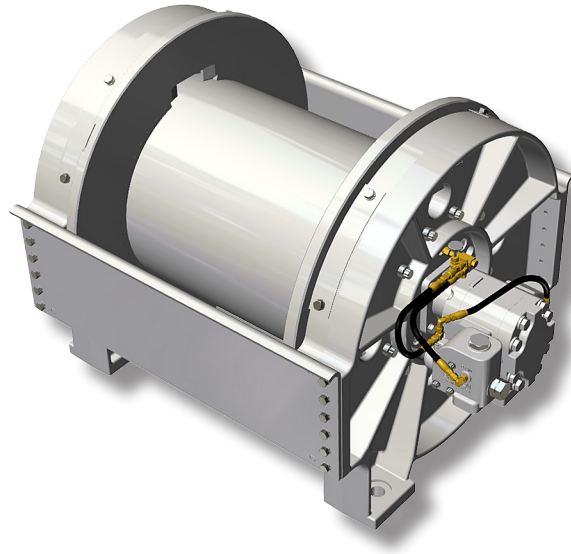


PARTS LIST

CH400B Construction Hoist



WRITE WINCH SERIAL NUMBER BELOW

--	--	--	--	--	--	--



**First 2 numbers indicate
year manufactured**

For serial number location see page 3

Visit our Web site at www.paccarwinch.com for the most comprehensive collection of winch, hoist, and drive information on the Internet. Most publications and specification sheets are available for downloading.

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FOREWORD

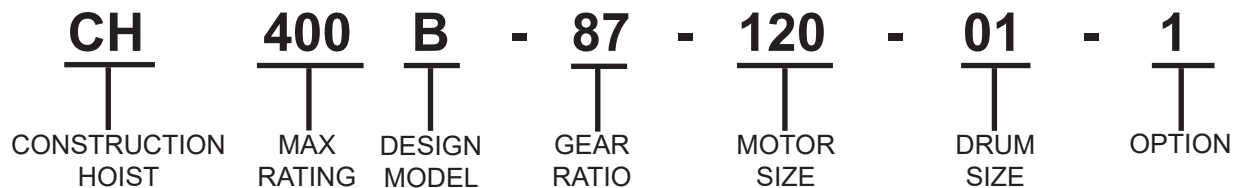
Read and understand this entire publication before operating or servicing your BRADEN hoist. Retain this manual for future reference.

The following service illustrations have been prepared to provide assembly, disassembly, and maintenance information for the hoist units covered in this publication. It is suggested that before performing any work on these units, all assembly and disassembly instructions should be read and understood.

Some illustrations in this manual may show details or attachments different from your hoist. Some components have been removed for illustrative purposes. Drawings in this manual represent a typical unit sold through distribution channels. Some hoists, particularly those sold directly to original equipment manufacturers, may differ in appearance and options.

Continuing product improvement may cause changes in your hoist which may not be included in this manual. For inquiries regarding your BRADEN hoist or this publication, contact your nearest BRADEN/Gearmatic dealer or the factory Service Department at 918-251-8511, Monday–Friday, 8:00 a.m. to 4:30 p.m. (CST).

EXPLANATION OF MODEL NUMBER



CH	Construction hoist
400	40,000-lb. first-layer line pull
B	Model series relating to design changes
87	Total gear reduction
120	Hydraulic motor displacement in cubic inches/revolution (decimal point eliminated, example 120 – 12.0 cu. in/rev)
01	Drum option
1	Permits testing and inspection per API 2C for offshore cranes

TO ORDER:

1. List model and serial numbers of the hoist.
2. Refer to cross-section drawing (exploded view), select the component(s) needed, and note item number.
3. Find item number on parts list. Show part number, description, and quantity required on your order.
4. Refer to Parts List and show price for each component or assembly.

RECOMMENDED PLANETARY GEAR OIL

Field experience, supported by engineering endurance tests, indicates the use of the proper gear oil and a program of regular preventive maintenance will help provide extended gear train life and reliable hoist brake performance. For this reason, BRADEN has published the following specifications to assist in determining which lubricant is best suited to your application.

For simplicity, BRADEN has listed available products in each temperature range that have been tested and found to meet our specifications. This is not to say that other lubricant brands would not perform equally as well.

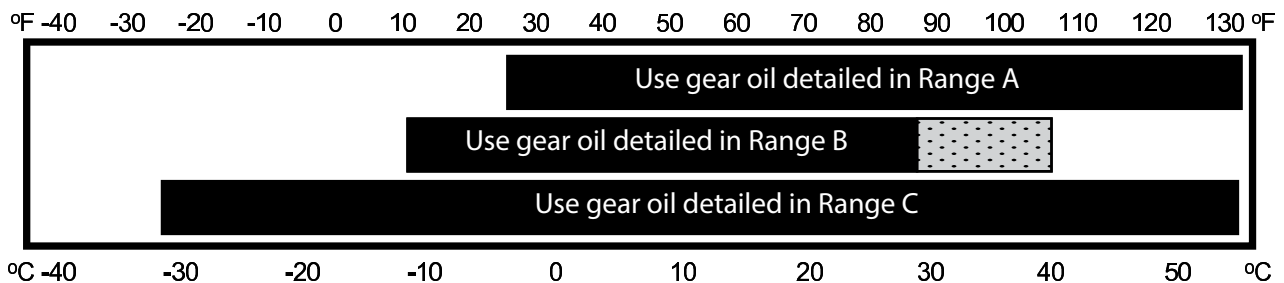
If the following lubricant brands are not available in your area, make certain your lubricant vendor supplies you with oil equivalent to those products listed below.

! WARNING !

Failure to use the proper type and viscosity of planetary gear oil may contribute to intermittent brake clutch slippage, which could result in property damage, severe personal injury, or death. Some gear lubricants contain large amounts of EP (Extreme Pressure) and anti-friction additives, which may contribute to brake clutch slippage or damage to brake friction discs or seals. **NOTE: DO NOT use oil that is labeled as meeting "API Service GL-5."** Oil viscosity, affected by ambient temperature, is also critical to reliable brake clutch operation. Our tests indicate excessively heavy or thick gear oil may contribute to intermittent brake clutch slippage. Make certain the gear oil viscosity used in your hoist is correct for your prevailing ambient temperature.

RECOMMENDED GEAR OIL

PREVAILING AMBIENT TEMPERATURE



SHADED TEMPERATURE RANGE IN THE CHART ABOVE NOT RECOMMENDED FOR SEVERE APPLICATIONS SUCH AS SUSTAINED FAST DUTY CYCLES OR FREQUENT WINCHING.

Winches are factory filled with Mobilgear 600 XP 150 or equivalent. Consult your oil supplier for other equivalent oils if required.

	Mobil	Shell	Chevron	Texaco
Range A	Mobilgear 600 XP 220	Omala S2 G 220	Gear Compounds EP 220	Meropa 220
Range B	Mobilgear 600 XP 150	Omala S2 G 150	Gear Compounds EP 150	Meropa 150
Range C	Mobilgear SHC 150	Omala S4 GX 150		

BRADEN
CARCO
Gearmatic

PACCAR WINCH
800 East Dallas Street
Broken Arrow, OK 74012
918-251-8511

SEAL KITS

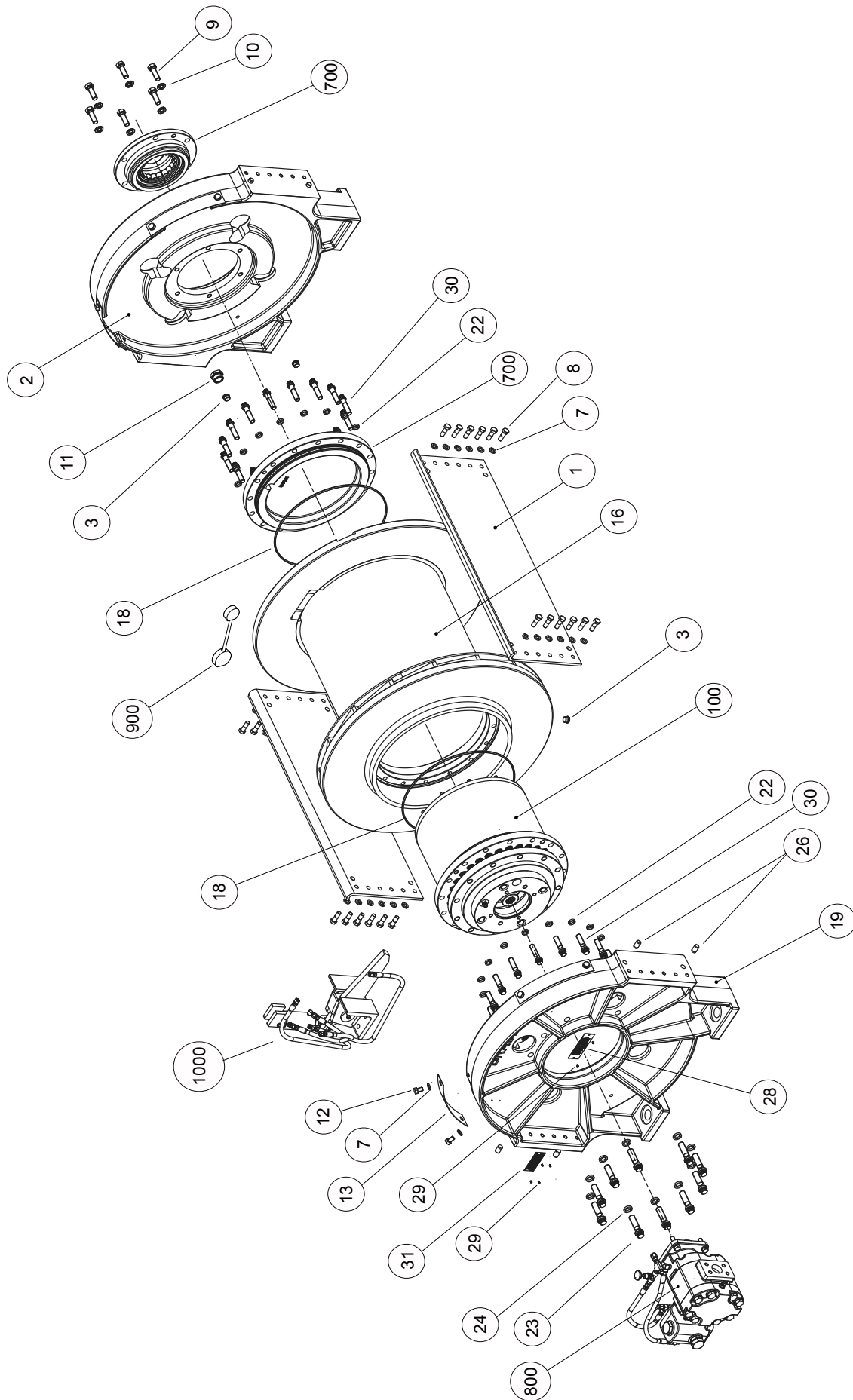
SEAL KIT – PART NUMBER 64266 (STANDARD HOIST)		
DESCRIPTION	PART NO.	QTY.
O-ring	13542	1
Seal	28816	1
Carrier, seal	28808	1
O-ring	28973	1
O-ring	103317	2
O-ring	10330	1
Backup ring	100033	1
O-ring	24484	1
O-ring	22685	1
Backup ring	72123	1
Lip seal	103086	1
O-ring	22358	1
O-ring	72112	1
O-ring	10052	1

