stopping time: The time elapsed between the initial brake application and a full stop. **Stroke**: Refers to a total distance traveled by a brake chamber push rod or slack adjuster arm during brake application.

Supply air tank: The air reservoir immediately downstream of the air compressor. (See Wet tank.)

Threaded drum: Brake drum improperly resurfaced on a lathe, resulting in a friction surface akin to that of a scored drum.

Tire rolling radius: Distance, expressed in inches, from the center of a tire/wheel assembly to the pavement, measured when mounted on a vehicle and loaded to its maximum rated capacity.

Torque balance: Achieved when individual brakes exert the degree of braking force required for each brake in the system to do its fair share of the work.

Tractor protection valve: Isolates tractor air system in event of a trailer breakaway or dangerous decrease in the tractor's reserve air, but is typically applied (via dash-mounted control) before disconnecting a trailer.

Trailer control valve: Hand operated valve, located on (or adjacent to) the steering column, which permits independent control of the trailer brakes. Also known as the trolley valve or hand valve.

Trailer push: Caused by the tractor braking prior to the trailer and/or greater tractor braking torque.

Trailer swing: Articulation of the trailer caused by locking only the trailer brakes.

Treadle valve: Foot-operated brake actuation valve.

Trolley valve: (See Trailer control valve.)

Turned drum: A brake drum that has been resurfaced on a lathe to remove scoring or other defects. Stay within manufacturer's limits.

Warning light/ABS: An indicator light on the truck or tractor instrument panel that illuminates to indicate the status of the ABS system. On trailer ABS, the indicator light may be located on the trailer body where the driver or maintenance personnel can easily see it.

Wedge brakes: As opposed to a brake applied by an S-cam, this type of brake is applied by a single or double wedge-type mechanism. This type of brake is self-adjusting and, as such, does not utilize a slack adjuster.

Wet tank: Also known as the supply air tank, that reservoir nearest to the air compressor where water and oil are most likely to accumulate (assuming the lack of a functional air dryer).

Worm gear: Component of slack adjuster. The worm and worm gear provide for adjusting lining-to-drum clearance.

