

PARTS MANUAL

MODEL PA90VS

FOR CATERPILLAR D7E

TABLE OF CONTENTS

General Safety Recommendations.....	3
Winch Housing & Fairlead Group.....	4
Motor Group	6
Output Planet Carrier Assembly	8
Intermediate Planet Carrier Assembly.....	9
Carrier Clutch Assembly	10
Sprag Clutch Assembly	11
Brake Housing Assembly.....	12
Brake Valve Assembly	13
Recommended Fastener Torque Chart.....	14
Mertric Conversion Chart	15

MODEL NUMBER DESCRIPTION

PA90VS	255	V
Basic Winch Model	Overall Gear Ratio 255:1	Motor Type V= Variable Displacement

PACCAR WINCH DIVISION

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General Safety Recommendations

Caterpillar D7E

Some illustrations in this manual may show details or attachments which may be different from your winch. Also, some components may be removed for illustrative purposes.

Continuing product improvement may cause changes in your winch which may not be included in this manual. When a question arises regarding your winch or this manual, contact your nearest PACCAR dealer or the factory Service Department at 918-251-8511, Monday - Friday, 8:00 a.m. to 4:30 p.m. CST, or by Fax at 918-259-1575. Provide the complete winch model number and serial number when making inquiries. The model and serial numbers are stamped into the winch housing on the upward facing surface near the forward most mounting flange.

PACCAR provides parts and service through a network of authorized dealers. Parts and service are not available directly from the factory. For the name of your nearest dealer, consult your local phone directory or call us at the phone number shown above.

WARNING

Make sure the tractor is secured so that it cannot roll away and the engine switched off before starting ANY work on the hydraulic system.

CAUTION

The hydraulics may only be operated or serviced independently by persons who are over the age of 18, are physically and mentally fit, and have been instructed on how to operate and service hydraulic systems

WARNING

The hydraulic system may be under high pressure. It must therefore be depressurized as specified in the operating instructions before starting any work on the hydraulic system.

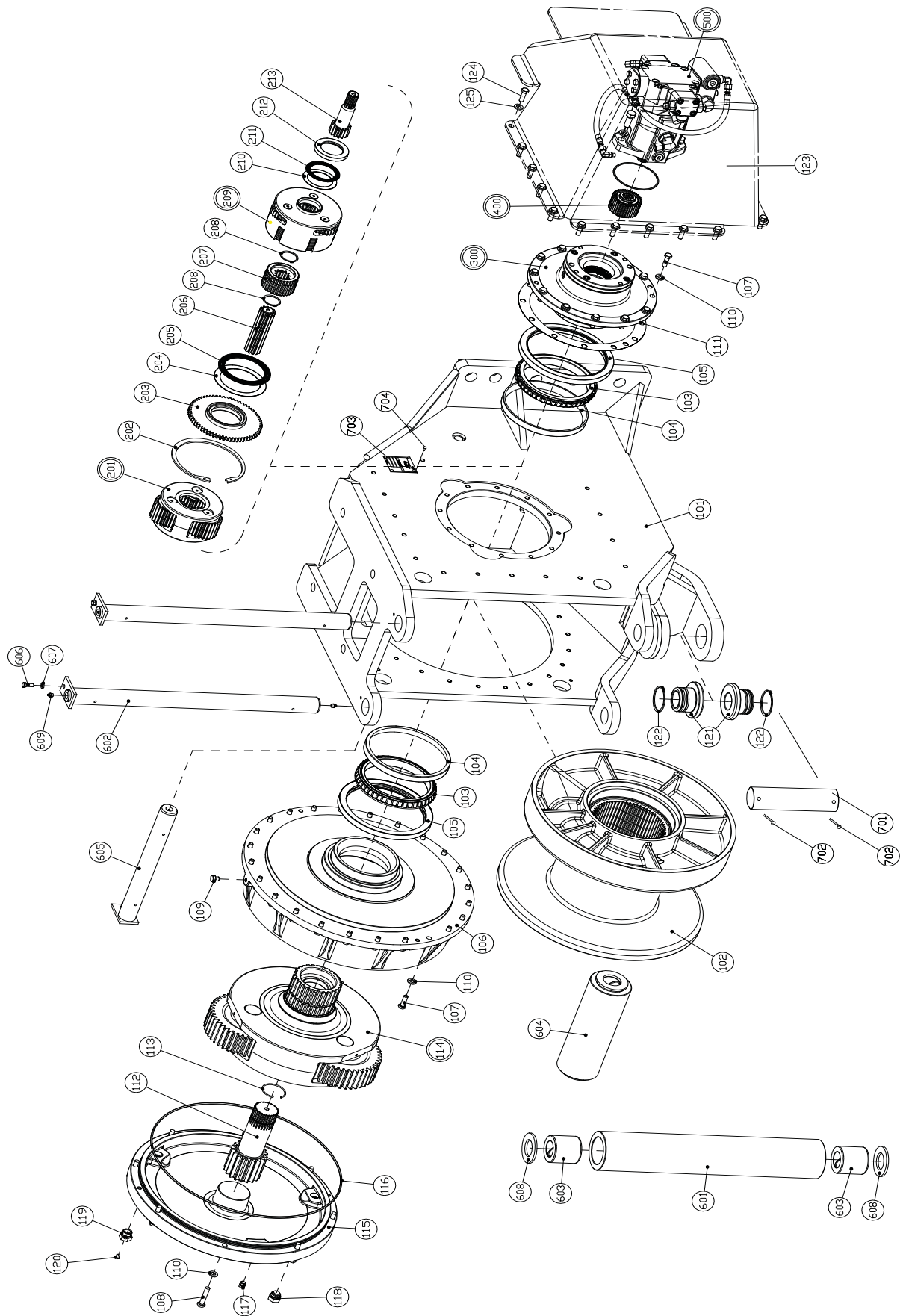
CAUTION

Beware of injuries when attempting to locate leaks. Always use a piece of paper or cardboard for this purpose, never your hands. Fluid emerging under pressure may not be visible but can penetrate the skin and cause serious injuries which must be treated by a medical professional without delay.

