



DEXRON® Dry Dual Clutch Transmission Gear Box and Manual Transmission Fluid

1 Scope

1.1 Material Description. This specification covers a fluid intended for use worldwide in GM manual and dry dual clutch transmissions (dDCT) as initial and top off fill for the gear box.

1.2 Symbols. Not applicable.

1.3 Applicability. GM manual and dry dual clutch transmissions.

1.4 Remarks. None.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D92	ASTM D1193	ASTM D4739	ASTM D7043
ASTM D97	ASTM D1298	ASTM D5185	CEC L-45-99
ASTM D130	ASTM D1418	ASTM D5293	CEC L-48-A-00
ASTM D412	ASTM D2240	ASTM D5800	CEC L-084-02
ASTM D445	ASTM D2270	ASTM D6082	FED-STD-791
ASTM D471	ASTM D2983	ASTM D6304	ISO 37
ASTM D664	ASTM D4289	ASTM D6594	SAE J2643
ASTM D892	ASTM D4629	ASTM D6922	VW PV 1454

2.2 GM Standards/Specifications.

GMW3059

2.3 Additional References.

- All GM DEXRON® testing forms, including Form A, are available from the Team Leader for Service Parts Engineering and DEXRON® Licensing or the GM Automatic Transmission Fluid (ATF) and Gear Oil Committee Chairman, via GM SupplyPower at: <https://gmsupplypower.covisint.com/>, Collaborate, Document Library
- EHDPROC 11
- Getrag Part Number 001.8.0541.14
- Getrag Part Number 2870090637
- GM Part Number GM9273457
- GM Part Number GM9986354
- GMSSP180 Synchronizer Durability Test
- Safety and Industrial Hygiene (S&IH) Technical Standard (TS), S&IH TS 3.4-160-02
- Vehicle Fleet Testing, and Proving Ground Durability Tests

3 Requirements

3.1 Test Requirements. Form A (see 2.3) is required for testing to be started on gear lubricants pursuing DEXRON® Dry Dual Clutch Transmission (dDCT) gear box and manual transmission fluid approval.

3.2 Mechanical Requirements. Test procedures shall be conducted as specified, with no deviations, unless expressly written authorization is obtained from the GM Automatic Transmission Fluid and Gear Oil Committee. Test parts are to be used as received. Replacement or modification of any part shall be made only if directed in this specification or to replace damaged parts. The laboratory must target to the mean of the specified test conditions.

3.3 Physical Requirements. Fluids qualified under this specification shall conform to the test methods and requirements as listed in Appendix A, Table A1.

3.4 Approved Additive Chemistries. Fluids meeting this specification shall be manufactured using additive chemistries listed in Appendix A, Table A2.

3.5 Requirements for New Additive Chemistry Combinations.

3.5.1 Tests must be conducted by a certified laboratory.

3.5.2 Successful completion of Appendix A, Table A1 using these fluid blends.

3.5.2.1 Seventy-five percent (75%) candidate, 25% reference fluid.

3.5.2.2 Fifty percent (50%) candidate, 50% reference fluid.

3.5.2.3 Twenty-five percent (25%) candidate, 75% reference fluid.

3.5.2.4 If applicable, 50% candidate, 50% any previously approved chemistry other than the reference fluid.

3.5.3 Successful completion of a 241 000 km (150 000 mi) fleet test using the new candidate chemistry and blends of fluids from 3.5.2. A proposal for the fleet test shall be submitted to and approved by the GM Automatic Transmission Fluid and Gear Oil Committee before commencing the fleet test.

3.5.4 Any additional testing as directed by the GM Automatic Transmission Fluid and Gear Oil Committee.

3.6 Additional Requirements.

3.6.1 The test requirements given in this specification are minimum or maximum acceptance limits for valid tests. No adjustments for test precision are to be applied as test variability was considered in the determination of the requirements.

3.6.2 The GM Automatic Transmission Fluid and Gear Oil Committee reserves the right to require any additional tests that may be deemed necessary to ensure satisfactory performance of fluids submitted for qualification as DEXRON® Manual Transmission and dDCT Gear Box Fluid.