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DB22			Heater Kit	
D-24000 Shutterstat 3-1 KN143310 EL-1300 D-25000 Fan Clutch Actuator 3-1 KN14050 EL-32000 D-36000 Shutterstat 3-1 KN14050 EL-32000 D-36000 Shutterstat 3-1 KN14110 EL-3200 D-36000 Shutterstat 3-1 KN14110 EL-3200 D-36000 Shutterstat 3-1 KN14111 EL-1400 F1650 Trico Cont 3-10 KN16050 EL-1600 F1720 Trico Cont 3-10 KN16050 EL-1600 F1720 Trico Cont 3-10 KN16051 EL-1600 F1720 F1720 Trico Cont 3-9 KN16053 EL-1600 F1720 F1720 Trico Cont 3-9 KN16051 EL-1600 F1720 F17		-62		CR248
D-25000 Fan Clutch Actuator 3-1 KNH-41050 EL-3200 No. Shutterstat 3-1 KNH-4110 EL-3200 DX195 Merritor Air Disc Caliper 3-1 KNH-4111 EL-1400 F1650 Trico Cont 3-10 KNH-6050 EL-1600 F1690 Trico Cont 3-10 KNH-6050 EL-1600 F1720 Trico Cont 3-10 KNH-6051 EL-1600 F1720 Millor Mounting Gasket 1-56 KNH-6051 A EL-1600 GK154916 Mounting Gasket 1-56 KNH-6051 A EL-1600 GK21376 Mounting Gasket 1-56 KNH-6050 EL-1600 GK241376 Mounting Gasket 1-56 KNH-6050 EL-1600 GK234070 Mounting Gasket 1-56 KNH-6050 EL-1600 GK235907 Mounting Gasket 1-56 KNH-6050 EL-1600 GK245370 Mounting Gasket 1-56 KNH-6050 EL-1600 GK245390 Mounting Gasket 1-56 KNH-6100 EL-1600 GK245370 Mounting Gasket 1-56 KNH-6100 EL-1600 GK245370 Mounting Gasket 1-56 KNH-61100 EL-1600 GK245370 Mounting Gasket 1-57 KNH-6150 EL-1600 GK245370 Mounting Gasket 1-57 KNH-6150 EL-1600 GK245370 Mounting Gasket 1-57 KNH-6150 EL-1600 GK245370 Mounting Gasket 1-57 KNH-6250 EL-1600 GK246370 Mounting Gasket 1-57 KNH-6250 EL-1600 GK246370 Mounting Gasket 1-57 KNH-6250 EL-1600 GK3918340 MOUNTI		⊱1	Haldex Air Disc Caliper	
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FPDP Wiper Motor	3-10 KN16050 EL-1600 1-48	-10	Trico Cont	F1690
SEC	3-10 KN16051 EL-1600 1-48	-10	Trico Cont	F1720
GR154916	3-9 KN16051A EL-1600 1-48	-9	Wiper Motor	FPDP
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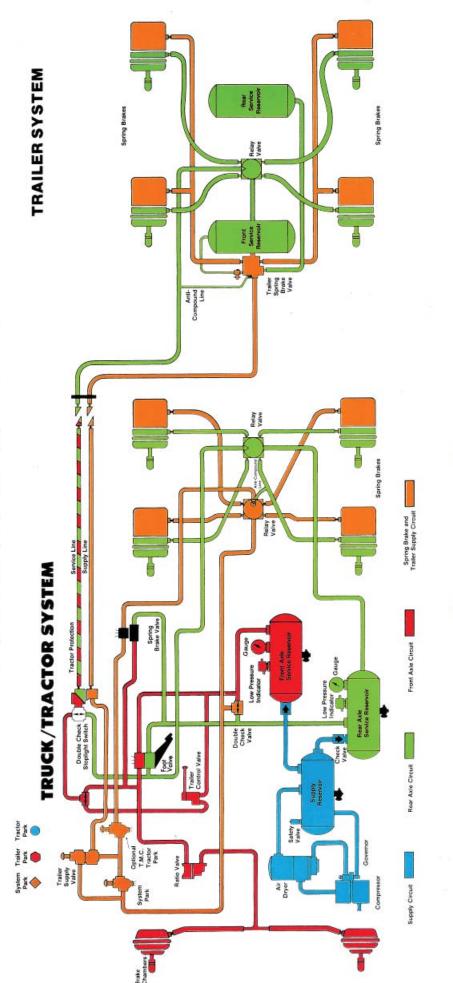
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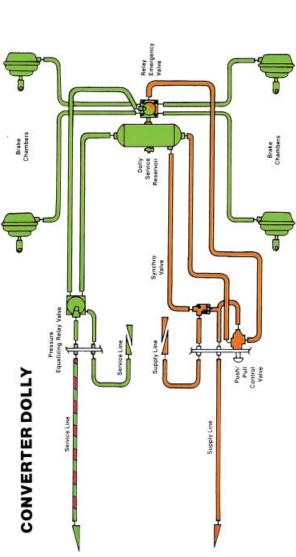
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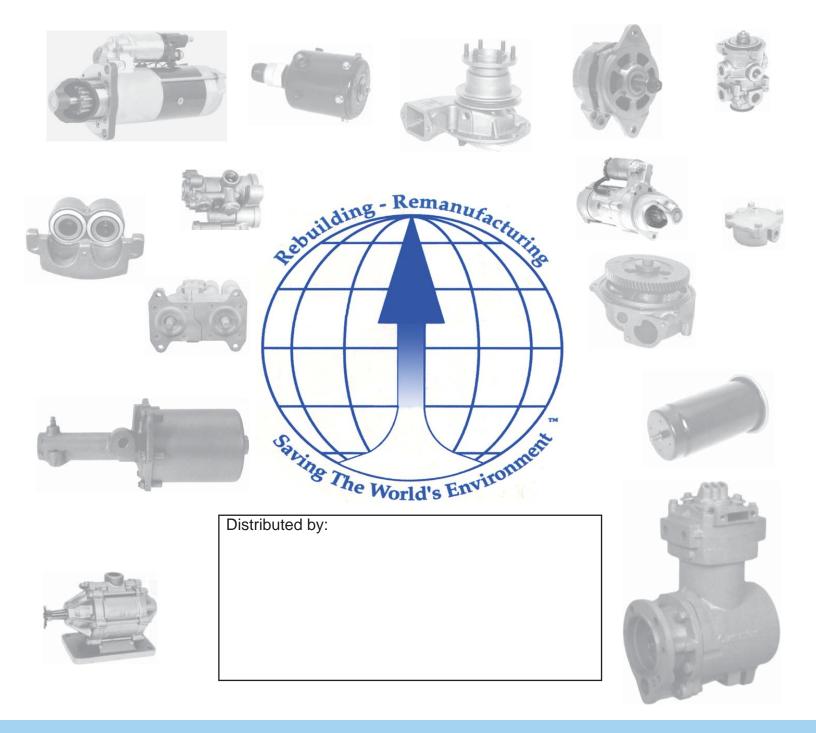
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