WARNING

Hydraulic hose lines must be examined regularly. The hoses must be replaced if damaged or deformed and upon expiry of their service life. The hose lines must comply with technical specifications of the supplier.

WINCH HOUSING AND FAIRLEAD GROUPS
PA90VS



WINCH HOUSING AND FAIRLEAD GROUPS

PA90VS

ITEM NO.	PART NO.	DESCRIPTION	QTY
101	356-3825	HOUSING, MACHINED	1
102	356-3828	CABLE DRUM	1
103	110-8366	BEARING CONE	2
104	110-8368	BEARING CUP	2
105	126-0772	OILSEAL	2
106	356-3829	RING GEAR	1
107	1A-1460	CAPSCREW (1/2 - 13 X 2 G8 Z)	12
108	7X-0325	CAPSCREW (1/2 - 13 X 2 1/2 G8 Z)	8
109	1K-6705	CAPSCREW (1/2 - 13 X 1/2 G8 Z)	1
110	8T-4223	WASHER, HARD (1/2)	44
111	356-3830	SHIM PACK	2
112	356-3831	OUTPUT SUN GEAR	1
113	356-3832	RETAINING RING	1
114	357-1901	OUTPUT PLANET CARRIER ASSEMBLY (REFER TO PAGE 8)	1
115	356-3834	END COVER	1
116	4H-6730	O-RING	1
117	148-8407	PLUG	1
118	126-0778	MAGNETIC DRAIN PLUG	1
119	126-3230	FILL-VENT PLUG	1
120	6U-1989	RELIEF VALVE/VENT	1
121	356-3826	BUSHING	2
122	102209 *	RETAINING RING	2
123	356-3865	MOTOR COVER	1
124	5P-2566	CAPSCREW (1/2 - 13 X 1 1/2 G8 Z)	24
125	8T-4223	WASHER	18
201	357-1899	INTERMEDIATE PLANET CARRIER ASSEMBLY (REFER TO PAGE 9)	1
202	103029 *	RETAINING RING	1
203	356-3840	THRUST RING	1
204	231-4084	THRUST WASHER	1
205	231-4088	NEEDLE ROLLER BEARING	1
206	355-6792	INTERMEDIATE SUN GEAR	1
207	357-1903	GEAR ADAPTER	1
208	1K-6995	RETAINING RING	2
209	357-1898	CARRIER CLUTCH ASSEMBLY 255:1 RATIO (REFER TO PAGE 10)	1
210	231-4087	THRUST WASHER	1
211	231-4085	NEEDLE ROLLER BEARING	1
212	356-3844	THRUST RACE	1
213	356-3845	PRIMARY SUN GEAR 255:1 RATIO	1
300	357-1897	BRAKE HOUSING ASSEMBLY (REFER TO PAGE 12)	1
400	356-3856	SPRAG CLUTCH ASSEMBLY (REFER TO PAGE 11)	1
500	357-1896	HYDRAULIC MOTOR GROUP (REFER TO PAGE 6)	1
701	356-3868	DRAWBAR PIN	1
702	3B-5320	COTTER PIN	2
703	105317 *	NAMEPLATE	1
704	7H-4543	DRIVE SCREW	4

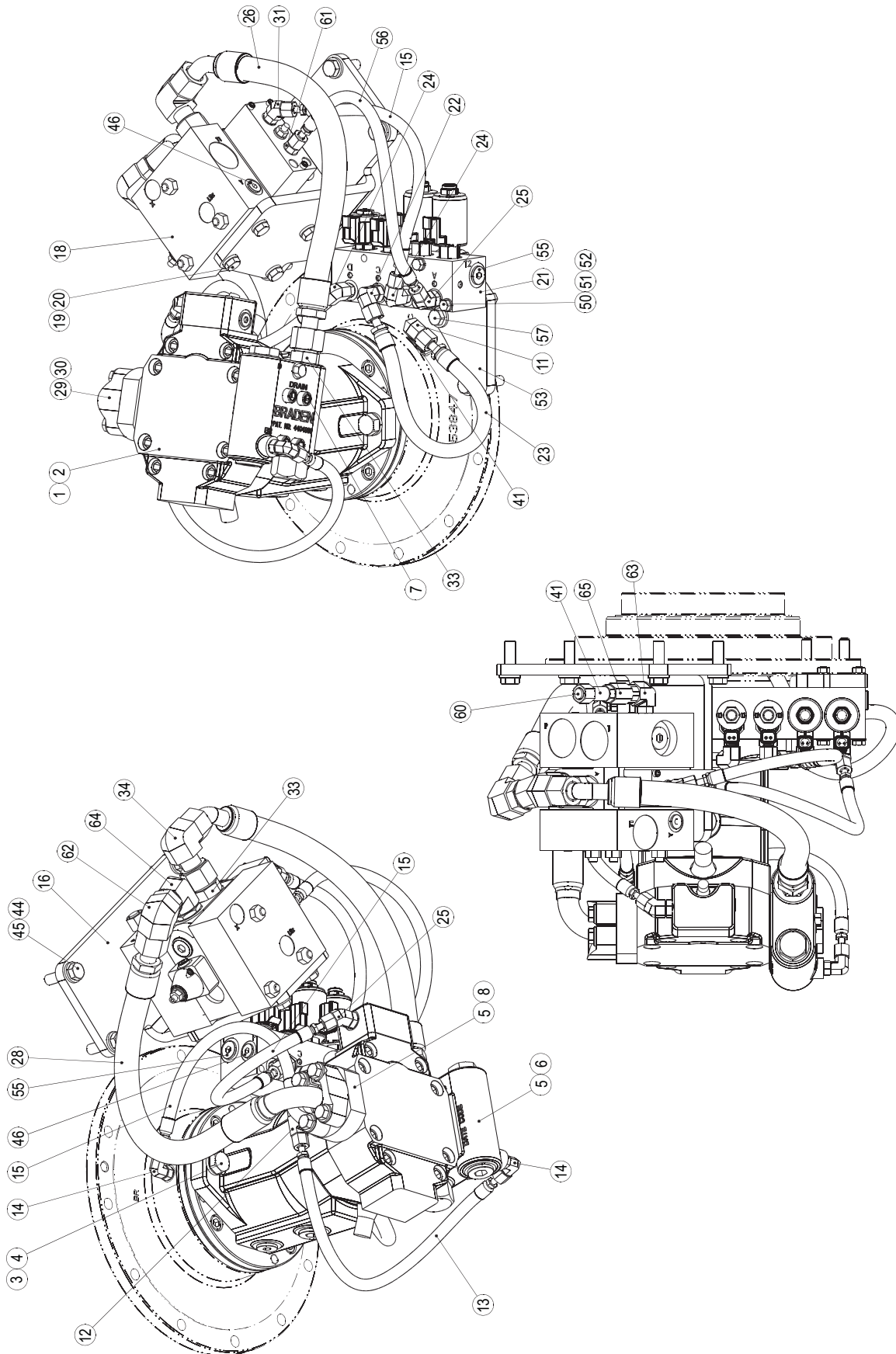
*PACCAR Winch Division part number. Caterpillar part number not available at time of printing.

