

# It Ain't Just Oil

**By Mike Weinberg  
Contributing Editor**

One thing we have seen that is consistent in the repair industry has been an unprecedented explosion of new and changing technology. An amazing number of new transmission and transfer-case designs soon will be appearing in your shop. The ever-increasing use of computer and electronic controls has made all the units more sophisticated, and diagnosis is becoming a stand-alone specialty.

*continues page 82*

## Borg Warner Transfer Cases

Unit #	RSG Lube	Qts Needed
1345	RSG-400+	4
1350	RSG-400+	2
1354	RSG-400+	2
1356	RSG-400+	4
1370	RSG-400+	4
4401	RSG-400+	4
4404	RSG-530GM	2
4405	RSG-400+	3
4406	RSG-400+	4
4407	RSG-400+	5
4410	RSG-400+	3
4411	RSG-400+	3
4416	RSG-400+	4
4472	RSG-530GM	3
4473	RSG-400+	3
4476	RSG-400+	4
4481	RSG-400+	4
4482	RSG-400+	4
4484	RSG-400+	4



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- Carbon fiber synchro rings
- Steel 3-4 shift forks
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1st	2nd	3rd	4th	5th	6th
2.98	1.99	1.35	1-1	.86	.73
2.71	1.79	1.30	1-1	.89	.75
2.62	1.73	1.35	1-1	.86	.73
2.29	1.60	1.21	1-1	.85	.76*

\*(Close Ratio)

## Up To Standards

### New Process Transfer Cases

Unit #	RSG Lube	Qts Needed
119	RSG-530GM	3
126/226	RSG-TRAK II	3
128/129	RSG-530GM	3
136	RSG-TRAKII	3
149	RSG-530GM	3
203	RSG-150GM	5
205	RSG-150GM	3
207	RSG-530GM	3
208	RSG-530GM	5
219	RSG-530GM	3
228/229	RSG-530GM	3
231	RSG-530GM	3
233	RSG-530GM	3
236/246	RSG-TRAK li	3
241	RSG-530GM	3
242	RSG-530GM	3
243	RSG-400+	3
244	RSG-530GM	3
247	RSG-247M	3
249	RSG-530GM	3
261	RSG-530GM	3
263	RSG-530GM	3
271/273	RSG-530GM	5

### New Venture Transmissions

Unit #	RSG Lube	Qts Needed
HM290/ 5LM60/3500	RSG-150GM	3
NV 3500	RSG-150GM	3
NV 4500	RSG-GL65	5
NV 5600	RSG-GL65	5
T350/A578/F5 MC1	RSG-9417	3

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mileage warranty  
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• Huge O.E. parts inventory  
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correct fluid. It may take several hundred miles of driving to get the ring linings to purge the wrong oil and begin to operate correctly. This is generally what you would call a tough sale to make to a customer who has just put a big dent in a credit card by paying your bill.

The discussion here is about using the correct factory-specified lube for your application and some suggested substitutes that can be used to improve transmission performance and durability. Do not experiment on your own unless you have the time and manpower to conduct research in a controlled environment or are in a last-ditch attempt to cure a problem and stay out of court. All the lube recommendations you see here have been made after testing and research that we have performed on countless gearboxes and transfer cases and have been proven to improve shift quality and increase durability over tens of thousands of miles.

Many units are specified to run on ATF, usually Dexron 3. This was started many years ago to eliminate cold-shift complaints on units that then were running 90-weight gear oil in cold climates. The transmissions were very difficult to shift until the lube warmed up.

There has been a lingering feeling in the trade that somehow ATF was not up to the job of running standard transmissions. This has always seemed strange to me, because if the repair industry had to test its finished product as the OEM manufacturers do, no shops could afford to be in business.

For instance, when the carmakers come up with a new synchro technology or a new transmission design, they usually order 2,000-plus pieces of the new design, build a number of units and proceed to shift them on test stands


and on the road to destruction. When these parts have been made to last through hundreds of thousands of shift cycles and countless road miles and the design has been improved to the point of diminishing returns, the part will be validated for production use.