SEAL KIT – PART NUMBER 64267 (HOIST WITH AUXILIARY BRAKE)		
DESCRIPTION	PART NO.	QTY.
O-ring	28934	1
O-ring	107860	2
O-ring	107859	2
Lip seal	105231	1
O-ring	29296	1
O-ring	103317	2
O-ring	10330	1
O-ring	103980	1
Backup ring	100033	1
O-ring	26373	1
O-ring	24484	1
O-ring	22685	1
Backup ring	72123	1
Lip seal	103086	1
O-ring	22358	1
O-ring	72112	1

BRAKE UPGRADE KIT

BRAKE UPGRADE KIT PART NUMBER 65355		
DESCRIPTION	PART NO.	QTY.
Brake piston, coated	111837	1
O-ring	111843	1
O-ring	111844	1

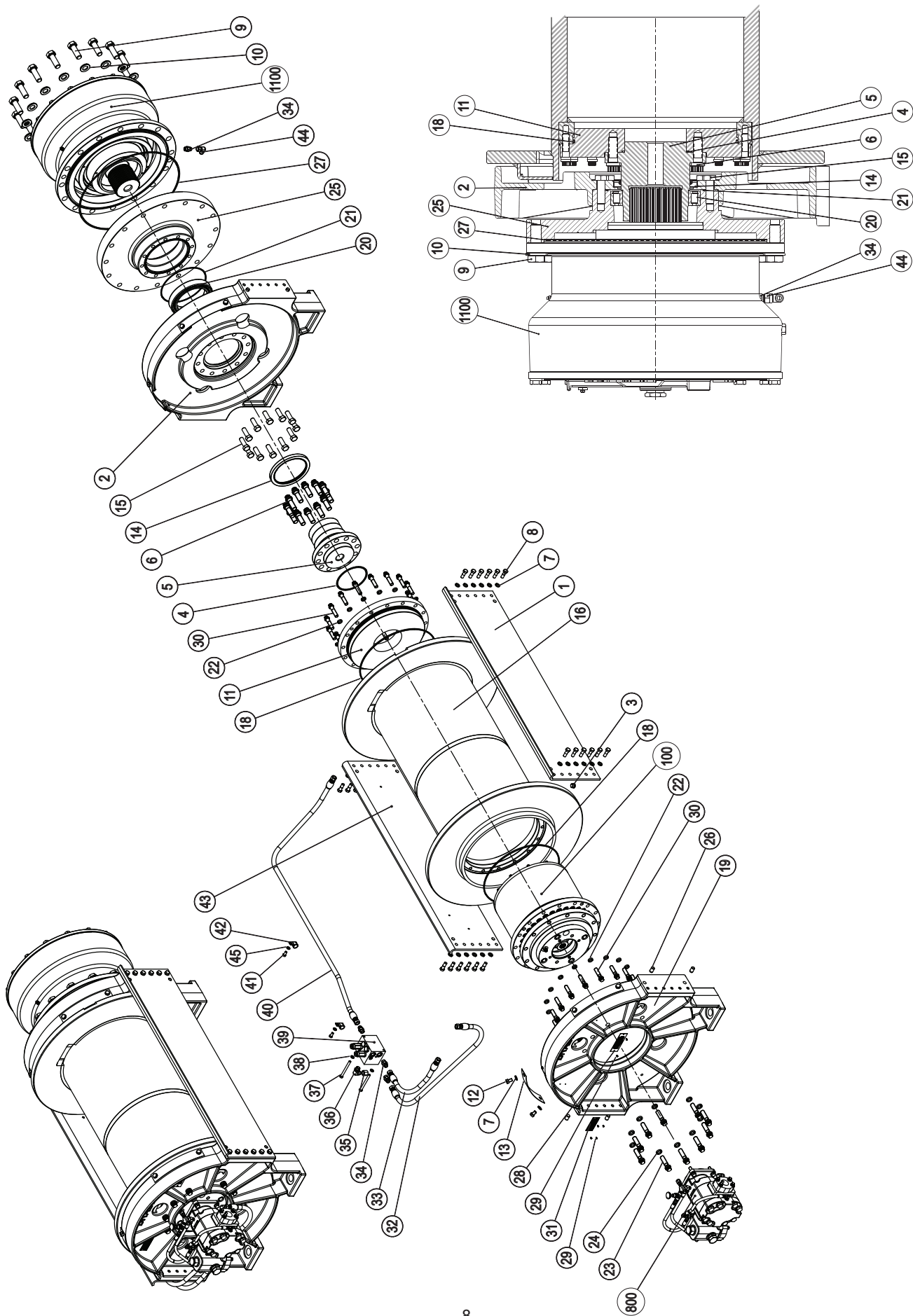
HOIST ASSEMBLY — STANDARD UNIT



HOIST ASSEMBLY — STANDARD UNIT

ITEM NO.	DESCRIPTION	PART NO.	QTY.
100	HD400B drive assembly	---	1
700	Drum support assembly	83031	1
800	Hydraulic motor group	---	1 - A/R
900	Cable clamp group (1 and 1-1/8 wire rope)	63249	1
1000	Ratchet and pawl group	64100	1 - A/R
1	Tie plate	23287	2
2	Support end plate	28835	1
3	Plug	32411	3
7	Lockwasher (1/2, Z)	11026	32
8	Capscrew, hex head (1/2 – 13 x 1-1/2, Grade 8, Z)	104322	24
9	Capscrew, hex head (5/8 – 11 x 2, Grade 8, Z)	72563	8
10	Lockwasher (5/8, Z)	102423	8
11	Sight gauge	25958	1
12	Capscrew, hex head (1/2 x 3/4, Grade 8, Z)	103250	8
13	Guard plate	26788	4
16	Cable drum (-01)	104267	1
	Cable drum (-02)	83027	1
	Cable drum (-21)	83330	1
	Cable drum (-01P)	83334	1
	Cable drum (-02P)	83579	1
18	O-ring	103317	2
19	Motor end plate	103276	1
22	Lockwasher, high-collar (5/8, Z)	102335	32
23	Capscrew, 12-pt (3/4 – 10 x 2-3/4, Z)	103349	10
24	Lockwasher, high-collar (3/4, Z)	103253	10
26	Dowel pin	21112	8
29	Drive screw	11842	6
30	Capscrew, 12-pt (5/8 – 11 x 2-1/2, Z)	103344	32
31	Nameplate	76381	1
32	Protector (SAE C)	NSS*	1
	Shipping cover (SAE D)	NSS*	1
33	Capscrew (SAE C)	NSS*	2
	Capscrew (SAE D)	NSS*	4
34	Cap	75281	1
35	O-ring (SAE C motor pilot)	10330	1
* NSS – Not serviced separately.			

HOIST ASSEMBLY – UNITS WITH AUXILIARY BRAKE



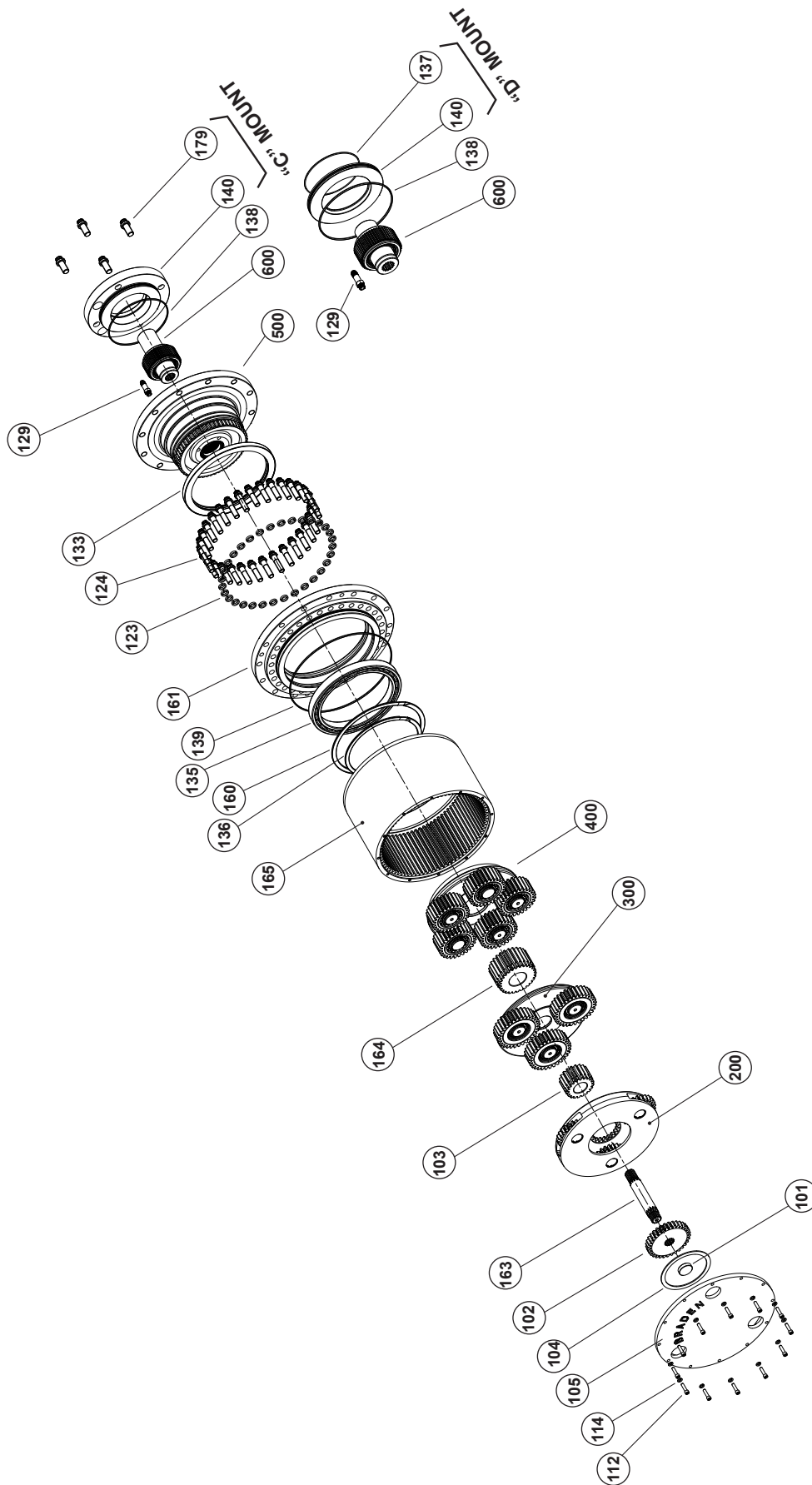
HOIST ASSEMBLY – UNITS WITH AUXILIARY BRAKE