ITEM NO.	PART NO.	DESCRIPTION	QTY	
			ROLLE	4-ROLLER
601	126-0836	VERTICAL ROLLER	2	2
602	126-0835	VERTICAL SHAFT ASSEMBLY	2	2
603	126-0794	BUSHING	6	8
604	356-3841	HORIZONTAL ROLLER	1	2
605	356-3842	HORIZONTAL SHAFT ASSEMBLY	1	2
606	4L-6454	CAPSCREW (3/8 - 16 X 1 G8 Z)	3	4
607	8T-4896	WASHER, HARD	3	4
608	126-0806	WASHER, HARD (2 in.)	6	8
609	3B-8489	GREASE FITTING	6	8
--	63433 *	4th ROLLER GROUP (INCLUDES ITEMS 603-609 NEEDED FOR ONE COMPLETE ROLLER INSTALLATION)		--

*PACCAR Winch Division part number. Caterpillar part number not available at time of printing.

Motor Group

Caterpillar D7E



Motor Group

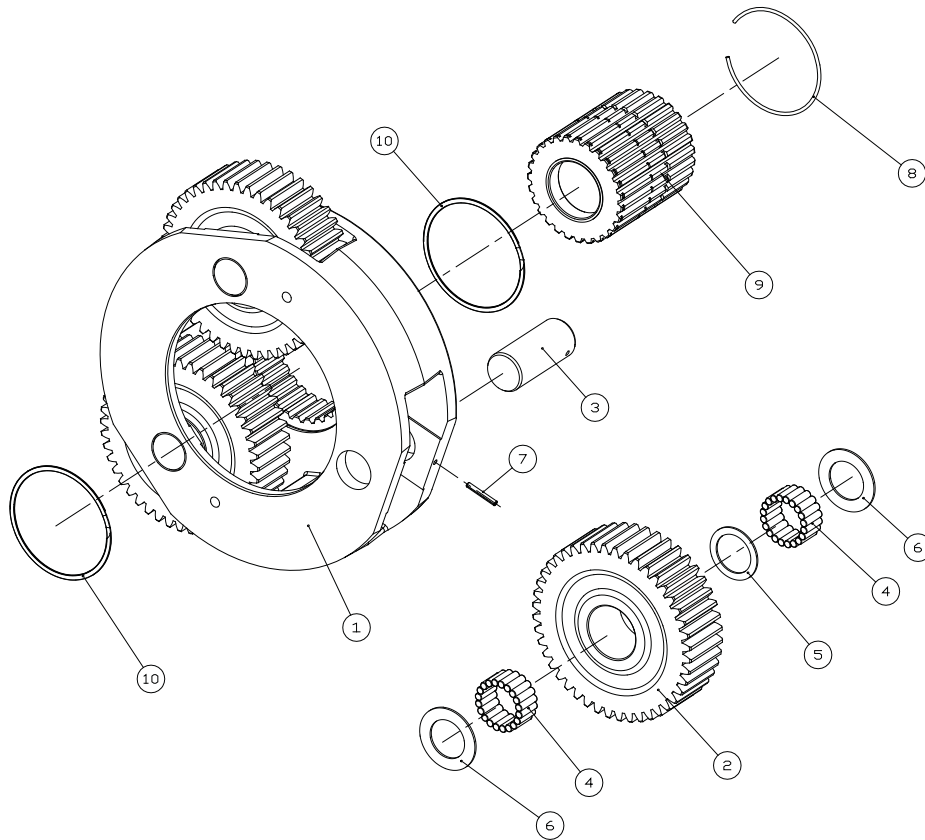
Caterpillar D7E

ITEM	PART NO	DESCRIPTION	QTY
29	126-7138	SPLIT FLANGE KIT	1
30	7X-0313	CAPSCREW (7/16 - 14 X 2 3/4 G8 Z)	4
31	148-8385	ELBOW	1
33	148-8327	ADAPTER	2
34	148-8392	ELBOW	1
41	164-9869	ADAPTER	2
43	8T-8917	CAPSCREW	14
44	8T-4223	WASHER	18
45	8T-8919	CAPSCREW (1/2 - 13 X 1 3/4 G8 Z)	4
46	162-0177	PLUG	2
50	7X-0276	CAPSCREW (5/16 - 18 X 3 1/2 G8 Z)	3
51	8T-4224	WASHER	6
52	6V-8189	NUT, HEX	3
53	356-3866	BRACKET	1
55	148-8395	PLUG, O-RING FLUSH	2
56	197-8745	HOSE ASSY	1
57	7X-0325	CAPSCREW (1/2 - 13 X 2 1/2 G8 Z)	2
60	6V-9829	CAP	1
61	148-8316	ADAPTER	1
62	148-8347	ELBOW	1
63	150-3065	ELBOW	1
64	167-1795	ELBOW	1
65	108590 *	FITTING ASSY ORIFICE	1

*PACCAR Winch Division part number. Caterpillar part number not available at time of printing.

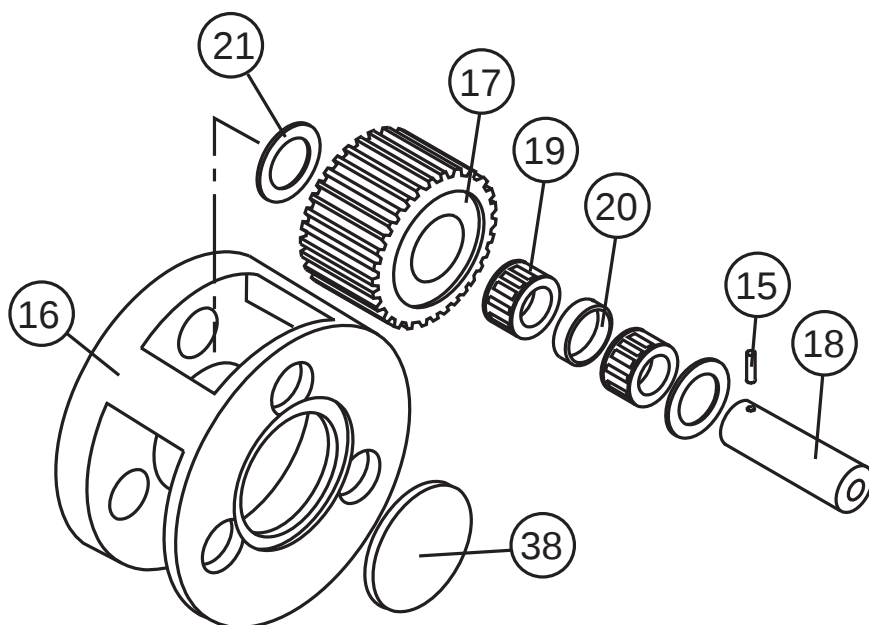
ITEM	PART NO	DESCRIPTION	QTY
1	356-3857	HYD MOTOR	1
2	4S-5898	O-RING	1
3	7X-0345	CAPSCREW (5/8 - 11 X 1 3/4 G8 Z)	2
4	3B-4510	LOCKWASHER	2
5	4F-7391	O-RING	2
6	126-2864	BRAKE VALVE ASSY	1
7	130-7445	CAPSCREW (7/16 - 14 X 2 3/4 G8 S HD)	4
8	126-0824	ADAPTER BLOCK	1
11	148-8367	ELBOW	1
12	148-8432	TEE	1
13	152-8369	HOSE ASSY	1
14	148-8369	ADAPTER	2
15	152-8368	HOSE	3
16	356-3858	BRACKET	1
18	356-3859	VLV DIRECTIONAL CONT	1
19	8T-4195	CAPSCREW, METRIC	4
20	8T-4121	WASHER	4
21	356-3860	VALVE SOLENOID	1
22	148-8378	ELBOW	1
23	158-6521	HOSE ASSY	1
24	148-8368	ELBOW 90°	2
25	150-3033	ELBOW 45°	2
26	356-3863	HOSE	1
28	356-3864	HOSE	1