ATF and synthetic ATF are


wonderful lubricants. They are the lube fill for virtually every automatic transmission and many standard gearboxes. The word synthetic gives the impression that these products are man made. Almost all lube oils are based on petroleum, with special additives combined to make the

*continues next page*

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Various Transmissions		
Unit #	RSG Lube	Qts Needed
AX15	RSG-150GM	4
AX5	RSG-150GM	4
BA10	RSG-150GM	3
FM145/146	RSG-150GM	3
GETRAG-360	RSG-GL65	4
M5R1	RSG-400+	3
M5R2	RSG-400+	4
Nissan Truck	RSG-1 50GM	3
NP535	RSG-150GM	3

Various Transmissions		
Unit #	RSG Lube	Qts Needed
RUG/OD	RSG-150GM	3
SM465	RSG-150GM	5
T-18/19	RSG-150GM	4
T45	RSG-400+	3
T5	RSG-400+	3
T56	RSG-400+	5
Toyota	RSG-150GM	3
Toyota R150/150F	RSG-150GM	4

entire package suitable for the job intended. Synthetic describes the cracking process used to refine the crude oil and realign the molecular structure to improve

on that created by Mother Nature. The main improvements that come with synthetic fluids are their inherent ability to handle higher temperatures without

oxidation and breakdown of the additive package.

There are drawbacks to the use of ATF in certain units, and we will make recommendations where it is safe to substitute other types of lube. One problem associated with ATF is that under certain operating conditions it has the ability to form a mist and vent from the transmission or transfer case undetected. Most of these units are "splash" lubricated, which means that the action of the geartrain throwing the oil around inside the case is enough to lube and cool the unit adequately.

Certain units are known to lose fluid through so-called evaporation or misting through the vent tube. This is very common on certain models of NP 231 transfer cases, particularly those that are used in vehicles without a front-axle disconnect. In these vehicles, the transfer-case chain is turning whenever the vehicle is in motion in two-wheel drive. The chain action causes the ATF to become a fine mist, which leaves the unit through the vent until oil levels are too low. The customer will never see a leak and also will never check his

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AWD Viscous Eliminators



**Rockland Standard Gear Inc.**

### JEEP Transfer Cases

All Jeep Transfer Cases are Remanufactured with the Latest G.E. Components  
\*Includes New Morse Chain

WRANGLER - 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

### FORD Transfer Cases

All Ford Transfer Cases are Remanufactured with the Latest G.E. Components  
\*Includes New Morse Chain

### Dodge Transfer Cases

All Dodge Transfer Cases are Remanufactured with G.E. Components  
\*Includes New Morse Chain  
\*Durango RT - Converts Full Time AWD to Select Trac or Command Trac

### GM Transfer Cases

All GM Transfer Cases are Remanufactured with the Latest G.E. Components with Updated Clutch Plates to Eliminate Chatter Problems

### Chatter-Free Transfer Case Lubricant

Prevent Costly T-Case Repairs  
• Eliminates driveline chatter and shudder in clutch-type transfer cases  
• Prevents clutch failure from lubricant breakdown  
• This is a lubricant not an additive  
\*Chatter-Free will not repair transfer cases that are already damaged!



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fluid level, as he would have to go under the vehicle with wrenches to do so.

We have substituted 5W-30 motor oil in these applications and the oil loss stops. Motor oil is safe to use in this application, because the transfer case does not have a pressurized lube system. If you put motor oil in a BorgWarner transfer case with a pressurized lube pump, it would fail in short order, because the pump is not designed to handle that type of viscosity.

Similar problems occur with the M5R1 and M5R2 transmissions in the Ford light-duty-truck line. These popular Mazda-built transmissions are specified to run on ATF but can suffer from the same misting problem. If you put higher-viscosity motor oil or gear lube in these units, they will not shift correctly and the unit will make a moaning noise as the input oil slinger tries to move a much-heavier fluid. These units should be run on synthetic ATF, and you should make your customer aware of the need to have the transmission fluid checked more frequently.

There are a great many new transfer-case models with computer-controlled clutch applications that require special fluids for proper clutch application and durability. Many of the GM units are specified to run on GM's Auto Trak II fluid for proper operation. It is still possible to have clutch concerns and chatter even when the correct fluid is installed. This is common with the NP 136 transfer cases used in the S10, Bravada and Astro vans. The typical tech call goes like this: "I took the transfer case apart and didn't find anything wrong with it. It chattered something terrible going around corners." This will happen with high-mileage units

where the fluid quality has failed with age. The fix here is to drain the fluid, replace it with new and add two bottles of Lubegard Red friction modifier. The chatter will continue for 100-200 miles of driving as the new fluid displaces the old in the clutch linings, but the results will be smooth operation again. Try the simple fixes first, and then take the unit apart if need be. To help you select the correct fluids, we have provided a lubrication guide for the most-popular units in the field.