3.6.3 Validation Requirements. Testing necessary for validating the use of this lubricant shall be prescribed by Materials Engineering. Testing will include, but will not be limited to, tests included in Section 3 of this specification, vehicle fleet testing, and Proving Ground Durability tests.

3.7 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to obtain a GM-approved International Material Data System (IMDS) submission.

4 Manufacturing Process

Not applicable.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. All shipments of material or parts under contract or purchase order manufactured to this specification shall be equivalent in every respect to the initial samples approved by Engineering. There shall be no changes in either formulation or manufacturing processes permitted without prior notification and approval by Engineering. Lack of notification by the supplier constitutes grounds for rejection of any shipment. While samples may be taken from incoming shipments and checked for conformance to this specification, the supplier shall accept the responsibility for incoming shipments meeting this specification without dependence upon purchaser's inspection.

The series of tests used to approve each batch of product along with acceptance limits will be agreed upon by the purchaser and seller. The laboratory providing the certificate of analysis must also participate in a proficiency

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testing program (round robin) that is approved by the Fuels, Fluids, and Lubricants Global Subsystem Leadership Team (GSSLT) or designate. The Fuels, Fluids, and Lubricants GSSLT or designate must receive copies of the proficiency testing reports directly from the test program administrator.

5.4 Initial Source Approval. No shipment shall be made by any supplier until representative initial production samples have been approved by the Fuels, Fluids, and Lubricants Global Subsystem Leadership Team or designees meeting the requirements of this specification.

5.5 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS). For new product submissions, or when a change in chemical composition of an existing product has occurred, a complete copy of the Material Safety Data Sheet/Safety Data Sheet must be submitted in compliance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) requirements or other country-specific MSDS/SDS requirements. In addition, product MSDS/SDS submissions must be in compliance with specific country General Motors S&IH TS 3.4-160-02 where available.

5.6 Trademark Licensing. Licenses to use the trademark DEXRON® and related "DD" identification numbers are issued for fluids which have been tested by an independent laboratory and/or by General Motors, and subsequently approved by the GM Automatic Transmission Fluid and Gear Oil Committee.

Note: For information on qualification of service replacement fluids for use in General Motors transmissions, drive units and/or axles, contact, the Team Leader for Service Parts Engineering and DEXRON® Licensing or the GM Automatic Transmission Fluid and Gear Oil Committee Chairman via GM SupplyPower.

6 Approved Sources

Materials supplied to this specification must be approved by General Motors.

The appropriate GM Materials Engineering department(s) must confirm material as meeting the requirements of this specification. Any test data sheets of material submitted to General Motors for such confirmation (e.g., during Production Part Approval Process (PPAP)) under this material specification must list all properties and must apply corresponding test methods of this material specification.

For other GM locations, the responsible engineering group should be contacted to obtain the approved source in that individual country.

7 Notes

7.1 Glossary.

Reference: Something of known performance characteristics, designated by the GM Automatic Transmission Fluid and Gear Oil Committee.

7.2 Acronyms, Abbreviations, and Symbols.

μ	Coefficient of Friction
AC	Alternating Current
ARDL	Akron Rubber Development Laboratory, Incorporated
ARKL	Axialrillen-Kugellager
ASTM	ASTM International
ATF	Automatic Transmission Fluid
BOV	Base Oil Viscosity
Ca	Calcium
CCS	Cold Cranking Simulator
cP	Centipoise
cST	CentiStoke
DC	Direct Current
DCT	Dual Clutch Transmissions
dDCT	Dry Dual Clutch Transmission
DKA	Deutscher Koordinierungsausschuss
EHDPROC	Elastohydrodynamic Film Forming Properties of One Fluid