OUTPUT PLANET CARRIER ASSEMBLY
PA90VS



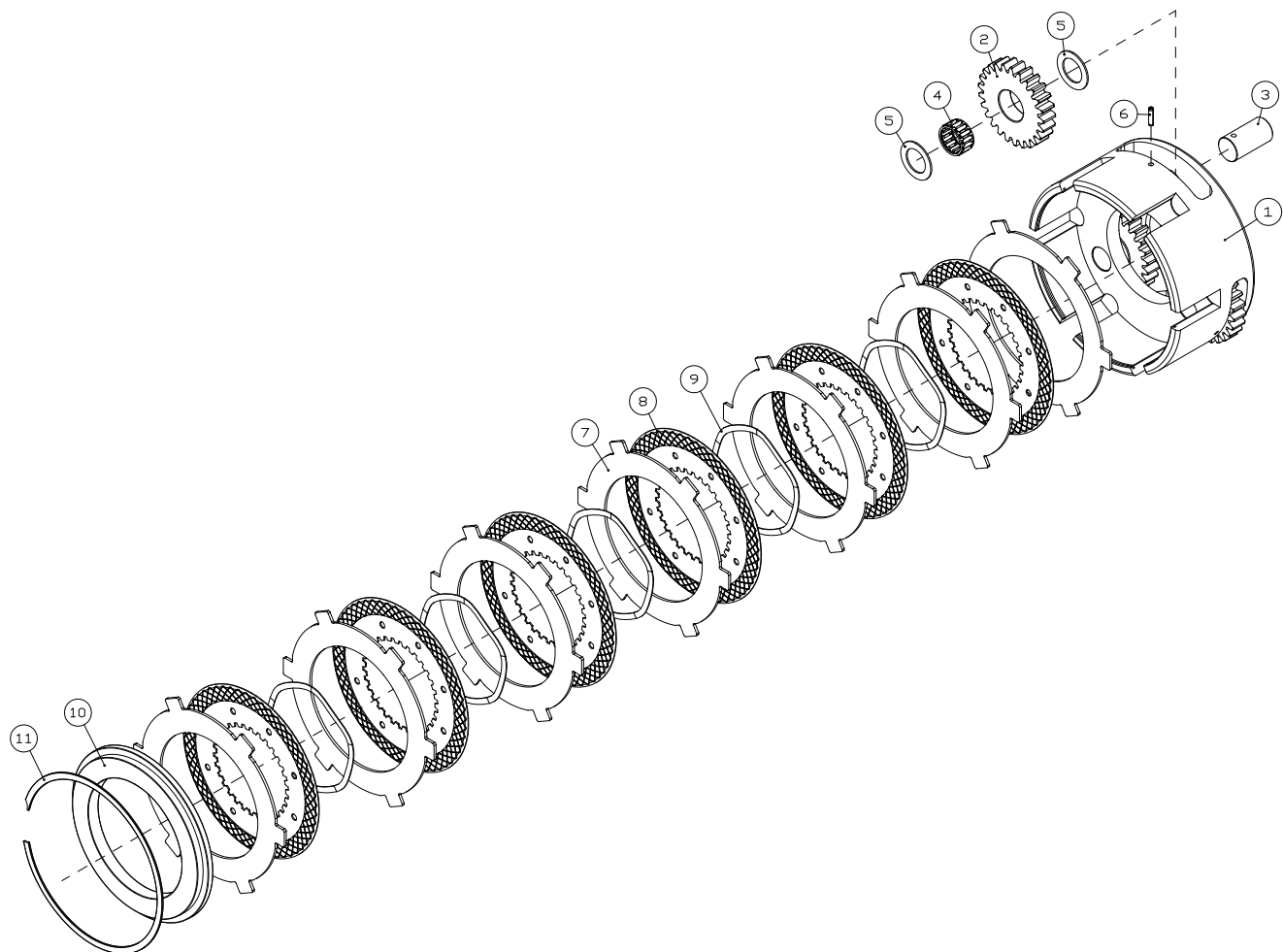
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	126-7135	OUTPUT PLANET CARRIER	1
2	231-2228	PLANET GEAR	3
3	126-0786	PLANET PIN	3
4	126-0785	ROLLER	120
5	126-0779	BEARING SPACER	3
6	126-0784	THRUST WASHER	6
7	4H-4737	ROLLPIN	3
8	126-0783	RETAINING RING	1
9	356-3833	DRUM SHAFT	1