ITEM NO.	DESCRIPTION	PART NO.	QTY.
20	Bearing	105232	1
21	O-ring	103980	1
22	Lockwasher, high-collar (5/8, Z)	102335	32
23	Capscrew, 12-pt (3/4 – 10 x 2-3/4, Z)	103349	10
24	Lockwasher, high-collar (3/4, Z)	103253	10
25	Adapter plate	105584	1
26	Dowel pin	21112	8
27	O-ring	26373	1
28	Approval plate	NSS*	1
29	Drive screw	11842	6
30	Capscrew, 12-pt (5/8 – 11 x 2-1/2, Z)	103344	32
31	Nameplate	76381	1
32	Hose assembly, -8 x 32.0 inches (813 mm)	70273	1
33	Hose assembly, -8 x 18.0 inches (457 mm)	69526	1
34	Adapter	70100	4
35	Cap	29908	1
36	Elbow	70109	1
37	Capscrew, hex head (5/16 – 18 x 4, Grade 8, Z)	104307	2
38	Lockwasher (5/16, Z)	11024	4
39	Combination valve assembly	105357	1
40	Hose assembly, -8 x 65.0 inches (1651 mm)	102893	1
41	Capscrew, hex head (3/8 – 16 x 3/4, Grade 8, Z)	104135	2
42	Hose clamp	25869	2
43	Tie plate	105599	1
44	Elbow	29046	1
45	Lockwasher (3/8, Z)	27152	2

* NSS – Not serviced separately.

ITEM NO.	DESCRIPTION	PART NO.	QTY.
100	HD400B drive assembly	---	1
800	Hydraulic motor group	---	1 - A/R
900	Cable clamp group (1 and 1-1/8 wire rope)	63249	1
1000	Ratchet and pawl group	64100	1 - A/R
1100	Auxiliary brake assembly	83333	1 - A/R
1	Tie plate	23287	1
2	Support end plate	105137	1
3	Plug	32411	1
4	O-ring	28934	1
5	Support shaft	105595	1
6	Capscrew, 12-pt (7/8 – 9 x 2-1/2)	105586	12
7	Lockwasher (1/2, Z)	11026	32
8	Capscrew, hex head (1/2 – 13 x 1-1/2, Grade 8, Z)	104322	24
9	Capscrew, hex head (1- 8 x 3, Grade 8, Z)	102597	16
10	Washer, hard (1-inch, Z)	101205	16
11	Drum support	105585	1
12	Capscrew, hex head (1/2 -13 x 3/4, Grade 8, Z)	103250	8
13	Guard plate	26788	4
14	Seal	105231	1
15	Capscrew, hex head (3/4 – 10 x 2-3/4, Grade 8, Z)	70791	12
16	Cable drum (-01)	104267	1
	Cable drum (-02)	83027	1
	Cable drum (-21)	83330	1
	Cable drum (-01P)	83334	1
	Cable drum (-02P)	83579	1
18	O-ring	103317	2
19	Motor end plate	103276	1

HOIST DRIVE

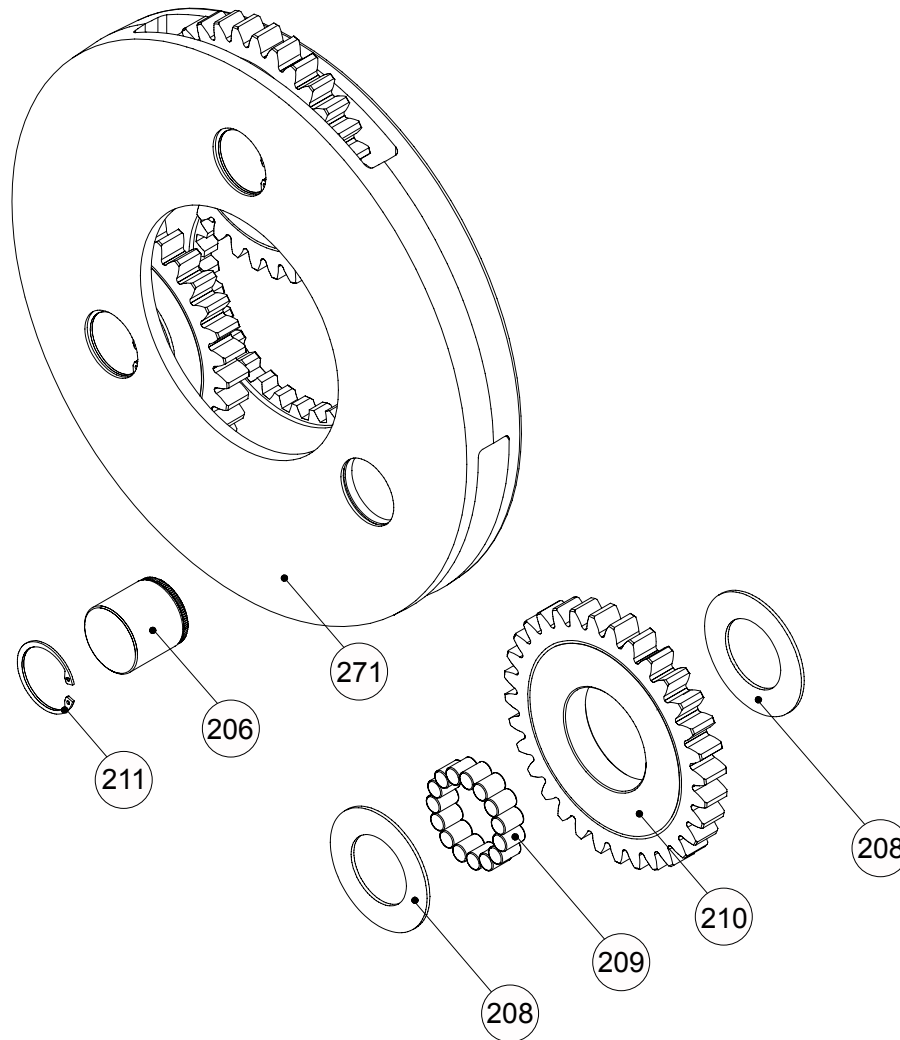


HOIST DRIVE

ITEM NO.	DESCRIPTION	PART NO.	QTY.
112	Capscrew, socket head (5/16 – 18 x 1)	24286	12
114	Lockwasher (5/16 Z)	11024	12
123	Lockwasher, high-collar (5/8, Z)	102335	32
124	Capscrew, 12-pt (5/8 – 11 x 2-1/2, Z)	103344	32
129	Adapter, long	29847	1
133	Seal	103086	1
135	Bearing	103080	1
136	Retaining ring	103087	1
137	O-ring (for SAE D motor mount)	10052	1
138	O-ring	22358	1
139	O-ring	72112	1
140	Motor adapter (SAE D)	103091	1
	Motor adapter (SAE C)	103273	
160	Retaining ring	103089	1
161	Bearing carrier	102989	1
163	Shaft (70:1 ratio only)	104344	1
164	Final sun gear	102408	1
165	Ring gear	102266	1
179	Capscrew (SAE C mount only)	103345	4
180	Tag "PRODUCT SHIPPED WITHOUT OIL" (not shown)	109034	1