EOT	End of Test
EOV	End of Life Oil Viscosity
ES	Elastomer Standard
FZG	Forschungsstelle for Zahnrader and Getriebebau
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
GMDCT	GM Dual Clutch Transmission
GSSLT	Global Subsystem Leadership Team
IMDS	International Material Data System
KOH/g	Potassium Hydroxide Per Gram
KRL	Kugel Rollen Lager
KV	Kinematic Viscosity
MSDS	Material Safety Data Sheet
MT	Manual Transmission
No.	Number
P	Phosphorus
PPAP	Production Part Approval Process
ppm	Parts per Million
rpm	Revolutions per minute
S	Sulfur
S&IH	Safety and Industrial Hygiene
SAE	SAE International
SDS	Safety Data Sheet
Si	Silicon
SRE	Standard Rubber Elastomer
SSP	Standard-Synchronizations-Prufstand
Temp	Temperature
TS	Technical Standard
UHP	Ultra High Purity
VW PV	Volkswagen Photovoltaic
Wt	Weight
Zn	Zinc

8 Coding System

This standard shall be referenced in other documents, drawings, etc., as follows:

Material per GMW16612

9 Release and Revisions

This standard was originated in May 2011. It was first approved by the General Motors Automatic Transmission Fluid and Gear Oil Committee in September 2011. It was first published in September 2011.

Issue	Publication Date	Description (Organization)
1	SEP 2011	Initial publication.
2	MAR 2012	Revision. (Fuels, Fluids, and Lubricants Global Subsystem Leadership Team)
3	DEC 2013	Addition of GM Aeration Test, and revision of old test methods with new limit updates. (Fuels, Fluids and Lubricants Global Subsystem Leadership Team)
4	MAY 2018	Refresh. (Materials - Fuels, Fluids and Lubricants Global Subsystem Leadership Team)

Appendix A

Table A1: DEXRON® Manual Transmission and dDCT Gear Box Fluid Test Methods and Requirements

Test	Method	Requirement
Profile Test	Proprietary GM Test	Report
Appearance	Visual Inspection	Clear amber liquid
Elemental Analysis	ASTM D5185 ASTM D4629	Report, parts per million (ppm): Ca, P, S, Si, Zn Report, parts per million (ppm): Nitrogen
Water Content	ASTM D6304	0.10% weight maximum
Miscibility and Homogeneity FED-STD-791	ASTM D6922 3430-Compatibility 3440-Storage Solubility	No separation or color change at end of test using reference fluid PASS PASS
Kinematic Viscosity	ASTM D445	1: 35 cSt maximum at 40 °C (104 °F) 2: 6.50 cSt maximum at 100 °C (212 °F)
Viscosity Index	ASTM D2270	150 minimum
Brookfield Viscosity	ASTM D2983	2: 10 000 cP maximum at -40 °C (-40 °F)
Cold Cranking Simulator (CCS) Viscosity	ASTM D5293	-30 °C (-86 °F), Report, centipoise (cP) -35 °C (-95 °F), Report, centipoise (cP)
Density	ASTM D1298	Report, typical 0.856 g/mL
Pour Point	ASTM D97	-45 °C maximum (-49 °F)
Flash Point	ASTM D92	180 °C minimum (356 °F)
Total Base Number	ASTM D4739	Report, milligrams of potassium hydroxide per gram (mg KOH/g)
Total Acid Number	ASTM D664	Report, milligrams of potassium hydroxide per gram (mg KOH/g)
Copper Corrosion	ASTM D130, 100 h, 150 °C	1B or better
Deutscher Koordinierungsausschuss (DKA) Oxidation Stability	CEC L-48-A-00 170 °C for 192 h Method B	1: ΔKV100 (%), maximum 30 2: ΔKV40 (%), maximum 40 3: VI Change, Report 4: ΔTAN (mg KOH/g fluid), Report, committee decision 5: Sludge rating of flask, maximum 2.0 6: Blotter, report with photo
Shear Stability, Kugel Rollen Lager (KRL)	CEC L-45-99, 40 h at 100 °C	Percent (%) loss of KV100, maximum 10% End of Test (EOT) KV100, minimum 5.5 (BOV+EOV)/2, minimum 5.0
Wear Test	ASTM D7043 Modified: A: 80 °C ± 3 °C B: 6.9 MPa C: 11.35 L (3 gal) Canister D: Conestoga Pump Parts	10 mg weight loss (maximum)