10	6V-4440	RETAINING RING	2

INTERMEDIATE PLANET CARRIER ASSEMBLY
PA90VS



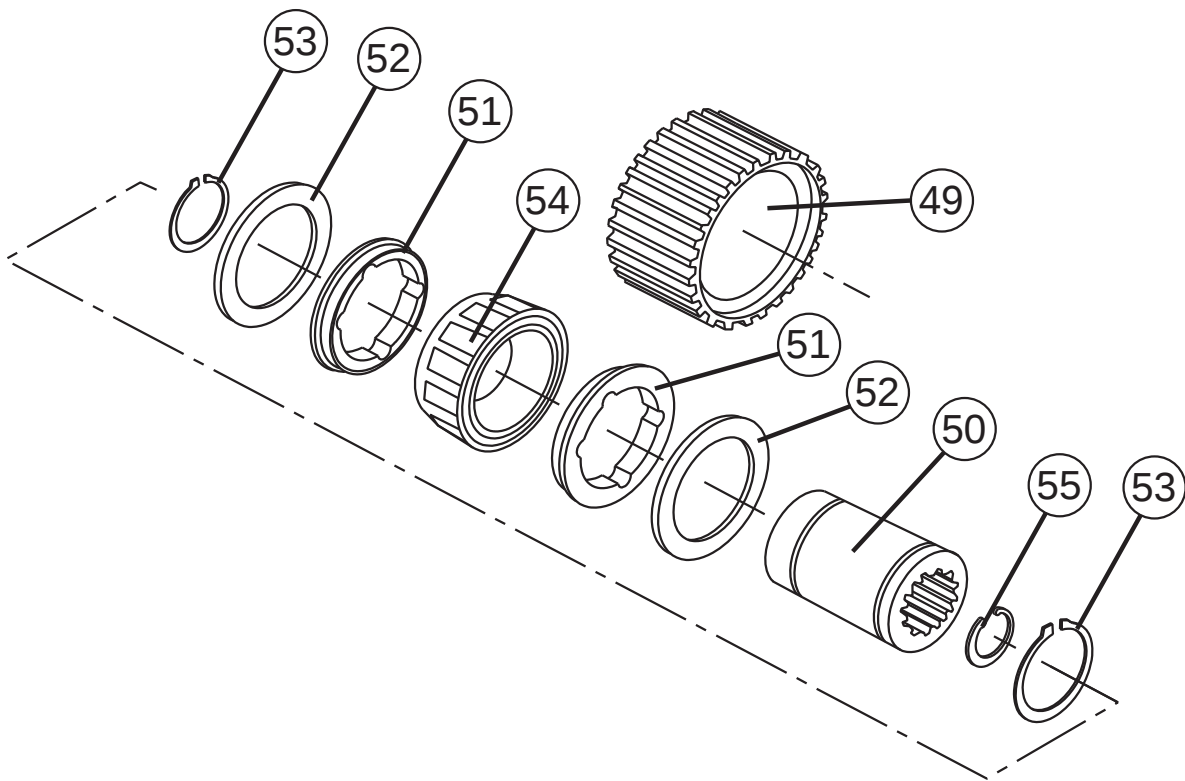
ITEM NO.	PART NO.	DESCRIPTION	QTY
15	356-3837	SPIROL PIN	3
16	356-3835	PLANET CARRIER	1
17	129-7311	PLANET GEAR	3
18	356-3836	PLANET GEAR SHAFT	3
19	031-4784	ROLLER BEARING	6
20	129-7313	BEARING SPACER	3
21	6V-6762	THRUST WASHER	6
38	356-3838	OUTPUT SPACER	1