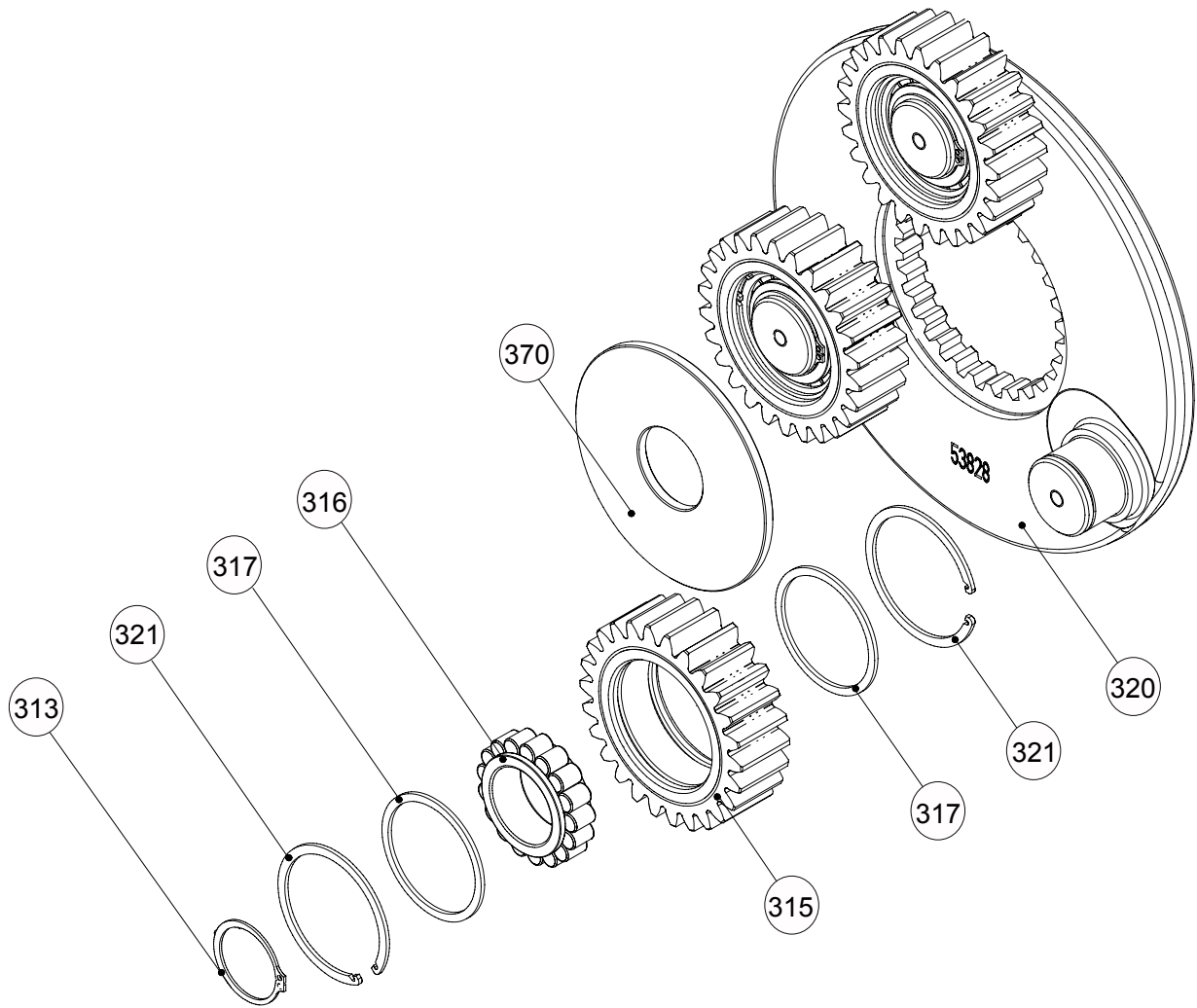
ITEM NO.	DESCRIPTION	PART NO.	QTY.
200	Primary planet carrier assembly (70:1 ratio)	83538	1
	Primary planet carrier assembly (87:1 ratio)	82778	
300	Primary planet carrier assembly (101:1 ratio)	83071	1
	Secondary planet carrier assembly (70:1 / 101:1 ratio)	83072	
	Secondary planet carrier assembly (87:1 ratio)	82809	
400	Final planet carrier assembly	82780	1
500	Brake cylinder assembly	82918	1
600	Overrunning clutch assembly	---	1
101	Thrust button	102322	1
102	Primary sun gear (70:1 ratio)	104334	1
	Primary sun gear (87:1 ratio)	102166	
	Primary sun gear (101:1 ratio)	102406	
103	Secondary sun gear (70:1 / 101:1 ratio)	102428	1
	Secondary sun gear (87:1 ratio)	102429	
104	Thrust washer	28728	1
105	Cover	102507	1

PRIMARY PLANET CARRIER



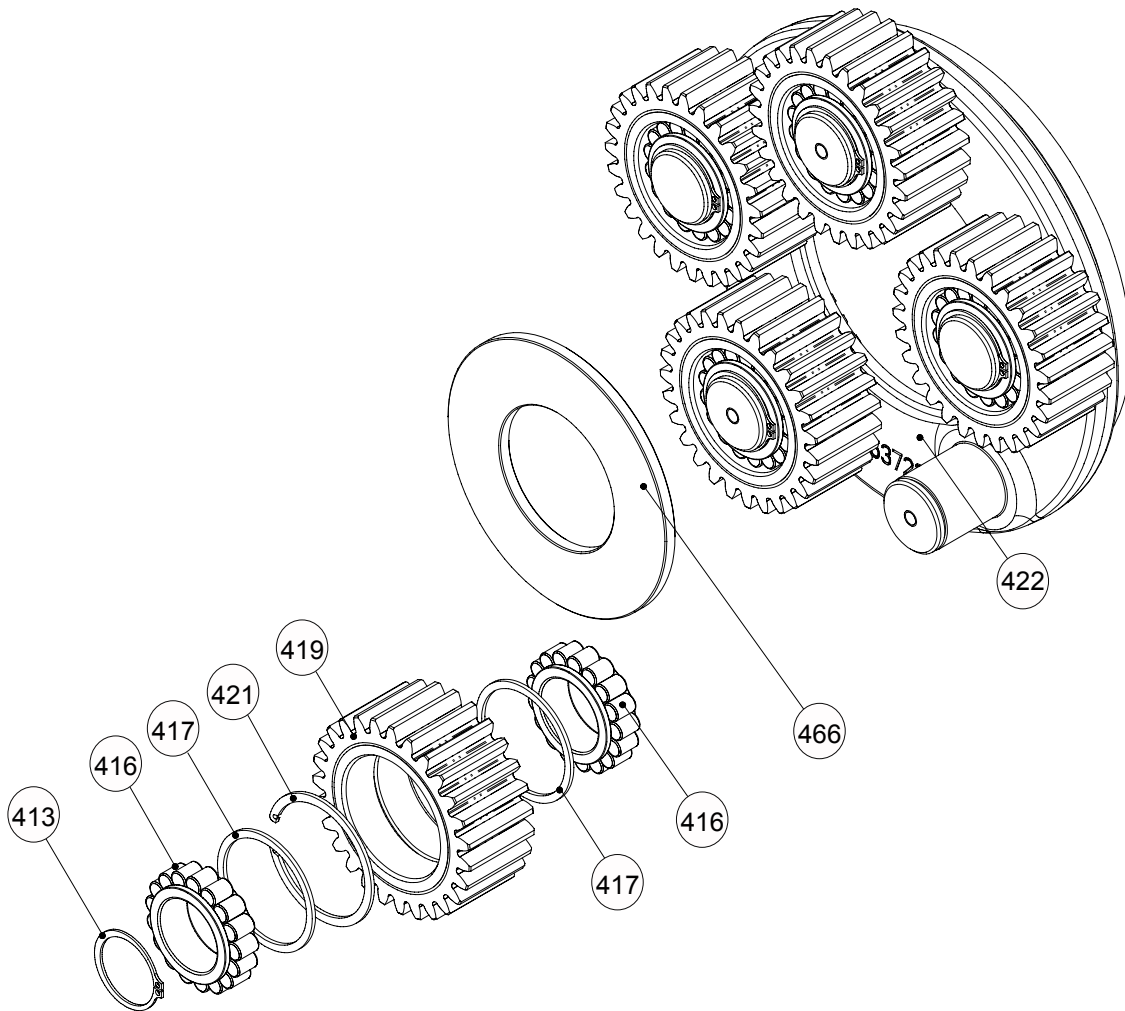
ITEM NO.	DESCRIPTION	PART NO.	QTY.
200	Primary planet carrier assembly (70:1 ratio)	83538	1
	Primary planet carrier assembly (87:1 ratio)	82778	
	Primary planet carrier assembly (101:1 ratio)	83071	
206	Primary planet pin	101921	3
208	Thrust washer	102324	6
209	Bearing roller	102325	45
210	Planet gear (70:1 ratio)	104333	3
	Planet gear (87:1 ratio)	102326	
	Planet gear (101:1 ratio)	102395	
211	Retaining ring	28734	3
271	Primary planet carrier (70:1 ratio)	106932	1
	Primary planet carrier (87:1 ratio)	101887	
	Primary planet carrier (101:1 ratio)	102741	

SECONDARY PLANET CARRIER



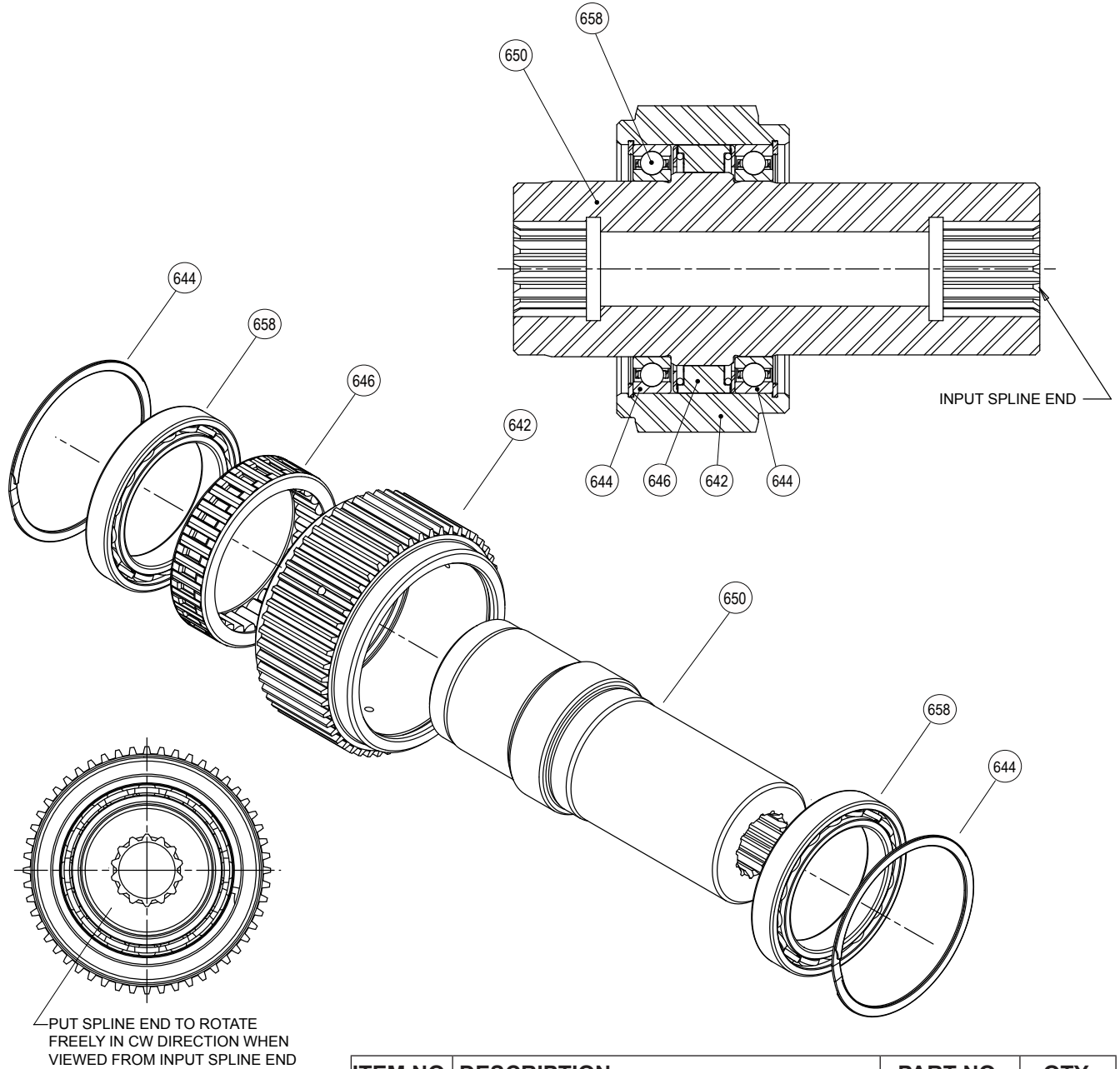
ITEM NO.	DESCRIPTION	PART NO.	QTY.
300	Secondary planet carrier assembly (70:1 / 101:1 ratio)	83072	1
	Secondary planet carrier assembly (87:1 ratio)	82809	
313	Retaining ring	12034	3
315	Secondary planet gear (70:1 / 101:1 ratio)	102382	3
	Secondary planet gear (87:1 ratio)	102328	
316	Bearing	102288	3
317	Thrust spacer	102296	6
320	Secondary planet carrier (70:1 / 101:1 ratio)	102738	1
	Secondary planet carrier (87:1 ratio)	102596	
321	Retaining ring	102330	6
370	Thrust spacer	102339	1