Ignorance in our world is a really dangerous thing. Don't assume, don't guess; look up the specifications and use the correct oil. An incorrect oil will cause Neon transmissions to sing and not shift, NV 4500 units to weld themselves together (that makes a

great boat anchor), ZF transmissions to be noisy and shift poorly, and any number of transfer-case malfunctions. You can't go wrong with the factory fill unless research has been done to improve upon that. **TD**

## THE BOTTOM LINE:

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- 87 Useful information.
- 88 Not useful information.
- 89 We need more information.

## Put an End to Transfer Case Failures For Good!

**Extreme HD • AWD-To-Part-Time Conversions**  
**Slip-Yoke Eliminator Kits • AWD Low-Range Lockups**  
**AWD Viscous Eliminators**



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**JEEP Transfer Cases**  
All Jeep Transfer Cases are Remanufactured with the Latest O.E. Components  
\*Includes New Morse Chain

WHAULER - XJ TO RAZOR MODEL  
 CHEROKEE - XJ RAZOR MODEL, RAZOR  
 LIBERTY - XJ RAZOR MODEL  
 GRAND CHEROKEE - XJ RAZOR MODEL, RAZOR MODEL, RAZOR MODEL, RAZOR MODEL  
 CHEROKEE/WAGNER/EZLIE - RAZOR MODEL, RAZOR MODEL

Rockland Standard Gear can custom fit all of these transfer cases to any TJ, XJ, ZJ, WJ, XJ & XJ model

**231J Command Trac**  
w/ Slip-Yoke Eliminator



**247J & 248J AWD**  
Non-viscous - more MPG, less wear  
Perfect for warmer climates  
Retains safety of AWD



**FORD Transfer Cases**  
All Ford Transfer Cases are Remanufactured with the Latest O.E. Components  
\*Includes New Morse Chain

EXPLODER, MUSTANGER - SHANTZ SHANTZ SHANTZ  
 EXPLODER, MUSTANGER - SHANTZ SHANTZ  
 BRONCO - SHANTZ SHANTZ  
 BRONCO - SHANTZ SHANTZ SHANTZ SHANTZ SHANTZ  
 BRONCO S - SHANTZ SHANTZ  
 ASTORIA - RAZOR  
 PICKUP - SHANTZ SHANTZ SHANTZ SHANTZ SHANTZ  
 MUSTANG - SHANTZ SHANTZ  
 ESCORTER - SHANTZ SHANTZ

**Dodge Transfer Cases**  
All Dodge Transfer Cases are Remanufactured with O.E. Components  
\*Includes New Morse Chain  
• Durango RT - Converts Full Time AWD to Select Trac or Command Trac

DURANGO - RAZOR, RAZOR, RAZOR, RAZOR, RAZOR  
 DAKOTA - RAZOR, RAZOR, RAZOR, RAZOR  
 RAM PICKUP - RAZOR, RAZOR, RAZOR, RAZOR  
 RAM QUAD CAB - RAZOR, RAZOR, RAZOR, RAZOR  
 RANGELANDER - RAZOR, RAZOR

**GM Transfer Cases**  
All GM Transfer Cases are Remanufactured with the Latest O.E. Components  
with Updated Clutch Packs  
to Eliminate Chatter Problems

BLAZER - RAZOR, RAZOR, RAZOR, RAZOR, RAZOR  
 RAZOR, RAZOR, RAZOR, RAZOR, RAZOR  
 RAZOR, RAZOR, RAZOR, RAZOR, RAZOR, RAZOR  
 ALL PICKUPS - RAZOR, RAZOR, RAZOR, RAZOR, RAZOR  
 RAZOR, RAZOR, RAZOR, RAZOR, RAZOR, RAZOR  
 BLAZER - RAZOR, RAZOR, RAZOR, RAZOR, RAZOR  
 TRAILBLAZER, EXCALIBUR - RAZOR, RAZOR  
 COLORADO - RAZOR  
 HUMMER - RAZOR, RAZOR  
 ASTRO, SAVANNAH - RAZOR, RAZOR  
 EXPLODER, SHANTZ - RAZOR

\*Includes New Morse Chain

**Chatter-Free Transfer Case Lubricant**

Prevent Costly T-Case Repairs  
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