CARRIER CLUTCH ASSEMBLY **PA90VS**



ITEM NO.	PART NO.	DESCRIPTION	QTY
1	356-3843	CARRIER CLUTCH	1
2	129-7305	PLANET GEAR	3
3	129-7306	PLANET GEAR SHAFT	3
4	129-7286	ROLLER BEARING	3
5	129-7307	BEARING RACE	6
6	126-0822	ROLL PIN	3
7	161-6434	BRAKE PLATE	7
8	161-6435	FRICTION DISC	6
9	231-2245	WAVE SPRING	5
10	231-2246	THRUST RING	1
11	119-1534	RETAINING RING	1

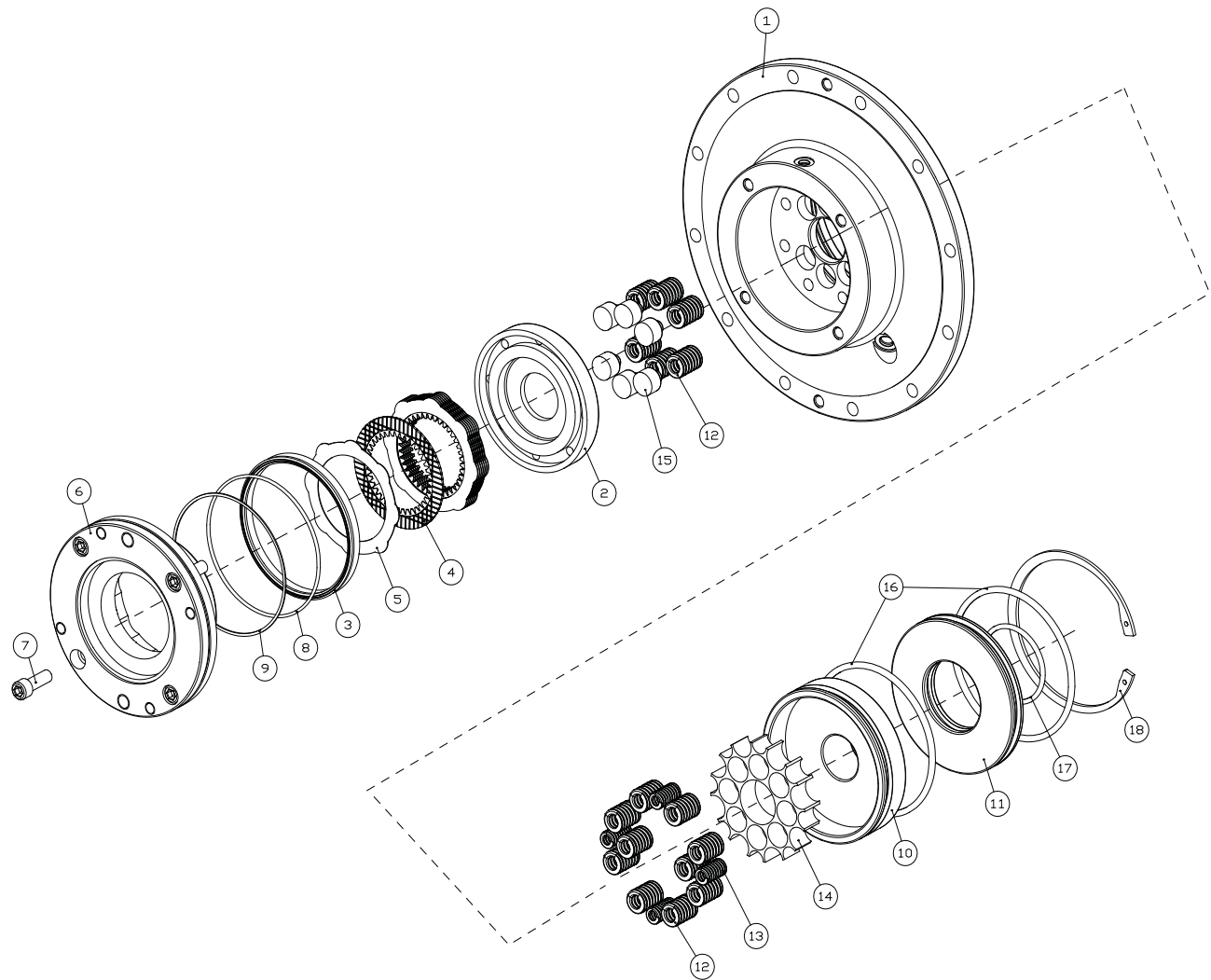
**SPRAG CLUTCH ASSEMBLY
PA90VS**



ITEM NO.	PART NO.	DESCRIPTION	QTY
400	356-3856	SPRAG CLUTCH ASSEMBLY (INCLUDES 49-55)	1
49	NSS	OUTER BRAKE RACE	1
50	NSS	INNER BRAKE RACE	1
51	126-0802	SPRAG BEARING	2
52	119-1572	THRUST BEARING	2
53	6V-7700	RETAINING RING	2
54	NSS	SPRAG CLUTCH	1
55	129-7285	RETAINING RING	1