FINAL PLANET CARRIER



ITEM NO.	DESCRIPTION	PART NO.	QTY.
400	Final planet carrier assembly	82780	1
413	Retaining ring	12034	5
416	Bearing	102288	10
417	Thrust spacer	102296	10
419	Final planet gear	102332	5
421	Retaining ring	102330	5
422	Final planet carrier	101868	1
466	Thrust spacer	102338	1

OVERRUNNING CLUTCH ASSEMBLY

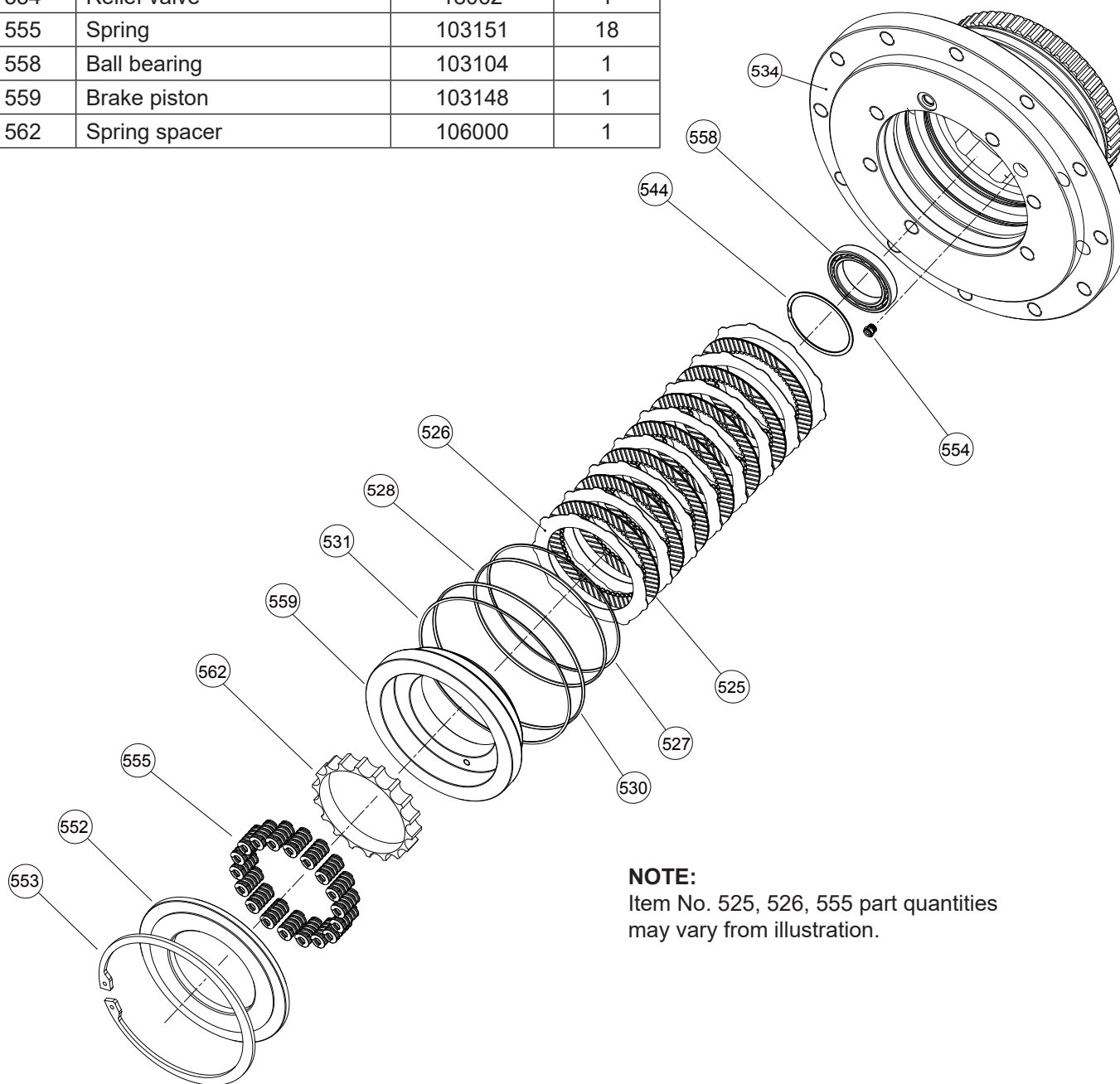


ITEM NO.	DESCRIPTION	PART NO.	QTY.
600	Overrunning clutch, D-shaft, overwound	82912	1
	Overrunning clutch, D-shaft, underwound	83527	
	Overrunning clutch, C-shaft, overwound	82911	
	Overrunning clutch, C-shaft, underwound	83506	
642	Outer race	NSS*	1
644	Retaining ring	103110	2
646	Overrunning clutch	NSS*	1
650	Inner brake race (D-shaft)	NSS*	1
	Inner brake race (C-shaft)	NSS*	
658	Ball bearing	103104	2
659	Retaining ring (D-shaft only)	24506	1

* **NSS** – Not serviced separately.

BRAKE CYLINDER ASSEMBLY

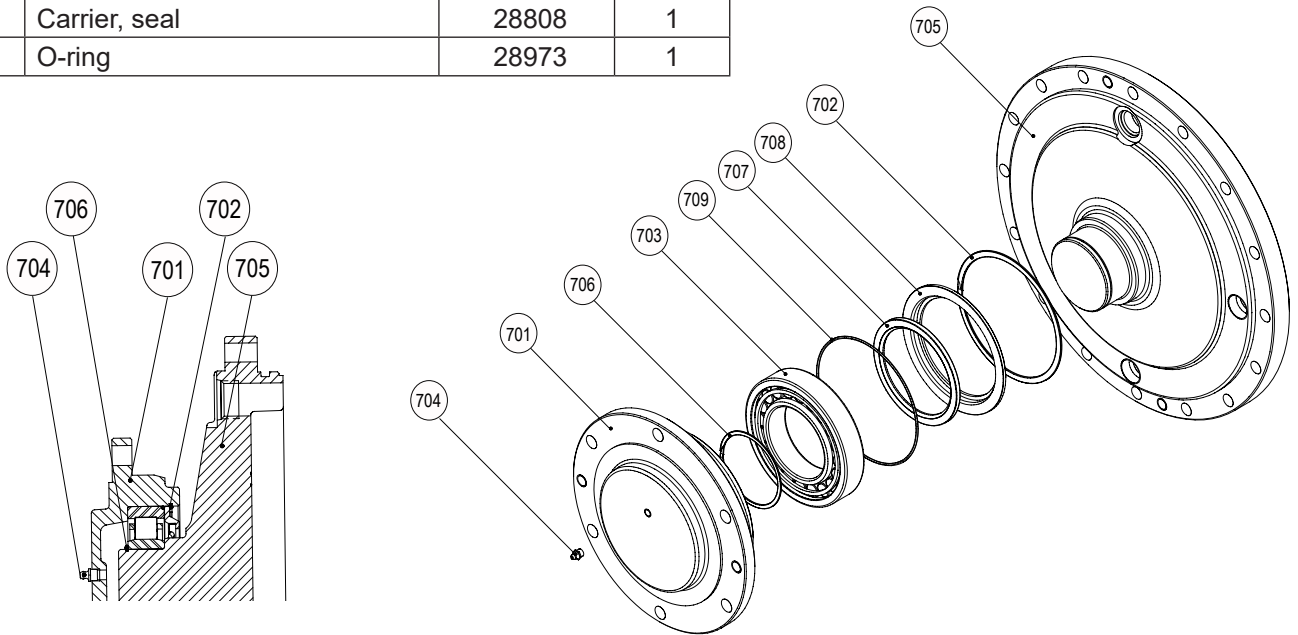
ITEM NO.	DESCRIPTION	PART NO.	QTY.
500	Brake cylinder assembly	82918	1
525	Friction disc	103167	7
526	Brake disc	102954	8
527	Backup ring	100033	1
528	O-ring	24484	1
530	O-ring	22685	1
531	Backup ring	72123	1
534	Motor support	102988	1
544	Retaining ring	103110	1
552	Spring stop	103150	1
553	Retaining ring	103154	1
554	Relief valve	18062	1
555	Spring	103151	18
558	Ball bearing	103104	1
559	Brake piston	103148	1
562	Spring spacer	106000	1



NOTE:
Item No. 525, 526, 555 part quantities may vary from illustration.

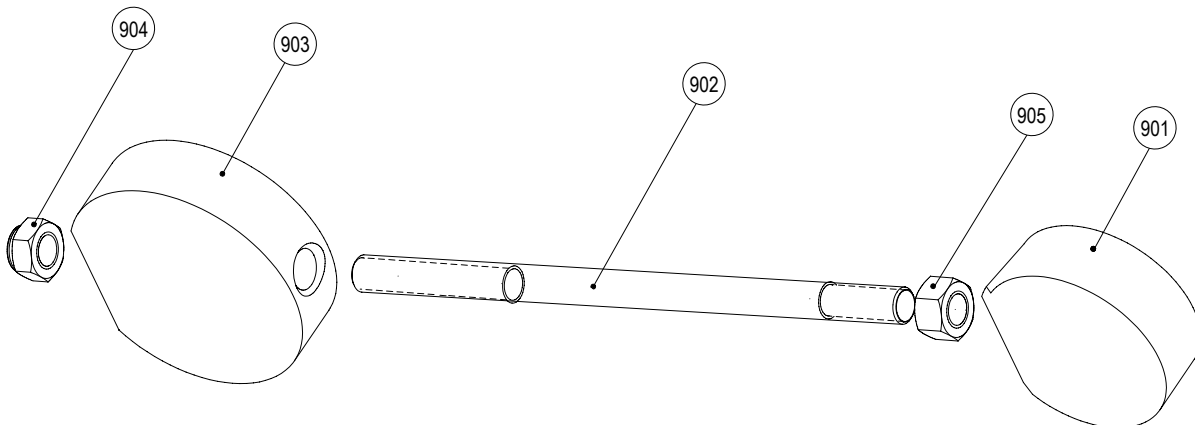
DRUM SUPPORT GROUP

ITEM NO.	DESCRIPTION	PART NO.	QTY.
701	Hub, outer	28799	1
702	Ring, internal retaining	28814	1
703	Bearing, roller	28815	1
704	Grease fitting	18047	1
705	Drum support	103785	1
706	Retaining ring, external	28813	1
707	Seal	28816	1
708	Carrier, seal	28808	1
709	O-ring	28973	1

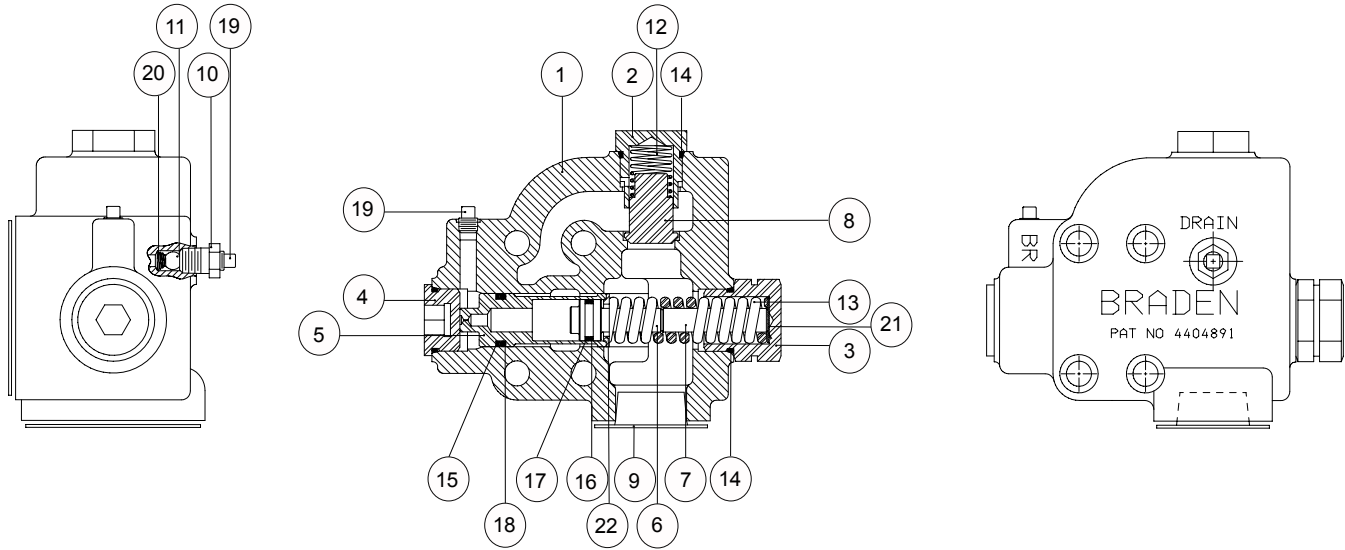


CABLE CLAMP GROUP

ITEM NO.	DESCRIPTION	PART NO.	QTY.
901	Cable anchor	103283	1
902	Cable clamp rod	103284	1
903	Cable clamp	103282	1
904	Nut, self-locking nylon insert	29659	1
905	Nut, hex	101439	1

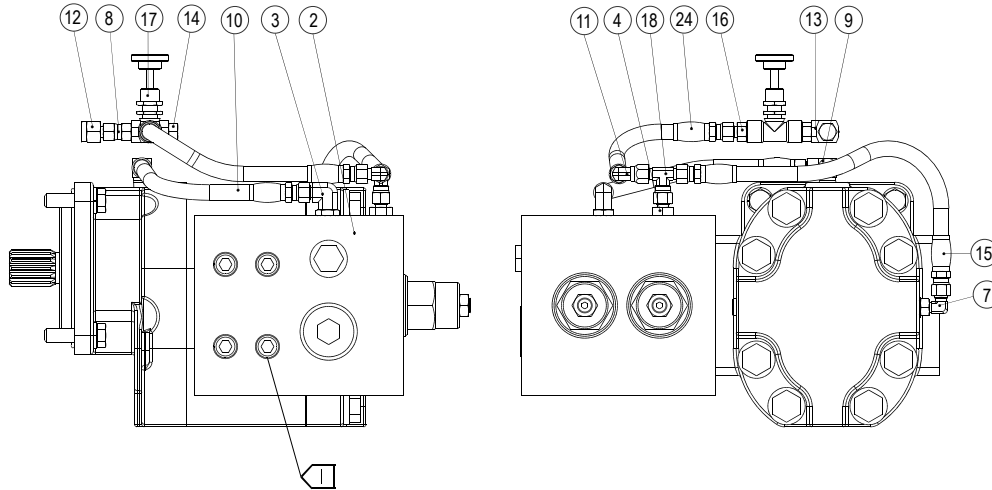
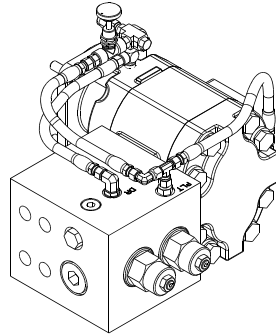


BRAKE VALVE ASSEMBLY



ITEM NO.	DESCRIPTION	PART NO.	QTY.
802	Brake valve assembly	81609	1
1	Brake valve housing	NSS*	1
2	Valve spring retainer	24424	1
3	Spring retainer	101016	1
4	Plug	24420	1
5	Brake valve piston	NSS*	1
6	Damper piston	NSS*	1
7	Damper piston extension	101017	1
8	Check valve poppet	NSS*	1
9	Shipping plug	NSS*	2
10	Reducer	24436	1
11	Ball, steel	24428	1
12	Check valve spring	24190	1
13	Main piston spring	24434	1
14	O-ring	24186	2
15	Backup ring	24778	1
16	O-ring	24776	1
17	Backup ring	24777	1
18	O-ring	21123	1
19	Pipe plug	18009	2
20	Check spring	25373	1
21	Shim, valve spring	25662	1
22	Spring seat	101015	1
* NSS – Not serviced separately.			

HIGH-FLOW BRAKE VALVE ASSEMBLY



NOTE:

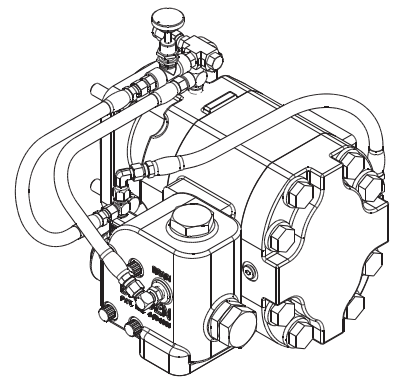
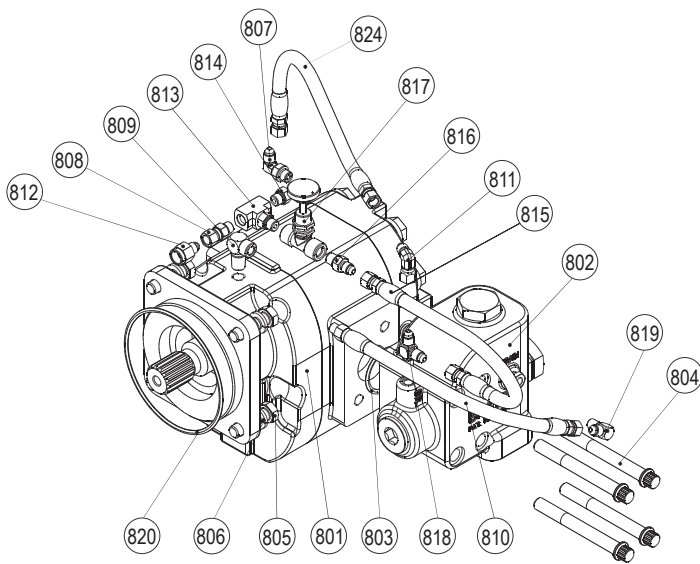
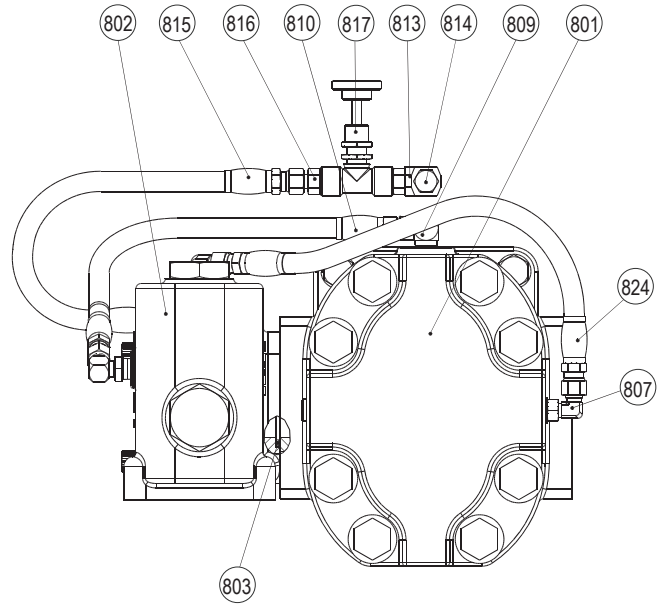
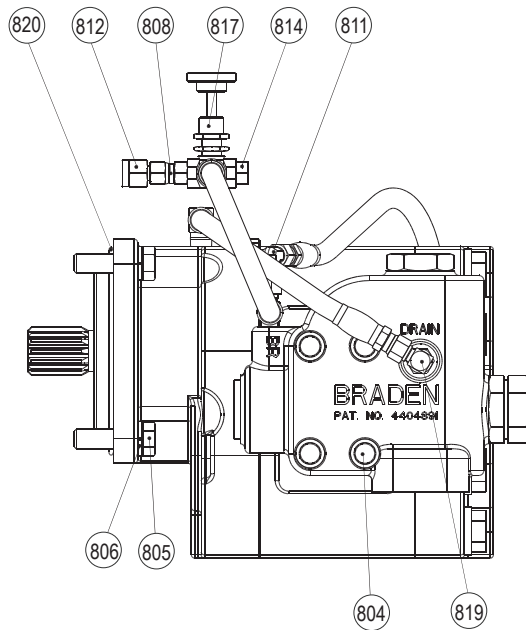
BRAKE VALVE ASSEMBLY (ITEM 2) INCLUDES CAPSCREWS AND O-RING