NSS - Not Serviced Separately

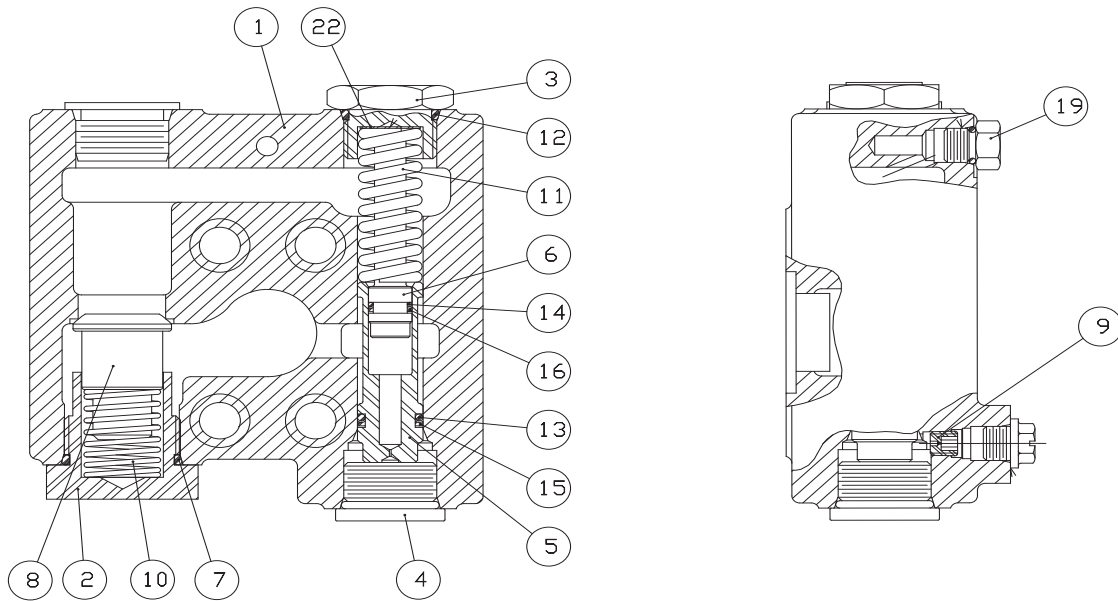
BRAKE HOUSING ASSEMBLY **PA90VS**



ITEM NO.	PART NO.	DESCRIPTION	QTY
1	356-3846	BRAKE HOUSING	1
2	356-3847	PRESSURE PLATE	1
3	3E-4210	SEAL	1
4	129-7321	FRICTION DISC	7
5	203-6623	BRAKE DISC	8
6	270-5167	MOTOR SUPPORT	1
7	21908 *	CAPSCREW (1/2 - 13 X 1 1/2 HEX SOCKET HD)	4
8	129-7294	O-RING	1
9	6J-5541	BACK-UP RING	1
10	356-3849	CLUTCH PISTON	1
11	356-3850	SEAL RING	1
12	356-3851	SPRING	16
13	356-3852	SPRING	4
14	356-3853	SPRING SPACER	1
15	356-3854	SPRING PUCK	6
16	8H-0273	O-RING	2
17	7H-2444	O-RING	1
18	103016 *	RETAINING RING	1

*PACCAR Winch Division part number. Caterpillar part number not available at time of printing.

BRAKE VALVE ASSEMBLY
PA90VS



ITEM NO.	PART NO.	DESCRIPTION	QTY
1	126-2467	BRAKE VALVE HOUSING	1
2	242-7228	VALVE SPRING RETAINER	1
3	296-4278	PLUG, SPRING RETAINER	1
4	9S-8008	PLUG	1
5	126-0819	SPOOL, LOW PRESSURE	1
6	126-2454	STOP, SPOOL	1
7	7M-8485	O-RING	1
8	242-7226	CHECK VALVE POPPET	1
9	126-2453	PILOT ORIFICE	1
10	126-0817	CHECK VALVE SPRING	1
11	242-7227	DIE SPRING	1
13	4J-5268	O-RING	1
15	126-3349	BACK-UP RING	1
19	155-3624	HEX HEAD PLUG (-4SAE)	1
22	8J-7269	SHIM, VALVE SPRING	1

RECOMMENDED FASTENER TORQUE

Higher or lower torque values for special applications will be specified; such as the use of spanner nuts, nuts on shaft ends, jam nuts and where distortion of parts or gaskets is critical.

Lubricated torque values based on use of SAE 30wt engine oil applied to threads and face of bolt or nut.

Avoid using thread lubricants as the applied torque may vary by 10 - 40%, depending upon the product used.

Bolt Dia. Inches	Thds Per Inch	Torque (LB-FT)			
		Grade 5		Grade 8	
		Dry	Lubed	Dry	Lubed
1/4	20 28	8	6	12	9
5/16	18 24	17	13	24	18
3/8	16 24	31	23	45	35
7/16	14 20	50	35	70	50
1/2	13 20	75	55	110	80
9/16	12 18	110	80	150	110
5/8	11 18	150	115	210	160

Bolt Dia. Inches	Thds Per Inch	Torque (LB-FT)			
		Grade 5		Grade 8	
		Dry	Lubed	Dry	Lubed
3/4	10 16	265	200	380	280
7/8	9 14	420	325	600	450
1	8 14	640	485	910	680
1 1/8	7 12	790	590	1290	970
1 1/4	7 12	1120	835	1820	1360
1 3/8	6 12	1460	1095	2385	1790
1 1/2	6 12	1940	1460	3160	2370

To convert lb•ft to kg•m, multiply lb•ft value by 0.1383.