ITEMS NOT SHOWN:

WARNING TAG

ITEM NO.	DESCRIPTION	PART NO.	QTY.
2	Brake valve assembly – high flow	104433	1
2A	Cartridge, counterbalance valve	104014	2
	Cartridge seal kit	64666	1
2B	Cartridge, check valve	109114	1
	Cartridge seal kit	64667	1
3	Elbow	25131	1
4	Adapter	31284	1
7	Elbow fitting	25302	1
8	Adapter	103947	1
9	Reducer elbow	24236	1
10	Hose assembly, -2 / -4 x 14.0 inches (356 mm)	13705	1
11	Elbow	26140	1
12	Reducer	27452	1
13	Tee	103565	1
14	Plug (-4 SAE)	25663	1
15	Hose assembly, -4 x 17.0 inches (432 mm)	25750	1
16	Adapter	25864	1
17	Needle valve	103936	1
18	Swivel tee	25748	1
21	Warning tag	25257	1
24	Hose assembly, -4 x 14.0 inches (356 mm)	25935	1

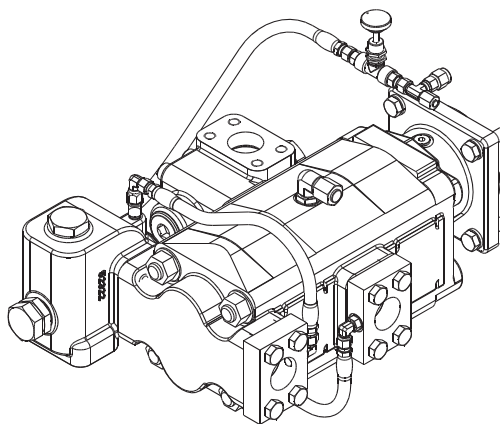
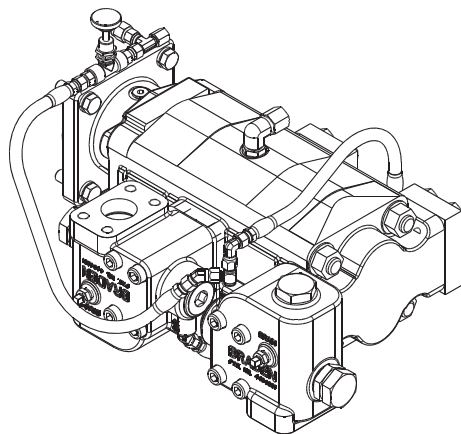
HYDRAULIC MOTOR ASSEMBLY — GEAR TYPE



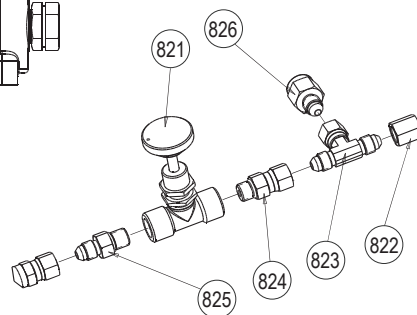
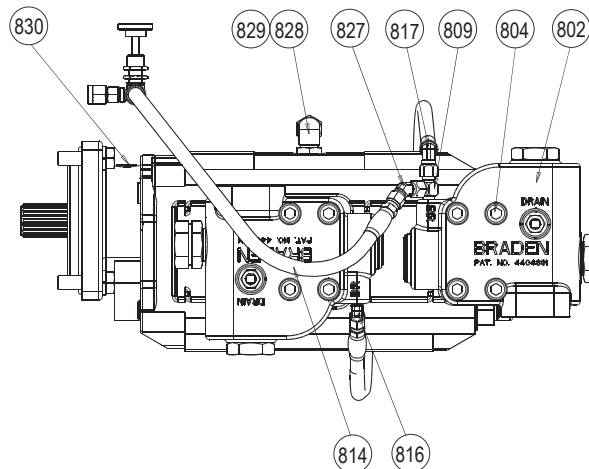
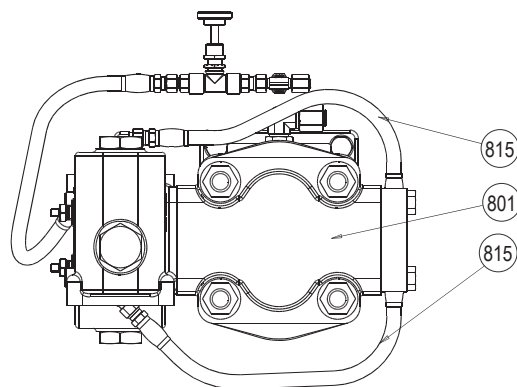
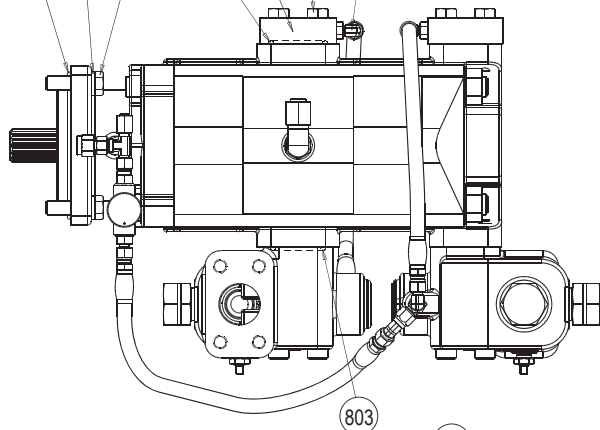
HYDRAULIC MOTOR ASSEMBLY — GEAR TYPE

ITEM NO.	DESCRIPTION	PART NO.	QTY.
800	Hydraulic motor GP (012)	63271	1
801	Hydraulic motor (12.03 CID)	100042	1
801A	Motor seal kit (for Parker WM76 motors)	64072	1
	Motor seal kit (for Permco 7600 motors)	64094	1
802	Brake valve assembly	81609	1
803	O-ring	13542	1
804	Capscrew, 12-pt (1/2 – 13 x 4-1/2)	103407	4
805	Capscrew, hex head (1/2 – 13 x 1-3/4, Grade 8, Z)	104323	4
806	Lockwasher (1/2, Z)	11026	4
807	Elbow	25302	1
808	Adapter	103947	1
809	Elbow	24236	1
810	Hose assembly, -4 x 14.0 inches (356 mm)	13705	1
811	Elbow	26140	1
812	Reducer	27452	1
813	Tee	103565	1
814	Plug	25663	1
815	Hose assembly, -4 x 17.0 inches (432 mm)	25750	1
816	Adapter	25864	1
817	Needle valve	103936	1
818	Tee	24526	1
819	Elbow	21163	1
820	O-ring	10330	1
821	Warning tag (not shown)	25257	1
823	Flange protector	NSS*	2
824	Hose assembly, -4 x 14.0 inches (356 mm)	25935	1
* NSS – Not serviced separately.			

HYDRAULIC MOTOR ASSEMBLY — TANDEM



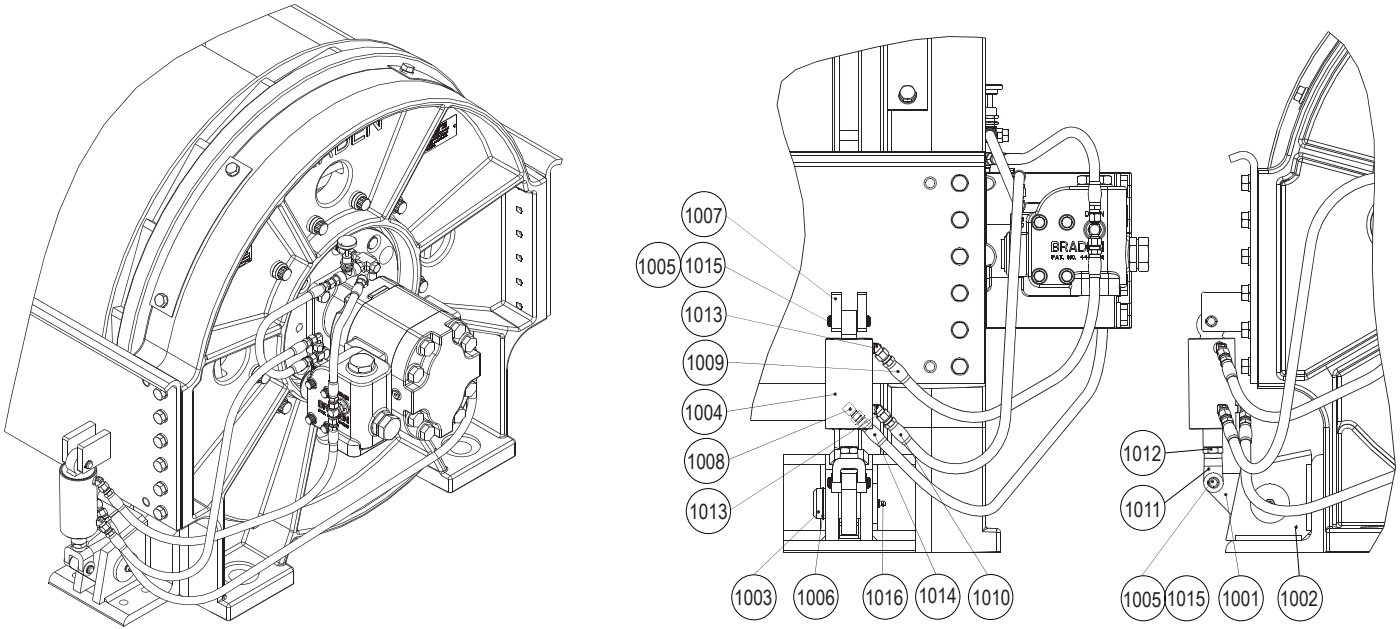
810 806 818 812 813 805 807



HYDRAULIC MOTOR ASSEMBLY — TANDEM

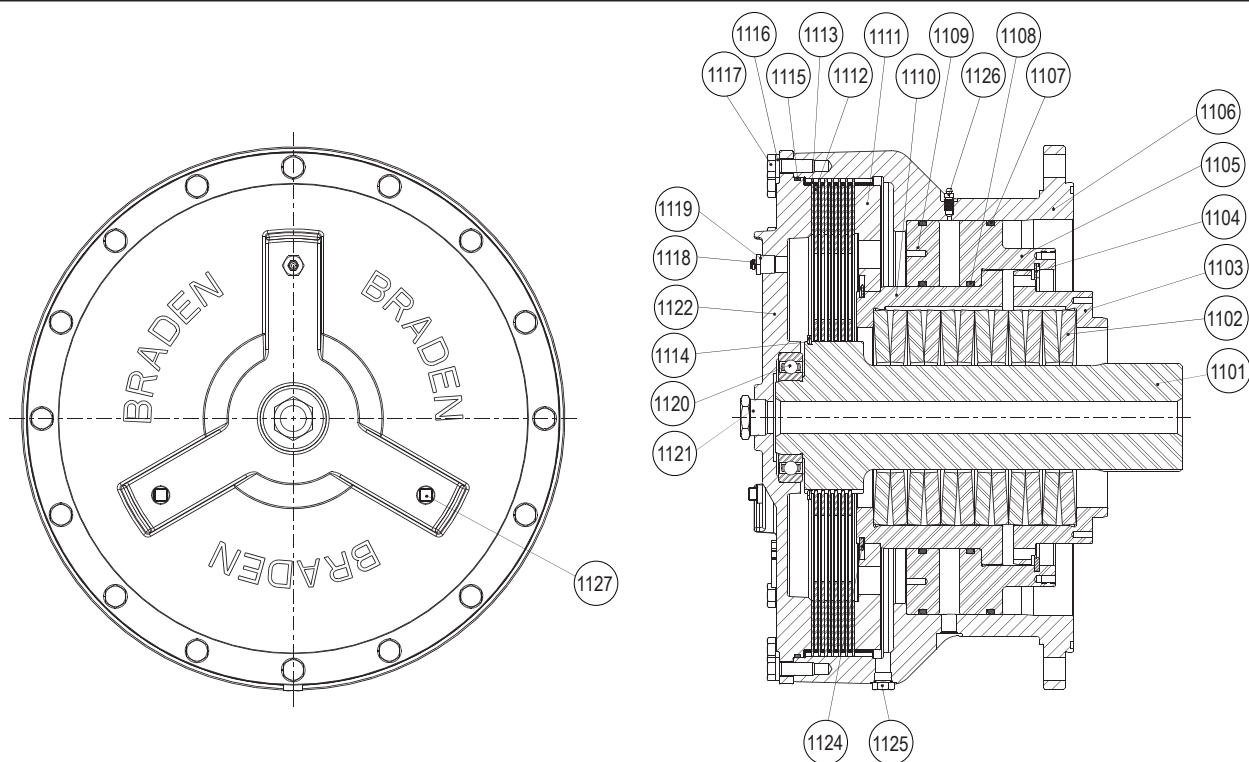
ITEM NO.	DESCRIPTION	PART NO.	QTY.
800	Hydraulic motor assembly (14.4 CID)	83687	1
	Hydraulic motor assembly (12.6 CID)	83599	1
801	Hydraulic motor – WM365 tandem (14.4 CID)	103264	1
	Hydraulic motor – WM365 tandem (12.6 CID)	103584	1
802	Brake valve assembly	81609	2
803	O-ring	13542	2
804	Capscrew, hex socket head (1/2 – 13 x 4-1/2, Z)	23690	8
805	Capscrew, hex head (1/2 – 13 x 1-1/2, Grade 8, Z)	104322	8
806	Lockwasher (1/2, Z)	11026	4
807	Elbow fitting	25302	2
809	Tee	24526	1
810	O-ring	10330	1
811	Bolted flange protector	NSS*	2
812	O-ring	72101	2
813	Manifold spacer	103483	2
814	Hose assembly, -4 x 18.0 inches (457 mm)	72318	1
815	Hose assembly, -4 x 14.0 inches (356 mm)	25935	2
816	Elbow	21165	2
817	Elbow	26140	1
818	Capscrew, hex head (1/2 – 13 x 1-3/4, Grade 8, Z)	104323	4
821	Needle valve	103936	1
822	Cap nut	70182	1
823	Swivel tee	25748	1
821	Adapter	103947	1
825	Adapter	25864	1
826	Reducer	27452	1
827	Union	70122	1
828	Elbow	70109	1
829	Cap	29908	1
830	Plug	25665	1
---	Warning tag, not shown	25257	1
* NSS – Not serviced separately.			

RATCHET AND PAWL ASSEMBLY



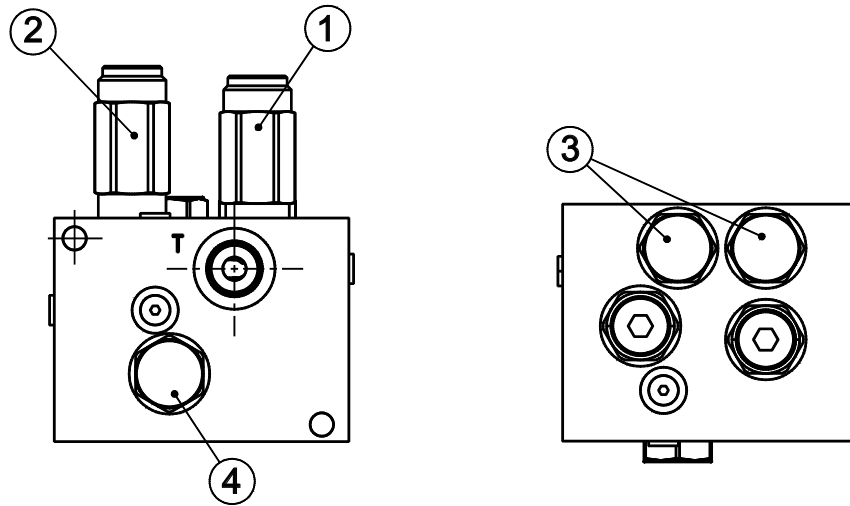
ITEM NO.	DESCRIPTION	PART NO.	QTY.
1000	Ratchet and pawl group	64100	1
1001	Pawl assembly	40155	1
1001A	Bearing	24921	1
1002	Pivot base	24871	1
1003	Pin	24876	1
1004	Cylinder assembly	81663	1
1005	Pivot pin	104153	2
1006	Snap ring	12035	1
1007	Mounting plate	52495	2
1008	Elbow	21163	1
1009	Cap nut	70182	3
1011	Clevis	24882	1
1012	Jam nut	18004	1
1013	Elbow	21165	2
1015	Retaining ring	101082	4
1016	Grease fitting	18047	1

AUXILIARY BRAKE ASSEMBLY



ITEM NO.	DESCRIPTION	PART NO.	QTY.
1100	Auxiliary brake assembly	83333	1
1101	Brake shaft	105596	1
1102	Disc spring	105135	12
1103	Spring retainer	105168	1
1104	Retaining ring	105226	1
1105	Piston	105172	1
1106	Brake housing	105157	1
1107	O-ring	107860	2
1108	O-ring	107859	2
1109	Seal ring	105173	1
1110	Spring retainer	105167	1
1111	Pressure plate	105175	1
1112	Friction disc	105134	6
1113	Separator plate	105133	7
1114	Retaining ring	108050	1
1115	O-ring	29296	1
1116	Lockwasher (5/8, Z)	102423	16
1117	Capscrew, hex head (5/8 – 11 x 1-3/4, Grade 8, Z)	103249	16
1118	Relief valve	18062	1
1119	Reducer	18066	1
1120	Ball bearing	24486	1
1121	Sight gauge	29102	1
1122	End cover	105156	1
1124	Retaining ring	105227	1
1125	Plug	70117	1
1126	Bleeder fitting	27472	1
1127	Pipe plug	18010	2

COMBINATION VALVE ASSEMBLY



ITEM NO.	DESCRIPTION	PART NO.	QTY.
1	Relief valve	107025	1
1A	Seal kit for Item No. 1	64050	1
2	Pressure red. Valve PR50	107026	1
2A	Seal kit for Item No. 2	64051	1
3	Load shuttle valve	107027	2
3A	Seal kit for Item No. 3	64049	1
4	Check valve	107028	1
4A	Seal kit for Item No. 4	64048	1

METRIC CONVERSION TABLE

English to Metric

Metric to English

LINEAR

inches (in.)	X 25.4	= millimeters (mm)	millimeters (mm)	X 0.03937	= 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)	centimeters ³ (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)	meters ³ (m ³)	X 35.315	= feet ³ (cu.ft.)
fluid ounce (fl.oz.)	X 29.57	= milliliters (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/cm ²)	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

$$^{\circ}\text{Celsius} = 0.556 (^{\circ}\text{F} - 32)$$

$$^{\circ}\text{Fahrenheit} = (1.8^{\circ}\text{C}) + 32$$

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