METRIC CONVERSION TABLE

English to Metric			Metric to English		
LINEAR					
inches (in.)	X 25.4	= millimeters (mm)	millimeters (mm)	X 0.3937	= inches (in.)
feet (ft.)	X 0.3048	= meters (m)	meters (m)	X 3.281	= feet (ft.)
miles (mi.)	X 1.6093	= kilometers (km)	kilometers (km)	X 0.6214	= miles (mi.)
AREA					
inches ² (sq.in.)	X 645.15	= millimeters ² (mm ²)	millimeters ² (mm ²)	X 0.000155	= inches ² (sq.in.)
feet ² (sq.ft.)	X 0.0929	= meters ² (m ²)	meters ² (m ²)	X 10.764	= feet ² (sq.ft.)
VOLUME					
inches ³ (cu.in.)	X 0.01639	= liters (l)	liters (l)	X 61.024	= inches ³ (cu.in.)
quarts (qts.)	X 0.94635	= liters (l)	liters (l)	X 1.0567	= quarts (qts.)
gallons (gal.)	X 3.7854	= liters (l)	liters (l)	X 0.2642	= gallon (gal.)
inches ³ (cu.in.)	X 16.39	= centimeters ³ (cc)	centimeters3 (cc)	X 0.06102	= inches ³ (cu.in.)
feet ³ (cu.ft.)	X 28.317	= liters (l)	liters (l)	X 0.03531	= feet ³ (cu.ft.)
feet ³ (cu.ft.)	X 0.02832	= meters ³ (m ³)	meters3 (m3)	X 35.315	= feet ³ (cu.ft.)
fluid ounce (fl.oz.)	X 29.57	= millileters (ml)	milliliters (ml)	X 0.03381	= fluid ounce (fl.oz.)
MASS					
ounces (oz.)	X 28.35	= grams (g)	grams (g)	X 0.03527	= ounces (oz.)
pounds (lbs.)	X 0.4536	= kilograms (kg)	kilograms (kg)	X 2.2046	= pounds (lbs.)
tons (2000 lbs.)	X 907.18	= kilograms (kg)	kilograms (kg)	X 0.001102	= tons (2000 lbs.)
tons (2000 lbs.)	X 0.90718	= metric tons (t)	metric tons (t)	X 1.1023	= tons (2000 lbs.)
tons (long) (2240 lbs.)	X 1013.05	= kilograms (kg)	kilograms (kg)	X 0.000984	= tons (long) (2240 lbs.)
PRESSURE					
inches Hg (60 °F)	X 3600	= kilopascals (kPa)	kilopascals (kPa)	X 0.2961	= inches Hg (60 °F)
pounds/sq.in. (PSI)	X 6.895	= kilopascals (kPa)	kilopascals (kPa)	X 0.145	= pounds/sq.in. (PSI)
pounds/sq.in. (PSI)	X 0.0703	= kilograms/sq.cm. (kg/cm ²)	kilograms/sq.cm. (kg/cm2)	X 14.22	= pounds/sq.in. (PSI)
pounds/sq.in. (PSI)	X 0.069	= bars	bars	X 14.5	= pounds/sq.in. (PSI)
inches H ₂ O (60 °F)	X 0.2488	= kilopascals (kPa)	kilopascals (kPa)	X 4.0193	= inches H ₂ O (60 °F)
bars	X 100	= kilopascals (kPa)	kilopascals (kPa)	X 0.01	= bars
POWER					
horsepower (hp)	X 0.746	= kilowatts (kW)	kilowatts (kW)	X 1.34	= horsepower (hp)
ft.-lbs./min.	X 0.0226	= watts (W)	watts (W)	X 44.25	= ft.-lbs./min.
TORQUE					
pound-inches (in.-lbs.)	X 0.11298	= newton-meters (N-m)	newton-meters (N-m)	X 8.851	= pound-inches (in.lbs.)
pound-feet (ft.-lbs.)	X 1.3558	= newton-meters (N-m)	newton-meters (N-m)	X 0.7376	= pound-feet (ft.-lbs.)
pound-feet (ft.-lbs.)	X .1383	= kilograms/meter (kg-m)	kilogram/meter (kg-m)	X 7.233	= pound-feet (ft.-lbs.)
VELOCITY					
miles/hour (m/h)	X 0.11298	= kilometers/hour (km/hr)	kilometers/hour (km/hr)	X 0.6214	= miles/hour (m/h)
feet/second (ft./sec.)	X 0.3048	= meter/second (m/s)	meters/second (m/s)	X 3.281	= feet/second (ft./sec.)
feet/minute (ft./min.)	X 0.3048	= meter/minute (m/min)	meters/minute (m/min)	X 3.281	= feet/minute (ft./min.)
TEMPERATURE					
°Celsius = 0.556 (°F - 32)			°Fahrenheit = (1.8 X °C) + 32		
COMMON METRIC PREFIXES					
mega	(M)	= 1,000,000 or 10 ⁶	deci	(d)	= 0.1 or 10 ⁻¹
kilo	(k)	= 1,000 or 10 ³	centi	(c)	= 0.01 or 10 ⁻²
hecto	(h)	= 100 or 10 ²	milli	(m)	= 0.001 or 10 ⁻³
deka	(da)	= 10 or 10 ¹	micro	(µ)	= 0.000.001 or 10 ⁻⁶